Date: 2015-09-17
Session: Short Oral Communications Foot & Ankle
Time: 08:30 - 10:00
Room: Yunfu Hall

Abstract no.: 40691

IN VIVO KINEMATIC STUDY OF THE TARSAL JOINTS COMPLEX BASED ON FLUOROSCOPIC 3D-2D REGISTRATION TECHNIQUE

Chen WANG, Xin MA, Xu WANG, Jiazhang HUANG, Chao ZHANG, Li CHEN, Jian XU, Xiang GENG

Background: The in vivo kinematics of the tarsal joints during normal gait are still unclear. Materials and methods: One fresh lower leg specimen was used to evaluate the accuracy of 3D to 2D registration procedure when applied in the tarsal joints. RSA was the gold standard while the spatial motions of each bone and joint measured by the radiographic 3D to 2D registration technique were compared to the RSA results in 6 degrees-of-freedom. Seven healthy subjects were recruited and the in vivo motions of each tarsal joint during stance phase of gait were obtained by utilizing the validated 3D to 2D registration technique. Results: The NCJ was associated with greatest out-plane translational error of 2.54 ± 0.67 mm while the subtalar joint have the largest rotational error of -1.3 ± 2.3◦. For the in vivo kinematics, TNJ had largest ROMs with 7.3±2.7°on the dorsiflexion/plantarflexion, 21.1±4.6°on the eversion/inversion and 16.1±4.4°on the external/internal rotation. From heel strike to midstance, the TNJ, STJ and CCJ were associated with 5.9°, 5.0°and 3.9°of dorsiflexion; 15.4°,8.2° and 5.8°of eversion and 9.7°, 7.6°and 4.9°of external rotation while from midstance to the heel off, associated with 6.3, 6.1°and 4.4°of plantarflexion;18.5°, 11.8°and 6.3°of inversion and 13.9°, 9.6°and 7.5°of internal rotation respectively. Conclusion: The single plane 3D to 2D registration technique could accurately measured the in vivo kinematics of the tarsal joints. The TNJ was associated with the greatest rotational mobility during stance phase. Synchronous and homodromous rotational motions were detected for TNJ, STJ and CCJ during the whole stance

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Abstract no.: 41836

A NOVEL STAGED TREATMENT FOR HIGH ENERGY PILON FRACTURE

Jianfeng XUE, Zhongmin SHI

Objective to analysis the clinical result of the novel staged treatment for high energy Pilon fracture. Method From Feb 2011 to Feb 2012 17 patients with type c3 Pilon fracture were treated with a new staged technique. Posterior approach was used in the primary surgery to reduce and fix the fibula and posterior fragment of tibia, which convert the fracture into type B. Definitive treatment were carried out with anterior approach after the soft tissue edema has subsided. AOFAS score was used to evaluate the clinical results. Result All of the patient get full follow-up (24~30 months). The fracture united in 6~9 months. Superficial necrosis of the anterior incision happened in 3 patients, and the wounds healed after local treatment and oral antibiotics. At final follow-up, the mean AOFAS score was 85.2, and range of ankle motion was 32.2°. Conclusion Risk of soft tissue complication was reduced with staged procedure, and since the posterior malleolar fragment were reduced primarily, definitive reconstruction of the distal tibial articular surface become relatively easier.

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Abstract no.: 39526

CLOSE REDUCTION AND PERCUTANEOUS SCREW FIXATION FOR TALAR NECK FRACTURES

Hu WANG

Purpose: Our hypothesis focused on closed reduction and percutaneous fixation of talar neck fractures can have lower rates of AVN and possibly improve clinical outcomes for patients who sustain talar neck fractures. Methods: 20 patients with talar neck fractures were emergency operated on by percutaneous reduction and percutaneous fixation with 4.5 mm cannulated screws, intro-operative using the CT confirm anatomical reduction and MRI monitoring hawkin sign and talus body necrosis. Injuries were classified according to modified Hawkins classification system. Recording the Visual Analogue Scale (VAS) and the AOFAS score , Hawkins sign,and complicaitons. Results: 20 patients were followed up over 24-60 monthes. A total of 20 fractures were classified as 5 had Hawkins type I injuries, 12 had Hawkins type II and 3 had Hawkins type Ⅲ.The me
Scale was 90.25 points (range: 85–97) and mean VAS was 1.2 points (rang:0-3) when walking on weighting. One patient with the cannulated screws on the incorrect position, no infected and nerve or vascular injured , one patient with subtalar traumatic arthritis, the VAS was 3 point ; one case with Hawkins type Ⅲ talus appear talar bo collapse and not need to treatment. 15 patients were observed the Hawkins sign between 8 to 12 weeks postoperative, 5 patients were not observed the Hawkins sign, inclinding one was talar body osteonecrosis demonstrate by MRI. Conclusion: Percutaneous reduction and fixation is a good method for treating the talus neck fractures, with low rate complication and good fuction outcomes, but only for simple displacement and anatomic reduction cases

Date: 2015-09-17
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Abstract no.: 39836

TREATMENT STRATEGY AND INTRAOPERATIVE DIAGNOSIS OF ACUTE ANKLE FRACTURE WITH DELTOID LIGAMENTS INJURY

Kai WU, Jian LIN, Jianhua HUANG, Qiugen WANG

Objective: To discuss the diagnosis value of tap test in acute deltoid ligaments rupture, and compare the outcomes of acute ankle fractures with deltoid ligaments injury treated with deltoid ligaments repair vs. transsyndesmotic fixation. Methods: Tap tests were performed during the fixation of 51 ankle fractures, who were suspected to be combined with deltoid ligaments injury. Those with positive results of tap tests were randomly assigned to two groups, and treated with deltoid ligaments repair with suture anchor or transsyndesmotic fixation respectively. All the subjects were assessed by AOFAS score system and VAS score system. Results: 45 cases were enrolled. 24 of them were assigned into syndesmotic screw group, and others were into deltoid repair group. Only three cases lost follow-up finally. At the final follow-up, all cases had achieved bony healing. The average AOFAS scores and VAS scores of the syndesmosis screw group were 85.2±7.54 和 1.56±1.20, and the data of the deltoid repair group were 87.5±6.30 和 1.79±1.47. There was no significant difference between these two groups regarding either AOFAS score or VAS score. The malreduction rate of transsyndesmotic fixation was 34.5%, whereas the rate of the deltoid repair group was only 5.26%. Conclusion: Integrity of deltoid ligaments has great effects on diastasis of the syndesmosis and widening of the medial clear space. Deltoid ligaments repair has the same outcomes as transsyndesmotic fixation, but it has lower malreduction rate. Tap test is of higher value to diagnosing of deltoid ligaments injury and verifying the effects of the treatments.

Date: 2015-09-17
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Abstract no.: 41723

MINIMALLY INVASIVE OSTEOTOMY AND FIXATION WITH ILIZAROV FIXATOR FOR THE TREATMENT OF CALCANEAL FRACTURES MALUNION

Lei LIU

Objective: to evaluate the clinical results of the Ilizarov fixator for the treatment of calcaneal fractures malunion. Methods: From November 2013 to February 2014, 15 patients with calcaneal fractures malunion were managed with Minimally invasive calcaneal osteotomy and Ilizarov fixator in our department, including 10 males and 5 females with an average age of 38.3years(23-56 years) . All patients underwent radiography including axial, lateral views and 3D CT imaging reconstruction befor surgery, and we applied the American 0rthopaedic Foot and Ankle Society(AOFAS) ankle and hindfoot score to assess the ankle joint function preoperativelv and at the last follow-up. The calcaneal osteotomy was performed through primary fracture line and we started to adjust the fixator 7 days after operation. Results: All 15 patients were followed up from 12 months to 17 months with an average of 15.4 month. The average bone reunion time is 13 weeks (12-15 weeks) and the fixator was maintained in patinets for 20-22 weeks. According to the AOFAS scale for ankle and hind foot there were 2 (13%) excellent, 8 (53%) good, 3 (23%) fair, and 2 (13%) poor results. The average score was 84 with a range of 58 to 92. There is no complications. Conclusion: Ilizarov fixator is an effective technique for the treatment of calcaneal fractures malunion with less invasion and little complication.

Date: 2015-09-17
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Abstract no.: 41720

TREATMENT OF TRAUMATIC TALIPES EQUINOVARUS WITH ILIZAROV FIXATOR

Lei LIU

Objective: to evaluate the clinical results of the Ilizarov fixator for the treatment of the traumatic talipes equinovarus. Methods: From July 2013 to January 2014, 15 patients with traumatic talipes equinovarus were managed with Ilizarov fixator in our department, including 10 males and 5 females with an average age of 38.3years (23-56 years) . 8 patients were treated only by Ilizarov fixator ; the limited release of soft tissue were performed in 5 patients; the dynamic muscle balance operation were performed in 2 patients with imbalance of muscle strength. We started to adjust the Ilizarov fixator slowly one week after operation. After the removal of the fixator we use plaster to maintain the neutral positon of ankle. We use X-ray to monitor the deformity correction and allow weight-bearing walking. Results: All 15 patients were followed up from 12 months to 18 months with an average of 15.4 month. All the patients achieved 0° dorsiflexion 5-8 weeks after the treatment while in the Ilizarov apparatus. The fixator was maintained in patinets for 9-12 months. All patients obtained satisfactory adjustment and had a good function. There are 5 cases of pin tract infection and were controlled by local wound care. Conclusion: Ilizarov fixator is an effective technique for the treatment of talipes equinovarus with less invasion and little complication.

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Abstract no.: 41143

CORRECTION OF POLIOMYELITIS FOOT AND LEG DEFORMITIES BY ILIZAROV TECHNIQUE

Md Mofakhkharul BARI

Introduction: Poliomyelitis is a common condition in developing countries and most of both treated and untreated cases result in knee, ankle and foot deformities. Leg shortening and complex foot deformities are very common in poliomyelitis. Materials and Methods: Between 1990 and 2013, 28 patients were treated by classic Ilizarov fixator aiming at producing a stable, plantigrade and cosmetically acceptable leg and foot. The types of deformities calculated before surgery were: equines foot (8) and equinocavovarus (6) and equino valgus (7) and equinovarus(3), vertical calcaneus (4). In 16 patients we observed LLD ranged from 3-7cm. we have performed different types of surgeries by Ilizarov technique by gradual controlled coordinated stretching (lengthening by mono focal corticotomy). Results: Our mean follow-up period was 5 years (range 2-16 years). The time in Ilizarov frame was 4 ½ months. All the patients were were satisfied with their gait, compared to pre-operative status. A painless, plantigrade foot was attained in all the patients and LLD was always corrected where needed. Residual varus and equinus deformity was observed in 3 cases and in 2 cases there was a stiff ankle. Discussion: Distraction method is coordinated correction of the leg and foot deformities is the best treatment option for poliomyelitis leg & foot deformity & considered to be safer than traditional method. Conclusion: The Ilizarov method and technique allows simultaneous progressive correction of all components of severe leg and foot deformities associated with LLD with minimal surgery reducing risks of neurovascular complications and avoiding important shortening of leg and foot.

Date: 2015-09-17
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Abstract no.: 41794

DISTRACTION ARTHRODESIS OF THE SUBTALAR JOINT FOR THE TREATMENT OF CALCANEAL MALUNION

Ying LI, Yong WU

Objective : To investigate the outcome of distraction arthrodesis of the subtalar joint for the treatment of calcaneal mal-union with loss of talocalcaneal height. Methods : The distraction arthrodesis of the subtalar joint is performed with a longitudinal incision, The union of the subtalar joint was analyzed. The height and hindfoot alignment was analyzed, and the AOFAS (American Orthopedic Foot and Ankle Society) score was assessed before and after the operation. Result : The average follow up time was 15.2months. All the longitudinal incision healed well. The post-operation X-ray film show the loss of the talocalcaneal height was 4mm (5mm improved), the decrease of talar declination angle was 10.2° (4.2°improved). For 4 previous valgus patients, the valgus angle was 2.9° (improved 9.7°), the average lateral shift was 12.3mm (5.1mm improved); For the patients in varus before the operation, varus angle is 9°(18°improved),the medial shift was 1mm (2mm improved) . AOFAS score improved from 33 preoperatively to 69 postoperatively. Delay union occurred in 1 smoker, non-union in 1 patient. ‘Z’ lengthening of the Achilles tendon was performed in 1 patient, 2 gastrocnemius recession was performed。

Conclusion : Distraction arthrodesis of subtalar joint is good to treat the calcaneal mal-union with loss of talocalcaneal height. More attention should be focused on the height and the alignment of the hindfoot. For some cases, lengthening of the Achilles and gastrocnemius should be done.

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Abstract no.: 39593

MEDIAL COLUMN SCREW WITH MINI-FRAGMENT LOCKING PLATE RAFTING TECHNIQUE FOR MININAL INVASIVE TREATMENT OF INTRA-ARTICULAR CALCANEAL FRACTURES

Zhongmin SHI

The aim of this study was to assess the clinical outcomes of surgical treatment for displaced intra-articular calcaneal fractures using rafting technique with mini-fragment locking plate via modified sinus tarsi approach and medial column screw to avoid varus deformity. In this retrospective study, a total of 16 patients (13 men and 3 women) with 16 displaced intra-articular calcaneal fractures were included. A modified sinus tarsi approach was used to reduce and stabilize the posterior facet using rafting technique with mini-fragment locking plate and multiple sagittal screws were added percutaneously to stabilize the calcaneal body and to control rotation. Intra-operative 3DCT was routinely used to evaluate the reduction and screw placement. Preoperative and postoperative Böhler's and Gissane angle were compared, American Orthopaedic Foot and Ankle Society (AOFAS) Ankle-Hindfoot scores and SF-36 scores were used to evaluate the final outcomes, and the complications were also recorded. The mean duration of follow-up was 18.4 months. The mean union time was 10 weeks. The mean preoperative Böhler's angle (13.4 ± 3.4 degrees), Gissane angle (88.1 ± 7.6 degrees) were significantly increased ($P < 0.05$) at final follow-up (25.5 ± 5.6, 116.2 ± 7.5, respectively). The mean postoperative AOFAS and SF-36 score was 83.3, 79.5 respectively. No wound edge necrosis, superficial or deep infection, or nerve injury were observed in these patients. The application of minimally invasive rafting technique using mini-fragment locking plate combined with percutaneous screw fixation is an effective option for displaced intra-articular calcaneal fractures.

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Abstract no.: 40063

ANATOMY OF THE 1ST AND 2ND LISFRANC JOINT SURFACE AND ITS CLINICAL SIGNIFICANCE

Chun-Guang LI

Introduction: To explore anatomic feature of the joint area of the first and second tarsometatarsal joints provide basis for treatment of Lisfranc injury. Define the injury of the screw across the first and second tarsometatarsal joints. Methods: 20 normal adult foot specimens were dissected. The joint area of the first and second tarsometatarsal joints were measured and analyzed respectively. Define the injury of the screw across the first and second tarsometatarsal joints. Results: The joint area of the first metatarsal was (3.13±0.32) cm2, second metatarsal was (2.15±0.31) cm2, the first cuneiform was (3.44±0.40) cm2,the second cuneiform was (1.70±0.30) cm2.The injury of the first tarsometatarsal joints surface of all the feet were the diameter of the screw, there are no damage of the surrounding area. The injury of the second tarsometatarsal joints of all the feet were the diameter of the screw when one screw across the joint. Six feet were the diameter of the screw when two screw across the joint. The injury of the second tarsometatarsal joints surface of 4 feet were not only the diameter of screw, but also the joint surface were fracture when two screw across the joint . Conclusions: Mean surface area of the first metatarsal base was smaller than the first cuneiform, the second metatarsal base was larger than the second cuneiform. We recommend the guidewire under fluoroscopic imaging and ensuring proper placement on the first pass for screw fixation of Lisfranc dislocations. We can also choose dorsal plate to treat the tarsometatarsal joint injury.

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Abstract no.: 39707

SURGICAL TREATMENT FOR MüLLER-WEISS DISEASE

Guangrong YU, Yunfeng YANG, Youguang ZHAO, Mingzhu ZHANG

Müller-Weiss disease is an uncommon osteonecrosis of the tarsal navicular of unknown etiology. From January 2008 to September 2014, we treated 49 patients suffering from Müller-Weiss disease, using the surgical arthrodesis of the talonavicular joint and naviculocuneiform joint with tricortical autologous iliac crest block fixed by screws and plate. They were 15 males and 34 females with a median age of 52.4 years. According to the Maceira staging system, 6 feet was grade 2, 20 feet were grade 3, 19 feet were grade 4, and 4feet were grade 5.We reviewed the medical records of the patients and took the radiological preoperative and postoperative evaluation. The preoperative and postoperative clinical functions were evaluated using the American Orthopaedic Foot and Ankle Society (AOFAS) ankle-hindfoot Scale. To treat Müller-Weiss disease, we introduced a surgical arthrodesis of the talonavicular joint and naviculocuneiform joint with tricortical autologous iliac crest bone block fixed by screws and plate. The median follow up was 26 months. All the feet fused solidly. The median time for complete fusion was 13 weeks. The median AOFAS ankle-hindfoot score improved from 45 points preoperatively to 86 points at last follow-up. In conclusion, the results of this series demonstrate the arthrodesis of the TNJ and NCJ with tricortical autologous iliac crest graft is a reasonable way for treatment of Müller -Weiss disease. Based on our experience with the patients, we believe that emphasis of the restoration of the length and alignment of the medial column could achieve a good outcome.

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Abstract no.: 39894

DIFFERENTIATED SURGICAL TACTICS AT HALLUX VALGUS OF I TOE

Saodat ASILOVA, Albert YUGAY, Bekzod UBAYDULLAEV, Avaz MIRZAIDOV

Background: The problem of valgus deformation of first toe steel not lost its actuality for today. In spite of variety operative techniques to correction given to pathology, the main defect there is a big volume interference on small anatomical segment, difficulty of the performance and often, unsatisfactory results of the treatment. The trend to minimization operative invasion in recent is also not avoid this problem, and the findings of the optimum method are in progress today. Purpose of the study: To improve treatment results of valgus deformation of first toe. Material and methods: Under observation from 2010 to 2015yrs were 59 patients. Valgus deformations of first toe were divided for 3 degrees (by author). Depending on of deformation degree, the treatment tactics will be different. Under I degree (29) to deformation patient treats conservative. The treatment is concluded in imposition of the splint between I and II toes, for lifting the heads of metatarsal bones under they are superimposed platen. Under II degrees (14) to deformation is conducted SERI-operation, modified by us. Under III degrees (16) to deformation is conducted operation Kramarenko-CITO. Results. There were studied remote results of the treatment of patients (80%) after surgical treatment. We have got the following results: good - 44 (75%), satisfactory - 14 (23%) and unsatisfactory - 1 (2%) patient. Conclusion. Thereby, differentiated tactics of the treatment of the patient deformation depending on degree I finger of the toe gives the good results (75%), which corresponds to the literary data.

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Abstract no.: 39377

DISTALLY BASED SURAL FLAP FOR FOOT AND ANKLE RECONSTRUCTION: A TECHNICAL PEDICLE EVOLUTION

Shi-Min CHANG

Introduction: Distally based sural flaps from the posterolateral or posteromedial lower leg aspect are initially a neurofasciocutaneous flap that can be transferred reversely to the foot and ankle region with no need to harvest and sacrifice the deep major artery. Its pedicle has evolved from a wide fasciocutaneous to a narrow perforator, including (1) fasciocutaneous, (2) adipofascial without overlying skin, (3) a perforator with intact septum, (4) a perforator-plus-adipofascial, and (5) a pure skeletonized perforator. However, flap venous congestion is yet an unsolvable problem postoperatively. Methods: The authors performed a various variations of distally based sural flaps of 56 cases, including (1) different levels of perforators, (2) different pedicle construction, (3) different flap constituents. Postoperatively, flap swelling was classified into a 5-grade assessment scale. Flap survival, complications and patient functional recovery were evaluated. Results: The overall complete total survival was 47 cases (84%), incomplete subtotal survival (distal partial necrosis) was 9 cases. Venous drainage was usually a special concern in hemodynamic physiology because the venous blood of the flap must reversely return to its distal pedicle against venous valves. Venous problems were one of the major reasons for flap complications and failures. Large superficial veins should be interrupted and ligated distal to the pivot point of the flap to prevent flap congestion and swelling. Conclusion: Distally based sural flaps are a versatile local reconstructive option for defects of the foot and ankle region. Flap venous drainage is still a major concern in clinical application.

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Abstract no.: 42397

SUPRAMALLEOLAR OSTEOTOMY FOR DISTAL TIBIAL VARUS DEFORMITY COMBINED ANKLE OSTEOARTHRITIS

Hongmou ZHAO

Objective: Distal tibial varus deformity is common in ankle joint osteoarthritis (OA) patients, the objective was to evaluate the functional outcomes of supramalleolar osteotomy in treatment of varus ankle deformity combined with osteoarthritis (OA) in adult patients, and review of the literature. Methods: From April 2007 to October 2012, twenty-two varus OA ankles were treated with supramalleolar osteotomy in our department, and contained 14 females and 8 males with a mean of 43.4 years old. According to modified Takakura stage, 14 were type-Ⅱ and 8 were type-Ⅲ. All of the included patients were treated with tibial medial opening osteotomies. Radiological angles and AOFAS scores were evaluated. A comprehensive search of relative literature in English from January 1995 to March 2014 was conducted. Results: The mean follow-up time was 38.3 months. The TAS improved from 78.6° (range 68° to 83°) to 89.0° (range 82° to 96°), with a significant improvement of a mean 10.4°. Also, the TTA and TLA were improved significantly (P<-- 0.01). The mean pre-operative AOFAS ankle-hindfoot score was 44.6 points (range 25 to 57 points), and the mean score at the last follow-up time reached 80.1 points (range 50 to 95 points), with a significant improvement of a mean 35.5 points, as well as the VAS scores. The scores were significantly higher in stage-Ⅱ OA patients comparing with stage-Ⅲ（P< 0.05). A review of relative literature included eight studies with 155 cases and a mean 55 months follow-up. The TAS and TLA and AOFAS scores were all improved significantly, and with a failure rate of 9%. Conclusions: We concluded that supramalleolar osteotomy could significantly improve the alignment and functional outcomes of varus ankle deformity; and the functional outcomes in patients with lower OA

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Abstract no.: 42396

ARTHRODESIS FOR TRAUMATIC FLAT FOOT CAUSED BY OLD MIDTARSAL FRACTURE DISLOCATION

Hongmou ZHAO

Objective: To evaluate the operation methods and short to mid-term outcomes of arthrodesis in treatment of flat foot caused by midtarsal fracture dislocation. Methods: From January 2009 to October 2013, Twenty-seven traumatic flat foot patients caused by midtarsal fracture dislocation were treated with arthrodesis in our department. Eighteen males and nine females with a mean age of 38.4 years (range 22 to 57 years) old, fourteen cases were left feet and thirteen were right. A retrospective analysis was used to evaluate the pro- and post-operative alignment of treated foot, and the AOFAS mid-foot score and VAS pain score were used to evaluate the functional outcome at the final follow-up time. Results: A total of 24 cases were followed with a mean time of 37.5 months (range 12 to 57 months). The talar first metatarsal angle and talar second metatarsal angle were significantly improved (P < 0.05) on weight-bearing anterior-posterior X-ray of foot. On the lateral weight-bearing X-ray, the Meary's angle was also significantly improved (P < 0.01), and the talocalcaneal angle was improved with no significant difference. The post-operative AOFAS mid-foot score was significantly improved in compare with the pre-operative score (30.5±14.9 vs. 81.5±6.3, P < 0.01), as well as the VAS scores (P < 0.01). Two patient was found with calcaneocuboid joint nonunion, and two skin necrosis were found; no deep infection or osteomyelitis was found. Conclusions: Midtarsal arthrodesis could significantly improve the alignment of traumatic flat foot caused by midtarsal fracture dislocation, and also could stable the arch of foot, and improve the symptoms. However, most of the patients could not reach the pro-injury motion level, early diagnosis and rational treatment still important to the midtarsal injury patients.

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Abstract no.: 42395

RESULTS OF CALCANEAL OSTECTOMY AND ACHILLES TENDON INSERTIONAL RECONSTRUCTION FOR ACHILLES TENDINITIS WITH HAGLUND'S DEFORMITY

Li CHEN

BACKGROUND: Insertional Achilles tendinosis is a clinical entity that commonly occurs with Haglund's deformity. Calcaneal ostectomy and complete detachment and reconstruction of the Achilles tendon were evaluated as a method of treatment for this condition. METHODS: Eleven consecutive patients (12 heels) who had Haglund's deformity with insertional Achilles tendinosis unrelieved by nonoperative measures were treated with the central Achilles-splitting technique. With The superior insertional fibers detached and degenerative tendon debrided, the inflamed bursal tissue was removed, and the prominent bone was resected. The central Achilles is reattached to bone with a speed bridge technique using suture anchors with fiber tape for a double-row suture fixation. Patients were evaluated preoperatively and postoperatively with the American Orthopaedic Foot and Ankle Society (AOFAS) Ankle-Hindfoot Scale. RESULTS: The AOFAS scores averaged 63.1 points preoperatively and 89.7 points postoperatively ($p < 0.001$). The procedures yielded eight excellent, two good and one fair at an average of twenty-eight months postoperatively. Complications included one infection, two altered sensation, and two heel tenderness. CONCLUSIONS: Calcaneal ostectomy and Achilles tendon insertional reconstruction is a feasible and efficient procedure for Haglund's deformity with insertional Achilles tendinosis. The functional and cosmetic results were satisfactory.

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Abstract no.: 40724

A SINGLE-DOSE INTRA-ARTICULAR MORPHINE PLUS BUPIVACAINE VERSUS MORPHINE ALONE FOLLOWING KNEE ARTHROSCOPY: A SYSTEMATIC REVIEW AND META-ANALYSIS

Guang-Hua LEI, Dong-Xing XIE

Objectives: the purpose of this study was to compare the efficacy and safety of a single-dose intra-articular morphine plus bupivacaine versus morphine alone. Methods: randomized controlled trials comparing a combination of morphine and bupivacaine with morphine alone injected intra-articularly after knee arthrocopic surgery were retrieved (up to August 10, 2014) from MEDLINE, the Cochrane Library and Embase databases. The weighted mean difference (WMD), relative risk (RR) and their corresponding 95 % confidence intervals (CIs) were calculated. Results: thirteen randomized controlled trials were included. Statistically significant differences were observed with regard to the VAS values during the immediate period (0-2h) (WMD -1.39; 95% CI -2.12 to -0.66; p = 0.0002) and the time to first request for rescue analgesia (WMD = 2.25; 95 CI 0.58 to 3.91; p = 0.008). However, there was no significant difference in the VAS pain score during the early period (2-6h) (WMD -0.64; 95% CI -1.36 to 0.08; p = 0.08), the late period (6-48h) (WMD 0.26; 95% CI -0.07 to 0.59; p = 0.12), and the number of patients requiring supplementary analgesia (RR = 0.78; 95% CI 0.57 to 1.05; p = 0.10). In addition, systematic review showed that intra-articular morphine plus bupivacaine would not increase the incidence of adverse effects compared with morphine alone. Conclusion: the present study suggested that the administration of single-dose intra-articular morphine plus bupivacaine provided better pain relief during the immediate period (0-2h), and lengthened the time interval before the first request for analgesic rescue.

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Abstract no.: 40704

SINGLE-DOSE INTRA-ARTICULAR BUPIVACAINE PLUS MORPHINE AFTER KNEE ARTHROSCOPIC SURGERY: A META-ANALYSIS OF RANDOMIZED PLACEBO-CONTROLLED STUDIES

Guang-Hua LEI, Yi-Lun WANG

Objectives: the purpose of this quantitative meta-analysis was to evaluate the efficacy and safety of single-dose intra-articular bupivacaine plus morphine after knee arthroscopic surgery. Data sources and study eligibility criteria: the comprehensive literature search, using Medline, the Cochrane Central Register of Controlled Trials, and EMBASE databases, was conducted in August 2014 to identify randomized placebo-controlled trials that used a combination of single-dose intra-articular bupivacaine and morphine for postoperative pain. Results: twelve articles were included in this meta-analysis. The acute postoperative visual analog scale (VAS) pain scores of the bupivacaine plus morphine group compared with the placebo group were significantly lower (WMD, -1.68; 95%CI: -2.17 to -1.19; p=0.000). The number of patients requiring supplementary analgesia was also significantly reduced (RR=0.60; 95%CI 0.39 to 0.93; p=0.02), while there was no significant difference in the time to first analgesic request (WMD=3.46; 95%CI -1.81 to 8.72; p=0.20), and short-term side effects (RR=1.67; 95%CI 0.65 to 4.26; p=0.29). Conclusion: the administration of single-dose intra-articular bupivacaine plus morphine after knee arthroscopic surgery is effective for pain relief, and with short-term side effects similar to those of the saline placebo.

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Room: Yunfu Hall

Abstract no.: 39956

ARTHROSCOPIC TREATMENT FOR OLD UNREDUCED POSTEROLATERAL ROTATORY DISLOCATION OF KNEE

Gang CHEN

Objective To explore the surgical treatment for neglected posterolateral rotatory dislocation of knee and evaluate the effect. Methods 16 cases with neglected knee posterolateral rotatory dislocation were performed surgical treatment, firstly release under arthroscopy, and then open reduction, lastly ligament reconstruction or repair in order to restore its stability. Those with fixed patellar dislocation were performed reduction and medial patellofemoral ligament reconstruction, among which two cases were performed modified medialization of tibial tuberosity. Patients with joint stiffness were fixed with external fixator across knee for six weeks. All cases were carried on preoperative and postoperative imaging examination and functional scoring. Results Tibiofemoral and patellofemoral congruence in all 16 cases was fully restored. Two cases of patients later underwent anterior cruciate ligament reconstruction, 1 case underwent posterior cruciate ligament revision, and functional status at the end of follow-up was satisfactory. Conclusion The treatment for neglected knee posterolateral rotatory dislocation combined arthroscopy with open surgery is relatively satisfactory, which applies new therapeutic approaches for this type of injury.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39685

A NEWRECOGNITIONOF THE MEDIAL ROTATORY WITH BUTTON LOCKED IRREDUCTIVE KNEE DISLOCATION

Jian LI

The medial rotatory with button locked irreducible knee dislocation is often irreducible with closed means as the medial femoral condyle button holes through the medial joint capsule, forcing the medial collateral ligament or other medial structures to invaginate into the joint. The use of medial rotatory is to highlight the damage structures. These type of dislocation was described as posterolateral type in Kennedy`s classification, and not mentioned in Schenck`s classification. Twelve patients of this type KD treated surgically in our department, and with a mean follow up of 2.1 years. The invaginated medial structures included MCL, MPFL, medial capsule and muscle of vastusmedialis. Length of time afterinjurying ranged from 1 week to 4 months. There are 3 patients having receivedinappropriate operations like ACL and/or PCL reconstruction, and 1 patient appeared the medial femoral condyle`s pressure leading to necrosis of the skin. All the twelve patients have received open surgery to reduce the knee and repair medial structures , and according the stability of joint to choose repairing or reconstructing, even revising the other ligament.All the patients`valgus and varus stress testing was normal and PDT was less than 6mm. IKDC Score was B and the mean Lysholm score was 90.12. No patient need further operation expect one patient received skin transplanted. We should improve the recognized for this special knee dislocation,to enhance the clinical outcomes and avoiding to miss diagnosis or misdiagnosis to delay or make inappropriate treatments.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39669

THE IATROGENIC ETIOLOGY AND TREATMENT OF THE OLD FIXED DISLOCATION OF THE KNEE

Jian LI

To analyze the iatrogenic etiology and the methods of treatment for the old fixed dislocation of the knee. A retrospective analysis of the clinical data for 14 treated patients were conducted. Specific operation methods should be applied according to the different conditions of patients with intraoperative incision release reset and the difficulties of reduction maintain and etc. All patients had successful operation and discharged from the hospital smoothly without complications. One patient had PCL laxity 1w after the reconstruction, causing joint reset loss. The patient accepted reoperation. To the last follow-up, 8 cases of knee reached 0 °at extension, and 120 °-135 ° at flexion; 4 cases of active knee extension with 10°to 15 °, and flexion with 90 °-100 °; 1 cases of patient with posterior instability of the knee with the PDT (+); 1 patient with valgus stress test positive. The exercise capacity of all patients decreased compared with pre-injury, 2 patients had significant exercise capacity constrained. But the exercise capacity of all patients improved significantly compared with pre-treatment. Lysholm score of all patients were 62-90. The operation treatment were positively adopted in order to salvage knee joint function. Specific operation methods should be applied according to the different condition of patients with intraoperative incision release reset and the difficulties of reduction maintaining. In general, the surgery is difficult with a long recovery period for knee function, but the knee function can get good recovery eventually. The different treatment methods and their guide lines need to be compared.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 40721

RISK FACTORS FOR NON-CONTACT ANTERIOR CRUCIATE LIGAMENT INJURY IN THE CHINESE POPULATION: ANALYSIS OF PARAMETERS IN PROXIMAL TIBIA USING ANTEROPOSTERIOR RADIOGRAPH

Guang-Hua LEI, Tuo YANG

Our study aimed 1) to investigate the relationship between proximal tibia parameters eminence width, eminence width index and tibia width and the injury of the anterior cruciate ligament, in order to determine whether a valid relationship exists in the Chinese population; 2) to explore the impact of gender on these parameters. A case-control study was conducted between the anterior cruciate ligament injury group (containing fifty three men and twenty women with non-contact anterior cruciate ligament injuries) and the control group (containing the same number of men and women with meniscal injuries). All subjects were matched for age and gender. There is no significant difference between the anterior cruciate ligament injury group and the control group in terms of tibia width. This result remained the same in both gender subgroups. The anterior cruciate ligament injury group signified a smaller eminence width and eminence width index, compared with the control group. This difference was also statistically significant in the male subgroup, but not for the female. The results of this study suggest that the decreased eminence width and eminence width index were found to be associated with the risk level of non-contact anterior cruciate ligament injury in the Chinese population. Despite the findings, it still remains unclear whether this association only exists in the male subgroup because of the relatively smaller sample size of the female subgroup.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39671

INDIVIDUALIZED RECONSTRUCTION OF ANTERIOR CRUCIATE LIGAMENT

Jian LI

Currently it remain controversial about the methods of ACL reconstruction. Whether the double-bundle reconstruction is better than the single-bundle reconstruction? Whether the anatomical reconstruction is superior to the isometric reconstruction? Whether the allograft has the same effect as the autograft? Whether ACL remnants should be reserved or discarded? Does ACL reconstruction do more good than harm in the acute phase? What are the surgical indications for the use of artificial ligament? Is ACL avulsion suitable for suture repair? And etc. Although more and more scholars tend to adopt anatomical reconstruction for ACL injury, the dispute has always existed with respect to the surgical procedure. We should use optimal methods of ACL reconstruction according to different mechanism of injury, respective atomical features, the ages and requirements of each patient. Based on our clinical experience over many years, we develop a set of individualized ACL reconstruction as followed. The autologous graft or artificial ligament is used for ACL injury in the acute phase, and that does not increase the long-term complications. For the large injury at the footprint area, we should use double-bundle ACL reconstruction, otherwise single bundle reconstruction is used. Try to retain ACL remnants when they don’t affect the bone tunnel positioning. The allograft is adopted when the autologous graft is insufficient. The suture repair is appropriate for ACL avulsion. Individualized reconstruction program and ehabilitation after operation are respectively draw up and timely adjusted for specific conditions of each patient, so as to ensure the good results of the operation.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 41205

DEVELOPMENT OF DECELLULARIZED ALLOGRAFT COMBINED WITH TENDON-DERIVED STEM CELLS FOR ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Jinzhong ZHAO

Via some special decellularization process, we can make pH modified decellularized allogenic scaffolds which embody porous structure, low antigen character, excellent biocompatibility and enough mechanical strength. This kind of scaffold is supposed to improve the allograft's poor results. Recently the tendon-derived stem cells (TDSCs) were suggested to be a potential suitable seed cells for tendon or tendon-bone repair. So in this study, we evaluated the effect of the tissue engineering graft (TEG), which was composed of decellularized semitendinous tendon (ST) allograft and TDSCs, as the fresh frozen allograft (FFA) substitute in ACL reconstruction. Histology results showed that the TEG got superior results than the FFA in cell infiltration, vascular formation, collagen birefringence and tendon-bone healing. Furthermore, via eGFP tracing analysis, eGFP positive cells were identified at both intra-articular graft and intraosseous graft at week 4, 8, 12 postoperatively. Micro-CT analysis showed that the TEG group achieved significantly higher BMD (mg HA/ cm3) at week 4 (88.77±9.50 vs. 78.13±9.02), week 8 (89.84±14.12 vs. 76.45±6.48) and week12 (94.64±8.73 vs. 82.56±6.78), as well as significantly higher BV/TV (%) at week 8 (44.06±5.28 vs. 39.62±2.36) and week 12 (47.06±5.59 vs. 40.35±3.17), compared with the FFA group. Mechanical analysis showed that the TEG group obtained significantly higher ultimate load (N) (28.42±9.54 vs. 18.58±7.27) and stiffness (6.69±2.34 vs. 4.19±0.65) than the FFA group at week 12. Thus, this kind of tissue engineered graft was suggested to be a promising substitute for common allograft in ACL reconstruction.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39322

HOW LONG IS ENOUGH FOR TENDON-BONE HEALING IN FEMORAL TUNNEL IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Yong-Jian WANG, Ying-Fang AO

To study the length to ensure the safe tendon-bone healing in femoral tunnel in anterior cruciate ligament (ACL) reconstruction. Methods: 8 ACL reconstruction cases using autogenous hamstring tendon were retrospectively studied. The length of tendon in femoral tunnel is less than 10 mm by individual reason. All the cases were followed more than 2 years. Anteroposterior stability was assessed by Rolimeter. 6 cases took the MRI to evalute the ACL and 4 cases underwent the second look arthroscopy. Results: Residual anteroposterior laxity at least 2 years postoperatively was 1.6 mm, similar to the regular cases. MRI show the reconstructed ACL have good tention. Second look arthroscopy confirmed the good results. Conclusion: 10 mm was enough for tendon-bone healing in femoral tunnel in anterior cruciate ligament reconstruction

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39182

TRANS-ARTICULAR DRILLING IN THE TREATMENT OF UNSTABLE JUVENILE OSTEOCHONDRITIS DISSECANS OF THE KNEE: MID-TERM RESULTS

Hong CHEN

Introduction: The aim of our study was to retrospectively review the mid-term clinical and imaging outcomes of unstable knee juvenile osteochondritis dissecans (JOCD) patients treated with trans-articular drilling. Methods: 63 patients diagnosed as knee JOCD and treated with trans-articular drilling between 2006 and 2012 were enrolled in the study. Arthroscopically trans-articular drilling was performed. Lysholm, Tegner, as well as International Knee Documentation Committee (IKDC) scores were recorded and compared preoperatively and at the latest follow-up. Antero-posterior, lateral, and tunnel view knee radiographs were used to examine healing process, and magnetic resonance imaging (MRI) was employed as verification. Results: The mean follow-up time was 4.2 years (range, 1-7.3 years), and 52 patients finished the follow-up. The average defect size was 2.79 cm2 (range, 1-4 cm2). 43 patients had excellent outcomes with full return to pre-injury activities and reported no symptom recurrence or deterioration over time. The overall healing rate was 82.7% (43/52). The average Lysholm score was improved from 51.3 to 85.8 (P = 0.001). The mean Tegner activity level was improved from 3.7 to 6.7 (P = 0.013). And the mean IKDC score was improved from 55.7 to 73.2 (P = 0.007). On average, healing was observed at 11.3 months after surgery (range, 6-18 months). Conclusions: Our series showed good to excellent mid-term results in unstable knee JOCD patients treated with trans-articular drilling. This technique is minimal invasive, effective, as well as cost-effective.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39151

ACTIVITY TOLERANCE AFTER MENISCAL ALLOGRAFT TRANSPLANTATION

Xintao ZHANG, Wentao ZHANG

Objective: To evaluate the ability of patients to return to preinjury levels of activity after meniscal allograft transplantation (MAT). Methods: The International Knee Documentation Committee score (IKDC), Lysholm score, Tegner score, Visual Analogue Scale (VAS) and physical examinations of patients treated with MAT were retrospectively reviewed to measure clinical outcomes, and questionnaires regarding activity and factors were analyzed. Results: Mean follow-up was 31 months for 61 patients (65 knees). The mean results for VAS, IKDC score, Lysholm score were significant better than the preoperative data ($P<0.05$), while there was no significant difference in the ROM and Tegner score ($P>0.05$). Thirty-eight (62.3%) patients were able to return to their previous level of activity. The remaining 23(37.7%) patients reached mean 76.7% of the previous level of activity. In the 23 patients reporting a decrease in activity, 10 cases reported the fear of re-injury as the primary factor limiting activity. In the remaining, pain (n=5), limitation of ROM (n=4), medical advice (n = 3), and a change in life situation (n = 1) were the reported primary reasons for decreased activity. Conclusion: The majority of active patients with meniscal disorders return to preinjury levels of activity after arthroscopically assisted meniscal allograft transplantation.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 39682

MEDIAL GASTROCNEMIUS TENDINOUS FLAP TO REPAIR THE HERNIA AFTER CYSTECTOMY FORPOPLITEAL-FOSSA CYST

Xin TANG

Object: This study to determine the outcome of a new technique using medial gastrocnemius tendinous flap to repair the hernia for treating huge popliteal fossa cyst. Methods: A total of 52 patients with huge popliteal fossa cyst were treated by open cystectomy through postmedial approach following the hernia repair using the medial gastrocnemius tendinous flap. The efficacy measures were the perioperative complications and the recurrence rate using B ultrasound or MRI (Magnetic resonance imaging). The secondary efficacy measures included the visual analog scale (VAS) pain score, the WOMAC A (pain), and C (function) scores and the total WOMAC score by patients and physicians. Results: A total of 52 patients were followed for average time of 16 months. No complication was recorded during perioperative period. No recurrence was noticed by B ultrasound or MRI. The VAS and the WOMAC A and C were significantly improved in the final follow up compared with that of pre-operation by patients and physicians (all $P<0.05$). Conclusion: This study suggests that medial gastrocnemius tendinous flap to repair the hernia is effective in treating huge popliteal fossa cyst with a low recurrence.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 42393

RARE CAUSE OF KNEE SYNOVITIS-TOURAINE-SOLENTE-GOLE SYNDROME 4 CASES REPORT

Bo YANG

Objectives: To discuss the rare reason of synovitis cause by pachydermoperiostosis (PDP) . As we all know that synovitis can be diagnosed easily according to its typical clinical manifestations such as swelling and pain of the affected joint. But its etiological diagnosis is usually very difficult due to complex etiology. For some patients, definite etiological diagnosis could not be obtained even after the post-operative pathologic examination. Common cause of synovitis includes trauma, infection, tumor, autoimmune disease and metabolic disease, etc. But there is one rare reason need to be considered in clinical practice,that is PDP or also could be called as Touraine-Solente-Gole Syndrome (idiopathic hypertrophic osteoarthropathy). Methods: There are four PDP patients with synovitis of knee joint were surgically treated in our department from Oct 2010 and reported as follows. PDP is a very rare soft tissue disease which involves skin and periosteum with unknown reason. It could be divided into primary and secondary type. For the primary type, some patients have family history and are thought to be autosomal dominant inheritance, but the genetic pattern and the mechanism is not clear. Such patients have earlier onset and more after puberty. But secondary PDP patients have primary diseases such as severe liver disease, bronchiectasis, gastric cancer, esophageal cancer, etc and no family history. The general onset is always late after the age of thirty. The four of our patients were around puberty onset with no basic diseases, so complied with primary manifestation. Their typical manifestation were mainly presented as acropachy, periostosis (swelling of periarticular tissue and shaggy periosteal new bone formation of long bones), pachydermia, furrowing of the face and scalp, increased secretion of sebum, drooping eyelids, excessive sweating and severe sweeling of the knee joints. X-ray showed thickening of periosteumand cortex of long bone of hand and foot.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy I
Time: 10:30 - 12:00
Room: Yunfu Hall

Abstract no.: 42392
DUAL-ENERGY CT STAINING TECHNIQUE: DETECTING KNEE SPORTS INJURY-FEASIBILITY STUDY

Tao ZHANG

Objective: To evaluate sports injury with a dual-energy (DE) computed tomographic (CT) staining technique. Methods: In this prospective institutional review board–approved study, 40 patients with sports injury underwent DE CTand arthroscopy. A software application was used to staining .Presence of cruciate ligament or meniscus injury were noted, and Presence of site was noted too by two radiologists, with arthroscopy serving as the reference standard. Results: Agreement of DE-CT with arthroscopy was good in the anterior cruciate ligament (κ=0.77), moderate in the lateral meniscus and medial meniscus (κ=0.41; κ=0.60), and excellent in posterior cruciate ligament (κ=1). Accuracy was 95%, 70%, 80% and 100% for the respective tissue. For cruciate ligament observer 1 achieved a sensitivity of 100%, a specificity of 95.7%, a positive predictive value of 83.3%, a negative predictive value of 100%, and an accuracy of 97.5%. Observer 2 achieved values of 100%, 97.8%, 97.1%, 100%, and 98.7%, respectively. For meniscus observer 1 achieved a sensitivity of 72.2%, a specificity of 77.3%, a positive predictive value of 72.2%, a negative predictive value of 77.3%, and an accuracy of 75%. Observer 2 achieved values of 83.3%, 79.5%, 76.9%, 85.4%, and 81.3%, respectively. Conclusion: ThisDECTstaining technique allowing cruciate ligament and meniscus assessment and potentially making sports injury of the knee detectable with CT.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy II
Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 39474

CONVENTIONAL ARTHROSCOPIC DUAL-ROW ROTATOR CUFF REPAIR VERSUS ARTHROSCOPIC UNDERSURFACE ROTATOR CUFF REPAIR: 1 YEAR FOLLOW UP

Benjamin Fu Hong ANG, Jerry CHEN, William YEO, Denny Tjiauw Tjoen LIE, Paul Chee Cheng CHANG

Conventional arthroscopic dual-row rotator cuff repair has been the standard technique for rotator cuff repair. Arthroscopic undersurface rotator cuff repair is a recent development. The undersurface repair is performed from the glenohumeral space alone, with no subacromial decompression. The aim of this study was to compare the clinical outcomes of conventional arthroscopic dual-row repair and arthroscopic undersurface repair. A consecutive series of 121 patients who underwent arthroscopic rotator cuff repair by a single surgeon was evaluated. Sixty-two patients underwent conventional arthroscopic dual-row rotator cuff repair (conventional group) and fifty-nine patients underwent arthroscopic undersurface rotator cuff repair (undersurface group). Both groups were comparable in age, gender and pre-operative scores. The mean length of operation for the undersurface group was 51 minutes and for the conventional group was 86 minutes ($P < 0.001$). At 12 months, the mean abduction range of motion for the undersurface group was 110 degrees, compared to 124 degrees ($P=0.005$) for the conventional group. This difference was not significant at 3 and 6 months. At 3, 6 and 12 months, there were no statistical differences in Constant, Oxford shoulder and UCLA shoulder scores, pain, strength, patient satisfaction and the meeting of expectations between the 2 groups. Arthroscopic undersurface rotator cuff repair is a faster technique compared to the conventional arthroscopic dual-row rotator cuff repair. Although the undersurface group had inferior abduction range of motion at 12 months, there was no significant difference in clinical outcome scores. Both methods achieved similar good clinical results, patient satisfaction and met patient’s expectations.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy II
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Room: Yunfu Hall

Abstract no.: 40601

A META-ANALYSIS COMPARING SINGLE-ROW AND DOUBLE-ROW REPAIR TECHNIQUES IN THE TREATMENT OF ROTATOR CUFF TEARS

Caiqi XU, Lei WANG, Chengyu ZHUANG, Jinzhong ZHAO

Introduction: Our purpose was to conduct a meta-analysis of recently published studies to compare the clinical results of a double-row technique with the results of a single-row technique for different tear sizes. Methods: All randomized, quasi-randomized clinical trials that reported the outcome of single-row repair and double-row repair techniques were included in our meta-analysis. Two subgroups were set according to the tear size. The outcomes were the Constant Score, ASES Score, UCLA Score, re-tear rate, range of motion and muscle strength. Results: There was a statistically significant difference in favor of double-row repair for the overall ASES score, re-tear rate and internal rotation range of motion. In subgroup 2 (tear size >30 mm), double-row techniques produce better outcomes than do single-row. There were no statistically significant differences in the overall Constant score, UCLA score, external rotation, and forward elevation range of motion or muscle strength.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy II
Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 40332

ARTHROSCOPIC BANKART REPAIR.IS IT SUPERIOR TO OLDER SURGICAL PROCEDURES FOR SHOULDER INSTABILITY?

Metwally SHAHEEN, Mostafa AZAB, Enjie IBRAHIM

Introduction: Evolution of shoulder instability surgery throughout the last century reached its summit with introduction of arthroscopy for managing labral tears and capsular laxity. This study was implemented to evaluate arthroscopic Bankart repair in face of open Bankart and open Latarjet procedures concerning stability, functional outcome and complications. Methods:75 shoulder instability cases chosen from the medical records and were divided into three groups; each consisting of 25 patients. Group1 (treated by arthroscopic Bankart repair), group 2(treated by open Bankart repair) and group 3(treated by Latarjet procedure for coracoid transfer). All patients were operated in the period between 2004-2007; the study was conducted in February 2014. Constant score (CS) was used for evaluation of the functional outcome during the last visit. Results:In group 1; 3 cases were found to have redislocation and one case of clinical subluxation which were all treated by latarjet coracoid transfer. CS revealed 20 cases (80%) excellent, 2 cases (8%) good, and 3 cases (12%) fair to poor outcome. No immediate postoperative complications were recorded. Group 2; one case of redislocation. 21 cases (84%) excellent, 4 cases (16%) good with no fair or poor results. One case of deep infection treated by wound debridement. Group 3; one case of redislocation. 20 cases (80%) excellent, 5 cases (20%) good with no fair or poor results. One case developed postoperative brachial plexus traction injury that recovered spontaneously in 7 weeks. Discussion and Conclusion: Concerning stability, open procedures show superiority over arthroscopic Bankart repair with no difference in long term functional outcome and complications between the arthroscopic and the open procedures.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy II
Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 40320

ARTHROSCOPIC REMPLISSAGE LIMITS SHOULDER RANGE OF MOTION WHEN COMBINED WITH BANKART REPAIR

Mostafa AZAB, Enjie IBRAHIM

Introduction: The engagement of Hill Sachs lesions at the anterior glenoid rim during arthroscopic Bankart repair treated by remplissage are evaluated regarding to the patients' range of motion (ROM) compared to the unaffected side. Methods: A retrospective study including 36 cases of arthroscopic Bankart repair (34 males and 2 females), underwent remplissage in addition to Bankart repair. Shoulder ROM was compared to the normal side in all directions of motion 2 years after the surgery; provided that all patients completed a similar postoperative rehabilitation program. Results: External rotation(ER) in the adducted arm was limited in all cases with loss of the last 10 to 15 degrees in 27 patients, 15 to 35 degrees in 4 patients and more than 35 degrees in 5 patients. ER in arm abduction revealed 28 patients can reach the back of the opposite shoulder by their hand, 5 patients can reach the back of the head and 3 patients cannot reach the back of the head. Other directions of motion remained unaffected. Discussion and Conclusion: Reviewing the literature revealed better results after remplissage concerning redislocation, but it also showed similar results to our study concerning the limitation of ER. Although arthroscopic remplissage is a good procedure when done in conjuction to arthroscopic Bankart repair in reduction of the incidence of redislocation; yet the possibility of limitation of ER is to be considered.

Date: 2015-09-17
Session: Short Oral Communications Arthroscopy II
Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 41778

MINI-OPEN LATARJET WITH THE WEDGE PROFILE PLATE FOR FAILED BANKARTS: IS THIS MODIFIED, MODIFIED LATARJET THE FUTURE

Mukul MOHINDRA, Deepak CHAUDHARY, Vineet JAIN, Deepak JOSHI, Ankit GOYAL, Nitin MEHTA

Introduction: Technical faults leading to coracoid fractures during screw insertion and coracoid graft osteolysis are concerns with standard screw fixation techniques in Latarjet procedure. The purpose of this study is to share our experience with mini open technique and the unique Arthrex mini-plate for graft fixation that ensures better compression and load distribution between coracoid graft and glenoid bone surface. Methods: We did retrospective analysis of 24 patients with recurrent anterior shoulder instability after arthroscopic Bankart's repair. Arthroscopic examination of affected shoulder was done in lateral position before making patient supine for open latarjet. A low profile wedge plate (Arthrex) with two low profile screws was used for performing the procedure. CT analysis was performed post operatively at 6 months to see graft union and results were evaluated using American shoulder and elbow score (ASES) and Western Ontario shoulder instability score (WOSIS). Results: Mean follow up time was 26 months. Postoperatively, mean forward elevation was 164.8 degrees and external rotation was 45.6 degrees. All patients returned to their previous occupation. None reported to be having any recurrent subluxation post-surgery. The mean ASES score was 92.5 while the mean WOSIS score was 76.84%. Only one patient had screw backing out from the plate. There was no case of coracoid graft osteolysis. Conclusions: The mini-open Latarjet procedure with graft fixation with Arthrex mini-plate provides satisfactory outcome and stabilization in patients who present with dramatic bone loss and failed soft tissue reconstruction. The only drawback is the relatively high cost of the implant

Date: 2015-09-17
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Room: Yunfu Hall

Abstract no.: 39967

ARTHROSCOPIC TRANSOSSEOUS ANCHORLESS VS. ANCHORED ROTATOR CUFF REPAIR: A COHORT ANALYSIS COMPARING CLINICAL AND PATIENT REPORTED OUTCOMES, STRUCTURAL INTEGRITY, AND COSTS

Uma SRIKUMARAN, Bashir ZIKRIA, Catherine HANNAN, Meera CHAPPIDI, Kelly KILCOYNE, Steve PETERSEN, Edward MCFARLAND

Introduction: Recent advancements in instrumentation have accommodated an arthroscopic, anchorless transosseous rotator cuff repair, which reproduces the gold standard of open transosseous repair. This study compares the clinical outcomes and cost effectiveness of anchorless, transosseous (AT) repair to the anchored transosseous, equivalent (TOE) technique. Methods: We conducted a retrospective cohort analysis of 90 arthroscopic rotator cuff repairs with minimum 1-year follow up. All patients had full thickness tears of the supraspinatus and/or infraspinatus tendons. We collected visual analog pain (VAS), range of motion, subjective shoulder value (SSV), and American Shoulder and Elbow Surgeons (ASES) scores. We performed ultrasound studies at 1-year postop. Results: There were 45 patients in both groups who met all inclusion criteria and completed a minimum 1-year follow up. Baseline demographic data for age and sex did not differ between groups. At minimum 1-year follow up, there was no difference between groups with respect to SSV ($p = 0.60$), VAS ($p = 0.36$), ASES score ($p=0.34$) or range of motion in abduction, forward elevation, and external rotation ($p=0.58$, 0.73, 0.48 respectively). Ultrasound studies showed no difference in rotator cuff integrity between groups at an average of 15.7 months after surgery. Cost analysis suggested 30-80% implant savings per case for the AT group depending on tear size. Conclusion: Arthroscopic transosseous rotator cuff repair achieves similar clinical outcomes, patient-reported outcomes, and healing rates with 30-80% reduction in implant costs, compared to traditional anchored techniques.

Date: 2015-09-17
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Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 39955

ANCHORED VERSUS ANCHORLESS ROTATOR CUFF REPAIR: A BIOMECHANICAL ANALYSIS

Uma SRIKUMARAN, Stanley GUILLAUME, Kelly KILCOYNE, Evan LANGDALE, Catherine HANNAN, Stephen BELKOFF

Introduction: Recent advancements in instrumentation have accommodated an arthroscopic, anchorless transosseous rotator cuff repair, which reproduces the gold standard of open transosseous repair. We evaluated the biomechanical properties of two arthroscopic techniques; transosseous-equivalent (TOE) repair with anchors versus anchorless arthroscopic transosseous repair (AT). Methods: Ten paired (20) fresh-frozen, human cadaveric shoulders were randomized to one of two repair groups after creation of a standardized size superior rotator cuff tear: TOE versus anchorless AT. Biomechanics testing was performed, with an initial pre-load, followed by cyclic loading and pull to failure. Mode of failure was recorded for each specimen. Results: The TOE repair demonstrated biomechanical superiority by having a significantly higher mean ± SD failure load (578.5±123.8 N) than the AT repair (468.7±150.9 N) ($P<0.05$). There was also a significantly larger amount of first-cycle excursion in the AT (4.70±2.04 mm) repair group compared to the TOE (2.97±1.97 mm) repair group. There was no significant difference between the two groups in regards to load to failure testing of stiffness and cyclic loading testing of cyclic elongation. Primary modes of failure were as follows: TOE, tendon (7/9 specimens); AT, bone (5/9 specimens). Conclusion: The TOE rotator cuff repair had significantly increased load to failure compared with AT. The most common mechanism of failure in the TOE group was at the musculotendinous junction. The AT group mostly failed as a result of suture failure, leaving the musculotendinous junction intact. This may have clinical implications on potential for revision repair in the clinical setting.

Date: 2015-09-17
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Abstract no.: 40859

SUBACROMIAL INJECTIONS IN COMBINED SHOULDER PATHOLOGIES – PREFERRED ROUTE? A CADAVERIC STUDY

Vishesh KHANNA, Senthilnathan SAMBANDAM, Duraisamy GOPINATH

Introduction: Similar presenting complaints, restricted range of motion, clinical tests with low sensitivity and specificity and overly sensitive MRI make it difficult to differentiate pain due to rotator cuff pathology from that due to LHB pathology. Differential shoulder injection has served as an important tool to differentiate these entities. The aim of this study is to find out the best route of subacromial space steroid injection associated with minimal extravasations into the biceps groove thereby providing the best diagnostic accuracy. Methods: Five fresh cadavers (10 shoulders) were utilized for this study. Subacromial injections through posterior and anterior approaches were performed injecting the shoulders with a lidocaine-dye mix. All cadavers were exposed using a deltopectoral approach. We hypothesized that the posterior route of injection has a higher diagnostic value in differentiating subacromial pathology from a long head of biceps (LHB) pathology while the anterior approach has better therapeutic role in coexisting pathologies. Results: Fluid injected through posterior approach seemed to remain within the subacromial space while with the anterior approach; the dye was seen in both subacromial space and bicipital groove in all five shoulders suggesting some extravasations into the biceps groove. Discussion: Shoulder injections have served as an effective pain-relieving modality for symptomatic subacromial pathologies. Our results show that the posterior route of subacromial injection is associated with minimal extravasations into the LHB groove and has a higher diagnostic value in differentiating subacromial pathology from LHB pathology. The anterior approach has a better role in coexisting pathologies.

Date: 2015-09-17
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Time: 14:00 - 15:30
Room: Yunfu Hall

Abstract no.: 40961

REVERSAL OF SUPRASCAPULAR NEUROPATHY FOLLOWING ARTHROSCOPIC REPAIR OF MASSIVE ROTATOR CUFF TEAR WITH ROUTINE NERVE RELEASE

Xuan HUANG, Zimin WAMG

Introduction: This study was aim to investigate the prevalence of suprascapular neuropathy (SSN) in the setting of massive rotator cuff tear (MRCT) and to determine if arthroscopic rotator cuff repair with routine nerve release, was associated with reversal of SSN and clinical improvement in pain and function. Methods: Over a 1 year period, 22 of 316 patients with cuff tears treated operatively were identified to have MRCT associated with retraction and severe fatty infiltration of the supraspinatus and infraspinatus muscles. All patients had pain and marked weakness in abduction and external rotation which did not improve with conservative treatment. Electromyographic (EMG) and nerve conduction velocity (NCV), as well as pre- and postoperative questionnaire and physical examination, were performed. Arthroscopic repair was performed on patients identified to have a MRCT in association with SSN. Results: Eleven of these 22 (50%) was confirmed SSN preoperatively, 2 had an associated upper trunk brachial plexus injury, and 1 had a cervical radiculopathy. All patients underwent arthroscopic cuff reconstruction with routine suprascapular nerve realse, follow-up EMG/NCV after 6 months demonstrated partial or full recovery of the SSN that correlated with complete pain relief and marked improvement in function. Conclusion: SSN is found in a significant proportion of patients with MRCT, and is associated with pain and dysfunction. Arthroscopic rotator cuff repair with nerve release can result in reversal of SSN and better heal of the rotator cuff, which may correlate with substantial improvement in pain and function.

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Room: Yunfu Hall

Abstract no.: 41011

TRANSTENDON DOUBLE-ROW SUTURE ANCHOR TECHNIQUE FOR REPAIR OF THE GRADE III PARTIAL ARTICULAR SUPRASPINATUS TENDON AVULSION

Zimin WANG, Xuan HUANG

Introduction: The standard technique for repairing partial-thickness tears of the rotator cuff includes completion of the lesion to a full-thickness tear. Grade III partial articular supraspinatus tendon avulsion (PASTA) form a subgroup deserving special consideration. We present a transtendon suture technique that is able to preserve the intact tendon fibers and to achieve firm attachment of the tendon to the humeral footprint using double-row suture anchor. The purpose of this study was to evaluate clinical and anatomic outcomes of patients following this procedure. Methods: Thirty-six patients in the senior author's practice who had isolated PASTA lesions treated by transtendon rotator-cuff repair were included and retrospectively reviewed. All patients were evaluated preoperatively and at a mean of 21.2 months (±9.7 months) postoperatively using standardized clinical evaluation (physical exam, American Shoulder and Elbow Surgeons, and Simple Shoulder Test). All patients underwent postoperative imaging with a MRI arthrogram. Results: There was a significant improvement in American Shoulder and Elbow Surgeons (42.7±17.5 to 86.9±25.2) and Simple Shoulder Test (4.6±3.2 to 10.1±3.8) scores from pre- to postoperative, respectively. At 2 months from surgery, radiographic healing of the tendon was noted and integrity of the supraspinatus tendon insertion to the footprint was confirmed by arthro-magnetic resonance imaging, with full recovery of daily activities and complete active range of motion confirmed at 6 and 12 months. Conclusion: For grade III PASTA lesion, transtendon double-row fixation exhibited superior biomechanical properties and satisfied clinical outcomes.

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Abstract no.: 40036

CYCLIC LOAD TESTING AND ULTIMATE FAILURE STRENGTH OF BIO-BONE SUTURE ANCHOR: A CADAVERIC STUDY

Lee HONGLIANG, Liu YUJIE, Qi WEI, Li CHUNBAO, Qu FENG, Guo QI, Lu XI

Purpose: The purpose of this study was to test 2 medial row anchors and 2 lateral row knotless anchors biomechanical properties: Medial row: 5.5-mm Bio-bone, 5.5-mm TwinFix Ti; Lateral row: 6.0-mm Bio-bone-locked, 5.5-mm Footprint Ultra PK. Methods: Twelve human cadaveric humeri with the mean ages of 45 years were used. We placed 4 suture anchor at 4 humeral sites per bone. Cyclic loading was performed to simulate postoperative conditions. The mean displacement at 100, 500 cycles, yield loads, and ultimate loads were recorded. Results: Most cyclic motion occurred during the first 100 cycles. None of the 4 anchors reached 5 mm of displacement even after 500 loading cycles. The mean displacement at 100, 500 cycles and yield loads for TwinFix Ti were greater than for Bio-bone and for Bio-bone-locked were greater for Footprint Ultra PK, neither with significant statistical difference ($P > 0.05$). The ultimate loads for the TwinFix Ti anchors were greater than for Bio-bone anchors (P=.001) and were greater for the Footprint Ultra PK anchors than for Bio-bone-locked anchors (P=.000). Conclusions: The 2 medial row anchors and the 2 lateral have the same mean displacement at 100, 500 cycles and yield loads. Clinical Relevance: Bio-bone anchors can provide initial fixation strength allowing postoperative rotator cuff rehabilitation protocol and the Bio-bone-locked anchors is credible as the lateral row anchor.

Date: 2015-09-17
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Abstract no.: 41084

AN ANATOMIC EVALUATION OF OMNISPAN SUTURE DEVICE PLACEMENT FOR ARTHROSCOPIC ALL-INSIDE MENISCAL REPAIR

Qi GUO, Xi LU, Hongliang LI, Wei QI, Yujie LIU

Purpose: The objective of this study was to determine the safety of the Omnispan meniscal suture repair system during all-inside repair of the posterior part of meniscus. Methods: Fifteen unembalmed fresh-frozen adult knee cadaveric specimens were used. The circumference of the cadaver knee was measured before dissection. After dissection, the devices were used in three positions of the posterior part of the meniscus at 15, 45 or 90 degrees of knee flexion, with a penetration depth of 15mm or 20mm. The distance between the needle and the neurovascular construction was measured, and the safety was evaluated. Results: The Omnispan meniscal repair devices were considered safe as used for the medial meniscus. For the lateral meniscus, the penetration depth of 15mm was considered safe for the central position, while 20mm unsafe ($P < 0.05$). Additionally, the ratio of the average penetration depth to the average circumference of the cadaver knee was found less than 0.05 for the safe penetrations. For the third point, which is more lateral, the risk of common peroneal nerve injury was higher with knee flexion at 90 degrees than 45 degrees ($P < 0.05$). Conclusions: The risk of vascular nerve injury was higher during puncture of the posterior horn of lateral meniscus. The ratio of the penetration depth to the knee circumference may be an important clinical predictor, and a ratio of less than 0.05 is recommended. The knee flexion at 15 degrees or 45 degrees is recommended for the medial or lateral meniscus repair, respectively.

Date: 2015-09-17
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COMPARISONS OF FEMORAL TUNNEL POSITION AND LENGTH IN ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH THREE DIFFERENT TECHNIQUES

Zimin WANG, Weidong XU, Quan LI

Introduction: We aimed to compare the modified transtibial (MTT), anteromedial portal (AM) and outside-in (OI) techniques of anterior cruciate ligament reconstruction with respect to femoral tunnel position and length. Methods: From 2012.5~2013.6, 62 primary anterior cruciate ligament reconstructions (22 in MTT group, 20 in AM group and 20 in OI group) were studied. Measurements of the tunnel aperture, and placement were taken from 3-dimensional computed tomography scans. The tunnel lengths were measured during surgery with arthroscopic gauge. Results: Tunnel length for groups MTT, AM and OI averaged 42.5mm, 34.6mm, and 36.8mm (P=0.039). The mean coronal angle of the tunnels as measured from the line tangent to the posterior femoral condyles was 55.30°, 46.2° and 51.2° (P>0.05), and the mean distance from the inferior articular surface to the edge of the tunnel was 4.2mm, 3.6 mm and 3.4mm (P>0.05) , the mean distance from the posterior wall to the edge of the tunnel was 3.5mm, 2.7mm, 3.1mm (P>0.05) for MTT, AM and OI group respectively. Conclusion: Drilling by the modified transtibial technique produces anatomic femoral tunnels as well as tibial tunnel independent techniques with longer tunnel length.

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Abstract no.: 42394

THE NEW CONCEPTS OF SHOULDER INSTABILITY: NOT ONLY FROM THE GLENOID, ALSO FROM THE HUMERAL HEAD

Binghua ZHOU

Abstract Background: The antero-inferior instability of shoulder is very common in the clinic. Their etiology research will help us diagnose and treat them. Most surgeons turn onto the soft tissue repair, Bankart lesion repair, and so on. However, their failure rate was very high. This situation let us recognize whether their true pathogeny comes from the bone. This study focused on assessing the relationship between anterior-inferior glenohumeral instability and bony adapbility of glenohumeral joint. Methods: Both shoulders in 24 patients with unilateral anterior-inferior glenohumeral instability were scanned with muhiplanar spiral CT scanner. The parameters of humerus and glenoidane the conformity index were messured. The conformity index at coronal view and axial view, constraint index at coronal view and axial view were calculated. Results There was significant difference between the instability side and the normal side of the antero-inferior instability group in the antero-posterior radius of glenoid curvature, retroversion angle in the 4th plane, the antero-posterior containment angle of glenoid curvature, the conformity index at axial view, the constraint index at axial view by paired-samples t test. Conclusion Based on this study, we concluded the antero-inferior instability of shoulder is related with the bony adapbility of glenohumeral joint: not only from the glenoid, also from the humeral head.

Date: 2015-09-17
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Abstract no.: 41490

HIP ARTHROPLASTY AS REMEDY FOR FAILED INTERNAL FIXATION AFTER INTERTROCHANTERIC FRACTURES – THE CHOOSE OF FEMORAL STEM LENGTH

Chaofan ZHANG, Wenming ZHANG, Wenbo LIN, Zida HUANG, Guochang BAI, Jianhua LIN

Purpose: To investigate the efficacy and safety of standard length femoral stems in arthroplasty as revision for failed internal fixation after intertrochanteric fractures. Methods: A retrospective analysis of 14 cases who were performed with hip arthroplasty for failed internal fixation after intertrochanteric fractures between January 2001 to December 2013 was performed. Results: The average age of the 14 patients at the time of internal fixation was 74.6 years old (Range, 56-91), Time duration between fixation failure and arthroplasty was 3 to 26 months. The average age at the time of arthroplasty was 75.8 years (Range, 58 -91). 5 were total hip replacements, 9 were hemiarthroplasty. 4 patients were operated with long stems while 10 with standard length stems, including 4 cementless and 6 cemented. After a follow-up time of 6.4 years (Range, 1-13), 2 lost follow-up and in the remaining 12 cases, 2 died. In 8 cases with standard stems, distal end of stems all did not exceed the distal screw holes but no periprosthetic fractures or stress fractures or observed in the follow-up. 2 cases had 3 times of hip dislocation but were managed with manipulative reduction and hip brace. There were no infections and revisions, Harris hip score raised from 35.6 preoperatively to an average of 79.4 after surgery. CONCLUSION: Joint replacement as a remedy for failed internal fixation of intertrochanteric fractures has a good result. Standard length stems, either cementless or cemented, can achieve safety and better results.

Date: 2015-09-17
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Abstract no.: 40571

A STUDY CONCERNING THE IMPACT OF HEAD-ACETABULA RELATION WITHIN WEIGHT-BEARING AREA ON PAIN GRADING IN NON-TRAUMATIC OSTEONECROSIS OF FEMORAL HEAD BY COMPUTER-AIDED ANALYSIS

Guoju HONG, Wei HE, Leilei CHEN, Guangxue YAO, Genfa DU

Introduction: To explore the impact of head-acetabula relation (HAR) within weight-bearing area on pain grading while standing in non-traumatic osteonecrosis of femoral head (NONFH) by computer-aided analysis. Methods: Hip X-rays of 98 patients (166 hips) with NONFH were treated. The HAR within weight-loading portion is estimated by computer-aided analysis. Calculated region is assigned in particular setting and then establish a function model to get the relevant parameters of HAR. Mechanical equilibrium conditions of HAR were analyzed and categorized. Rank sum tests were used to demonstrate the different HARs with the impact on pain grading. Results: Pain grading correlated with HAR ($P < 0.001$). The results of rank sum tests for several independent samples showed significant difference in HAR among pain groups ($P < 0.001$). The normal HAR is ranged from 0.98 to 1(covariance) even the necrosis area exists. When the covariance is less than 0.98(medium: 0.98-0.94, serious: 0.94-0), pain appears and pathological changes will be detected. And all these changes can be reinforced by straight-line fit of each portion of HAR. Conclusion: Radiographic evaluation of head-acetabula relation within load-bearing area is believed sensitive to predict pain grading and pathological changes in NONFH. The reason is presumably that pain results from unmatched HAR, including femoral head collapse, cartilage wear and so on. The HAR can be used as an index for the prediction of advancement of disease, the evaluation of treatments and the living quality of patients.

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Abstract no.: 39271

COMPARISON OF ACETABULAR VERSION ANGLE MEASUREMENTS BETWEEN PRONE AND LEWINNEK PLAN COMPUTED TOMOGRAPHY IMAGES

Hao WU

Objective: To investigate the differences of acetabulum related parameters between the horizontal plane and true pelvis plane on CT images. Methods: Hip CT images of 80 normal cases were collected with natural supine position. The direction of CT scanning was perpendicular to the horizontal plane. Bilateral acetabular anteversion angle, abduction angle, centre edge angle (CE angle), acetabulum width, acetabulum depth and angulus acetabularis were measured, as well as the angle between the true pelvis plane and horizontal plane. All CT images were performed three-dimensional reconstruction, then images were collected with the scanning direction perpendicular to the true pelvis plane. The same parameters were measured for statistical analysis. Results: There were no significant differences between the parameters of two sides of the acetabulum in both reference planes. Significance was detected between the genders. In horizontal plane, the abduction angle, acetabulum width and depth were remarkably higher in female ($p < 0.05$). Pelvic tilt was positively correlated with the difference values of acetabular anteversion angle and CE angle, and was negatively correlated with the differentials of acetabulum depth and angulus acetabularis ($p < 0.05$). Conclusion: Traditional CT measurement of acetabulum parameters may result in errors. More attentions should be paid to during the pre-operative planning by the surgeons.Keywords: acetabular version angle, prone plan, Lewinnek plan, computed tomography images.

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Abstract no.: 41074

THE IN-VITRO WEAR PARTICLES ANALYSIS OF TI6AL4V FEMORAL HEAD COATED CARBON-BASED NANO MULTILAYER FILM

Ji LI, Zhongli LI, Wenzhen QU, Weixiong LIAO, Hao ZHANG

Introduction Carbon based nano multilayer film is a coating onto substrates to obtain desired surface properties produced using magnetron sputtering technology. In the research, the properties of coated Ti6Al4V femoral heads were evaluated by characterizing the wear particles in vitro and comparing the results with the CoCrMo alloy head. Method The research was studied with a hip wear simulator using fetal bovine serum as a lubricant. There're three types of artificial femoral heads: A, CoCrMo alloy (Zimmer, America); B, Ti6Al4V coated carbon based nano multilayer film; C, CoCrMo alloy (Jing hang, China). Each team's counterface is UHMWPE acetabular cup. Collecting lubricant respectively every 0.33million circles (mc). We analyzed the wear particles in 1mc, 3mc and 5mc lubricant samples. The characteristics of particles were determined by SEM-EDX. The size, shape and number of particles were measured according to SEM pictures and calculating concentration subsequently. The level of metal debris and ions were detected by ICP-MS. Results The analysis of EDX shows, 90% of the elements composed the particles are C and O, there're not obvious metal element peaks. According to the SEM pictures, the number of 0.1-1um particles is much more than the particles>1um.But particles>1um have a higher volume ratio. There're different shapes of 0.1-1um debris. Among the 3 teams, Team B has the least UHMWPE wear particles per unit area on the filter, and the ratio of spherical-like debris is the highest. ICP-MS shows that the concentration of metal debris and ions among 3 teams has no statistical difference.

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Abstract no.: 41927

THE EFFECT OF MEDICARE 3-DAY RULE ON PATIENT'S LENGTH OF STAY, DISPOSITION AND COSTS AFTER TOTAL HIP ARTHROPLASTY

Victor HERNANDEZ, Fabio OROZCO, Zachary POST, Alvin ONG

Introduction: The Medicare 3-day stay rule was instituted in 1965 to prevent improper and excessive utilization of the skilled nursing benefit. Our objective was to describe the disposition of patients undergoing primary total hip replacement (THA). In addition, we compared the length of stay and overall hospital inpatient cost between Medicare patients and those with private insurance undergoing primary THA. Methods: We queried the Nationwide Inpatient Sample database for patients with a history of primary THA over the period of 2002-2011. The data was weighted to allow national estimates. Demographics, hospital stays, disposition and payment were reported. Patients were matched based on age, gender, Elixhauser comorbidities (30 total), and chronic heart disease. Results: A total of 1,946,006 procedures were estimated in the period 2002-2011. The percentage of patients discharged on day 1 in the private insurance group went from 3-5.5% and from 1-1.9 %in the Medicare group. The change in discharge from the Medicare group at the 3rd day remained almost unchanged in the private group (49-51%) but increased for the Medicare (49-57%) and the adjusted cost per day. Discussion: The Medicare 3-day rule affected the length of stay in this population. There was trend to toward decreasing length of stay in patients with private insurance. While, there was change in LOS in the Medicare population. Also the disposition has changed for both groups with a trend toward going home vs rehab. We suggest that this outdated rule must be revised, in order to increase the cost effectiveness of THA.

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Abstract no.: 40070

EFFECTIVENESS EVALUATION OF MINIMALLY INVASIVE OF DHS IN THE TREATMENT OF FEMORAL NECK FRACTURE IN ELDERLY

Lei LIU

Objective: To explore the indications, operation points and recent effectiveness of dynamic hip screw in the treatment of femoral neck fracture in elderly. Methods: A retrospectively study was conducted to analysis the clinical data of 42 old patients who had been treated for femoral neck fracture with DHS in our department. There were 21 males and 21 females with a mean age of 68.5 years. According to the Garden classification: there were 19 cases of type Ⅱ, 21 cases of type Ⅲ and 2 cases of type Ⅳ. Singh Index classification: there were 3 cases of level 2,19 cases of level 3 and 20 cases of level 4.The Harris criterion, complications and function recovery after operation were documented. Results: The average hospitalization time in 42 patients was 11.2 days. All patients were followed up 12-26 months (mean, 18months). All incisions healed primarily. No lung infection, deep venous thrombosis or other complications occurred. Partly screw retreat were found in 2 cases, their internal fixation device were removed after fracture healing. Internal fixation cutting were found in 1 case, good recovery after total hip arthroplasty. The others were recovered well. Time to healing ranged from 3-6 months(average,4.5 months).According to Harris criterion after operation,15 cases were rated as excellent,24 cases as good,2 cases as fair and 1 case as poor. The Harris criterion was significantly improved from 30.52±2.71 at preoperation to 86.61±2.53 at 6 months after operation ($P<0.05$). Conclusion: The DHS can be suggested for old patients with femoral neck fracture, considering the trauma is small and it can allow the patients to active and weight-bearing early. It also can avoid the various complications of artificial joint replacement. Especially suitable for the patients with lesser

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Abstract no.: 40137

VASCULARIZED ILIAC BONE GRAFTING IN THE TREATMENT OF FEMORAL NECK NONUNION IN YOUNG ADULTS

Yeming WANG, Jianguo ZHANG, Wanfu WEI

The purpose of this study was to evaluate the clinical outcomes of vascularized iliac grafting for femoral neck nonunion in patients younger than fifty years. Twenty-two patients underwent vascularized iliac grafting and internal fixations for femoral neck nonunion were retrospectively analyzed. Their mean age was 36.6 years. The cases were evaluated radiographically and clinically. All the patients were followed up for an average of 53.1 months. The mean time to union for all patients was 5.4 months. The mean Harris hip score had increased from 55.3 preoperatively to 85.1 at the latest follow-up. The average neck-shaft angle had changed from 127.4 ° preoperatively to 128.3°postoperatively. The postoperative progression of osteonecrosis of the femoral head was found in tree patients. Two patients were pain free and one patient required total hip arthroplasty nine years after the revision procedure. There was no further progression in three patients with preoperative radiological evidence of the femoral head osteonecrosis. This study indicates that vascularized iliac grafting is a viable option in treatment of femoral neck nonunion in young adult.

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Abstract no.: 39513

PERIOPERATIVE SURGICAL COMPLICATIONS OF HIP REVISION: REASONS, PREVENTION AND TREATMENT

Weiming LIAO

Objective: To investigate factors related to the perioperative surgical complications of the revision of THA Methods: We retrospectively reviewed seventeen cases of perioperative surgical complications in patients who received a revision between January 2003 and December 2010. The average of follow-up time were 42 months. Results: Eleven of intraoperative complications were detected: 1 case with acetabular fracture which required a second revision; 2 cases with perforation of bone cortex when distracting cement out of the femur; 2 cases with intertrachanteric fracture which were reduced and fixed with wire.; 1 case was related to inappropriate femur prosthesis which postoperative x-ray showing bone cortex damage; 1 case of micro fracture happened when placing femur prosthesis; 2 cases were caused by bias of cemental prosthesis and asymmetrical cement distribution; 3 cases were due to miss location of acetabular prosthesis. Postoperative complications occurred in 6 cases: 1 case with deep hematoma; 2 cases with hip joint dislocation; 1 case with hip joint instability; 1 case undergone second surgery to adjust the femur prosthesis position; 1 case with postoperative haemorrhage around the acetabular and treated by intervention embolization. The average scores of the Harris scale is 47 scores before surgery and 86 scores in the follow-up after the revision. No more complications occurred in these patients. Conclusion To prevent perioperative surgical complications of hip, we consider that adequate preparation before surgery is crucial, including a well body condition, a well plan for the surgery, potential problems and difficulties that may challenge surgeons in the revision.

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Abstract no.: 41064

IMPACT OF HIP JOINT CENTER HEIGHT ON BASIC STRESS PATHWAY ABOVE ACETABULAR DOME

Yong NIE

To investigate the effects of hip joint center height on the basic stress pathway and provide clinical acetabular reconstruction guidance for total hip arthroplasty (THA). 【Methods】 Subject-specific finite element model was developed from CT data to generate 2 normal hip models and an inhomogeneous material property assignment for pelvic trabecular bone was conducted to set corresponding elastic modulus for each element. The basic stress pathway above the acetabular dome was defined as two parts: 3D basic trabecular bone stress distribution and quantified basic cortical bone stress level, using the 2 normal hip models. The effects were then analyzed by generating 14 reconstructed acetabular cases with different hip center heights within a range of 0 to 15 mm above the anatomical hip joint center. 【Results】 Under the same body weight condition, the 3D trabecular bone stress distributions above the acetabular dome were consistent, especially the quantified cortical bone stress levels were all above 20 MPa and showed no statistically significant difference ($p>0.05$). The 3D trabecular stress distribution decreased significantly in all cases, while the 80% of the basic cortical bone stress level was maintained in cases when the hip joint center was reconstructed in the range of 0-5 mm above the anatomical position. 【Conclusion】Reconstructing the hip joint center correctly contributes to maintain the basic stress pathway above the acetabular dome during acetabular reconstruction, thus helping restore the normal hip biomechanics and preserve the stability of the implants.

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Abstract no.: 39516

SELECTIVELY UPWARD OF ACETABULAR IMPLANTS IN PATIENTS WITH ANATOMICALLY ABNORMAL ACETABULUM DURING THA: A PRELIMINARY STUDY

Zhiqi ZHANG, Weiming LIAO, Ming FU

Objective: To investigate the effectiveness and method of selectively upward placement of acetabular implants in patients with anatomically abnormal acetabulum. Methods: Twenty-six cases received THA from January 2005 to December 2010. There were 21 females and 5 males with an average age of 52.3 years, and 11 were left hip and 15 were right hip. The preoperative Harris score was 45.85 ± 10.04. The principles of acetabular implants were that more than 70% of the bone-implant interface was covered, the upward distance of acetabular implant was less than 15 mm, and the acetabular implants should be placed to the anatomical rotational center as close as possible without massive structural bone graft. Results Acetabular implants were placed within 5 mm from the anatomical rotation center in 11 cases. The upward distance of acetabular implant was 5-10 mm in 8 cases and was 10-15 mm in 7 cases. One case had dislocation at 3 days after operation, and was cured after closed reduction and conservative treatment without recurrence. The follow-up time ranged from 15 to 71 months. The last Harris score was 91.42 ± 3.59, showing significant difference when compared with preoperative score ($P<0.001$). But the Harris scores were no significant difference in different group. No loosening or subsidence of the implant was observed during the follow-up. Conclusions: The acetabular implants should be placed as close to anatomical rotation center as possible. However, appropriate upward distance could be acceptable to meet 70% coverage of bone-implant interface and the implant stability.

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Abstract no.: 41741

OPTIMIZED MAGNETIC RESONANCE IMAGING OF JOINT ARTHROPLASTY : CLINICAL VALUE FOR DIAGNOSIS OF PERIPROSTHETIC INFECTION

Chuan HE, Yong LU, Meihua JIANG, Jianmin FENG, Yi WANG, Zhihong LIU

Introduction: The clinical and imaging diagnosis of peripros¬thetic infection, especially low-grad infection is frequently challenging. The purpose of our study was to evaluate clinical value of optimized Magnetic Resonance Imaging for the assessment of patients who are clinically suspected to have peripros¬thetic infection. Methods: From Jan 2012 to June 2014, thirty-five painful hips following primary hip arhroplasty (HA) and eleven painful knees following primary total knee arthroplasty (TKA) were assessed using optimized MRI, CT, standardized radiographs, triphasic bone scan and blood test. The diagnosis of MRI were correlated with intraoperative findings as well as with microbiological and histological examinations (when available). The sensitivity and the specificity of MRI diagnosis were determined according to final diagnosis. Results: Magnetic resonance imaging demonstrated the bone-implant interface and the surrounding soft-tissue envelope in all hips and knees. Periprosthetic infection was pre-operatively diagnosed on MRI in 14 hips and 3 knees, 16 of which were confirmed by intraoperative findings as well as with microbiological and histological examinations. In addition, one false-negative hip and two false-positive cases (one hip and one knee) were found. The MR imaging features of infection include layering of a thickened hyperintense synovium, extracapsular soft-tissue and bone edema, local lymphadenopathy, and extracapsular collections increase the positive predictive value. Conclusion: Optimized MRI was effective for the assessment of the periprosthetic infection. The use of modified magnetic resonance imaging parameters provided a useful adjunct to conventional examinations for the evaluation of patients with painful hip and knee arthroplasty.

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Abstract no.: 40661

PRELIMINARY APPLICATION OF COMPUTER-ASSISTED PATIENT-SPECIFIC NAVIGATIONAL TEMPLATE FOR PROXIMAL FEMORAL CORRECTIVE OSTEOTOMY

Shi QIANG, Li XU

Introduction: Proximal femoral corrective osteotomy produces excellent clinical results for developmental dysplasia of hip (DDH), but the surgical procedure is technically challenging, and severe complications related to the osteotomy have been reported. To provide a safe, accurate surgical procedure, we have developed a novel computer-assisted patient-specific navigational template for individual patients. The aim of this article was to present preliminary application of a computer-assisted, patient-specific navigational template for proximal femoral corrective osteotomy. Methods: Patients with proximal femoral deformities requiring instrumentation were recruited. Volumetric CT scan was performed on each femur and a three-dimensional reconstruction model was generated from the scan data. Using reverse engineering technique, the optimal derotational and shortening osteotomy were determined and a drill template was designed with a surface that is the inverse of the lateral femoral surface. The drill template and its corresponding femur were manufactured using rapid prototyping technique and tested for violations. The navigational template was sterilized and used intraoperatively to assist with the proximal femoral corrective osteotomy. Result: There were no major complications related to the osteotomy such as redislocation or avascular necrosis. The actual femoral anteversion angles corresponded almost exactly to the planned corrective angles in all cases. We have developed a novel, patient-specific, navigational template for proximal femoral corrective osteotomy with good applicability and high accuracy.

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DIFFERENCES OF SIZING AND ROTATIONAL LANDMARKS OF DISTAL FEMUR BETWEEN SOUTHERN CHINESE AND CAUCASIAN

Zongke ZHOU

Background: To investigate the exact sizing and rotational landmarks of the distal femur collected from a large group of healthy Southern Chinese using three dimensional computer tomographic measurements, and to correlate the measurements to the known dimensions from Caucasian. Methods: This study evaluated distal femoral geometry in 125 healthy Southern Chinese. The articular surface width from medial to lateral transepicondylar (ML), anteriorposterior dimension (AP) were measured. A characterization of the aspect ratio (ML/AP) was made for distal femur. Known dimensions from Caucasian were compared with the morphologic data. The differences of rotational landmarks and sizing between the Southern Chinese and Caucasian were assessed with use of the Student t test. Results: ML and AP were larger values in Southern Chinese male than female (ML: 70.38±3.09 vs. 62.09±2.52mm, P<0.001; AP: 63.68±2.82 vs. 57.83±2.91mm, P<0.001). The results showed that Southern Chinese knees were generally smaller than Caucasian (ML: 67.27±4.95 vs. 76.8±7.2mm, P<0.001). The femoral aspect ratio of Southern Chinese was significantly smaller than Caucasian (1.09±0.04 vs. 1.28±0.06, P<0.001). Anteroposterior line minus epicondylar line angle was 90.14±1.30° (Caucasian 90.33±2.44°, P>0.05), anteroposterior line minus posterior condylar line angle was 83.18±1.94° (Caucasian 86.82±2.71°, P<0.001), epicondylar line minus posterior condylar line angle was 7.00±1.70° (Caucasian 3.60±2.02°, P<0.001). Conclusion: Modified knee implants were asked for Southern Chinese patients with smaller sizing of distal femur and the aspect ratio (ML/AP). Recent anthropometric studies have suggested that current design of total knee arthroplasty (TKA) does not cater to racial anthropometric differences.

Date: 2015-09-17
Session: Short Oral Communications Hip
Time: 16:30 - 18:00
Room: Yunfu Hall

Abstract no.: 42400

CLINICAL EFFICACY OF ADEQUATE ANTIBIOTICS COMBINED WITH DEBRIDEMENT SURGERY IN THE TREATMENT OF PERIPROSTHETIC JOINT INFECTION

Weidong XU

[Objective] To explore the methods and clinical efficacy in the treatment of periprosthetic joint infection (PJI) after total hip and knee arthroplasty. [Method] Between 2007 and 2014, 18 patients with PJI after total hip replacement (THR, including 4 cases after one stage revision operation) and 10 patients with PJI after total knee arthroplasty (TKA) were reviewed. There were 16 male and 12 female cases, and the average age was 54 years (range, 20-78 years). Among these patients, 21 cases were diagnosed early infection, 3 cases were delayed infection, and 4 cases as late infection. The average Harris Hip score for the PJI patients increased from 42.3 to 78.4, and so as the HSS score improved from 42.9 to 78.4 after debridement and antibiotic therapy. All the patients suffered inflammation with/without effusion of the incision before therapy, and bacterial culture and drug sensitivity test of the exudates were routinely conducted. There were 9 cases with sinus connected with joint cavity, 5 cases with sinus obstructed to joint cavity, and the remaining 14 cases were with swelling or effusion wound. For patients with sinus, debridement operation were arranged. At the same time, intravenous infusion of vancomycin (vancocin), levofloxacin and oral rifampin treatment were applied for 3-6 weeks, then oral levofloxacin and rifampin were continued to 3-4 months after operation. For patients without sinus but only swelling and exudate, intravenous infusion of vancomycin or oral levofloxacin and rifampicin would be applied. [Result] Taking prosthesis removal as successful treatment, there were 2 failure cases in the total 28 patients. One case suffered removal of the prosthesis because of no response to the antibiotics, cement spacer was placed and no revision operation was offered. Another case suffered several invalid anti infection treatment, and finally amputated. The rest 26 patients were

Date: 2015-09-17
Session: Short Oral Communications Hip
Time: 16:30 - 18:00
Room: Yunfu Hall

Abstract no.: 42399

THE ACCURACY AND USEFULNESS OF DIGITAL TEMPLATING IN ACETABULAR RECONSTRUCTION FOR DEVELOPMENT DYSPLASTIC HIPS

Yan KANG

Purpose: The purpose of the randomized and, prospective study was to assess the accuracy and usefulness of digital templating in acetabular reconstruction in patients with development dysplastic hip (DDH). Methods: This study included 50 hips, of which there were 50 hips, 23 hips had a preoperative digital templating and 27 hips had not. The cup location, orientation and size in both groups were preoperatively and postoperatively evaluated by the surgeon. A templating-software TraumaCadTM Version 2.0 was used. Results: The exact match (15hips) or error of only one size (19 hips) was of (82.6%). The qualification rate of the acetabular reconstruction was 73.91% for patients had preoperative digital templating and 37.04% for patients hadn’t (p = 0.009). Conclusions: Our results demonstrated that digital templating was useful in acetabular reconstruction for development dysplastic hip with acceptable accuracy. Normal 0 7.8 磅 0 2 false falsefalse EN-US ZH-CN X-NONE MicrosoftInternetExplorer4

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40267

SINGLE PARARECTUS APPROACH FOR BOTH-COLUMN ACETABULAR FRACTURE

Shicai FAN, Xiaodong YANG, Guang XIA

Objective: To explore the clinical effect and surgical operating points of single pararectus approach for the internal fixation of both-column acetabular fractures Methods: From January 2012 to June 2014, 28 patients with both-column acetabular fractures were surgically managed through pararectus approach. 12 males and 16 females. According to Judet-Letournel classification, There were 18 anterior column with posterior hemitransverse fractures,10 both-column fractures, 15 cases involving the pelvic fracture. All these fractures were treated through the pararectus approach, the plate was placed in interior pelvic ring to fix the anterior column. Then, the posterior column was fixed by antegrade lag screw (6.5mm). All of these operations were finished under direct vision. Results: All the 28 cases underwent the operation successfully. Postoperative X-ray and CT exams showed excellent and good reduction of anterior column and posterior column, without operative complications. According to the Matta radiological evaluation postoperatively, reduction of acetabular fracture was rated as excellent in 20 cases and fair in 3 cases. The rate of excellent and good was 89.20 %(25/28). All patients were followed up for 6 to 18 months and all patients achieved bone union. According to the modified Merle d'Aubigne and Postel scoring system, 19 cases were excellent and 2 fair after operation. The rate of excellent and good was 92.8 %.(26/28). Conclusions: Surgical management of acetabular fractures through a single pararectus approach can provides adequate exposure of the anterior columns and the medial surface of posterior column, with this approach we also has the advantage of excellent visual control of reduction and fixation.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 39817

SCHWANNOMA OR NEURILEMMOMA IN BRACHIAL PLEXUS : A CLINICAL REVIEW OF 29 CASES

Gang ZHONG

Objective: To analyse the clinical characteristics, diagnosis and key points of surgery of 29 cases of brachial plexus Schwannoma , so as to improvement the clinical treatment. Methods: Retrospective analysis the brachial plexus Schwannoma cases (from 2010.1-2014.12), discuss the clinical symptoms、treatment methods and the prognosis. Results: There were 29 cases in brachial plexus, among these Schwannoma, solitary mass occurred in 26 cases, multiple masses in 3 cases, resection of the tumour was carried out in 25 cases, including 7 cases of tumours behind clavicle, were resctioned after we cut off the clavicle. in the remaining 4 cases, the tumour was remove mistakenly together with the nerve trunk in other hospital, the nerve get A certain degree of function improved after nerve grafting. There were no nerve function deficit and recurrence over a peroid of follow-up from 4 month to 4 year in 23 cases. 2 cases of patients with postoperative get the thumb part dysfunction and partial intrinsic muscle palsy respectively, recovery was almost normal when the patients were discharged, and they were remained in the process of follow-up. Conclusions: The effective diagnosis and treatment of schwannoma in brachial plexus depend on comprehensive knowledge , preoperative imaging check , atraumatic surgical operation. The tumours should be cut off for the most degree within the tumour capsule to decrease the recurence possibility, and remain the normal nerve function at the same time, we should cut off the clavicle if it is necessary.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40467

A BIOMECHANICAL INVESTIGATION ON CURRENT FIXATION OPTIONS FOR PROXIMAL HUMERUS FRACTURES: LOCKED INTRAMEDULLARY NAIL AND LOCKED PLATE.

Hui ZHAO, Yongchao QIN, Junlin ZHOU

Recent advancements in implant technology offer options for surgical management that have been adopted into surgical practice. The objective of this experiment is to biomechanically compare the current fixation options of proximal humerus fractures and establish load to failure and stiffness values. Eighteen match-paired (36 total) fresh-frozen, cadaveric specimens were randomized to receive different fixation constructs following creation of proximal humerus fractures. Fixation constructs tested consisted of Locked Plate (LP) and humeral intramedullary nail (IMN). Specimen bone density was measured to ensure no osteoporotic and other bone. Constructs were tested for stiffness and ultimate load to failure and compared via one-way ANOVA, and $P<0.05$ was considered significant. The ultimate compression load of fixation groups were lower than that of Control group ($P<0.05$), no significant difference between groups of fixations ($P>0.05$); The tensile load of fixation groups were lower than that of Control group ($P<0.05$). The stiffness of fixation groups were lower than that of ($P<0.05$).The stiffness of fixation groups were lower than that of Control. No significant difference was detected between the fixation groups in different loads ($P>0.05$). We concluded that biomechanical testing of modern fixation options for proximal humerus fracture exhibited that PHN and LPHP have a similar biomechanical strength in the compression and tensile resistance, both can provide stable fixation in the treatment of proximal humerus fracture.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40761

THE TREATMENT OF UNSTABLE DISTAL CLAVICLE FRACTURES (NEER II) USING DIFFERENT INTERNAL FIXATIONS

Jian XIONG, Jianhai CHEN, Yu DANG

Introduction: Explore different internal fixation methods (clavicular hook plate-A group, anatomical plate-B group, arthroscopically assisted Endo-buttons-C group) clinical efficacy of distal clavicle fractures (Neer II).Methods: Since 2001 to 2014, a total of 58 cases Neer II distal clavicle fractures patients in different surgical ways were followed up. Assessing their clinical results through VAS score, Constant score, SST score et al. Results: The average follow-up of 57 months. All patients maintain anatomic reduction and have bone healing at last follow-up. Group B&C patients with blood loss was significantly lower than in group A ($p < 0.05$). Incision length of patients in group C was significantly lower than group A&B ($p < 0.05$). All patients' affected shoulders VAS score are 1.2 + 1.6, greater than the contralateral 0.3 + 0.8 ($n = 58$, $p < 0.05$), and Constant & SST scores were 90.2 +12.2 and 10.2+2.1, less than contralateral shoulder 98.4 + 5 points and 11.7 + 0.9 ($n = 58$, $p < 0.05$).Group A,C affected shoulders' VAS score greater and SST Constant scores less than the contralateral shoulder, the results were statistically significant. However, the three groups of follow-up patients' affected shoulder VAS score, Constant and SST scores showed no statistical significance. Conclusion: Surgical treatment of distal clavicle fracture (Neer II) show good effects. The Endo-buttons fixation under arthroscope is a better choice that the surgeries are more comprehensive, less invasive and have less postoperative complications and shoulder irritations than clavicular hook plate.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40572

MANAGEMENT OF COMPLEX VASCULAR INJURY IN UPPER EXTREMITY WITH TEMPORARY INTRAVASCULAR SHUNT FOLLOWED BY IMMEDIATE FLOW-THROUGH FLAP TRANSFER

Qing-Tang ZHU, Jian QI

Complex vascular injury refers major vascular injury associated with two or more tissue injuries resulting in an ischemic limb. It needs not only emergency vascular reconstruction but also adequate soft tissue coverage. The aim of the present paper is to report our experience in management of complex vascular injury in upper limb with temporary intravascular shunt (TIVS) followed by immediate flow-through flap transfer. From Jan 2011 to Feb 2014, 4 patients with complex vascular injury in the upper limb were admitted to our hospital. Prior to radical debridement, a shunt was placed to bridge the proximal and distal stumps of the lacerated vessels. After debridement and fracture fixation, anterolateral thigh (ALT) flap was harvested, the shunt was removed and the flap was transferred in a flow-through manner, the descending branch of lateral circumflex femoral artery and accompanied veins was used to reconstruct the injured vessels. All patients were followed-up for 1 to 3 years. All limbs and flaps were survived, and the reconstructed vessels were patent. The donor site morbidities were minimal. In conclusion, management of complex vascular injury in the upper limb can be extremely challenged. Radical debridement is crucial but often results in extensive soft tissue defect. Flow-through flap transfer can achieve promising vascular reconstruction and adequate soft tissue coverage as well, but it is high technical demands and time-consuming. TIVS can promptly restore perfusion to the limb and minimize the ischemic time before definitive vascular reconstruction.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 41285

COMPARISON OF FUNCTIONAL RESULTS BETWEEN PARALLEL VERSUS ORTHOGONAL PLATING IN THE MANAGEMENT OF DISTAL HUMERAL FRACTURES (AO -TYPE C)

Samrat Smrutiranjan SAHOO, Saurabh SINGH, Hemant BANSAL, Pritesh GUPTA

Background: The difficulties in the management of distal humeral fractures are the complex 3-dimensional geometry, limited soft tissue coverage and less bone stock. The most widely used method for the fixation of distal humeral fractures is the dual plate fixation (either in parallel or orthogonal configuration). Our study was to compare the functional results between the two fixation methods in the management of distal humeral fractures (AO –Type C). Material and methods: Our study population of 40 patients were randomly divided into two groups: group I - parallel plating (n=19); group II – orthogonal plating (n=21), operated with posterior approach to elbow by olecranon osteotomy or triceps-retracting approach. Mayo Elbow Performance Score (MEPS) was used to determine the functional results of the elbow at 1 yr after operation. The surgical time, blood loss, bone union time, incidence of complications and recovery of function were indices of outcome. Results: MEPS for group I (89.78±7.2) came more than group II (88.00±8.31), (p value = 0.474). Parallel plating method scored better than the orthogonal plating method with respect to bone union time, less incidence of non-union, mean flexion and extension arc, and MEPS score but mean operative time and average blood loss, and incidence of implant impingement were more in group I than group II. (But values statistically insignificant). Conclusion: Both the parallel and perpendicular plating methods can provide anatomical reconstruction and stable fixation with the application of appropriate surgical technique for AO Type – C distal humeral fractures with comparable functional outcomes.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 41731

MANAGEMENT OF NONUNION OF EXTREMITY LONG BONES USING MODIFIED BONE GRAFTING METHODS WITH SWAN-LIKE SHAPE MEMORY CONNECTOR – REPORT OF 143 CASES

Shuogui XU, Panfeng WANG, Chuncai ZHANG, Yuntong ZHANG, Panyu ZHOU

Introduction: The management of nonunion has remained a constant challenge. The associated bone defect, shortening, deformity and plates or screws breakage and loosening complicate the management. A modified bone grafting method with Swan-like Shape Memory Connector may minimize some of the problems frequently encountered in these patients. In this study, we prospectively evaluated the clinical outcome of 143 consecutive patients regarding nonunion of extremity long bones managed using the modified bone grafting methods with Swan-like Shape Memory Connector. Patients and methods: A total of 143 patients (including 4 clavicles, 50 humeri, 54 forearms, 36 femurs and 14 tibias), mean age 41.5 years, were stabilized using the modified bone grafting methods with Swan-like Shape Memory Connector for nonunion of long bones. The mean time since injury was 9 months. 36 cases had infection history in the surgical sites which were cured before our definitive operation. The bone and functional results were assessed at the end of treatment. Results: Union was achieved in all cases (99.3%) except one patient suffered hardware breakage which was cured by reoperation with the same method. The average time for union was 4.5 months. The functional results were excellent in 97 cases, good in 31 cases, fair in 11case and poor in 4 cases. Conclusions: The modified bone grafting methods with Swan-like Shape Memory Connector is an effective method for treating nonunion in the extremity with or without bone loss.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40860

TO STUDY MANAGEMENT OF FIFTY ADULT PATIENTS WITH INTRAARTICULAR LOWER END RADIUS FRACTURES TREATED WITH DIFFERENT MODALITIES OF SURGICAL MANAGEMENT

Vishal MANDLEWALA, Ashish SURYAWANSHI

Introduction: Fractures of distal end of the radius are the most common fractures that orthopaedic surgeons have to treat. Range of fracture extends from simple extraarticular to highly communited intraarticular fractures. It comprises 75% of all forearm fractures. Some of these fractures are caused by severe high energy trauma, resulting in intra-articular involvement and comminution. We decided to study the management of intraarticular fracture of lower end radius using different modalities of surgical management and their outcomes. Aims and objectives: The aim is to study the outcome in 50 cases of intraarticular fractures of lower end of radius in adults treated with different modalities such as Kirschner wire and casting, external fixation and open reduction and internal fixation with plate osteosynthesis. Materials and methods: Fifty adult patients with intraarticular lower end radius fractures treated at the Department of Orthopaedics, Dr D.Y.Patil medical college and research centre, pune were included in the study. K wire fixation was done in 17 patients, external fixation was done in 9 patients and plate osteosynthesis was done in 24 patients. Result: In our series for K wire fixation we had 77% of excellent and good results. In external fixator we had 67% fair results. In plate osteosynthesis we had 70% of excellent and good combined results Conclusion: Open reduction and internal fixation of displaced and communited intraarticular fracture of distal end of the radius appears to be the treatment of choice where alignment of articular surface cannot be obtained by closed means.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 40705

MANAGEMENT OF RADIAL NERVE PALSY FOLLOWING OPEN REDUCTION AND INTERNAL FIXATION OF HUMERAL SHAFT FRACTURES

Xianyou ZHENG, Fu KAI, Yimin CHAI, Bingfang ZENG

Background: Management of humeral shaft fractures accompanied by palsy of radial nerve has long been a controversial issue. However, radial nerve palsy following open reduction and internal fixation of humeral shaft fractures was less discussed. The purpose of this study was to review the outcome of surgical exploration comparing with expectant treatment in these patients and analyze the possible reasons to make prophylaxis. Patients and methods: We retrospectively analyzed 40 patients, who had radial nerve palsy after open reduction and internal fixation of humeral shaft fractures, from 1003 patients of humeral shaft fractures treated with open reduction and internal fixation in our hospital from Jan. 2006 to Nov. 2014. Surgical intervention was indicated in eighteen patients if functional recovery of the radial nerve was not present after 4-6 months' expectant treatment. 22 patients were treated expectantly lasting 12 months, and tendon transfer was performed in cases of no radial nerve recovery. At the time of follow-up, the clinical outcome was graded with use of the Mayo Wrist Score. Results: All 18 patients of surgical exploration had radial nerve recovery at an average follow-up of 10 months, and 17 patients had an excellent score according to the Mayo Wrist Score. 20 of 22 patients treated expectantly underwent tendon transfer after twelve months' expectant treatment. Mayo Wrist Score between two groups has statistical difference ($p<0.05$). Conclusions: Radial nerve palsy following open reduction and internal fixation of humeral shaft fractures should be managed by surgical exploration. A non-operative approach was not recommended.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 39380

EFFECTS OF THE ALTERATION OF EARLY IMMUNE FUNCTION FOLLOWING POSTTRAUMATIC SPLENECTOMY ON FRACTURE HEALING

Yang WANG, Jian-Jun LI

Introduction : Spleen islymphoid organ related with fracture healing .Studies were carried out focusing on the effects of the changes of immune function after traumatic splenectomy on fracture healing. Methods: Patients enrolled were separated into three groups 1) compound traumatic, multiple fracture, splenectomised (CMS)2)compound traumatic, multiple fracture (CM) 3) simple fracture(S). Patients with head injuries were excluded. First, blood samples were obtained at the 1st, 5st, 7st and 14st day after fractures. Emergency splenectomy was underwent in the first day injured. Mononuclear cells, lymphocyte percentage and cytokines including TNF-α , IL-6 in the peripheral blood were examined .Second, Intraoperative fresh hematoma at the fracture sites were also taken to record the number of macrophages and lymphocytes and quantify the TNF-α , IL-6. Finally, the state of fracture healing was followed up through postoperative X-ray films examining BMD and BG . Results: In each of the three groups, the monocytes percentage, lymphocytes percentage , the quantity of TNF-α , IL-6 and in the peripheral blood presented a dynamic alteration ; Among the groups, These cells and cytokines in the CMS group were lower than the others'($P<0.05$) ;In the hematoma, the counts of macrophages and lymphocytes and the production of TNF-α and IL-6 in the CMS group was less than the others'($P<0.05$).Between the CM group and S group, the difference was also significant($P<0.05$).The BMD and BGwere lowest in the CMS compared with the other two groups at different time points($P<0.05$).Conclusion: Splenic immune function play an important role in bone repair. Reserving the injured spleens and enhancing the level of immunity may be beneficial to the fracture healing.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 42429

CLINICAL OUTCOMES OF ALLOGRAFT WITH LOCKING COMPRESSION PLATES FOR ELDERLY FOUR-PART PROXIMAL HUMERUS FRACTURES

Hua CHEN, Peifu TANG, Ming HAO, Zhang WEI, Xiangdang LIANG, Qun ZHANG, Yizhu GUO, Lihai ZHANG

Objectives: To assess clinical outcomes of anatomical allograft or fibula shaft with locking compression plates (LCPs) in elderly four-part proximal humeral fracture. Methods: Between January 2010 and December 2011, 22 elderly patients (9 males and 13 females, aging 52 - 84 years) who suffered from four-part proximal humeral fractures received allograft with LCPs for treatment. The mean length of the calcar segment was 6.4 ± 4.4 mm. The average medial-hinge displacement was 13.4 ± 9.6 mm. Seven cases received anatomical allograft and 15 received fibula shaft; Postoperative evaluations included constant-Murley score (CMS), the disability of the arm, shoulder and hand (DASH) score, and subjective ratings, radiographic imaging, range of motion (ROM) and complications. Results: The ROM and strength was considerably limited compared with the normal side, while there were no significantly differences in pain and daily activity between the unaffected and affected side. Additionally, no significant differences were found in patient subjective ratings, CMS and DASH scores between the patients augmented with fibular shaft and anatomical allograft. One case developed avascular necrosis (AVN) and screw cutout into articular surface. Besides, varus displacement occurred in one case, but the patient acquired good function without revision. There was no infection, bone nonunion, and hardware-related complications occurring in any case. Postoperative neck-shaft angles were 126.2 ± 13.2° (ranging 90-150°). Conclusion: Both anatomical allograft and fibula shaft with LCPs in elderly four-part proximal humeral fracture acquire good results. Four-part proximal humeral fracture; Locking-compression plates (LCPs); Fibular shaft; anatomical allograft

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 42428

HEMIARTHROPLASTY FOR COMPLEX PROXIMAL HUMERAL FRACTURE WITH A MEAN 5 YEARS FOLLOW-UP

Xinghuo ZHANG

OBJEXTIVE : Hemiarthroplasty is a successful treatment for patients with complex proximal humeral fractures. There have been limited studies with midterm clinical and radiologic outcomes. We report our results in our university hospital. METHODS : From Jan 2007 to Nov 2011, fifty two consecutive cases of hemiarthroplasty were performed by an antero superior approach in 52 patients (39 women and13men). The patients' mean age was 73 years (range, 65-81years). The mean follow-up period was 5 years (4-8years). 49 patients were available for final review, and two were lost to follow-up. RESULTS: There are no infection and loosing cases in all patients .Mean Constant Murley score was 53.6. Tuberosities complications and reduction in the acromion-humeral distance were negatively related to clinical outcome. Effective rehabilitation are positively related to clinical functional. Recovery. Age at surgery displayed a negative correlation with clinical outcome, this is mainly due to great variability in the elder group of patients. CONCLUSIONS: Hemiarthroplasty is an effective surgery for complex humeral fractures in the majority of patients. Outcomes display a great variability in relation to X-ray alterations and age at surgery. A careful attention in patient selection is necessary.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 42427

A USEFUL SURGICAL STRATEGY FOR PROXIMAL TIBIAL FRACTURES (AO/OTA TYPE 41-C) WITH DIAPHYSEAL INVOLVEMENT

Dankai WU

Objective: Relatively few studies have addressed surgical strategy for complex proximal tibial fractures by now. The purpose of this study was to assess the results of a single lateral locking plate using minimally invasive plate osteosynthesis (MIPO) for proximal tibia fractures (AO/OTA type 41-C) with diaphyseal involvement. Methods: From Jun 2009 to Jun 2014, 20 patients (fifteen women and five men, mean age 35.8 years) were managed for proximal tibial fractures which extend into the diaphyseal region of the bone, including three 41-C1, eleven 41-C2, and six 41-C3. Twelve patients were open fractures. A single lateral locking plate characterised by percutaneous technology was used with or without additional lag screws. Mobilization was started immediately after the procedure, and non-weight-bearing was maintained for at least 6 weeks, then progressively weight bearing depends on both clinical and x-ray findings. Results: Primary union was achieved by 16 of the 20 study subjects. Early bone grafting was performed in 4 cases with a massive initial bone defect and staged bone grafting was used in one to treat nonunion. The mean articular step off was 1.0 mm (range, 0–3 mm). No patient had malalignment greater than 10°. Acceptable range of knee motion of ≥120º was achieved in sixteen, and the mean knee Hass score was 87.4 at final follow-up visits. The complications included superfical infection in one patient. Conclusions: The surgical strategy can provide favorable results in the treatment of proximal tibial fractures (AO/OTA type 41-C) with diaphyseal involvement. Surgical strategy, proximal, tibial fractures, Minimally invasive surgical procedure, single lateral, locking plate.

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 42426

THE VALUE OF TIP-APEX DISTANCE IN EVALUATING THE CLINICAL APPLICATION OF BIAXIAL SYSTEM FOR PROXIMAL FEMORAL FRACTURES

Jia ZHANG, Qiang LI, Sheng ZHU

As a crucial indicator to evaluate the position and depth of lag screw in monoaxial proximal femoral nail system, Tip-apex distance (TAD) has been universally acknowledged , and the ideal value is less than 25mm in clinical application, however, how to evaluate the position and depth of lag screw in biaxial proximal femoral nail system is still lack of a good indicator. 【Purpose】Our study is to testify if the TAD is an effective indicator of predicting cut-through and cut-out in biaxial proximal femoral nail system. 【Method】We studied retrospectively the cases all used biaxial nail system (TAN, Smith&Nephew) to treat proximal femoral fracture between January of 2007 to April of 2009. The total 71 cases whose age is 62.2±17.4 included 26 male patients and 45 female patients. We collected follow-up X-rays(preoperative , immediately after operation and 1 year after operation) of all these patients and measured the TAD value of the lag screw and the anti-rotation screw, however, these two screws always coincided in lateral X-rays and cannot be measured conveniently, so we regarded the tip of the screw which is closer to the edge of femoral head(The lag screw) as Tip while the Apex is still the same with the classical TAD standard and measured the TAD value immediately after operation and 1 year after operation.5 cases had cut-through or even cut-out of lag screw out of total 34 patients in group A(TAD < 25mm); 8 cases had cut-through or even cut-out of lag screw out of total 37 patients in group B(TAD > 25mm). We chose SPSS13.0 software to compare TAD and the rate of cut-through and cut-out between group A and group B. 【Result】No significant difference of cut-through and cut-out was found in gender,

Date: 2015-09-18
Session: Short Oral Communications Trauma Miscellaneous
Time: 10:30 - 12:00
Room: Qingyuan Hall

Abstract no.: 42425

ANTEGRADE INTRAMEDULLARY NAILING: ANOTHER CHOICE FOR DISTAL FEMORAL FRACTURE

Jianhong WU, Jiandong WANG, Qiugen WANG

Objective: To explore the effects and possibility of the antegrade intramedullary nailing for distal femoral fracture. Methods: The medical records of 18 patients (5 open and 13 closed fractures; aged 20 to 65 years) who received antegrade nailing fixation for a distal femoral fracture at the Trauma Center between March 2008 and 2014 were retrospectively reviewed. The fractures were classified as 32 type A2 (n=2), A3 (n=5), B2 (n=4), C3 (n=3), and 33 type A2 (n=4) per association for osteosynthesis and association for the study of internal fixation classification. Active isometric quadriceps exercising and passive motion of the knee were started immediately after surgery, partial bearing of the affected leg was allowed until the bone union was emerged on the X-rays. Follow-up was available for all patients at a minimum of nine months (mean, 18.1 months). Treatment outcomes were assessed by range of knee motion, lower limb axial, bone union, knee-rating scale, and Harris hip scores. Results: The mean follow-up was 18.1 months. The mean time of radiographic healing was 4.1 months. The mean range of knee motion was 110.4º; the mean Harris and Hospital for Special Surgery knee scores were 91.7 and 92, respectively. The alignment of all affected legs was normal. Ligamentous instability and nerve injuries were not seen in all the patients. There was no implantation failure. Conclusion: Antegrade intramedullary nailing could achieve good effects for special type distal femoral fractures; hence it could be an alternative choice for some selected distal femoral fractures

Date: 2015-09-18
Session: Short Oral Communications Research I
Time: 14:00 - 15:30
Room: Qingyuan Hall

Abstract no.: 41787

A NOVEL GOAT MODEL OF ACUTE CERVICAL SPINAL CORD INJURY UTILIZING A PERCUTANEOUS EPIDURAL BALLOON CATHETER: METHOD FEASIBILITY AND PRELIMINARY OBSERVATIONS

Xuan HUANG, Hongxing SHEN

Introduction: To establish a goat model of acute cervical spinal cord compression injury, utilizing a modified percutaneous technique with a Foley double-lumen urine catheter. Methods: 12 goats, weighed between 45 and 50kg, were randomizedly divided into 3 groups: control, 0.5ml and 1ml compression. All animals received a trans-lumbosacral-interlaminar-space epidural balloon catheter (5-Fr) insertion using a percutaneous technique. The balloon catheter was then advanced under fluoroscopic guidance, until its distal tip reached the middle of C7 vertebra level. One week later, for Group B and C, the balloon was inflated by half-strength contrast material, 0.5ml and 1ml, respectively, while Group A remained deflated. The balloon was left inflated for 30 minutes, then deflated. Quantitative assessment of spine canal occupying rate was accomplished by using an off-line software program based on CT images. Motor function was assessed by modified Tarlov scale. Spinal cords from the injured level were then obtained for pathologic examination. Results: After inflation, the occupying rate of Group B and C achieved 43.4%±2.5% and 88.1%±2.3% form 6.7%±0.7% and 6.6%±0.6%, respectively. Ventral compression of the spinal cord and hyperintensity signal were noted on MRI. Animals in Group B and C became paraplegic after inflation, and a positive correlation between injection volume and Tarlov score was observed. Pathological findings confirmed spinal cord injurt in group B and C at 48h after injury. Conclusion: Percutaneous epidural balloon catheter insertion differs from previous techniques by avoiding surgical exposure and the associated artifacts.

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CT MORPHOMETRIC ANALYSIS TO DETERMINE A RELIABLE GUIDE IN DIRECTING THE SAGITTAL ANGLE OF PEDICLE SCREWS IN SUBAXIAL CERVICAL SPINE

Jun YAN, Ka LI, Yanping ZHENG, Jianmin LI

Axial computed tomography (CT) images of 70 adult cases were obtained. Multi-directional pedicle axis reconstruction images of subaxial cervical spines were analyzed. The angle formed by the tangential line passing the ipsilateral adjacent outer laminae cortex to the pedicle axis in the oblique sagittal plane (TPA) was recorded. A total of 350 vertebrae were analyzed. Averaged TPA ranged from 89.8° at C3 to 90.7° at C6. The TPA showed a high level of consistency close to a right angle and might serve to be a reliable guide in determining the direction of subaxial cervical pedicle axis in the sagittal plane.

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USEFULNESS AND TROUBLE OF MINIMUM OPEN (1 INCH) OPEN-DOOR LAMINOPLASTY

Kanji SASAKI

Introduction: Surgeries for cervical spinal stenosis are widely undergone. Most of the cases are required to widen whole canal because stenosis is not usually segmental. Thus minimum-open isn't major and we choose conventional laminoplasty (Hirabayashi's/ Kurokawa's procedure). Although these resulted well, we are sometimes troubled with severe nape pain. We developed minimum-open procedure and certify whether this reduce nape pain or not. Materials and Methods: We selected seventy-two cases with open-door laminoplasty (LP), including forty-nine male and twenty-three female (average 66.0 years old). All cases were undergone LP from C3-C7 by single surgeon. For 44 cases, we underwent minimum-open (C3-7 Using titanium plate/screw, skin incision 1 inch). To practice the procedure, our device is only to use two right angled Gelpi-retractors. For comparative cases, 28 cases were conventional LP (Hirabayashi's procedure: C3-7 using hydroxyapatite brocks, 3-4 inch). We compared surgical times, nape pain (VAS), recovery rate of neurological deficit (JOA score), hospitalized duration and trouble during surgery. Results: The recovery-rate at 1 month didn't significantly differ (Conventional: 46%/ minimum-open: 55%). There were no C5 palsy and worsened neurological deficit. Surgical time of minimum-open (average 61 min.) was significantly superior to conventional (72). Although hospitalized duration was 7.0 days (minimum-open) and 8.7 (conventional), nape pain of the minimum-open at discharge (VAS 2.3) was significantly less than conventional (3.0). For one case of minimum-open, we underwent repeat surgery, because of the impingement of spinous process and muscles. Conclusion: Minimum-open LP is easy and safe. This will take the place of conventional procedure.

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ASSOCIATION BETWEEN RS4753426 POLYMORPHISM IN MTNR1B GENE AND ADOLESCENT IDIOPATHIC SCOLIOSIS: A META-ANALYSIS OF 7,072 PARTICIPANTS

Kai ZHOU, Zongke ZHOU

Purpose The purpose of the present study is to assess and synthesize the currently available evidence on the association between rs4753426 polymorphism and AIS, and evaluated the associations in different ethnicities. Methods A search was performed in PubMed, Embase, EBM, Medline, EBSCO, CNKI and Wangfang databases up to August 2014. The included studies were assessed in the analysis of the allele models as follows: (a) T allele versus C allele for the allele level comparison; (b) CC + CT versus TT for dominant model; (c) CC versus CT + TT for recessive model, (d) CT versus TT and CC versus TT for co-dominant model. Meta-analysis was performed by STATA 12.0 software to estimate the pooled odds ratio (OR) and the 95 % confidence interval (CI). Results Six studies with 7,072 total participants (2,906 patients with AIS and 4,166 controls), were eligible for inclusion. Overall, significant association between rs4753426 polymorphism and AIS risk was found in the dominant model [CC+CT vs TT: OR=1.27, 95 % CI (1.05–1.54), P=0.012] and heterozygote model [CT vs. TT: OR=1.22, 95 % CI (1.00–1.49), P=0.047]. In the subgroup analyzed by ethnicity, we found C allele [OR=1.34, 95 % CI (1.02–1.75), P=0.034] and CC genotype [OR = 1.57, 95 % CI (1.00–2.44), P=0.049] were significantly associated with AIS in Asian group but not in Caucasian group. Conclusions In summary, this meta-analysis find a significant association of rs4753426 polymorphism with risk of AIS in Asian population. Further investigation of this association is necessary in other ethnic population.

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Abstract no.: 40094
EXPERIMENTAL STUDY OF TISSUE ENGINEERING TENDON

Zhou XIANG

Objective: To obtain artificial tendon by tissue engineering. Methods: Tenocytes were isolated from the human embryonic tendons by digesting it with trypsin and collagenase. Then the cells were subcultured to 13th generation. These cells were able to grow adhering to the wall and stop growing with contact inhibition. The time of cell group duplication was 4 days, which was similar to the peak time of its mitosis. Hydroxyproline content was detected in different generation cells and the results showed that the cultured human embryonic tenocytes had same collagen synthesis capacity .There was no change in biologic characteristics with cell subculture. The tenocytes were co-cultured with carbon fiber, polylatic acid (PGA) and collagen scaffolds .The optimal material was chosen based on the observation of histocompatibility and cell growth. The tenocyte-scaffold complexes were implanted into rabbits to repair Achilles tendon defects. Morphological changes of tenocytes and synthesis of type Ⅰ collager culture, the histocompatibility between tenocytes and carbon fiber strengthened, collagen coated PGA was best. Two weeks after implantation, the tenocytes proliferated inside the steric frame and synthesized collagen. At the suture site, the collagen fibers of the implant fused with the recipient tendon collagen fibers, indicating healing between the implant and recipient tendon SEM observation revealed that the tenocytes aligned regularly and evenly among the carbon fibers. Conclusions : Combined culture of tenocyte with mix- woven of carbon fiber and PGA scaffold is able to make tissue engineering tendon.

Date: 2015-09-18
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Abstract no.: 40093

CLINICAL APPLICATION OF BIO-DERIVED BONE TRANSPLANTATION WITH TISSUE ENGINEERING TECHNIQUE: 7 YEAR FOLLOW-UP

Kun PENG, Zhou XIANG

Objective : To summarize the medium-term clinical result of bio-derived bone transplantation in orthopedics with tissue engineering technique. Methods : From December 2000 to June 2001, 10 cases of various types of bone defect were treated with tissue engineered bone, which was constructed in vitro by allogenous osteoblasts from periosteum (1 × 106 /mL) with bio-derived bone scaffold following 3 to 7 days co-culture. Six men and 4 women were involved in this study, aged from 14 to 70 years with a median of 42 years. Among them, there were 2 cases of bone cyst, 1 case of non-union of old fracture, 6 cases of fresh comminuted fracture with bone defect, and 1 case of chronic suppurative ostemyelitis. The total weight of tissue engineered bone was 3-15 g in all the cases, averaged 7.3 g in each case. Results : The wound in all the case healed by first intention. For 7 year follow up, bone union was completed within 3.0 to 4.5 months in 9 cases, but loosening occurred and the graft was taken out 1 year after operation in 1 case. The X-ray films showed that 9 cases achieved union except one who received resection of the head of humerus. No obvious abnormities were observed, and the function of affected limbs met daily life and work. Conclusion : Bio-derived tissue engineered bone has good osteogenesis. No obvious rejection and other complications are observed in the clinical application.

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Abstract no.: 41715

IN VITRO PROLIFERATION AND CHONDROGENESIS OF RABBIT BONE MARROW MESENCHYMAL STEM CELLS INDUCED BY BMP-7-LOADED PLGA MICROSPHERES

Jialei CHEN

Purpose: Aim to prepare and evaluate the bone morphogenesis protein-7 (BMP-7) loaded controlled-releasing microspheres made by poly (lactide-co-glycolide) (PLGA). In addition, the proliferation and chondrogenesis of rabbit bone marrow mesenchymal stem cells (MSCs) induced by BMP-7-loaded PLGA microspheres as an novel alternative for cartilage tissue engeering would be researched in vitro. Methods: Double emulsion method was applied in preparation of microspheres. The proliferation potential of third passage MSCs was detected by MTT assay and growth curve was gained based on the data from MTT assay. Compare to proliferation and chondrogenesis of MSC between BMP-7-loaded PLGA microspheres group and controlled group. Results: BMP-7-loaded PLGA microspheres were prepared with rounded-morphology and smooth surface. The average diameter of microsphere was 14.45±5.97μm, range from 2.5μm to 28.2μm. The average protein-loadage and protein-envelopment was 11.1% and 70.6%, respectively. The releasing speed of microspheres was rapid at first phase with percentage of accumulation of releasing-protein was 33.73±1.56%. Then, the releasing-curve went to steady gradually, but the releasing accumulation of BSA was increasing. Compared to controlled group, the BMP-7/PLGA group was with more number of cells growing to larger size and plentiful kytoplasm. Meanwhile, the GAG contents in BMP-7/PLGA group on 14th and 21st day was 41.35±2.04μg/ml, 58.22±2.54μg/ml respectively, representing difference statisticsly. Conclusion: BMP-7-loaded PLGA microspheres prepared by double emulsion method was good morphologic, with high protein-loadage and protein-envelopment, and capable of controlling releasing BMP-7. BMP-7-loaded PLGA microspheres were capable of promoting proliferation and chondrogenesis of MSCs via in vitro releasing BMP-7.

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Abstract no.: 41115

THE STUDY OF SECURITY AND BIOCOMPATIBILITY OF INJECTABLE ABSORBABLE POLY AMINO ACID / CALCIUM SULFATE (PAA/CS) COMPOSITES IN VIVO

Chang ZOU

OBJECTIVE: To evaluate the security and biocompatibility of the new composites through animal experiments. METHODS: The composite materials were implanted into musculus sacrospinalis of New Zealand rabbits, and its diffusion solution were injected into Kun Ming rats' body and New Zealand rabbits' back skin respectively. RESULTS AND CONCLUSION: The general condition of rats were good after the injection of the diffusion solution, and the body weight was growing, without significant edema, adhesions, necrosis of intra-abdominal organs .The skin stimulation reactions such as erythema and edema were not observed after the injection of diffusion solution into rabbits. The inflammatory reaction nearby the implants was slight after intramuscular implantation of the rabbits in the early stage, then weakened gradually. The Capsule-like structure was also be absorbed gradually,and no significant rejection was observed. The activity of cytochrome oxidase and lactate dehydrogenase of muscles cells nearby the implants had no significant decrease after implantation. All of the above prompted that the new Poly amino acid / calcium sulfate composites has good biocompatibility and excellence safety in vivo.

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Abstract no.: 41075

COMPARING STUDY OF THE HISTOPATHOLOGICAL FINDS AND LEVEL OF RELATED FACTORS BETWEEN GLUCOCORTICOID-INDUCED OSTEONECROSIS OF FEMORAL HEAD AND HIP OSTEOARTHRITIS.

Xiaowei XIE, Fuxing PEI

Objective : To study the mechanism of glucocorticoid-induced osteonecrosis of femoral head (ONFH) through comparing research the histopathological chang and level of PPARγ,Runx2 ,DKK-1 between glucocorticoid-induced osteonecrosis of femoral head and hip osteoarthritis. Methods: We collected 40 patients who were diagnosed glucocortcoid-induced osteonecrosis of femoral head and hip osteoarthritis , each group contained 20 patients respectively , then made histopathological and Immunohistochemistry study. Results : Lots of large diameter adipocytes are full in the femoral head of patients that induced by glucocorticoids , large number of bone trabecula were fractured and the columnar trabeculae showed porotic, manifesting thinning. The positive expression of PPARγ,DKK-1 were abundantly while Runx2 was so poor in glucocorticoid-induced ONFH. Compairing with glucocorticoid-induced group,in the hip osteoarthritis group, the number and diameter of adipocytes were more small and the columnar trabeculae showed compact and the positive expression of PPARγ,Runx2,DKK-1 were just opposite to the glucocorticoid-induced ONFH group. Conclusion : PPARγ, DKK-1, Runx2 are key factors to regulate the differentiation of bone marrow stromal cells (MSC).Exogenous glucocorticoids could up regulate the level of PPARγ and DKK-1 while reduce the level of Runx2 which would cause the number of osteoblasts decreased obviously but MSC derived adipocytes rised significantly, simultaneously, ONFH happened because the activation of osteoclasts was enhanced but the bone remodeling was impaired.

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Abstract no.: 41067

THROMBOPROPHYLAXIS WITH RIVAROXABAN AFTER TOTAL IOINT REPLACEMENT INCREASES THE INCIDENCE OF WOUND LEAKAGE

Yingchun CAI, Fuxing PEI

Objective: To observe the security and clinical effects of rivaroxaban against deep venous thrombosis (DVT) comparing with low-molecular-weight heparin (LMWH). Methods: Retrospectively 165 patients undergoing primary joint replacement were included. 65 patients took rivaroxaban 10mg/d after the surgery, and 100 patients were injected subcutaneously with LMWH 2000IU/d. During their hospital stay, we investigated the rate of wound leakage, ecchymosis, venous thromboembolism and transfusion. The length of stay, and volume of drainage were also observed and analysed. Results: The rate of wound leakage and ecchymosis of rivaroxaban group were 29.23% and 12.31%; they were obviously higher than LMWH group statistically which were 11% and 6% respectively. The other indicators such as length of stay, transfusion rate, venous thromboembolism rate and drainage volume were of no difference statistically. Conclusion: Rivaroxaban led to a higher incidence of wound leakage and ecchymosis comparing LMWH, but it didn’t increase the length of stay, drainage volume and transfusion rate. Both rivaroxaban and LMWH were of high clinical effects and security in the thromboprophylaxis after total joint replacement.

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Abstract no.: 41149

THE PROGNOSTIC VALUE OF HER-2 EXPRESSION IN OSTEOSARCOMA PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS

Tu JIAN, Li ZHIYONG, Shen JINGNAN

Introduction: HER-2 is widely recognized as a prognostic factor for several kinds of cancer, but it is still unclear in osteosarcoma. We aimed to investigate the relationship between HER-2 expression and the survival outcomes of osteosarcoma. Methods: We searched in PubMed, EMBASE and Cochrane library. The latest searching date was November 1, 2014.All the available data were summarized and analyzed, following the methodological assessment and data extraction. Results: No differences were found between patients with HER-2 positive and negative expressions on 5-year overall survival (OS) (OR = 1.61, 95% CI 0.79-3.29, p = 0.19),5-year event-free survival (EFS) (OR=1.80, 95% CI 0.69-4.71, P=0.23) and histological response to neoadjuvant chemotherapy (OR = 0.59, 95% CI 0.17-1.99, P=0.39). Osteosarcoma patients with HER-2 positive expression were more prone to develop pulmonary metastasis than those with HER-2 negative expression (OR=2.09, 95% CI 1.18-3.70, P=0.01). Conclusions: Our meta-analysis demostrated that no difference was found between patients with HER-2 positive and negative expressions on 5-year OS, EFS and histological response to neoadjuvant chemotherapy. But it may predict lung metastasis. Thus HER-2 expression maybe partially related with the poor prognosis of osteosarcoma.

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Abstract no.: 42411

RATIONAL REGIMEN OF CRYOTHERAPY IN TOTAL KNEE ARTHROPLASTY

Chu WANG, Wenwei QIAN

Background: Cryotherapy plays important role in rehabilitation after injury or trauma. However, the utilisation of cryotherapy in total knee arthroplasty hasn't drawn enough attention, and different results have been derived from different studies. The key issue is that regimens varies from hospitals, while there is limited data on regimen of cryotherapy in total knee arthroplasty. Objective: Exploring the rational regimen of cryotherapy in total knee arthroplasty. Method: Literatures in PubMed with detailed regimens have been reviewed on different regimens of cryotherapy and corresponding effects on pain, swelling, and range of motion. Results: Seven articles have described detailed regimen. In terms of those literatures, eight hours daily is the cut-off point for effectiveness of cryotherapy. More than eight hours leads to even better results, as with ten hours usage equals the effect of epidural analgesia. Two hours each time for four cycles at the interval of one hour has been recommended by Hospital for Special Surgery. The therapy should start right after the total knee arthroplasty, and lasts for six weeks, while the first week is cardinal for pain control, and is effective for swelling and range of motion. Cryotherapy during the other five weeks helps in swelling and promoting range of motion. Serious adverse event does happen while the patients adopt cryotherapy at home, such as frostbite and necrosis of the skin. Conclusion: According to the exploration of the literatures, two hours each time for four cycles at the interval of one hour daily can be the optimal regimen for cryotherapy. The therapy can last six weeks, while the first week is the most important one.

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Abstract no.: 42410

MIR-26A REGULATES PGE2 PRODUCTION IN LIPOPOLYSACCHARIDE INDUCED THP-1 MACROPHAGE CELLS BY INHIBITING COX-2

Jiaquan LUO, Tin YU

Macrophages induced by lipopolysaccharide (LPS) stimulation, lead to the production of inflammatory mediators, which are crucial to host defense and skeleton regeneration. MicroRNAs are short noncoding RNAs that regulate key biological processes via suppression of gene expression at post-transcriptional levels. Recently, miR-26a and COX 2 has been shown to be differently expressed at early time in the anterior lumbar fusion model. However, the role of miR-26a in LPS-induced THP-1 macrophage cells remains unclear. Here we found that the expression of miR-26a and COX-2 was inversely expressed in THP-1macrophage cells in response to LPS stimulation in time-dependent manner by one-step real-time quantitative PCR. In addition, overexpression of miR-26a marginally reduces the levels of COX-2 protein in LPS-treated THP-1 macrophages. A luciferase reporter gene experiment suggests that the 3'-untranslated region of COX-2 carries a binding site for miR-26a. Moreover, miR-26a mimics decreased the production of PGE2 and interleukin-6, increased the the production of interleukin-10, but did not affect tumor necrosis factor-αand interleukin-1β in LPS-stimulated THP-1macrophage cells, while miR-26a inhibitor opposite effect. These results suggested that miR-26a may function as a novel feedback negative regulator to LPS-induced production of PGE2 and some related cytokines via inhibiting the expression of COX-2.

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Abstract no.: 42409

EXPERIMENTAL STUDY OF SURVIVAL OF PEDICLED PERFORATOR FLAP WITH FLOW-THROUGH AND FLOW-END BLOOD SUPPLY

Yang WANG, Yong HU, Zhengxun LI, Zheng HUANG, Songhua CAO, Wenpeng XU, Weiyang GAO

Introduction: This study evaluated survival of a pedicle flap with a perforator lateral branch and flow-through blood supply, compared to that of the flow-end blood supply with a perforator terminal branch. Methods: Forty Sprague-Dawley rats, twenty in each group, were assigned for transfer of a superficial epigastric artery-pedicle island flap with a flow-through or a flow-end configuration of blood supply. Laser doppler scanning was used after surgery to evaluate flap perfusion. The rats were euthanized on day five and lead oxide-gelatine enhanced flap angiography and histology with hematoxylin and eosin staining was performed. Dorsal midline tissue was excised for quantification of vascular endothelial growth factor by Western blot assay. Results: On postoperative day five, the flow-through group of rats exhibited a significantly greater area of flap survival, mean (standard deviation) 97.8 (3.5) per cent versus 80.8 (10.2) per cent, P = 0.003, microvascular density, 303 (19) versus 207 (41) per mm2, P< 0.001, and perfusion, 8.64(0.14) versus5.95 (0.14) perfusion units, P< 0.001 compared with the flow-end group. The flow-through group exhibited more angiosomes connected by dilated vascular anastomoses between the skin and subcutaneous fasciae. Conclusion: The flow-through blood supply improves pedicle perforator flap survival. perforator flap, flow-through, flow-end, survival, choke

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Abstract no.: 41736

HAS THE MODE OF OPERATIVE TREATMENT AN EFFECT ON THE INCIDENCE OF CRPS IN DISTAL RADIUS FRACTURES?

Evelyn MURPHY, Derek CAWLEY, Michael O'SULLIVAN

Background: Fractures of the distal radius may cause complex regional pain syndrome in 1-37% of cases. Factors common to those who develop CRPS include onset at third to fourth week post cast removal, female gender, tight casts and repeated reductions without sufficient analgesia. Methods: A retrospective review of 10 years of distal radius type CRPS patients who were eligible for inclusion through applying the criteria of Veldman and Gorise: (4/5 of the following present at the wrist/hand/fingers), and if they occurred (or increased) after activity. Results: 80 patients were initially described as having CRPS in distal radius fractures based on a review of charts from 2005 to 2015. 35 of these patients were excluded as they either did not meet the eligibility of Veldman/Gorise (28) or went on to have an alternative explanation for their symptoms at a time in the future (7). 45 patients were remaining. Three groups existed: conservative management with cast, K-wiring and open reduction internal fixation. There was a trend towards a higher incidence of CRPS in patients who underwent K-wiring. CRPS was more common in the more severe fracture types and in females. The average time of onset was in keeping with international norms. The diagnosis of CRPS increased per year however this was not statistically significant. Conclusion: CRPS should remain a diagnosis of exclusion. There was a trend towards an increase in CRPS in patients treated with K-wiring over ORIF. At risk groups included females aged 45-60.

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Abstract no.: 41933

CLINICAL POSSIBILITIES OF THE METHOD OF POLYFUNCTIONAL COMPRESSION-DISTRACTION OSTEOSYNTHESIS IN HAND SURGERY

Guseynali ISMAYLOV

Introduction: Progress in the development of the surgery of the hand for the purpose of helping the permanent and temporary disabled to the normal workable condition and improvement of functional possibilities for self-service became possible thanks to the method of transosseous osteosynthesis. Material and Methods: The present paper is based on the experience of surgical treatment of 1893 patients (2648 segments). Patients age varied from 0,10 to 76 years old, of congenital and acquired etiology. 73% of patients had prior surgical interventions. The tactics of treatment for patients with diseases of the hand was individualized depending on the etiology of the disease, character and complication of the prior treatment attempts, and also on the condition of tissues and joint functions. The method of transosseous osteosynthesis allowed for detailed solving of the problem of treatment of the present patients' groups, creating good conditions for regeneration and restoration of functions, providing reliable fixation of bone fragments, decreases the invasiveness of the surgery, preserves the innervations and blood-supply of fragments, regulates optimal rate and rhythm of distraction and possibilities of early functional weight bearing in the process of treatment. Result: Upon the completion of reconstructive and restorative treatment in all cases good results were obtained. Conclusion: All above-mentioned facts prove the feasibility of method of transosseous compression – distraction osteosynthesis, providing organotypic restoration of the hand a perfect condition in practical medicine.

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Abstract no.: 40119

MINI-EXTERNAL FIXATOR VS BUTTERS PLATE FOR TREATMENT OF LOWER END RADUIS

Mohamed ELDEEB

Introduction: fractures of lower end of radius are common there are meany varieties fro treatment of these type of fracture. Intra-articular and open fractures are challenges for orthopedic surgeons. The purpose of the study is to evaluate results of treatment of mini-external fixators in comparison to ORIF using butteres plate for surgical treatment of fracture of lower end radius. Methods: from year 2005 to 2012, 22 cases were treatment in Jeddah hospital, KSA for fracture lower end of radius, using AO classification. First group (A) was treated by mini-External fixators assisted with pre-cutaneous K-wires fixation under intensified intr-operative image other group (B) treated by ORIF and fixation by buttress plate & screw throw anterior approach. comparison of two groups were done for, time of operation, length of hospitalization ,healing of fracture, function (flextion-extension-pronation-supination)and complication results: mini invasive technique in group(A) operation time is lasted from 30-75 min in complications were loosing, fracture pin<stiffness infected plate ,injures of important structure were evaluated . Discussion & Conclusion: the efficiency of using mini invasive technique with mini external fixator assisted with pinning have more advantages than using ORIF of fracture of lower end of radius. mini invasive surgery for correction of severe comminuted and intra articular fracture of lower end of radius have more superiority & advantages than other methods , as short operative time , early mobilization , large range of movement of wrist joints ,great haling outcome , less complication and easy removed post-operative.

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Abstract no.: 39522

TOPOGRAPHIC MATCHING OF DISTAL RADIUS AND PROXIMAL FIBULA ARTICULAR SURFACE FOR DISTAL RADIUS OSTEOARTICULAR RECONSTRUCTION

Shanlin CHEN, Hailong ZHANG

Introduction: Proximal fibula graft has been used for reconstruction of osteoarticular defect in distal radius. Restricted motion and subluxation are commonly complications affecting clinical outcome, and increased joint congruity was believed to improve wrist function. Methods: Using computed tomography scanning and created 3-dimensional model, we develop a coordinate transformation algorithm for matching of proximal fibula graft and native distal radius to identify the best laterality for grafting and determine its optimal position for placement of proximal fibula graft in the reconstruction. Results: The mean radii of best-fit sphere of distal radius and proximal fibula articular surface were 24.5 ± 0.4 mm and 23.8 ± 0.3 mm. After reconstruction, mean radial inclination of fibula was 24.0±0.4° for ipsilateral graft and 14.2±0.5° for contralateral, and mean volar tilt of fibula was 14.4±0.5° for ipsilateral graft and 24.3±0.5° for contralateral. Mean area percentage of distal radius articular surface reconstructed by proximal fibula graft was 46.5±1.8% for ipsilateral graft and 43.4±1.7% for contralateral graft. For accurate placement of proximal fibula graft, longitudinal axis of proximal fibula was in the same of coronal plane with the one of distal radius and lateral to it by a distance of 0.3±1.1mm. The styloid of fibula was 2.2±0.6mm proximal to styloid of radius with a dorsal rotation of 41.8±5.7° around fibula longitudinal axis. Conclusions: Ipsilateral proximal fibula graft provides a better match for reconstruction of distal radius articular surface than the contralateral, and the position for graft placement is quantitatively determined.

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Abstract no.: 39759

COMPLICATIONS OF DISTAL RADIUS LOCKING PLATES - EXTENSOR TENDON IRRITATION

Yen Liang LAI

INTRODUCTION: The use of volar locking compression plates for the treatment of fractures of the distal radius is becoming increasingly popular because of the stable biomechanical construct, less soft-tissue disturbance and early mobilisation of the wrist. However, these plates include variety of complications, such as flexor and extensor tenosynovitis, tendon injury and intra articular screw or peg penetration. We describe cases of rupture/(irritaion) of the extensor tendon after treatment of displaced fractures of the distal radius by volar locking plates. And provide evidence by ultrasonography on intra- or post-operation to prevent these complications. MATERIALS & METHODS: We retrospectively reviewed 145 patients with fractures of the distal radius who had been treated using volar locking plates between 2012 and 2013. All take ultrasonography examination when noted wrist weakness and finger stiffness at 2 weeks and four weeks. RESULTS: Six patients (4.1%) subsequently presented with a rupture of an extensor tendon, four involving extensor pollicis longus, and one of extensor digitorum communis to the index finger and the tendon of extensor indicis proprius. 20 patients (13.7%) presneted with weakness and irritation tenosynovitis.

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Abstract no.: 41803

ARTHROSCOPIC VERSUS OPEN DORSAL WRIST GANGLION EXCISION: A 7 YEARS RETROSPECTIVE STUDY TO COMPARE THE RATES OF RECURRENCE.

Altaf AHMED, Mohamad HACHEM, Karthik KARUPPAIAH

Background/Introduction: Ganglia constitute 50-70% of all tumours in hand and wrist. Surgical treatment with either open or arthroscopic excision is offered in selective cases. Aim/Purpose: The purpose of this study was to compare the outcome between Arthroscopic and open surgical techniques in dorsal wrist ganglion. Methods: 121 patients with dorsal symptomatic ganglions underwent excision by either arthroscopic (27 patients) or open surgical technique (94) from April 2007 to June 2014. Out of 121 patients, 86 were females and the average age of patients was 33years. Patients who already had surgery or any other pathology in wrist joint were excluded. At average follow-up of 5.04 months (1 week-24months) the recurrence rate between arthroscopic and open dorsal wrist ganglia excision was compared. Chi Square test was used to compare the recurrence rate in both groups to determine the statistical importance. P Value of less than 0.05 was considered as significant. Results: One patient had recurrence in arthroscopic group and six in open excision group. The By comparing these two surgical techniques for recurrence rate, the p value calculated by Chi Square test was not significant. Conclusions: Our results demonstrate that at follow-up, the rates of recurrence with arthroscopic dorsal ganglia excision are comparable with that of open excision.

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Abstract no.: 40985

LIMIT OF CONTROLLED WOUND HEALING IN HAND'S LOSS OF SKIN SUBSTANCE MANAGEMENT AFTER SCORPION AND VIPER'S BITES

Amine HAMZA, Chanez AIT ALI

Introduction: Scorpion and viper's bites are public health problem in many countries worldwide. They may arise loss of skin substance in 18% of cases. By this study, we seek to estimate the maximum skin surface area that can be healed using controlled wound healing to determinate the usage's limit of this technic. Methods: Prospective study including 117 patient victim of scorpion or viper's bites presenting a loss of skin substance treated using controlled wound healing. We determinate the repartition by sex, age, localization and estimation of loss of skin substance surface as three types. Type 1: less than 1 cm2, type 2: between 1 cm2 and 2 cm2, type 3: more than 2 cm2. We also evaluate the average delay of skin recovery. Results: This study included 73% men and 27% women, upper limb 36% and lower limb 64%, loss of skin substance area was in 62% of cases type 1, in 27% of cases type 2 and in 11% of cases type 3. The skin recovery was obtained in 87% of cases for type 1, 37% for type 2 and 13% for type 3. The average recovery delay was 23 days for type 1, 58 days for type 2 and 87 days for type 3. Conclusion: The efficiency of usage of controlled wound healing in management of loss of skin substance after scorpion and viper's bites is limited to type 1 where the skin loss under 1 cm2 and the recovery takes an average delay of 23 days.

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TUBERCULOSIS OF HAND AND WRIST - OUR SERIES OF 29 PATIENTS

Jatin PRAKASH

Introduction: Though rare, the tuberculosis of hand and wrist are cause of major morbidity. Common feature among all available reports on hand and wrist tuberculosis was a delay in diagnosis causing residual stiffness and pain after treatment. Minimal initial symptoms, rarity of the lesion and ability of wrist tuberculosis to mimic more common pathologies accounts for the delay. Materials and method: 29 patients with skeletal lesion in wrist and hand. The diagnosis was confirmed using biopsy. Patients were started on multidrug ATT. Those not responding were taken up for debridement. All patients were assessed on Green O'Brian scoring system. . All these were studied separately for the clinical presentation, the nutritional status (Rainey-Mcdonald nutritional index), time from onset of symptoms to presentation, treatment required, prognosis and complications. Results: Proximal phalanx of 4th digit and metacarpal of 5th digit were most commonly involved bones in our series with 5 cases of each. Capitate was most common carpal bone followed by lunate. The duration of symptoms ranged from 5 weeks to 24 weeks (mean: 11.13 weeks). Most of these patients came with complains of pain followed by swelling. In our series we had 10 patients who had sinus. 7 patients did not respond favourably to ATT over 12 week's period who were taken up for surgery. 21 of 29 patients had no major complications. There was 1 case of pathological fracture in our series and 7 cases of arthritis/ residual significant pain at end of follow up.

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Abstract no.: 41394

AGE AND GENDER-RELATED COLLAGEN DISTRIBUTION CHANGES IN TRANSVERSE CARPAL LIGAMENT IN PATIENTS WITH CARPAL TUNNEL SYNDROME (CTS)

Koichi SASAKI, Srinath KAMINENI, Anthony SINAI

INTRODUCTION: The purpose of this study was to investigate age and gender related changes in collagen isoform expression in the transverse carpal ligament (TCL) in patients with idiopathic carpal tunnel syndrome (CTS). METHODS: Biopsies of the TCL were collected from 10 patients undergoing surgery. These were divided equally into two groups of five, with equal numbers of men (average age 49.6) and women (average age 57.4). Histological [Hematoxylin & eosin and Picrosirius red (PSR) staining] and western blot (WB) examinations were performed. RESULTS: Histological examination showed an increase (73%) in fibroblast cell densities in the specimens from the CTS patients. Men had significantly increased collagen I and less collagen III ($P < 0.05$) than in the women, observed from the PSR staining-polarization microscopic and WB analysis data. An age-related decline of collagen I expression in both women and men was observed and the ratios of collagens III to I ($P < 0.05$) were significantly increased in women compared to men. Collagen type VI was a major component of both women and men. Collagens II, V and X were also elevated, but to a lesser extent. CONCLUSION: We conclude that our data corroborates and enhances understanding of the TCL in CTS. Collagen I and III are elevated, but other lesser collagen isoforms, II, V, VI, and X, are also up-regulated. Furthermore, there appears to be an overall decrease in the in up-regulation as a function of advancing age.

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Abstract no.: 41090

RICE BODY FORMATION OF THE SMALL FINGER IN A NON-TUBERCULOSIS PATIENT: A CASE REPORT

Michael SATURNINO

Introduction: Rice bodies often occur in the joints among patients with rheumatologic or infectious diseases. These rice bodies usually occur at the knee and shoulder. Case Presentation: In this paper, we present a case of a 38 year-old male with a progressive swelling of his left small finger. Patient neither has rheumatoid arthritis nor tuberculosis infection. Management & Outcome: Numerous rice bodies erupted during synovectomy which was done last February 2014. Histopathologic diagnosis was fibrinous loose bodies. No recurrence or complications were reported after 1 year post-surgery. Discussion: Only a few have reported cases of patients with rice body formation in the tendon sheaths without rheumatoid arthritis or tuberculous infection and there is still no consensus on the etiology. Although rare, surgical excision provided safe and definitive treatment in this case.

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Abstract no.: 39633

MUTILATING HAND INJURIES; PRINCIPLES AND MANAGEMENT PROTOCOL

Mohamed KOTB

Introduction; Reports in the literature on mutilating hand injuries have evolved from a focus on achieving adequate skin coverage in the earliest case reports to reconstructing more functional hands in later reviews. Advances in microsurgery have fostered the restoration of function with improved techniques in replantation of amputated parts, free tissue transfer for adequate coverage of wounds, improved nerve coaptation, and toe-to-hand transfers. Method; Strategy We aimed at radical debridement and single stage reconstruction to achieve best functional result regardless of technical complexity. The patient must be hemodynamically stable before embarking on any salvage procedure.

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Abstract no.: 41579

DUPUYTREN'S CONTRACTURE, AS A MANIFESTATION OF SYSTEMIC PATHOLOGICAL PROCESS OF CONNECTIVE TISSUE IN PATIENTS WHO HAVE IN THE PAST BEEN EXPOSED TO IONIZING RADIATION

Sergiy GURYEV, Nataliya ISKRA

Introduction. Among the numerous methods of treatment benefit in the treatment of these interventions remains with reasonable removing tissue palmar aponeurosis and definition criteria recurrence of disease process. Methods and results. Analysis of surgical treatment of Dupuytren's contracture patients formerly exposed to low doses of ionizing radiation, showed that relapse pathological process within one year after surgical treatment of patients who have had a aponeurosis and surrounding tissues had a pronounced cell proliferation of fibroblasts with the presence of some mature fibrotsytiv form. In all preparations of these patients has been a fibrous tissue of varying degrees of maturity, cell proliferation of fibroblasts, cells from cell interchange without cellular deposits of collagen to form dense strands. Relapse was not observed in patients in the tissues of the palm are not observed diversity stages of maturation of tissues. In preparations homogeneous structure presented loose connective tissue with irregular monomorphic proliferation of fibroblasts. Liver fibrosis of varying degrees of term occurrence to 5 years were 78% of patients with recurrent one year. Patients who had no recurrence over 5 years in 86% of cases had liver fibrosis first stage - more than 5 years. All patients diagnosed with osteoarthritis of the spine and discovered disease, osteoporosis - 95.3% of patients with low back pain - 81.2%, spondylarthritis - 97% ligamentosis. All patients showed a combined pathology. With increasing degree of Dupuytren's contracture and increased ratio combining pathology.

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Abstract no.: 41767

THE USE OF CROSS KIRSCHNER WIRE FIXATION FOR COMMINUTED PHALANGETTE FRACTURE WITH NAIL LOSS

Shen LIU, Wei WANG, Cunyi FAN

Introduction: Although single Kirschner wire fixation for phalangette fracture has been widely used, few studies have specially addressed the influence of nail loss on the stability and its associated solution. Methods: Removing a 1-mm section of the phalangette in 32 cadaveric whole-finger specimens created a comminuted phalangette fracture model (AO type A3). Four groups were meanly arranged for both flexion and rotation testing: group I, single 1mm Kirschner wire fixation of the fracture with nail loss; group II, single wire fixation with nail intact; group III, cross 1mm wire fixation of medial and lateral columns of the fracture with nail loss; group IV, cross wire fixation with nail intact. Results: The peak force of group IV (28.78 ± 2.98 N) was significantly greatest. The breaking force from group I (17.14 ± 5.20 N), II (20.26 ± 4.83 N) to III (22.57 ± 4.11 N) reveal an ascending trend, although no significant difference was detected among them. The peak torque of group I(0.45 ± 0.02 N.m) was significantly least, while that from group II (1.09 ± 0.20 N.m), III (1.12 ± 0.27 N.m) to IV (1.37 ± 0.15 N.m) reveal an ascending trend with no significant difference. Conclusions: Cross Kirschner wire fixation of medial and lateral columns of comminuted phalangette fracture, especially during nail loss, can provide more stability than single Kirschner wire fixation do. However, further study should be performed due to the limited specimens in this study.

Date: 2015-09-19
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Abstract no.: 41450

RECONSTRUCTION WITH SCAPULAR HEMIARTHROPLASTYENDOPROSTHESIS AFTER SCAPULECTOMY FOR MALIGNANT TUMOR

Li MIN, Chongqi TU

Objective: To evaluate the early clinical result of scapular hemiarthroplastyendoprosthesis for malignant scapular tumor. Methods: Six patients who underwent scapular hemiarthroplastyprosthetic replacement between 2011 and 2012 were reviewed retrospectively. Results: The average follow-up period in this case series was 17.3 months. Satisfactory shoulder contour was achieved. There was no infection, dislocation, acromion exposure, pressure ulcer, wound healing problems or other mechanical failure. At the final follow-up, the mean MSTS93 score was 24.7 of 30 points. Pain was relieved in every patient, with a full score of 5 points. Emotional acceptance, hand position and dexterity received mean scores of 3.3, 4.2, 4and 5 respectively. All patients reported limitations in their function and lifting ability, with a mean score of 3.3 and 3.2 respectively. The ranges of active should erabduction and forward flexion motion were 40° to 80° and 30°to 75°, respectively. There were no significant differences about function, lifting ability, and MSTS scores between there current patients and the others. Conclusion: As long as mastering the indications carefully, reconstruction with scapular hemiarthroplastyendoprosthesis can provide early stage oncologic salvage and result in good postoperative function with a low rate of complications for malignant tumors.

Date: 2015-09-19
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Abstract no.: 41416

PATHOLOGICAL FRACTURE IN HIP REGION WHAT IS UNIQUE?

Vijay Kumar KHARIWAL, Sadhna GARG

Hip is the common site for metastatic lesion & even for primary bone tumours .The cases which present with pain & limp are diagnosed but those which present directly to the surgeon after fracture are treated as routine fracture in more than 90 % of the times specially by general orthopaedic surgeon. These are diagnosed after the fracture fail to unite or with complication like massive haemorrhage on the table, after metastasis appear other sites, after fungation of wound. This study is undertaken on 50 cases, these were diagnosed after the surgery. All these patients were victim of surgeon negligence or ignorancy.In 27 cases it was isolated metastasis, in 12 it was multiple myeloma,in 7 it was part of mutiple metastasis & in 5 cases it was primary malignancy which was treated as metastasis .The clinician can treat properly by taking proper history of pain even mild before fracture&this is sufficient to tell about preexisting pathology which can be metabolic ,infective,or neoplastic primary ,isolated secondary M.M. or part of multiple metastasis .In isolated secondary & primary lesion patient is deprived of curative radical surgery & in case of mutiple lesion local complication occurs & the tumour may be sensitive to other modalities like CCT ,R/T, hormone therapy,biologicals etc.This happens because after fracture it is difficult to recognise small lytic area. In such fracture one should take history ,clinical ,laboratory ,radiological work up rather jumping to surgery& tissue histology for definitive treatment.

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Abstract no.: 41408

THE CLINICAL APPLICATION OF RADIO-FREQUENCY IN METASTATIC TUMOR OF THE SACRUM

Xiaojun MA

[Abstract] Objective To investigate the clinic value of CT guided adiofrequency ablation in the treatment of metastatic tumor in sacrum. Methods: a retrospective analysis of 13 cases of CT guided sacral adiofrequency of metastases from 2009 May to 2014 March.Assessment the pain in patients with 1, 3 month after after operation. Results: 13 patients were successfully done with RFA treatment. 7 patients pain were relieved for more than 10cm,and 4 case were relieved for less than 10cm.All patients had no serious complications, no peri-operation period death. Conclusion: CT guided radiofrequency ablation is a safe, effective, less trauma, better tolerated method for local treatment of metastases bone.

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Abstract no.: 41317

CLINICAL EVALUATION OF LOWER ABDOMINAL AORTA BALLOON OCCLUSION IN PELVIC OR SACRAL TUMORS RESECTION

Yi LUO

Objective: To evaluate the clinical efficiency of balloon occlusion of the lower abdominal aorta in blood loss control during resections and restruction of pelvic or sacral tumor. Methods: From Jan 2005 to Jun 2011, 156 patients were diagnosed as sacrum or pelvic tumor and underwent surgery in our institution. Temporary balloon occlusion of abdominal aorta was used in 51 patients during the sacral or pelvic tumors surgical operations (balloon group). Another 105 patients received the traditional operation method (control group). The whole surgery time, the quantity of blood loss during the surgery and blood transfusions, the complication, mean days in hospital, The result in two groups were compared with each other. Results: All patient got en block resection in balloon group, while 9 cases in control group was not for intraoperative bleeding can't control and operation wild very indistinctly. In balloon group, average operation time was 171.96±65.16 minutes. The intraoperative blood loss was 746.86±722.73 ml. The blood transfusion was 411.76±613.73 ml. The postoperative lead flow was 294.50±146.09 ml. The postoperative tube removal was 2.98±1.07 days. There were statistically significantly less than those in contral group ($P<0.05$). No significant difference was found in postoperative complications and 5 years recurrence and metastasis between 2 groups ($P>0.05$). Conclusion: Intraoperative abdominal aorta occluding can effectively control intraoperative hemorrhage, and clearly show the operation field, reduce the operation time, effectively control the blood loss and blood transfusions. Appropriately extend balloon blocking time, can obviously improve the tumor en block removal rate and the safety of the operation.

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Abstract no.: 41232

THE USE OF MEGAPROSTHESIS IN PROXIMAL HUMERAL TUMORS

Edward Jay Patrick SALAO, Richard ROTOR, Rafael CLAUDIO

Introduction: Prior to limb salvage techniques, the basic principles of surgical oncology for the extremities consisted solely of determining the correct level at which to perform an amputation. Simultaneous advances in chemotherapy, surgical and imaging techniques have encouraged preservation of the limb as the first choice of management. Case Presentation: The patient is a 23 year old male, with a chief complaint of mass on the left shoulder area. Physical examination findings were the presence of a firm, non-movable, non-tender, 12 x 10 x 7 cm mass on the left deltoid area. The diagnosis was primary bone tumor, parosteal osteosarcoma, proximal 3rd of the humerus, left. Management and Outcome: Surgery was done last October 20, 2009, which was a wide resection of the left proximal humerus with shoulder arthroplasty using megaprosthesis. The radial nerve was incised due to its involvement in the tumor. The distal 3rd of the humerus was reamed afterwards, and the proximal humerus endoprosthesis was inserted. The biopsy results revealed osteosarcoma of the left proximal humerus. The patient underwent tendon transfer last March 23, 2010, and was referred for physical therapy. 3 years post-surgery, shoulder ROM is 90 degrees on forward flexion, 30 degrees extension, 40 degrees abduction, and 45 degrees internal and external rotation. Musculoskeletal Tumor Society (MSTS) score was 28/30. 5 years post-surgery, shoulder ROM was almost the same as that in 2012. MSTS score was also 28/30. X-rays revealed no signs of joint subluxation and aseptic loosening of the implant.

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Abstract no.: 41133

CLINICAL ANALYSIS OF ZOLEDRONIC ACID AND IBANDRONATE IN THE TREATMENT OF METASTATIC BONE DISEASE

Hong DUAN

Introduction: The aim of this study was to compare the efficacy and toleration of zoledronic acid and ibandronate in the treatment of metastatic bone disease. Methods: We retrospectively studied 26 patients with metastatic bone diseases which were histological diagnosed between 2008 and 2011. 12 patients were in zoledronic acid group and 14 in ibandronate group. All of the patients were treated with 4mg zoledronic acid every four weeks, or 4 mg ibandronate for four consecutive days and then 4mg ibandronate every four weeks. The visual analogue scale (VAS),skeletal-related event (SRE),time to first SRE (T-SRE),bone turnover markers were monitored during the fellow-up. Results: Aute-phase (flu-like) reactions were recorded in zoledronic acid group. The pain of the Ibandronate group was palliated significantly compared to zoledronic acid group in the first month . VAS were significantly lower at the sixth month in both groups .There wasn't statistically significant for the change of bone turnover markerin the two groups. Ibandronate and zoledronic acid were similar in the parameter of SRE and T-SRE. Ibandronate was less affected the renal function compared to zoledronic acid seemingly, but there wasn't statistical significance ($p>0.05$). Conclusions: Both of the two bishosphonates have good therapeutic effect and tolerance. The adverse effect of Ibandronate is lighter than zoledronic acid . The loading dose administration of Ibandronate could rapid relief of metastatic bone pain than zoledronic acid, which may improve the quality of life better than zoledronic acid.

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PELVIC TUMOR RESECTION AND RECONSTRUCTION IN -Ⅳ AREA

Xinghua SONG, Zheng TIAN, Jiangtao CHEN, Chong WANG, Leilei XU, Liwen DING

Retrospective analysis of 32 patients with pelvic tumors treated in our hospital from January 2011 to Feberary 2015. Age 14 to 74 years old (average 44.0 y.), 17 cases were male, 13 were female. Twenty-one cases were primary tumor, including chondrosarcom, osteosarcoma, synovial sarcoma, Giant cell tumor, osteoid osteoma, aneurysm sample bone cyst, hemangioma, malignant osteochondroma, eosinophilic granuloma and hydatid disease. According to Enneking classification, 2 cases in I area, 4 cases in II area, 3 cases in III area, 1cases in IV area, 7 cases in II+III area, 9 cases in I+IV area, 4 cases in I+II+III area, 2cases in I+II+III+IV area. All cases treated with resection and reconstruction, including bone graft, bone cement filling, bone cement filling+plates internal fixation, lumbosacral reconstruction, partial pelvic prosthesis replacement and half pelvis inactivated replantation. All patients with postoperative follow-up, Follow-up time from 2 months to 4 years, the median time is 22.5 months. 2 case died during the follow-up period, 2 cases of pulmonary metastasis, 4 cases of recurrence. 5 cases had complications: including 1 cases of hemorrhagic shock, 1 cases of incision infection, 1 cases of artificial hip joint dislocation, 1 cases of pubic bone plate fracture, 1 cases had nerve injury. Functional score of MSTS is 77% on average. Wide surgical resection of the pelvic tumor is effective to reduce the local recurrence rate and have long-term survival in patients with malignant tumors. Individual reconstruction method is beneficial to patients with different pelvic tumor.

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CLINICAL CHARACTERISTICS AND TREATMENT OUTCOME OF CHINESE NASOPHARYNGEAL CARCINOMA SKELETAL METASTATIC CASES

Haomiao LI, Bo WANG, Zixiong LEI, Dadi JIN

Objectives: To identify the clinical characteristics and to evaluate the treatment outcome of the Chinese cases suffering from nasopharyngeal carcinoma skeletal metastasis. Methods: Fifty-two Chinese patients were retrospectively investigated. Of these, 43 patients were originally from Guangdong Province, 4 from Guangxi Province, and the other 5 from Hainan Province. The pathological diagnoses included non-keratinized undifferentiated carcinoma of 19 cases and poorly differentiated squamous cell carcinoma in 33 cases. Metastatic sites include spine (27 cases), pelvis (8 cases), proximal femur (6 cases), scapula (5 cases), rib (3 cases) and other sites (3 cases). Treatments included operation in 37 cases, radiotherapy in 22 cases, and chemotherapy in 19 cases. Results: The improvement rate of limb function was 71.43% and of spinal cord function was 82.61%. Survival duration after treatment included less than 6 months in17 cases, 6 months to 1 year in 11 cases, 1-2 years in 8 cases, 2-3 years in 8 cases, 3-5 years in 5 cases, more than 5 years in 3 cases. The patients with received regular chemotherapy and those without regular chemotherapy, who survived more than 1 year, accounted for 70.59% and 34.29% respectively. Conclusion: The incidence of the Chinese nasopharyngeal carcinoma patients with skeletal metastasis and that of nasopharyngeal carcinoma are similar in geographical distribution. Non-keratinizing undifferentiated carcinoma and poorly differentiated squamous cell carcinoma are two pathologic types with highest incidence of skeletal metastasis. The prognosis of the patients treated with formal chemotherapy is better than that of other patients.

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Abstract no.: 40485

RESECTION ARTHROPLASTY VS. RESECTION ARTHRODESIS; WHICH ONE WOULD BE FUNCTIONALLY BETTER IN AGGRESSIVE GIANT CELL (GCT) TUMOR OF DISTAL RADIUS

Dariush SAVADKOOHI, Ehsan PENDAR, Mohammad SAVADKOOHI, Babak SIAVASHI

Aim: The aim of this study was a comparison between functional statuses of the patients with aggressive GCT of distal radius, treated either by resection arthroplasty or resection arthrodesis according to the musculoskeletal tumor society (MTS) functional evaluation system. Materials and methods: 22 cases of GCT of the distal radius treated by resection and either reconstruction arthroplasty (12 cases) or reconstruction arthrodesis (10 cases) using the ipsilateral autogenous fibular graft (minimum follow-up: 1.5 year) have been included in this study. The mean resected length of the radius was 8 cm. Functional results were assessed using the MTS system. Results: Radiological union was achieved at mean 15 weeks in both groups. In the resection arthroplasty group, the mean supination, pronation, flexion and extension ranges were 50, 40, 43, and 28 respectively. In the resection arthrodesis group, the ranges of supination and pronation were 45 and 30 respectively. Grip strength in patients with resection arthroplasty compared to the resection arthrodesis was found to be 61%. In arthroplasty group, the functional results were excellent in 5, good in 4, and fair in 3 cases. In arthrodesis group, the functional results were excellent in 3, good in 3, and fair in 4 cases. Conclusion: Compared to resection arthrodesis, resection arthroplasty is useful in preserving the functional movement and stability of the wrist as well as achieving a satisfactory range of movement and grip strength.

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Abstract no.: 40301

ONCOLOGICAL AND FUNCTIONAL OUTCOME FOLLOWING SURGICAL TREATMENT FOR SACRAL CHORDOMA: A LONG-TERM FOLLOW-UP STUDY OF 115 CONSECUTIVE PATIENTS

Tao JI, Wei GUO, Rongli YANG, Xiaodong TANG, Yi YANG, Yifei WANG

Background: The purpose of the current study was to evaluate the long-term functional and oncological outcomes of 115 consecutive patients with sacral chordoma. Also a scoring system for detailed evaluation of sacral nerve has been proposed. Methods: One hundred and twenty-two patients with sacral chordoma received surgical treatment in our institution from Jul 2003 to Jul 2012. There were 78 males and 37 females. The mean age at the time of operation was 54.0. The extent of sacrum involvement was S1-S5 in 22 patients, S2-S5 in 48 patients, and S3-S5 in 39 patients. Tumor with lumbar vertebra involved was found in 6 patients. The developed scoring system consisted three domains, including motor function and sensation of lower limbs, urination and uriesthesia, and defecation and rectal sensation. The overall function was given as a percentage. Results: Follow-up information was collected in 115 patients. The mean follow-up was 51 months. The distal metastasis occurred in 17 cases (14.8%). Eighteen (15.7%) patients died of disease at the last follow-up. The local recurrence rate was 37.4%. The local recurrence for tumor with S3 and below involved was 20.5% and marginal or wide resection was achieved in 36 out of 39 patients. The overall sacral nerve function was 12.2% of normal in bilateral S1 (17) preservation, 24.9% in bilateral S2 (37) preservation, 72.2% in bilateral S3 (40) preservation. Conclusions: Wide or marginal surgical margin is associated with significant improvement in disease-free survival. Postoperative function is determined by the level of sacral nerve preserved.

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Abstract no.: 40178

GROWTH INHIBITORY EFFECTS AND MECHANISM OF ATRA COMBINED WITH IFN-β AND GRIM-19 AND STAT3 ON HUMAN OSTEOSARCOMA CELL LINE

Yan ZHANG, Jia-Zhen LI

Introduction: To research the growth inhibition of human osteosarcoma cell line (MG-63) intervened by ATRA combined with IFN-β, and the effect on the gene GRIM-19 and proto-oncogene STAT3, and to research the relationship between GRIM-19 and STAT3. Methods: MTT colorimetric methods research growth inhibition of MG-63 intervened by different concentration of ATRA/IFN-β; flow cytometry AnnexinV-FITC/PI methods research the condition of apoptosis; RT-PCR methods study amplification of gene GRIM-19 and STAT3 induced by ATRA combined with IFN-βor singly; Western blot methods study the expression of GRIM-19 and STAT3 of MG-63.Results: ARTA/IFN-βcan inhibit the growth of MG-63;and this is associated with concentration and time. It is significant that both compare with other groups ($P<0.05$) .Either ATRA or IFN-βcan induce apoptosis of MG-63,but both can greatly increase it. The expression of GRIM-19mRNA is increased significantly (1.62±0.095) ($P<0.01$) .While, the expression of STAT3mRNA decreased (0.12±0.032) ($P<0.01$) .There is significant statistic difference that GRIM-19 protein increases(1.85±0.060) ($P<0.01$) and STAT3 protein decreases(0.54±0.075) ($P<0.01$) .ARTA or IFN-β inhibited the proliferation of MG-63,and the effect of inhibition increases significantly used both. The mechanism may be that ARTA/IFN-β induce the high expression of GRIM-19, and the GRIM-19 protein combine with the special domain of STAT3, decreasing the expression of proto-oncogene STAT3.

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LEIOMYOSARCOMA OF BONE - A CONCISE REVIEW OF LITERATURE

Philipp Theodor FUNOVICS, Madeleine WILLEGGER, Stephan BRÖNIMANN, Joannis PANOTOPOULOS, Reinhard WINDHAGER

Leiomysarcoma of bone (LMS) is an orphan disease. This study aimed to evaluate the outcome of LMS within pooled data from literature and own cases. A systemic search for the MeSH terms „leiomyosarcoma “AND „bone“ with use of the online Databases MEDLINE, Embase, CINAHL and Google Scholar was conducted. The search was not limited to any language. Case reports and case series of LMS of extragnathic bone were included. The tumor had to be intraosseous, with other primary sites of origin clinically excluded (i.e. patients with previous history of LMS of the uterus). We evaluated demographic, pathological and therapeutic variables. Eighty-eight studies with a total amount of 197 LMS have been identified. Additionally, 15 new cases treated at our institution were included, resulting in a total amount of 212 cases. Mean age at diagnosis was 49 years (range, 9-87). 51% of patients were female and 49% were male, respectively. Mean follow-up was 35 months (range, 0-220). The most common site of appearance was the distal femur (36%) followed by the proximal tibia (22%). Amputation was performed in 22% of patients. In 27% limb salvage was achieved with endoprosthetic reconstruction and 5% had biological reconstrcution. 7% of patients had distant metastasis at diagnosis and 30% of patients developed metastasis during follow up. The local recurrence rate was 10%. The mean overall survival was 126 months (range, 2-220). Pooled data analysis revealed specific clinical characteristics and outcome for this rare tumor including all reported cases of LMS of bone to date.

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ANALYSIS OF CLINICAL DIAGNOSIS AND TREATMENT OF EASY-TO-MISDIAGNOSIS TELANGIECTATIC OSTEOSARCOMA

Junqiang YIN, Jingnan SHEN, Gang HUANG, Jin WANG, Weihai LIU

Objective: To investigate the clinical, radiological and pathological characteristic of telangiectatic osteosarcoma and factors that affect the prognosis.Methods:28 cases of telangiectatic osteosarcoma confirmed by pathology from 2001 to 2011 were analyzed retrospectively and the clinical, radiological and pathological characteristic was analyzed. These cases were followed up.Results:28 of 512 osteosarcoma patients were diagnosed as telangiectatic osteosarcoma (5.5%), included 17 male and 11 female patients. Their average age was 18.7 years old. The locations of lesions were femur (16 cases), proximal humerus (3 cases), tibia (7 cases), fibula(2 cases).6 cases had lung metastasis and 8 cases had pathologic fracture at first visit. Limb salvage surgery was performed in 15 patients and amputation surgery was performed in 13 patients. Among 24 patients followed up, 13 cases acquired disease-free survival, 10 died of lung or other sites metastasis and one survived with tumor. In this group, the radiological characteristic was expansive or osteolytic bony destruction and multiple cyst cavity with different proportion of solid soft tissue. The lesions had ill-defined margin without sclerotic margin. There were often local bone cortex destruction and soft tissue mass formation, but little tumor bone formation. Pathological examination showed cavities with blood cells like aneurysmal bone cyst,but there were tumor cells on the wall of cyst cavities and a little tumor bone formation. Conclusion: Telangiectatic osteosarcoma is a rare subtype of osteosarcoma. Combination of clinical characteristic, radiological and pathological examination can help improve the clinical diagnosis rate. Because of preoperative pathologic fracture and fast progression, telangiectatic osteosarcoma has a higher amputation rate than other subtypes of osteosarcoma. Degree of malignancy, lung metastasis and sensitivity to chemotherapy are main factors that affect the prognosis of telangiectatic osteosarcoma.
Keywords: telangiectatic osteosarcoma, clinical, radiology, pathology

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Abstract no.: 40156

COMPARISON OF SURGICAL OUTCOMES BETWEEN BLADE RETRACTOR MINIMAL ACCESS MICRODISCECTOMY AND MICROENDOSCOPIC DISCECTOMY FOR LUMBAR DISC HERNIATION: A PROSPECTIVE RANDOMIZED STUDY WITH SURGERY PERFORMED BY THE SAME SPINE SURGEON

Tao LI

Background. The kernel of minimally invasive lumbar disc surgery was reduced muscle injury. The aim of this study was to compare surgical outcomes between blade retractor minimal access microdiscectomy and microendoscopic discectomy for lumbar disc herniation. Methods. One hundred eighty-nine patients were randomized to two groups. Group A (101 patients) was treated by blade retractor minimal access microdiscectomy (MAMD), and Group B (88 patients) was treated by microendoscopic discectomy (MED). We were the first to compare blade retractor minimal access microdiscectomy with microendoscopic discectomy and report the results. Pre- and postoperative clinical findings including intraspinal operation time, extraspinal operation time, bleeding, the mean duration of hospitalization, Visual Analogue Score(VAS), Oswestry Disability Index scores(ODI), serum creatine phosphokinase(CPK), cross-sectional areas(CSA) and peridural scar tissue formation were assessed. Results. There were no significant differences between the two groups in intraspinal operation time, bleeding, mean duration of hospitalization, VAS score for sciatica, ODI score, CPK ratio, and peridural scar tissue formation. Statistically significant differences were observed in the extraspinal operation time and VAS score for lumbar pain, but the differences were not large. Conclusions. MAMD and MED are safe and effective for performing minimally invasive lumbar microdiscectomy. The results of our study indicated that MAMD is a valid alternative to MED.

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TREATMENT OF LUMBAR DEGENERATIVE DISEASE BY MICROENDOSCOPY-ASSISTED MINIMALLY INVASIVE VERSUS OPEN TRANSFORAMINAL LUMBAR INTERBODY FUSION: A RETROSPECTIVE STUDY WITH TWO-YEAR FOLLOW-UP

Limin RONG

Objective: To evaluate the clinical outcomes of microendoscopy-assisted minimally invasive transforaminal lumbar interbody fusion (MI-TLIF) and open TLIF for lumbar degenerative disease.Methods: From November 2010 to January 2014, 110 patients of lumbar degenerative disease underwent single-level TLIF (55 MI-TLIF, 55 open TLIF). Operative duration, blood loss, analgesic usage, ambulatory time, radiation exposure (fluroscopic time, dose area product, skin entrance dose), adjacent segment degeneration (ASD) rate, complication rate, and improvement of VAS, JOA score and ODI were compared. Results: The patients were followed up for 6 to 42 months (average for 23.5 months). MI group showed less Intraoperative blood loss (MI: 206 ml, open: 491 ml), less postoperative analgesic usage (MI: 46.1 mg, open: 78.1 mg) and shorter ambulatory time (MI: 2.3 d, open: 4.0 d). While surgical duration (MI: 188.7 min, open: 145.1 min), fluroscopic time (MI: 55.5 s, open: 18.7 s), dose area product (MI: 3890.0 mGy/cm2, open: 1503.6 mGy/cm2), skin entrance dose (MI: 19.4 mGy, open: 7.6 mGy) in MI group were larger. At final follow-up, VAS, JOA score and ODI in either group were significantly improved, and MI group was associated with more improvement (without statistical difference). ASD and complication rates in both groups were similar. According to modified MacNab criteria, there were more cases ranking excellent or perfect in MI group (without statistical difference, MI: 53/55, open: 51/55).Conclusion: MI-TLIF showed longer operative duration and more radiation exposure. But it brought less iatrogenic injury, blood loss, analgesic usage, earlier rehabilitation and comparable middle-term clinical outcomes.

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PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY : THE COMPLICATIONS AND PREVENTIVE STRATEGIES

Changqing LI

0bjective To summarize and analyze the complications in percutaneous endoscopic lumbar discectomy (PELD) for lumbar disc herniation, and discuss preventive strategies . Methods A retrospective review was performed on 893 patients (524 males and 369 females) with lumbar disc herniation treated with PELD between May 2005 and December 2011. The average age was 44.3 years old. 46 cases with recurrent lumbar disc herniation were also involved. All of the patients had typical low back pain and leg pain, also were confirmed lumbar disc herniation or recurrence by CT and MRI. After local anesthesia, PELD was performed assisted by C-arm monitoring. The complications during operation and postoperation were studied retrospectively . Results Dural tear was found in 1 patient, recovered after tightly suturing the incision. Fragment omissions in 6 patients, and all the patients underwent second discectomy by MED. 3 patients had nerve root injury, 2 of the patients were completely recovered in 3-6 months after operation, the other one was no any recovery . Postoperative spondylodiscitis was in 2 patients and retroperitoneal hematoma was in 1 patient, recovery after conservative treatment. Postoperative dysesthesia occured in 24 patients, disappeared by neurotrophy and physiotherapy. The mean follow-up period was 31.6 months (range , 6 -75 months) . Recurrent disc herniation occurred in 22 patients, the recurrent rate was 2.5%. Conclusions The complications in PELD include dural tear, fragment omissions , nerve root injury , spondylodiscitis , dysesthesia, and recurrence . Preventive strategies to reduce the complications include strict indication , aseptic technique , well anatomic knowledge, skilled and gentle operation.

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PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY VIA TRANSILIAC APPROACH FOR L5S1 DISC HERNIATION WITH HIGH ILIAC CREST

Qingquan KONG

Objective: To describe a technique for treating L5S1 disc herniation with high iliac crest to pose an alternative to overcome those routine percutaneous endoscopic lumbar discectomy (PELD) can not deal with and explore the best indication of this new surgical technique. Material and method: 12 cases with high iliac crest underwent transforaminal PELD via transiliac approach under the epidural anesthesia. The Lumbar MRI and reconstrctuion CT were done for all cases before and after operation. Pre/post-operative nerve function and pain score of lower extremity were evaluated by neurological Frankel grade and visual analogue scale (VAS). Result: Postoperatively radicular symptoms has completely relieved in all cases (male 7, female 5). VAS of lower extremity were improved from 7.2±1.3 score preoperatively , to 0.4±0.7 score on postoperative. There has no neural injury complications. Lumbar MRI and reconstrctuion CT postoperatively showed that the disc herniation were removed completely. The patient was discharged the next day after operation. Conclusion: Transforaminal PELD via transiliac approach under the epidural anesthesia is an effective and safe surgical procedure and its proper indications may be for L5S1 herniation spreaded from intraforaminal zone to the lateral or central zone of the spinal canal, with high iliac crest, and for recurrent L5S1 disc herniation after conventional surgical treatments, with high iliac crest. The indication of this technique may be expanded if the skill of the establishment of iliac canal and foraminolpasty has been mastered proficiently

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NEW INSTRUMENT FOR PERCUTANEOUS POSTEROLATERAL LUMBAR FORAMINOPLASTY: CASE SERIES OF 134 WITH INSTRUMENT DESIGN, SURGICAL TECHNIQUE AND OUTCOMES

Zhenzhou LI

Objective: The authors report the design of a new instrument for percutaneous posterolateral foraminoplasty and analyze the mid-term outcome of percutaneous foraminoplasty followed by transforaminal endoscopic discectomy in treating non-contained lumbar disk herniation. Method: 148 patients with non-contained lumbar disk herniation were confirmed by symptom, sign and concordant imaging. Follow up were obtained for 134 cases. They were all treated with percutaneous foraminoplasty followed by transforaminal endoscopic discectomy, including 14 cases of L3-4, 78 cases of L4-5 and 42 cases of L5S1. The VAS scores of pre-operative and post-operative low back pain and sciatica were compared. Oswestry Disability Index (ODI) and MacNab scores were also obtained. Result: All the procedures were performed successfully within 40-80 min (average 65 min) and blood loss was 20-50 ml (average 30 ml). Follow-up was up to 5 years. Postoperative VAS scores of low back pain and leg pain were significantly decreased compared with preoperative VAS scores ($P<0.01$). There were 75 of excellent, 49 of good and 4 of fair according to MacNab score system, with total successful rate (excellent and good) up to 92.5%. Only 5 cases with L5S1 disc herniation complained about sunburn syndrome. Conclusion: Our new instrument is safe and effective for percutaneous foraminoplasty. Transforaminal endoscopic discectomy followed by foraminoplasty is a good and minimally invasive alternative treatment for non-contained lumbar disk herniation.

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Abstract no.: 40006

AXIAL LUMBAR INTERBODY FUSION (AXIALIF) PLUS POSTERIOR MICROENDOSCOPIC LUMBAR DISCECTOMY FOR LUMBOSACRAL DEGENERATIVE DISEASES

Wenjun WANG, Wenjun WANG

Introduction: To evaluate the clinical outcomes of axial lumbar interbody fusion(AxiaLIF) plus posterior microendoscopic lumbar discectomy for lumbosacral degenerative diseases. Methods: From March 2010 to March 2013, 31 cases suffering from lumbosacral degenerative diseases and undergoing axial lumbar interbody fusion and microendoscopic lumbar discectomy were reviewed retrospectively. There were 18 males and 13 females with the age at time of surgery ranging from 39 to 59 years (mean, 45 years). There were 21 with L5/S1 segment involved, 10 with L4/5 and L5/S1 segment involved. The operation time, blood loss and complications were recorded . Fusion rate was observed . Visual analogue scale(VAS) and Japanese Orthopaedic Association (JOA) scores were used for clinical assessment . Results: The average operation time was 130min (range, 90-170min) and the average intraoperative blood loss was 80ml(range, 50-160ml) in 31 patients . All cases were followed up from 6 to 24 months(average, 16.5 months). The fusion rate of bone graft body was 83.9% at 6 months of follow-up, 5 cases of postoperative bone fusion time delay, incomplete bony fusion was shown after 12 months of follow-up. The VAS score of low back pain for preoperative and final followup was 7.19±1.04 and 0.69±0.58 respectively. The VAS score of leg pain for preoperative and final follow-up was 7.27±1.96 and 0.87±0.49 respectively. The JOA score for preoperative and final follow-up was 13.01± 2.03 and 26.62±1.25 respectively. Conclusions: Axial lumbar interbody fusion and microendoscopic lumbar discectomy is an effective method for degenerative lumbosacral diseases .

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Abstract no.: 39191

ANATOMICAL RELATION BETWEEN S1 SACROILIAC SCREWS' ENTRANCE POINTS AND SUPERIOR GLUTEAL ARTERY

Yong ZHAO

Objective: To provide the anatomical basis for avoiding damage to the superior gluteal artery in the sacroiliac screw placement horizontally. Methods: 74 healthy superior gluteal artery CTA vascular imaging of adults (37 women and 37 men) were done with 128-slice spiral CT. The CT attendant measuring software was used to portray the "safe bony entrance area" (short for "safe area") of the S1 segment in the standard lateral pelvic view of three dimensional reconstruction. The anatomical relationship between S1 sacroiliac screws' safe area and the pelvic outer superior gluteal artery branches was observed and recorded. Results: 3 cases were found have no bony space for horizontal screw placement in S1 segment. Among the remaining 71 sample cases, there are 32 cases (45.1%) where the deep superior branch of superior gluteal artery passes through the safe area of S1 entrance point. There was not distinguishing feature and regularity of the overlap of the deep superior branches and the safe area. In the 39 cases in which superior gluteal artery branches disjointed from the safe area, the deep superior branches of superior gluteal artery were the branches closest to the safe area. The nearest distance between the deep superior branch and the safe area is 0.86±0.84cm. Conclusion: There is a high risk of accidentally injury of the deep superior branches of superior gluteal artery in the process of S1 sacroiliac screw placement. Even entry points are located in the safe bony entrance area, absolutely secure placement cannot be assured.

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Abstract no.: 40160

A MINIMALLY INVASIVE SURGICAL STRATEGY FOR THORACIC METASTATIC TUMOR ACCOMPANIED WITH NEUROLOGIC COMPRESSION

Yutong GU, Jian DONG, Xiaoxing JIANG, Feng ZHANG, Robot MCGUIRE

Objectives: To evaluate the feasibility, efficacy and safety of minimally invasive pedicle screws fixation (MIPS) combined with percutaneous vertebroplasty (PVP), minimally invasive decompression and tumor resection for treating thoracic metastasis with epidural involvement and neurologic symptoms. Methods: Eighteen patients, who sustained single-level thoracic vertebral metastasis and neurologic compression underwent the procedure of MIPS (The minimal-access in a paraspinal sacrospinalis muscle-splitting approach was performed to insert pedicle screws into the vertebrae under direct vision and two rods of the appropriate size were placed over the pedicle screws through subcutaneous soft tissues and muscles) combined with PVP, minimally invasive neurological decompression and tumor resection through mini posterior midline approach. The mean prognostic score was 6.4 (range, 6-7 points) according to Tomita scoring system. The pain intensity in the previously symptomatic region was evaluated with visual analog scale pain scores (VAS) and the severity of the neurologic deficit was assessed by using the ASIA impairment scale. Results: Clinical follow-up was available for 17 patients in this study ranging from 12 to 16 months (mean time, 14.2 months) and other 1 patients died 8 months after surgery. The VAS score significantly dropped from 8.9±0.7 before operation to 3.1±0.6 ($P < 0.05$) immediately after the operation and to 0.6±0.5 ($P < 0.001$) at final follow-up. Improvement of paraplegia was observed after surgery in all of these patients. Conclusions: MIPS combined with PVP, minimally invasive decompression and tumor resection is a good choice of surgical treatment for thoracic metastatic tumor accompanied with neurologic compression.

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BIOMECHANICAL ANALYSIS OF A NEW PEDICLE SCREW AND PLATE SYSTEM FOR MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION

Jie LI, Yue ZHOU

Introduction: The monoaxial pedicle screw and plate (MP) system is an alternative to the polyaxial pedicle screw and rod system (PR) for MI-TLIF. It enhances the treatment effect of lumbar spondylolisthesis and provides added stabilisation after cage instrumentation, especially in axial rotation. The study was aimed to evaluate the immediate stabilizing effect and construct stiffness of the system. Methods: Eight calf lumbar specimens were instrumented with polyaxial pedicle screw and rod system or MP system at L4–L5 in a TLIF mode. Range of motion (ROM) was recorded in intact versus instrumented status. Strain gauges were instrumented at L4 and L5 to record the strain distribution under flexion and lateral bending. The failure modes and construct stiffness of MP and PR constructs were recorded during static compression bending tests. Results: MP fixation significantly reduced ROM ($p < 0.001$) at the lumbar level relative to the intact state (flexion/extension: 88.7%; lateral bending: 94.7%; axial rotation: 53.8%). PR fixation resulted in similar ROM reductions ($p <0.001$) relative to the intact state (flexion/extension: 83.1%; lateral bending: 92.6%; axial rotation: 42.3%). The compressive strain with MP fixation was not significantly different from that with PR fixation. The difference of construct stiffness between PR and MP construct wasn’t significant ($p =0.54$). Conclusions: MI-TLIF augmentation with pedicle screw-plate system fixation increases fusion construct stability equally to the pedicle screw-rod system.

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Abstract no.: 42407

THE ANALYSIS OF PERCUTANEOUS FULL ENDOSCOPIC DISCECTOMY COMBINED WITH LOCAL APPLICATION OF STEROID IN LUMBAR DISC HERNIATION: A PROSPECTIVE, RANDOMIZED, CONTROLLED TRIAL

Yi JIANG

Objective :To explore the clinic value of treating lumbar dis herniation with sciatica by percutaneous transforaminal endoscopic discectomy (PTED)with or without local application of steroid. Methods: From May 2012 to June 2013,65 cases undergoing PTED technique were perspective, randomized, controlled analyzed.32 males and 33 females, mean age 42.3±13.2 years old, were enrolled. There were 41 cases in L4/5 and 24 cases in L5S1. The straight leg test of all patients was positive. PTED with local application of steroid as experiment group and those without steroid as control group were set up scrupulously. The Visual Analog Scale and Japanese Orthopedic Association score were followed up in different interval time. Result: All procedure were accomplished successfully within 80.2±27.9 minutes. Follow-up time were 19.2±3.1 months. The VAS of experiment group in pre-operation, post-operation one day, one week, two weeks, three months, six months and one year was 7.0±1.3 , 0.8±1.3,0.7±1.2 , 1.0±1.6,0.7±0.7. The control group was 7.2±1.4,0.6±1.0 , 1.3±1.1,0.9±1.1 , 0.6±0.7.The JOA score of experiment group in pre-operation, post-operation one month, six months and one year was 8.4±1.9 , 26.6±1.6 , 27.3±1.6,27.7±1.6. The control group was 8.3±1.2,27.2±1.8,27.1±1.9,27.5±1.4.There was significant improvement in pre and post operation in both of VAS and JOA score ($P<0.05$) . However, no different was revealed in two groups ($P>0.05$) . Conclusion: It is safe and effective to deal with the lumbar disc herniation with

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LOCAL BONE AUTOGRAFT FOR MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION : CLINICAL AND RADIOGRAPHIC OUTCOMES

Yu LIANG, Wejian WU

Objectives Minimally invasive transforaminal lumbar interbody fusion (MI-TLIF) has been wildly accepted as a promising surgical procedure to treat lumbar degenerative conditions. It offers comparable clinical outcomes to the open transforaminal lumbar interbody fusion with less approach-associated trauma. Many studies were focusing on the avoidance of iliac crest morbidity that is considered as one of the commonest complications. This study was aimed to evaluate clinical outcomes and radiographic fusion rate with local bone filled cage used in MI-TLIF. Methods This is a retrospective study. 47 patients who underwent one segment MI-TLIF with local bone autograft cage using were retrospectively studied. During the surgery, the local bone deprived from laminectomy and facetomy were carefully collected. The attached soft tissue was peeled off. all the collected local bone were then cut into small pieces for filling the cage. Clinical outcome was evaluated with Oswestry Disability Index (ODI). Visual analog scale was used to assess the preoperative and postoperative leg and back pain. Fusion rates were evaluated with CT scan and dynamic films. Results All the cases were performed by 2 senior spine surgeons. Average age was 51 years (range, 23-67years), Gender: male 20, female 27, follow-up time was 2.7 years (range, 2.0-3.1years). Clinical improvement: ODI from 65 to 29, VAS: 7 to 3 for leg pain and 9 to 2 for back pain ($p<0.005$). Clinical improvement rate was 93% (excellent in 66% and good in 27% of the patients). Radiographic fusion rate was 70.2%. there is no intra-operative complications. Conclusion The clinical outcomes of MI-TLIF using local bone autograft were reliable even though the fusion rate was lower than published data

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COMPUTER-ASSISTED, MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION: ONE SURGEON'S LEARNING CURVE

Yunfeng XU, Wei TIAN, Bo LIU, Qin LI, Guilin ZHANG, Da HE, Qiang YUAN, Ning YUAN, Zhao LANG

PURPOSE : To evaluate the learning curve associated with computer-assisted navigation minimally invasive spine surgery (CAMISS) and transforaminal lumbar interbody fusion (TLIF) for the surgical treatment of lumbar degenerative disease. METHODS : Seventy-four consecutive patients with lumbar degenerative disease underwent CAMISS TLIF between March 2011 and January 2013; all surgeries were performed by a single surgeon. The patients were followed for at least 24 months (average, 38 months). According to the plateau of the asymptote, the initial 25 patients constituted the early group and the remaining patients comprised the latter group. The clinical evaluation data included operative times, anesthesia times, intraoperative blood losses, days until ambulation, post-operative hospital stays, visual analog scale (VAS) leg and back pain scores, Oswestry disability index (ODI) values, Macnab outcome scale scores, complications, radiological outcomes, and rates of conversion to open surgery. The learning curve was assessed using a logarithmic curve-fit regression analysis. RESULTS : The complexity of the cases increased over the series, but the complication rate decreased. There were significant differences between the early and late groups with respect to the average surgical times and durations of anesthesia ($p < 0.05$), but no differences in intraoperative blood losses, days until ambulation, or post-operative hospital stays. The improvements in VAS leg and back pain scores and ODI values for each group were similar; there were significant improvements ($p < 0.05$) at 3, 12, and 24 months after surgery when compared with preoperative scores. There were no significant differences in the VAS leg and back pain scores or ODI values between the two groups at those time points. The complication rate was 12.00% for the early group and 6.82% for the later group ($p > 0.05$). No significant differences were found between the two groups with regard to Macnab outcome scale scores or

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Abstract no.: 42404

CASE REPORT: SURGICAL TREATMENT FOR A PARAPLEGIC PATIENT INDUCED BY CONGENITAL FACTOR X DEFICIENCY

Tianbing WANG, Weicheng LIN, Jing ZHOU, Wei HUANG

Objective: reviewing a patient with traumatic spinal epidural hematoma induced by congenital FX deficiency. Methods: reporting a case of paraplegic patient induced by traumatic spinal epidural hematoma, which was associated with congenital FX deficiency. discussing the disease of factor x deficiency. Results: the patient was treated with fresh-frozen plasma (FFP) or prothrombin complex concentration (PCC) to improve his coagulation function, and operation to remove his spinal epidural hematoma. He has recovered with no sign of complication. Conclusion: replacement therapy with FFP and PCC is useful method for patients with congenital factor x deficiency. it’s safe to do surgery in these patients including do operation of spine.

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Abstract no.: 41429

PERCUTANEOUS BALLOON KYPHOPLASTY FOR OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES IN PATIENTS WITH CHRONIC LIVER DISEASE

Rugang ZHAO, Qiang ZHANG

Objective: To explore the clinical efficacies of Percutaneous Balloon Kyphoplasty applied for osteoporotic vertebral compression fractures in patients with chronic liver disease and assess risk factors for postoperative complications of PKP. Methods: Retrospective analysis the data of 52 consecutive patients with vertebral compression fractures combined with chronic liver disease (20 patients) and primary osteoporosis (32 patients) who were treated with PKP in our hospital from January 2011 to January 2013. Age, gender, bone mineral density , number of injured vertebra, preoperative vertebral compression, preoperative VAS score, preoperative ODI score was recorded respectively. Results: There were no significant differences in VAS score and ODI score between two groups at the same preoperative or postoperative periods. Compression rate in chronic liver disease group and primary osteoporosis group were 0.47 ± 0.11 and 0.42 ± 0.13 , and restoration rate were 0.26 ± 0.083 and 0.24 ± 0.077 respectively, the differences were not statistically significant(p=0.101 and p=0.47). Three months recollapse rate in chronic liver disease group were 0.13±0.044 while 0.11±0.032 in primary osteoporosis group, the difference was statistically significant (p=0.014). Conclusion: PKP for the treatment of OVCFs with chronic liver disease is efficacious, but short-term follow-up showed that the redress of spinal deformity is not sustained. Chronic liver disease is the independent risk factor for the presence of postoperative wound infection and gastrointestinal bleeding.

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Abstract no.: 41302

EPIDUROSCOPY IN PATIENTS WITH FAILED BACK SURGERY SYNDROME

Muhammad Jamil SABIT, Mert AKBAS

Background: Failed Back Surgery Syndrome (FBSS) is a major clinical problem, which is defined as persistent or recurrent pain, mainly in the region of the lower back and legs even after successful Spine surgeries. Epiduroscopy aids in identifying painful structures in the epidural space, establishing a diagnosis and administering drug therapies. This endoscopic technique may play a role in the management of FBSS. Objective: The aim of this study is to assess the effect of Epiduroscopy for chronic pain related to failed back surgery syndrome. Method: The investigators studied 79 patients of both sexes (60.75% female and 39.25% male), between 21 and 85 years old (the mean age= 52.65), with persistent chronic back pain after lumbar spine surgery for more than 6 months. Epiduroscopy was performed via caudal canal approach through a 14G epidural needle inserted through the sacral hiatus by local anesthesia and sedation under fluoroscopy. The patients were evaluated within 3 and 6 months after intervention. Treatment success was defined as 50% or more pain relief maintained during months of follow-up. Results: Of 79 patients enrolled, 31 patients (39.24 %) achieved fifty percent or more pain relief which was considered as treatment success. Eighteen patients (22.78%) showed between twenty to fifty percent improvement, and 30 patients (37.97%) did not show any improvement. Conclusion: Epiduroscopy seems to be an affective procedure in patients with Failed Back Surgery Syndrome, although it can be considered as a step before the Spinal Cord Stimulation (SCS).

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Abstract no.: 41280

TOPHACEOUS GOUT OF THE SPINE: THE VALUE OF MRI AND CT IN ESTABLISHING A DIAGNOSIS

Hai LU, Hui ZHANG

Objective: To establish if computed tomography (CT) imaging and magnetic resonance imaging (MRI), both of which are widely used in the diagnosis of spinal disease, can also be used to document gouty of the spine. Method: Three patients with tophaceous gout and clinical involvement of the lumbar vertebrae (one case), thoracic vertebrae (one case), and thoracolumbar vertebrae (one case) were assessed with CT and MRI. Results: In all three cases, CT images revealed similar CT densities (160–170 HU) of tophaceous gout, with well-defined masses. The height of the intervertebral space was not noticeably different, and the spinal tophus was distributed almost all the way around the facet joints. The MRI scan showed medium or low signal intensity on T1WI and heterogeneous signal intensity on T2WI. Synovial thickening was clearly observable in the MR imagery. Conclusion: CT and MRI could be the most effective method of identifying lesions in spinal tophaceous gout.

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Abstract no.: 41125

KYPHOPLASTY USING 'TEMPERATURE GRADIENT INJECTION TECHNIQUE' FOR THE TREATMENT OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES

Liu TAO, Yang HUILIN

Introduction: We prospectively compare kyphoplasty with 'Temperature gradient injection technology' with kyphoplasty using traditional injection technique for the treatment of osteoporotic vertebral compression fractures.

Methods:The study population included 129 patients (160 vertebral fractures) in the 'Temperature Gradient Injection group' and 105 patients(128 vertebral fractures) in the 'Traditional injection group'. The mean follow-up period was 25.3 months and 24.7 months respectively. The baseline characteristics including sex, age, number of prevalent fractures, etc were comparable for both groups. Outcomes were measured pre- and postoperatively using VAS, ODI, the kyphosis angle and cement leakage .

Results: In the 'Temperature Gradient Injection group', VAS improved from 7.8±1.3 preoperatively to 2.1±1.9 at last follow-up (P <.05). Preoperatively, the ODI was 77.3±5.9, which improved to 39.7±9.7 (P <.05). The anterior vertebral height improved from (61.5±5.7)% preoperatively to (84.6±2.9)% at last follow-up(P <.05). The kyphosis angle improved from 17.90±7.80 to 0.50±7.50 at last followu-up(P < .05). In 'Traditional injection group', VAS improved from 7.5±1.6 to 2.3±2.5 at last follow-up (P <.001). Preoperatively, the ODI was 75.3±7.2, which improved to 38.7±10.9 (P <.05). The kyphosis angle improved from 18.30±8.50 to 8.70±6.50 (P < .05). There was no significant difference in VAS, ODI, the anterior vertebral height and the kyphosis angle between the two groups both preoperatively and postoperatively (P >0.05). T There were only 3 patients having cement leakage (2.3%) in 'Temperature Gradient Injection group', which was significantly less than 'Traditional

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Time: 14:00 - 15:30
Room: Qingyuan Hall

Abstract no.: 41116

EFFECT OF OSTEOPOROTIC FACTORS ON INTERNAL FIXATION OUTCOMES IN PATIENTS WITH LUMBAR DEGENERATIVE DISEASES

Ning ZHANG, Li Peng YU, Guo Yong YIN

Objective: To investigate the effect of osteoporotic factors on internal fixation outcomes in patients with lumbar degenerative diseases(LDD). Methods: 87 patients with LDD who underwent spinal internal fixation were analyzed retrospectively. Osteoporosis risks of all patients were assessed using OSTA and Frax. ODI、VAS、EQ-5D Questionnaires were finished in the meantime. All the data were analyzed. Results In the group without intervertebral fusion, gender, age, course, weight, OSTA index, OSTA grades and FRAX had no significant correlation with postoperative clinical curative effect ($P>0.05$). In intervertebral fusion group, weight were positively correlated with ODI score of postoperative follow-up ($P < 0.05$); OSTA was negatively correlated with and ODI score of postoperative follow-up ($P<0.01$), positively correlated with EQ- 5D scores of postoperative follow-up($P<0.01$); OSTA grades and EQ-VAS of postoperative follow-up were negatively correlated ($P<0.05$); FRAX A showed a positive correlation with ODI score ($P < 0.05$) and a negative correlation with EQ- 5D scores. FraxB was negatively correlated to EQ-VAS of postoperative follow-up. Conclusion Internal fixation outcomes in patients with lumbar degenerative diseases will become worse, with the increase of age, weight, and osteoporosis risk.

Date: 2015-09-19
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Abstract no.: 41112

METHYLPREDNISOLONE CAN PREVENT THE ACUTE PHASE RESPONSE OF ZOLEDRONIC ACID IN ORTHOPEDIC PATIENT AFTER SURGERY WITHOUT WEAKENING THE EFFECT AFTER ONE YEAR.

Li Peng YU, Jian CHEN, Ning ZHANG, Guo Yong YIN

Objective: To observe the effect of low dose methylprednisolone in the prevention of acute phase response (APR) of zoledronic acid (ZA) for the treatment of osteoporosis in orthopedic patients. Methods: A prospective study was conducted within 2 years in the orthopedic department of our hospital. After surgery, 5mg zoledronic acid were used in patients with osteoporosis(280 cases). Low-dose methylprednisolone (80mg*2d, 52 patients, M group) or Saridon (228 cases*3d, S group) were used to prevent the APR, recording adverse reactions in all cases within one year. Bone mineral density (BMD) was compared before and after treatment. Results: 32 cases in M group, compared with 158 cases in S group were followed up for one year. 3 cases APR and 2 cases fever occurred in M group. The incidence is much lower than S group (64.1%/62.7%). No bisphosphonate-related osteonecrosis of the jaw occured during follow-up. Lumbar spine and hip BMD significantly improved in both groups, BMD improvement rate was similar between 2 groups(lumbar spine (10.39.0)% vs.(8.26.1)%) , hip (4.1 2.3)% vs. (4.1 2.3)%(P>0.05). Conclusions: ZA is effenctive in the treatment of osteoporosis in postoperative orthopedic patients, but the rate of APR was significantly higher than that reported in literature. The prevention effect of NSAIDs for APR in patients after surgery is weak. Methylprednisolone can be more effective in reducing the rate of APR, without weakening of the effects of ZA in the treatment of osteoporosis.

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Room: Qingyuan Hall

Abstract no.: 39739

RELATION BETWEEN SELF-IMAGE SCORE OF SRS-22 WITH DEFORMITY MEASURES IN FEMALE ADOLESCENT IDIOPATHIC SCOLIOSIS PATIENTS

Yipeng WANG, Liang WANG, Bin YU, Jian Guo ZHANG, Jianxiong SHEN, Guixing QIU

BACKGROUND: Adolescent idiopathic scoliosis (AIS) is a pathology which affects the individual's functioning in the widely understood physical, psychic, and social aspects. More attention should be paid to patients' perception of self-image when evaluating the spine deformity. The present retrospective study evaluated the associations between the deformity measures and self-image score as determined by the SRS-22 questionnaire in Chinese female AIS patients. HYPOTHESIS: The self-image score correlates significantly with deformity measures. The location of main curve apex and the number of curve could affect the self-image score. MATERIALS AND METHODS: We retrospectively reviewed the records of 202 female patients, collected data on patient's age, body mass index, radiographic and physical measures and self-image score of SRS-22 questionnaire. According to the location of main curve apex and the number of curve, the patients were divided to different subgroups. Correlations between deformity measures and self-image score of different groups were evaluated by the Spearman correlation test. RESULTS: The self-image score correlated negatively with the main Cobb angle, apical vertebral translation (AVT), and razor hump height. There is no significant difference of self-image score between thoracic curve (TC) and thoracolumbar curve (TL/LC) subgroups. And the self-image scores of one-curve, two-curve and three-curve subgroups are similar. DISCUSSION: For Chinese female AIS patients in our study, self-image was found to correlate negatively with the main Cobb angle, AVT and razor hump height. And the location of scoliosis apex and the number of curve are not influencing factors of self-image perception.

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Abstract no.: 39542

EVALUATION OF ENDOSCOPIC DORSAL RAMUS RHIZOTOMY IN MANAGINGFACETOGENIC CHRONIC LOW BACK PAIN

Zhenzhou LI

Objective: To study the effectiveness of surgical dorsal endoscopic rhizotomy for the treatment of facetogenic chronic low back pain.Methods: From April 2011 to November 2011, 58 patients who were diagnosed with lumbar facetogenicchronic low back pain (CLBP) and thereafter experienced >80% reliefs of pain with two comparative lumbar medial branch blocks were recruited in the study. Of those 58 patients, 45 cases (the operation group)received dorsal endoscopic rhizotomy, and the remaining 13 cases (the conservative group) received con-servative treatment. Patients' preoperative and postoperative VAS score, percentage of pain relief and theMacNab score were analyzed and compared. Anatomic variations and any possible complications wererecorded.Results: In the operation group, VAS scores of pain (low back/referred) at any time point postoperativelywere significantly lower than that before MBB ($P < 0.05$), which, however, showed no significant difference as compared to the scores after MBB ($P > 0.05$). In the conservative group, VAS scores of pain (lowback/referred) at any time point postoperatively with conservative treatment decreased significantly compared with that before MBB ($P < 0.05$) and were significantly higher than that after MBB ($P < 0.05$).Percentage of pain relief in the operation group at any time point postoperatively were significantly higher than that in the conservative group ($P < 0.01$). The MacNab scores of 1 year follow-up in the operation group were higher than that in the conservative group. Conclusion: Dorsal endoscopic rhizotomy is safe and effective for the facetogenic CLBP, and can achievebetter clinical outcome than the conservative treatment.

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Abstract no.: 41506

VALIDATION OF THE CHINESE VERSION OF THE MD ANDERSON SYMPTOM INVENTORY - SPINE TUMOR MODULE

Nanfang XU, Zhehuang LI, Feng WEI, Liang JIANG, Xiaoguang LIU, Dang LEI, Fengliang WU, Zhongjun LIU

Introduction: Tumors involving the spine were associated with unique symptoms due to segmental instability of the spinal column and compression of the spinal cord or nerve roots. The occurrence of these symptoms has been shown to predict patient survival and affect their health-related quality of life (HRQoL). Currently, there is no disease-specific instrument in Chinese for assessment of HRQoL in these patients. The objective of this study was to validate the Chinese version of the MD Anderson Symptom Inventory – Spine Tumor Module (MDASI-SP). Methods: The MDASI-SP was translated according to established guidelines and culturally adapted into Chinese. A total of 42 patients diagnosed with a tumor involving the spine at a single center between November 2014 and February 2015 participated in this study and each was asked to complete a questionnaire booklet containing: (1) the MDASI-SP, (2) the Short Form Health Survey (SF-36), and (3) Functional Assessment of Cancer Therapy: General (FACT-G). MDASI-SP questions were grouped into physical, emotional, mental, pain, social, and functional domains. Results: The Cronbach alpha coefficient between the pain domain of MDASI-SP and that of FACT-G was 0.735. For the functional, emotional, and social domains, it was 0.70, 0.77, 0.71, respectively. Conclusion: The Chinese translation of MDASI-SP demonstrated validity and may be used by itself for evaluation of patient-reported HRQoL, especially for symptoms specific to spine tumors. Future research is necessary to validate the translation in a larger sample of patients and test-retest reliability should be assessed in a non-surgical setting to demonstrate reliability.

Date: 2015-09-19
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Abstract no.: 40833

ACCURACY OF JOA SCORE BASED ON PATIENT RECALL OVER A TWO-YEAR PERIOD

Nanfang XU, Miao YU, Shaobo WANG, Jiang LIANG, Feng WEI, Zhongjun LIU

Background: Standardized instruments such as the Japanese Orthopaedic Association (JOA) survey, one of the most commonly used instrument in spine surgeries, are critical to orthopaedic outcomes research. The purpose of this study was to quantify the accuracy of JOA scores based on patient recall as a function of the duration of the recall interval. Methods: 131 patients who underwent laminoplasty for cervical spondylotic myelopathy were enrolled. Each patient was given a JOA score as part of their standard of care upon admission and was then assigned two JOA scores at regular post-operative follow-up visits, one based on their own recall of prior function, and one reflecting their current status. 35 patients were followed for 3 months, 43 for 12 months, and 53 for 24 months. Actual and recalled JOA scores for each group were statistically compared. Kruskal-Wallis analysis was used to determine any differences in recall accuracy between the groups. Pearson correlation coefficients quantified relations between recall accuracy and patient age and current function. Results: There were no significant differences in recall accuracy across the 3 groups ($p=0.67$). Recalled JOA scores were highly correlated with actual baseline values ($r=0.724$). Recall accuracy was neither correlated with patient age nor current JOA scores ($p=0.08$, $p=0.19$). Conclusions: Patients with cervical spondylotic myelopathy are able to recall prior level of function accurately for up to two years. Although data collected prospectively remain optimal, our results suggest that research conducted using JOA scores produces reliable assessment of functional status with acceptable recall bias.

Date: 2015-09-19
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Abstract no.: 41009

ELEVATED POSTOPERATIVE BLOOD GLUCOSE AND HEMOGLOBIN A1C ARE ASSOCIATED WITH INCREASED PERIPROSTHETIC JOINT INFECTION FOLLOWING TOTAL JOINT ARTHROPLASTY

Weidong XU, Xuan HUANG

Introduction: Diabetes is an established risk factor for complications following total joint arthroplasty (TJA). However, the correlation between postoperative blood glucose and hemoglobin A1C levels with complications, especially the rate of periprosthetic joint infection (PJI) following TJA is not well described. Methods: All patients undergoing elective primary TJA at our institution from 2008 through 2011 with both postoperative blood glucose and hemoglobin A1C (HA1c) levels at POD1-4, 1-month and 3-month were identified in a retrospective review. From among 1897 patients, those with wound complications within thirty days after the index arthroplasty were identified. A control group matched for exact age, sex, procedure, tourniquet use, surgical approach, and use of antibiotic cement was also created. Fourty-five patients met the study group inclusion criteria. The mean patient age was 72y/0. Results: The odds ratio for developing a surgical site complication was 3.75 (95% confidence interval, 1.25 to 11.22; p = 0.02) in patients with a mean postoperative glucose of >10.1mmol/L, 3.0 (95% confidence interval, 0.97 to 9.30; p = 0.08) in patients with a maximum postoperative blood glucose of >14.2mmol/L, and 9.0 (95% confidence interval, 1.14 to 71.20; p = 0.03) in patients with a postperative HA1c value of >6.7%. Conclusions: Patients with a mean postoperative blood glucose of >10.1mmol/L or a postperative HA1c level of >6.7% are at increased risk for PJI following primary TJA. These results show that poor postoperative glucose control is independently associated with PJI.

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Abstract no.: 40561

THE POST-OPERATIVE ANALGESIA EFFECT OF IBUPROFEN AND TRAMADOL IN SUPRACONDYLE FRACTURE OF HUMERUS IN CHILDREN

Guanghui ZHU, Haibo MEI, Kun LIU, Jiangyan WU, Jin TANG

Objective: To compare the post-operative analgesic effect of ibuprofen suspension and tramadol hydrochloride tablets in supracondyle fracture of humerus in children who were managed by open reduction and internal fixation. Methods: 150 patients with type III supracondyle fracture of humerus who were managed by open reduction and internal fixation were randomly allocated into ibuprofen group (group A) and tramadol group (group B) with 75 cases each. Oral ibuprofen Suspension was given to group A in a 8 hours interval for 48 hours after anesthesia recovery while tramadol hydrochloride tablets was given to group B respectively. The Faces Pain Scale - Revised post-operative 1 h, 8 h, 16 h, 24 h, 32 h, 40 h, 48 h were taken note. Any adverse effect was also recorded. Results: The FPS-R scores in both groups showed no significant difference before medication, post-operative 1 h, 8 h, 16 h, 24 h, 32 h, 40 h, 48 h and 72 h ($P>0.05$). The number of cases who needed additional acetaminophen in group A and B were 6 (8%) and 9 (12%). No respiratory depression or hypersensitivity was founded in both groups. The number of cases with adverse effect in group A and B were 13 (17.3%) and 27 (36%) . The adverse effect rate in group A is lower than group B ($P<0.05$). Conclusion: For pediatric cases with supracondyle fracture of humerus who were managed by open reduction and internal fixation, the post-operative analgesia effect of ibuprofen suspension is equal to that of tramadol hydrochloride tablets with lower adverse effect.

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Abstract no.: 40509

EVALUATION OF ASSESSMENT OF CAREGIVER EXPERIENCE WITH NEUROMUSCULAR DISEASE (ACEND): RELIABILITY AND RESPONSIVENESS OF A NEW CAREGIVER-REPORTED OUTCOME MEASURE IN PATIENTS WITH CEREBRAL PALSY (CP)

Nanfang XU, Hiroko MATSUMOTO, Julie YOSHIMACHI, Heakyung KIM, Joseph DUTKOWSKY, Joshua HYMAN, Benjamin ROYE, Michael VITALE, David ROYE

INTRODUCTION: Cerebral Palsy is the most common cause of chronic childhood disability. Caregivers must provide prolonged care over the life span thus measuring caregiver impact has become a focus in the assessment of outcomes in CP. Assessment of Caregiver Experience with Neuromuscular disease (ACEND) has been validated in children with CP and their caregivers and represents a useful outcome assessment tool to measure caregiver quality of life (QOL). ACEND contains 41 items, two domains and seven sub-domains. The current study aims to present the first evaluation of responsiveness of ACEND among caregivers of children with CP following Botulinum toxin (Botox) injection to relieve spasticity. METHODS: 41 patients with baseline ACEND scores and at least one score following Botox injection were enrolled. Age of the patients was 9.6±5.4 years. Follow-up was 6.4±4.7 months. 10 patients were GMFCS I, 5 were GMFCS II, 6 were GMFCS III, 9 were GMFCS IV, and 11 were GMFCS V. RESULTS: Baseline ACEND scores were 117.7±47.7 and the scores at follow-up averaged 120.4±49.5. Baseline and follow-up ACEND scores for each study participant were found to be strongly correlated with a coefficient of 0.929 ($p<0.001$). Paired-sample t-test revealed the average change in ACEND score was 2.7 ($p=0.352$), with the follow-up scores higher. CONCLUSIONS: The strong correlation between the two scores for each study participant suggest that ACEND has high reliability in the population under study, children and adolescents with CP with relatively balanced distribution of gender, age, ICD-9 diagnosis, GMFCS level, and follow-up time.

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Abstract no.: 40120

MULTIPLE OSTEONECROSIS IN ADOLESCENTS AND YOUNG ADULTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS：A CASE SERIES

Yu-Hang GAO

Multiple Osteonecrosis (ON) is rare in systemic lupus erythematosus (SLE) patients especially in adolescents and young adults. We report three cases of SLE patients in adolescents and young adults with multiple ON. The clinical features, imaging findings and treatments are reviewed. All three cases were female patients treated with high dose of corticosteroid therapy for a substantial period, the average age was 17.7 year old, symptomatic ON occurred on the second or third year after on set. Besides the symptomatic joints, more “silence ON” were found by screening magnetic resonance imaging (MRI) especially in weight-bearing joints. Two cases had pain relief after conservative treatments, one case received surgical treatment due to the progressive ON of the hips, all of them consulted their rheumatologists to adjust the administrations for SLE since multiple ON occurred. ON should be considered in young patients with a history of high dose corticosteroid therapy when symptomatic joint pain occurred within 2 or 3 year after SLE onset. screening MRI of weight-bearing joints were necessary to young SLE patients who had symptomatic pain even within one joint. patients who had early diagnosis of multiple ON can benefit from conservative treatments and adjust administrations to prevent further glucocorticoid-related damage such as ON in time.

Date: 2015-09-19
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Abstract no.: 40118

EFFECTS OF METFORMIN ON OSTEOCLASTS DIFFERENTIATION IN VITRO

Ming LU, Haomiao LI, Zixiong LEI, Shuangwu DAI, Dadi JIN

Objective: To investigate the effects of metformin on the differentiation of osteoclast in osteoclast precursor Raw264.7 cells as well as intracellular signal transduction. Methods: The murine macrophage cell line, Raw264.7, was used. Receptor activator of NF-κB ligand (RANKL) was used to stimulate osteoclast differentiation from Raw264.7 cells. Osteoclast differentiation was assessed by Tartrate-Resistant Acid Phosphatase (TRAP) and actin fluorescence staining and counting the TRAP-positive cells after exposure to different concentrations of metformin (0,400,800 and 1000μM) or rapamicin (100nM) in the presence of 50 ng/ml RANKL for 5 days. Bone-resorbing activity was evaluated by BD BioCoat™ Osteologic™ Bone Cell Culture System. The expression of osteoclast-specific genes like TRAP, capthesin K, calcitonin receptor (CTR) and matrix metalloproteinase (MMP-9) was evaluated by RT-PCR. The expression of tumor necrosis factor-α (TNF-α) S6K1 (Thr389), S6(Ser235/236), 4EBP1(Thr37/46) and c-Fos protein was evaluated by ELISA kit and Western blot analysis respectively. Results: Metformin dose-dependently inhibited RANKL-stimulated osteoclasts differentiation in Raw264.7 cell culture, as manifested by decrease of TRAP-positive multinucleated cells and pit erosion area, down-regulation of TRAP, cathepsin K, CTR and MMP-9 mRNA and reduction of TNF-α and c-Fos protein expression. Further study revealed that RANKL activated mTOR complex 1 (mTORC1) signaling, while metformin impaired RANKL-stimulated mTORC1 signaling. Rapamycin, an mTORC1-specific inhibitor and immunosuppressive macrolides could also prevent RANKL-induced osteoclast differentiation and bone resorption in vitro. Conclusion Metformin inhibits osteoclastogenesis in vitro, which may due to reduction of TNF-α and c-Fos protein expression, and mTORC1 signaling is involved in this process.

Date: 2015-09-19
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Abstract no.: 39163

ARTHROSCOPIC SINGLE BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION USING QUADRUPLED HAMSTRING TENDON AUTOGRAFT BY ANTEROMEDIAL TRANSPORTAL TECHNIQUE - A PROSPECTIVE STUDY

Dilip Chand Raja RAJA, Rajesh PURUSHOTAMAN, Sibin SURENDRAN

Introduction: arthroscopic intra articular acl reconstruction with soft tissue graft has become the standard treatment for symptomatic acl deficient individuals .success of acl reconstructions depends primarily on achieving 1. Proper tunnel position 2. Graft fixation 3. Accelerated rehabilitation protocols. For the past 15 years, the most common technique was to create the femoral tunnel through the tibial tunnel. This often resulted in a high anterior femoral tunnel which resulted in a vertically placed graft providing less rotational stability. The position of the femoral tunnel was improved by drilling through the anteromedial portal. This results in a more horizontally and anatomically placed graft which is likely to provide more rotational stability. Study design: we did a prospective cohort study of 172 individuals with minimal follow up of two years. Materials and methods: the clinical, functional and radiological outcome of arthroscopic single bundle acl reconstruction using quadrupled semitendinosus-gracilis graft fixed using endobutton for femoral graft fixation and interference screw for tibial fixation, using transportal technique was studied. Result: the native acl has a mean obliquity of 40-55 degrees. The obliquity of the femoral tunnels were measured in ap radiographs with goniometer. The mean obliquity achieved was 47.95 therefore achieving excellent anteroposterior and rotational stability. Conclusion: this surgical technique allows for a more anatomical acl reconstruction by achieving the native acl obliquity. We strongly recommend that this surgical technique with simplicity, reproducibility, relatively less morbidity allowing for a good anatomicity of graft placement is an excellent cost effective surgical intervention

Date: 2015-09-19
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Abstract no.: 40935

CLINICAL OUTCOMES FOLLOWING ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION UTILIZING HAMSTRING TENDON AUTOGRAFTS

Fares UDDIN, Fahad AL-KHALIFA, Naif ALHAMAM, Abdulla ALJAWDER, Rashad ABUBARIS, Rashid HAMEED

A case series demonstrating functional outcomes of 36 patients two years following Anterior Cruciate Ligament (ACL) reconstruction utilizing hamstring autografts is presented here. We employed a quadruple strand technique with cortical endobutton fixation. The methods of evaluation comprised of the 2000 International Knee Documentation Committee (IKDC) knee forms, clinical hamstring and quadriceps muscle strength testing in guidance with the Medical Research Council (MRC) grading, single leg triple hop assessment for distance, and the Aircast Rolimeter arthrometer for objective joint laxity. Mean IKDC score was 84.05±14.37. A clinical final evaluation of normal or nearly normal was obtained by 97.2% (35/36) the participants. Passive motion deficit measured clinically using a goniometer was also found to be normal or nearly normal in 97.2% (35/36). 100% of patients had normal or near normal grades for clinical manual knee ligament tests. 94.4% (34/36) patients had normal or near normal compartmental findings, and 100% of patients had normal or near normal harvest site findings. Hamstring muscle strength of the operated knee was clinically assessed to be 5/5 in 86.11% of candidates, while quadriceps muscle strength measured 5/5 in 100% of the subjects. The triple leg hop for distance demonstrated optimal performance with a limb symmetry index of 95.3±13.3%. Arthrometric measurements revealed a mean side to side difference of +0.70±1.78 mm with Lachman’s test and +0.67±1.43 mm with the anterior drawer test between the operated knee and the normal contralateral knee. We conclude that at 18 months our subject group displayed exceptionally satisfactory functional outcomes.

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Abstract no.: 41005

OUR EXPERIENCE OF ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION WITH USING SEMITENDINOSUS AND GRACILIS TENDONS

Farrukh USMONOV, Mirkhakim AZIZOV, Murodjon IRISMETOV

Introduction. Treatment of anterior cruciate ligament injuries is an actual problem. With using an arthroscopic technique it is possible to restore anterior cruciate ligament with a less invasive technique, which gives possibility of early rehabilitation. Materials. 79 patients (69 male, 11 female) at age from 14 to 58 y.o. with ACL ruptures were operated. 55 patients obtained trauma during sport activity. 33 patients had isolated ACL ruptures, 46 patients had meniscus injuries: 28 medial meniscus tear, 14 lateral meniscus tear, 4 both meniscuses tear. Remoteness of trauma was from 2 month to 5 years. In all patients' semitendinosus and gracilis autografts were used. In patients with meniscus tear simultaneous partial or subtotal meniscectomies were performed depending of type of meniscus tear. Patients were recommended to do isometric quadriceps exercises from the next day of operations. Gradual knee flexion motions were recommended in 3-4-day after surgery. Results. All operated patients were observed monthly till eight month. Lysholm score was used for evaluation of results. By the eight month excellent results occurred in 30 patients, good results in 46, satisfactory in 3 patients. Recurrent synovitis was occurred in one patient who was treated with appropriate medicines for a long time. Revision surgery was done in 1 patient from the infection process which's condition was improved after revision and appropriate treatment. Majority sportsmen returned to sport. Thus, this method of ACL reconstruction is effective, less traumatic, gives possibility to return patients and sportsmen to previous activity.

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Abstract no.: 41887

IPSILATERAL BONE-PATELLAR TENDON-BONE REHARVEST AUTOGRAFT IN REVISION ACL RECONSTRUCTION

Haytham ABDEL-MONEIM, Ahmed ELGUINDY

Introduction: Numerous graft alternatives both autogenous and allogenic have all been accepted as reasonable options for ACL revisions. The purpose of the study was to review our experience with reharvesting ipsilateral bone-patellar tendon-bone (BPTB) autograft in revision ACL reconstruction. Methods: Ipsilateral BPTB autograft was reharvested in nine revision cases with the primary surgery more than 18 month prior to revision surgery. Seven males and two females were included. In eight cases, an additional lateral tenodesis with the gracilis tendon was added. Scores were calculated for International Knee Documentation Committee (IKDC) forms. Radiographs and CT scan were obtained. Results: The mean age at revision surgery was 26.18 years old. The mean follow-up period was 18.7 months. Eight patients had a firm end point on Lachman examination, and an equal pivot shift test. Postoperative satisfactory range of motion was achieved in all patients. The differential postoperative anterior tibial translation on stress Lachman was [-1 to 2 mm] in two cases, [3 to 5mm] in five cases, and [6 to 10 mm] in two cases. Harvest site pathology showed moderate pain in one case which resolved completely within three months. No patient was re-operated for instability after revision surgery. All patients stated their knee to be good or very good. Conclusion: Ipsilateral BPTB reharvest autograft is a good alternative in revision ACL reconstruction with satisfactory results. This preserves the contralateral BPTB autograft for revision ACL surgery and will not create a symptomatic problem in the contralateral knee that was previously normal.

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Abstract no.: 41415

COMPARATIVE STUDY ON SINGLE-BUNDLE AND ANATOMIC 4-TUNNEL DOUBLE-BUNDLE POSTERIOR CRUCIATE LIGAMENT RECONSTRUCTIONS

Jia-Kuo YU, Ying-Fang AO

Introduction: To compare the difference of the clinical results between the conventional single-bundle posterior cruciate ligament reconstruction (SB-PCLR) and the anatomical 4-tunnel double-bundle posterior cruciate ligament reconstruction (ADB-PCLR). Method: 40 patients who meet the involved specifications were followed up retrospectively. Their average follow up time was 47.7±22.7 months. Their average age was 35.1±13.8 years old. Among them, 20 accepted the ADB-PCLR, 20 accepted the SB-PCLR. In both groups, the age, involved knee side, and gender showed no significant difference. The subjective IKDC 2000 score, the Lysholm score, and the Tegner score before operation between the two groups showed also no significant difference. No significant anteroposterior tibia translation difference measured by the KT2000 was found between the two groups before PCL reconstructions. Results: Except for 20 ADB-PCLRs and 20 SB-PCLRs, 12 of the 40 patients had partial meniscectomies simultaneously. Cartilage injuries shaving and smoothing were done for 9 cases of them. The subjective IKDC 2000 and Tegner scores in the ADB-PCLR group were significant higher than in SB-PCLR group, the tibia anteroposterior translation of the involved knee measured by KT 2000 with 15 , 20, 30 pounds and maximum fource were significant less in the ADB-PCLR group (2.05 ± 1.88, 2.08 ± 1.91, 2.015± 1.97, 2.3±1.8mm) than in the SB-PCLR group(3.24±1.86, 3.27±1.78, 3.41±1.92, 3.4±1.7mm), with p value of 0.03, 0.03, 0.03 and 0.02 respectively. Conclusion: Knee function evaluation by subjective IKDC2000 and Lysholm scores showed the ADB-PCLR could restore the knee function better.

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Abstract no.: 39892

ENHANCED SUTURE REPAIR FOR ANTERIOR CRUCIATE LIGAMENT RUPTURE

Lei SUN

Introduction: Anterior cruciate ligament (ACL) repair used to be a classic treatment for ACL rupture, which had been almost abandoned since 1990s due to inferior outcome to ACL reconstruction. Nevertheless, ACL repair could get a regenerated structure with the original neurovascular supply and the native insertion structure. Methods: Under arthroscope, 2 bone tunnels of 2 mm in diameter were created aiming at the outer margins of anteromedial and posterolateral bundles on the insertions of the ACL on both tibial and femoral sides respectively. No 2 Vicryl sutured the torn ACL by an interlocking stitch, and attached with a tissue block of periosteum to fill defect of torn ACL for biologic enhancement, was passed through femoral tunnels. In addition, double-stranded No 5 Ethibond was inserted and routed through the bone tunnels on both tibial and femoral sides for biomechanical enhancement. Finally, sutures are individually tied at maximum manual tension at posterior drawer position. Results: The patients were followed up from 6 months to 17 months. At the latest follow up, all of the 12 patients restored the previous activity of daily life, associated with symmetric range of motion of the affected knee compared with the uninjured knee. Of them, 9 patients presented bilateral equilibrium in Lachmen test and anterior drawer test, by contrast, the remaining 3 patients showed grade 1 laxity of injured knee in comparison with the unaffected knee. Additionally, all patients accompanied negative results of pivot shift test. Conclusion: The preliminary results are very encouraging.

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Abstract no.: 41825
EVALUATION OF PIVOT SHIFT IN ACL DEFICIENT KNEES

Mustapha Usman IBRAHIM, Jvs VIDYASAGAR

ACL is commonly affected in knee injuries. Proper evaluation is important in diagnosis. Pivot shift, an important clinical evaluation test for the anterolateral stability of the knee. It is painful hence most patients will not co-operate if not under anaesthesia. It is a 3 dimensional test showing anterioposterior, rotational and angular displacement of tibia in relation to femur. This study was done to estimate the angle of tibial displacement in ACL deficient knees. It was a prospective study done between jan-march 2015. Fifteen patients met the inclusion criteria. After anaethesia, pivot shift was performed. After scrubbing, knee was flexed to 300. Three K-wires were placed as follows: Most prominent part of lateral femoral epicondyle, point “A”. Gerdys’ tubercle of tibia, point “B”. Central part of fibula head, Point “C”. After marking length of AB, AC and BC distance were taken and recorded. Then K-wire from point “A" was removed and the knee extended. At 00, the most prominent part of lateral femoral epicondyle was identified and K-wire was passed, the point marked as” A1”. Measurements are taken after joining the new triangle A1B, A1C and BC distance. The measurements were plotted on a graph and the various angles measured. The difference between angle “A” and “A1” was determined as the pivot shift angle. Results was analyzed using Microsoft excel. Angle range of 2-9 degrees and a mean of 6.1degrees were found. It was concluded that this technique is useful in estimation of pivot shift angle in ACL deficient knees.

Date: 2015-09-19
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Time: 16:00 - 17:30
Room: Qingyuan Hall

Abstract no.: 39803

ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION: COMPARED ANTEROMEDIAL PORTAL VERSUS TRANSTIBIAL DRILLING TECHNIQUES

Xinghuo ZHANG, Zhang YAKUI

INTRODUCTION: The aim of our study was to compare clinical and radiological outcomes of patients who underwent single-bundle anterior cruciate ligament (ACL) reconstruction with anteromedial portal (AMP) and transtibial (TT) techniques. METHODS: Total 48 patients underwent arthroscopic single-bundle ACL in 2007 and 2009. using AMP technique in 23 patients and TT techniquein 25 patients. The patients were evaluated retrospectively. Rigid fixation was used for femoral fixation, and Introfix were used for tibial fixation of the graft. Lachman test, Pivot shift test, Lysholm, International Knee Documentation Committee (IKDC-2000) scoring systems were used in the clinical and functional evaluation of patients before and after the surgery. Time to return activity level were assessed. RESULTS: The mean follow-up time was 62.5±2.3months and 63.4±21.1months in the AMP and TT groups, There was a significant difference between the AMP group (85.6 %) and the TT (34.8%) group compared of anatomical placement of the femoral tunnels and grafts ($p < 0.01$). No significant difference was found between the two groups in terms of the Lachman test ,Pivot shift test, Lysholm, and IKDC scores, and activity level ($p > 0.05$). The patients in the AMP group returned to activity level 1.2months earlier ($p < 0.001$). CONCLUSIONS: The AMP technique was superior to the TT technique in achieving anatomical placement of the graft and in recovery time to return activity level; however, there was no difference between groups in terms of the clinical and functional outcomes in the medium-term follow-up..

Date: 2015-09-19
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ALL-EPIPHYSEAL ANATOMIC SINGLE-BUNDLE ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION IN SKELETALLY IMMATURE PATIENTS

Xuan HUANG, Zimin WANG

Introduction: Treating anterior cruciate ligament (ACL) injuries in juvenile population requires balancing the risk of chondral and meniscal injuries associated with delaying treatment against the risk of growth disturbance from early surgical reconstruction. "Physeal-sparing" reconstruction techniques exist, however, none report the anatomic single-bundel reconstruction of ACL while keeping the graft and fixation entirely in the epiphysis. Methods: We describe an all-inside technique with the femoral tunnel drilled retrograde and the tibial tunnel drilled retrograde; both tunnels are entirely within the epiphysis. Fixation of the hamstring autograft is achieved with bioabsorbable interference screw on both the femur and tibia. Sixteen case examples are presented with a mean age of 11.2y/o, Tanner Stage 1 development. Results: All patients had stable knees based on Lachman and KT-1000 testing and no evidence of growth disturbance. All had full ROM and symmetric strength for knee flexion and extension. All patients returned to their sports activities 3 months after surgery. Conclusion: By placing the graft at the native ACL's anatomic attachment points without spanning or violating the growth plates at any step of the procedure, an all-epiphyseal ACL reconstruction theoretically minimizes the risk of growth disturbance in juvenile patients.

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Abstract no.: 41385

ANATOMIC RECONSTRUCTION OF ANTEROLATERAL LIGAMENT COMBINED WITH ANTERIOR CRUCIATE LIGAMENT USING THE SAME HAMSTRING AUTOGRAFT: TECHNIQUE REPORT

Zimin WANG, Xuan HUANG[1], Zhe LU

Introduction: Recently, the anterolateral ligament (ALL) has been identified as an important structure to control internal rotation of the tibia after ACL injury. This study aimed to report a novel technique of anatomic ACL and ALL reconstruction with hamstring autograft. Methods: Sixteen pts with ACL injury and grade 3 pivot shift test underwent this procedure. Two strands of hamstring autograft (ST & GT), usually longer than 24 cm, were folded at its point of 1/3 for weaving. The graft was designed as one half with 4 strands for ACL and another half with 2 strands for ALL. The whole graft would be longer than 16cm. A single femoral tunnel was drilled with outside-in technique to address both the ACL and ALL insertion points on femur. The tibial insertion of the ALL was taken to be roughly halfway between the Gerdy tubercle and the fibular head. The graft was secured with interference screw in femoral tunnel. In two tibial tunnels, either interference screws or Endo-buttons were used depends on how much graft in tunnels. Results: 13 pts were re-examined at an average follow-up of 16 ± 7months. The average differential anterior drawer test at the last review was 2.5 ± 3.4 mm with KT1000 and 92% pts had a negative pivot shift test at final follow-up. Conclusion: This study demonstrated that a combined anatomic ALL and ACL reconstruction using hamstring autograft successfully controls the rotatory instability of the ACL injured knee in the majority of cases without specific complications.

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Abstract no.: 39673

A NOVEL ALL-ARTHROSCOPIC PCL TIBIAL INLAY RECONSTRUCTION

Jian LI

To design all new apparatus and surgical processes for total arthroscopic tibial inlay. The new apparatus consisting of three main components for total arthroscopic tibial inlay were designed and manufactured, and the corresponding surgical processes were experimented on 8 cadaveric knees. The apparatus for tibial sloting including three components was designed and manufactured successfully, which could be used easily. The surgical process was proved to be feasible, which could be performed within a short time (mean, 83.6 minutes). The graft fixation was proved to be firm enough by mechanical tests. Image examination (X ray, CT and MRI) proved that the location of implants was appropriate. The newly designed apparatus and surgical processes for all arthroscopic tibial inlay were proved to be simple and useful, which could be further optimized.

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Abstract no.: 39890

COMBINED RECONSTRUCTION OF INTRA-ARTICULAR AND EXTRA-ARTICULAR LIGAMENTS FOR TREATMENT OF MULTIPLE LIGAMENT INJURED KNEE

Lei SUN, Bo WU

Introduction: To evaluate the technique features and the clinical outcomes of combined reconstruction of intra-articular and extra-articular ligaments for treatment of multiple ligament injured knee. Methods: Eighteen patients with acute multiple ligament injured knee without concomitant neurovascular injuries were surgically treated by combined reconstruction of intra-articular and extra-articular ligaments. An intra-articular ligament and an extra-articular ligament, such as ACL/PLC or PCL/PMC, were simultaneously reconstructed using the same graft passing through the femoral bone tunnel which connected both femoral insertions of the intra-articular and extra-articular ligaments. The reconstructed extra-articular ligament like PMC or PLC was firstly tensioned and fixed at knee flexion position, subsequently the reconstructed ACL and PCL were concurrently tightened and secured near full extension of the knee. Results: They were followed up from 13 to 42 months with a mean of 24.8±9.4 months. Of the 18 patients, none had gross malalignment or gait abnormalities, 10 patients returned the level of preinjured activity. Significant improvements in knee stabilities were shown in stress tests ($P<0.001$). Lysholm scores increased from 0.6±0.9 preoperatively to 91.2±6.0 at the final follow up ($P<0.001$). Conclusion: This procedure has advantages of simplifying operative manipulation, decreasing iatrogenic injuries and saving operative time, is associated with reliable clinical outcome in knee stability and function.

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Abstract no.: 39644

COMBINED RECONSTRUCTION OF MCL WITH PCL USING BILATERAL HAMSTRING TENDONS IN ACUTE KNEE INJURY MANAGEMENT: A MINIMUM 1-YEAR FOLLOW-UP STUDY

Pandian SELVARAJ, Ravi Sankar KIRUBANANDAN, Arunkumar PANDIAN

Aim: Isolated PCL reconstruction without MCL reconstruction in grade 3 lesions can lead to persistant symptoms of rotatory instability and failure of PCL reconstruction. We present a case series of 5 patients who underwent simultaneous PCL-MCL renconstruction with a follow-up of 1 year. Method: Between 2012 and 2014 we operated on 6 cases with 2 ligament reconstructions at the same time. Same technique was followed in all the cases. TegnerLysholm knee scoring scale, Valgus and Varus instability, range of movement and complications were recorded pre-operatively and post-operatively. All patients underwent strict rehabilitation protocol and assessed by single surgeon post-operatively. Results: At follow-up of 1 year, there was no medial instability (valgus stress) or posterior laxity (posterior drawer test negative) in all the 5 cases. One patient lost follow-up. The mean medial instability pre-operatively 9.2mm (range 8mm to 12mm) was reduced to 0.7mm (range 0mm to 1.8mm). Pre-operative posterior instability were present in all the 5 cases. None of the patient had any posterior instability at 1 year follow-up. All the 5 patients had a range of movement flexion above 100 deg and none of the patients had any fixed flexion deformity. One patient had superficial wound infection at the graft harvested site, which healed with debridement and antibiotics. Pre-operative TegnerLysholm knee score was 13.2 (range 6 to 20) which improved to 86.8 (range 80 to 95 points). Conclusion: Early reconstruction of MCL in knees with multi-ligament injuries helps in early rehabilitation, good recovery of knee function, ROM and quadriceps strength.

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Abstract no.: 40765

ARTHROSCOPIC REPAIR WITH MARROW STIMULATION TECHNIQUE IS EFFECTIVE IN HORIZONTAL MENISCAL TEARS

Qi ZHOU, Yu-Li WU, Hai-Shan WU, Yun-Li ZHU, Qi-Rong QIAN

Objective: The clinical efficacy of arthroscopic meniscal repair with marrow stimulation technique was evaluated in the treatment of horizontal meniscus tear. Methods: 20 patients with horizontal meniscus tears treated by arthroscopic meniscal repair with bone marrow stimulation techniques are complete followed-up. Function outcome is evaluated by the visual analogue scale(VAS), Lysholm score, Tegner score. The success rate of meniscus repair is evaluated by clinical symptoms and postoperative function. Results: The average follow-up was 18.6 + 5.1 months. The average VAS score was decreased from 6.9 to 1.6 ($P<0.001$), Lyshom score from 49.5 ± 16.3 up to 91.6 ± 7.2 points ($P<0.001$). Tegner score rised from 3.5 ± 1.3 to 7 ± 0.6 ($P<0.001$). At the time of the last follow-up, 18 patients (90%) did not have any clinical symptoms. Conclusion: Arthroscopic meniscal repair with marrow stimulation technique is effective in the treatment of horizontal meniscus tear. Marrow stimulation technique promote healing of horizontal meniscal repair.

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Abstract no.: 39217
THA IN ACETABULAR FRACTURES
Maher HALAWA

THA is indicated in fresh acetabulalr fractures(within 3weeks) if there is comminution of the post. wall , unreconstructed comminuted roof of the acetabulum with marginal impaction or associated ipsilateral fracture neck of femur. THA can be done in inadequate internal fixation and/or complication of such surgery as AVN or infection. they can be done in neglected acetabular fractures i.e more than 4 weeks post injury. 72 cases have been collected from 1989 till 2013. the methods of reconstruction will be presented with the functional outcome using modified Merle D'ubenier postel assessment score.Finally the complication of such prosedure will be presented mainly sciatic nerve injury and dislocation of the hip

Date: 2015-09-19
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Abstract no.: 41685

ACUTE TREATMENT OF ACETABULAR FRACTURES

Masafumi KISHIMOTO, Jun OKAMOTO

Objective: Among pelvic injuries, acetabular fractures are less commonly associated with vascular injuries and hemorrhagic shock, but in some cases hemodynamic resuscitation is required. The acute treatment of such cases of acetabular fracture is reported here. Materials and Methods: Since 2004, 56 cases of acetabular fractures were treated at our center; in 9 cases patients exhibited shock and were treated with TAE (T group), whereas the other 47 cases did not (non-T group). We analyzed the age, mechanism of injury and fracture type, using the Judet and Letournel classification, of each case. Result: The average age of the T group was 58.3 years of age (4 male, 5 female), and for the non-T group it was 46.8 years old (44 male, 3 female). The age difference between groups was found to be statistically insignificant. In both groups, traffic accidents were the most common mechanism of injury. The fracture types of the T group were 7 both-column, 1 anterior and 1 posterior column + posterior wall; in the non-T group 16 were both-column, 16 posterior wall, 4 posterior column + posterior wall, 3 transverse, 3 anterior column and the rest (3) were miscellaneous. The probability of TAE treatment was high in both-column fractures. Conclusion: Even in acetabular fractures, the possibility of shock should be considered, especially in cases presenting with both-column fractures.

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Abstract no.: 41792

TECHNICAL ERROR RELATED UNUSUAL STRESS RISER FRACTURES

Jihyo HWANG

Introduction: Stress riser fracture is another form of stress fracture which is also known as a Young's modulus fracture. As the majority of stress riser fractures can be preventive, the prevalence is not known properly. Materials and Methods: We analyzed all fractures which are related to the stress riser fractures in the femurs which occurred between 2002 and 2015, and we found only 13 cases of 12 patients' typical stress riser fractures in the femurs. The proper incidences are very rare. Results: 5 (38 %) cases are subtrochanter area, 3 (23 %) cases are femoral neck fracture and the others (38 %) are proximal to middle shaft fractures. Subtrochanter areas are more common sites to the stress riser fractures in the femur. The empty holes by the screws, guide pins or drill bits acted as stress risers in 8 cases (61.5 %). The screws and plates or nail acted as a stress risers in 4 cases (30.8 %). Furthermore the tip of the prosthesis acted as a stress riser in 1 case (9.1 %). As such empty holes are major culprits in the stress riser fractures. Conclusions: Any type of screw holes can be a cause of stress riser fracture in the femur regardless of age. The implant in the femur should be considered as major stress riser especially in older patients and the peritrochanteric stress riser fractures are related to technical errors. Hence, we should be more advertent in stress riser fractures for prevention of reoperations.

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Abstract no.: 40321

LATERAL-RECTUS APPROACH AND ILIAC ARTERY EMBOLIZATION FOR TREATMENT OF SACRAL FRACTURE WITH SACRAL NERVES DAMAGE

Shicai FAN, Guang XIA, Xiaodong YANG

To explore the clinical effect and surgical techniques of lateral-rectus approach and iliac artery embolization for sacral fracture with sacral nerves damage.Methods From August 2010 to August 2014, 8 patients with sacral fracture accompanied by sacral nerves damage managed through the lateral-rectus approach and iliac artery embolization.There were 3 males and 5 females,with an average age of 37.4 years(from 22 to 57 years).According to Denis classification,All patients were Denis II fractures involving the anterior pelvic ring fractures,5 limb fractures,3 cases involving organ injury.All fractures were treated with the lateral-rectus approach and iliac artery embolization in the horizontal position with general anesthesia.The fractured pelvis was fixed by plate at anterior ring after plates and hollow screws were implanted to reduce sacral fracture.Results All the 10 cases underwent the operation successfully. Postoperative X-ray and CT exams showed excellent and good reduction of sacrum.According to the Matta radiological evaluation postoperatively, reduction of sacral fracture was rated as excellent in 4 cases,good in 2 cases and fair in 2 cases.The rate of excellent and good was 75.0%. All patients were followed up for 6 to 24 months and all patients achieved bone union., 4 cases got complete recovery,3 cases made partial restoration, 1 case no significant effect.conclusions The method of lateral-rectus approach and iliac artery embolization for sacral fracture with sacral nerves damage is effective and safe.

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Abstract no.: 40462

MODIFIED SUBINGUINAL APPROACH IN THE TREATMENT OF ACETABULAR FRACTURES :AN ANATOMICAL STUDY AND CLINICAL EVALUATION

Xiaodong QIN

Objective To evaluate a modified subinguinal approach without iliac osteotomy for anterior surgical treatment of acetabular fractures which involved the anterior wall and labrum or in combination with femoral neck fracture. Methods The subinguinal approach was modified after anatomical study. The clinical evaluation was undertaken between May 2010 and March 2012. 34 patients with acetabular fracture that involved the anterior wall and labrum or in combination with femoral neck fracture were treated with open reduction and internal fixation. 15 patients were treated through modified ilioinguinal approach; while the other 19 patients were treated through modified subinguinal combined Kocher-Langenbeck approach. According to the Letournel-Judet classifications of acetabular fracture, there are 17 simple fractures and 17 complicated fractures. The operations were undertaken 5 to 16 days after injury, with a mean time of 7.4 days. Results According to the anatomy results of 12 adult cadaver, the inguinal ligament was reflexed and continued from the aponeurosis of external oblique with a length of 11.09±0.24 cm, which was constructed to form part of abdominal muscle. The conjugate of inguinal ligament and iliopsoas muscle on the anterosuperior iliac spine was 0.69±0.08 cm. The vertical dimension from the saphenous vein to the inguinal ligament was 3.58±0.49 cm. Conclusion In the modified subinguinal combined Kocher-Langenbeck approach, the inguinal ligament is perfectly preserved. Modified subinguinal approach can provide broad visualization of anterior and medial wall of acetabulum and anterior hip capsule, which is a better modification and supplement for classic ilioinguinal approach.

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Abstract no.: 41124

MODIfiED STOPPA APPROACH COMBINED WITH ILIAC CREST APPROACH FOR THE TREATMENT OF ACETABULAR FRACTURES: A RETROSPECTIVE REVIEW OF 42 PATIENTS

Yue FANG

Objectives: Report the technical aspects, complications, radiographic results and clinical outcomes after minimum 2-year follow up of modified stoppa approach for the treatment of acetabular both-column fractures. Materials-methods: We reviewed a consecutive cohort of 42 patients with acetabular both-column fractures treated by one surgeon through a modified stoppa approach combined with the lateral window of the ilioinguinal approach. There were 26 females and 16 males with the mean age of 38 years. The mean Injury Severity Score (ISS) was 18.5 points. The mean preoperative displacement of acetabular fractures was 16.7 mm, and Intra-articular loose fragments (IAFs) were found in 16 patients.Results: The mean operative time was 213 minutes. The mean blood loss was 673 ml and the mean wound drainage was 116ml, with a mean blood transfusion of 280ml. Articular surface of hip achieved anatomic reduction in 20 cases. Long-term follow up data (average 37 months) were available for all patients. The mean Merle d'Aubigné score was 15.7 with 28 patients(66.7%) achieving a functionally perfect or good result. Conclusion: Using this approach for the treatment of acetabular fractures permits a satisfactory reduction results in majority of patients while giving perfect visualization and access to the quadrilateral plate and posterior column.

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Abstract no.: 40157

PRELIMINARY CLINICAL OBSERVATION ON TREATMENT OF COMPLEX DISTAL FEMUR FRACTURE BY RETROGRADE INTERLOCKING INTRAMEDULLARY NAIL COMBINED WITH LOCK PLATES

Zhidong CAO, Dianming JIANG, Jingyue GOU

Objective To investigate the efficacy of treatment by limited open reduction and fixation with retrograde interlocking intramedullary nail combined with locking plates in the patients with complex distal femur fracture. Methods The data of 13 cases with complex distal femur fracture treated by limited open reduction and fixation with retrograde interlocking intramedullary nail combined with lock plate from October 2010 to January 2013 were analyzed retrospectively in regard to operation time, bleeding volume, fracture union time and complications, and so on. Furthermore, function score of fractured knee was obtained according to Merchant knee score method. Results The operation was performed with average operation time of 108 min and bleeding of 215 ml. During follow-up time, no obvious complications were found postoperatively except for 2 cases of superficial infection of the incision, finally excellent rate of function score up to 91.3%. Conclusions It is with the advantages of highly stable, minimally invasive and good effect that the treatment by limited open reduction and fixation with intramedullary nail combined with locking plate is a good option for complex distal femur fracture, and can be recommended, especially in basic-level hospital.

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Abstract no.: 42441

CLINICAL STUDY OF MINIMALLY INVASIVE TREATMENT FOR UNSTABLE PELVIC RING INJURIES USING MODIFIED STOPPA INCISION COMBINED WITH PERCUTANEOUS SACROILIAC FIXATION

Longpo ZHENG

Objective To evaluate the feasibility and clinical efficacy analysis on the application of using modified Stoppa incision combined with percutaneous sacroiliac fixationts in the treatment of unstable pelvic ring injuries. And to explore the application prospects of the method in the treatment of pelvic ring unstable fracture.Methods From January 2004 to January 2012, total of 23 cases of unstable pelvic ring fractures were included in the study. There were 16 males and 7 females with an average age of 42.5 years (ranging from 17 to 72). The follow-up is 3 to 72 months, with an average of 38.4 months. The causes of injury: fall injury on 7 cases, car accident on 9 cases, crush injury on 5 cases, 2 cases for their own fall. AO fracture classification: 3 cases B1, 7 B2, 2 B3, 4 C1, 3 C2, 4 C3. Sacral fractures Denis type: 15 cases type Ⅰ, 4 type
fixation had been done by modified Stoppa incision and posterior pelvic ring by percutaneous bilateral sacroiliac fixation. Calculate the operative time and blood loss. Results All patients were followed up. In accordance with Matta fractures scoring criteria, excellent on 14, good on 9. Function score according with Majeed pelvic fractures, excellent on 18 cases, good on 4, ok on 1. No traumatic hip arthritis, nerve damage, bladder and urethral injury, skin necrosis and other complications happend. Surgical time and bleeding volume were significantly reduced compared with conventional surgery type, which should have the statistical significance ($P<0.01$). Conclusions Modified Stoppa incision combinedwith percutaneous bilateral sacroiliac fixation on the treatment of unstable pelvic ring fractures have greatly reduced the complications caused by conventional surgery, and significant reduced intraoperation blood lossing and operation time. At the same time , the surrounding

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Abstract no.: 42440
AN IMPROVED BENDING PLATE FOR SACRAL DENIS II FRACTURES
Wei WANG, Jun YANG

Purpose: To improve traditional sacral posterior plate.It is superficial of internal fixation which conventional percutaneous posterior pelvic plate placed, compression is easy to cause skin necrosis. It attracts more attention on preoperative traction and manual reduction, and can't open decompression of previous pelvic ring before. Methods : 7 patients with sacral fractures all combined sacral nerve injury. We bend the traditional pelvic plate on physiology, from the third hole bending 70 ° to 90 ° to the same direction on both sides, attaching with bilateral iliac spines on the inside edge. We drill along the direction of the iliac wing and 15 °, 25 ° to the horizontal direction, trying to keep the needle within the bone and screwing two 50-70 mm screws on each side. Results : All patients were followed up; the fracture healing is well, with no serious complications. Partly neurological recovery was noted in 2 cases , with walking gait and squat function normally. The average follow-up time was 17.9 months. Majeed rating: excellent: 2, good: 4, fair: 1.Conclusion: The improved sacral posterior plate can be effectively carried out on the fracture fixation, at the same time to the sacral nerve decompression effect, is a kind of feasible operation method.

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Abstract no.: 42439

SAFE ZONE FOR SCREW INSERTION IN THE TREATMENT OF THE COMMINUTED QUADRILATERAL PLATE FRACTURE INVOLVING ACETABULAR FOSSA: AN ANATOMICAL STUDY AND CLINICAL EVALUATION

Chengla YI

Objective: This study focus on anatomic study and Clinical implementation of the safe zone for screw insertion in the quadrilateral plate while treated with comminuted quadrilateral plate fractures involving acetabular fossa. Methods: We cut the hernipelves and then assembled the cross-sections to define the exact projection of the boundary of the acetabulum on the quadrilateral surface. Then three lines (X, Y, Z) could be drawn tangent to the boundary of the circle while X parallel to iliopectineal line(IL) , Y perpendicular to the iliopectineal line , and Z parallel to the posterior border of the ischial body.We defined that D1 was the distance between line X and iliopectineal line, D2 was the distance between sacroiliac joint and line Y, and D3 was the distance between line Z and the posterior border of the ischial body. The distance of D1, D2, D3 on the quadrilateral surface, which could determine a safe zone for screw insertion, was measured and recorded using a standard measuring caliper and flexible ruler. To minimize the risk of error during these steps, all measurements throughout the study were repeated three times by the same investigator (sun yun) and averaged.By analyzing twenty adult cadavenc hernipelves, it was possible to identify a safe zone for extra-articular screw placement in the quadrilateral plate. Base on the anatomic study, we designed different buttress plates or a reconstruction plate in different configurations used for fixing the quadrilateral plate fractures. Some of these plate-screw systems were implemented in 8 patients with comminuted quadrilateral plate fractures, and lead to good results. Results: Our study suggested that the distance of D1, D2 and D3 was 50±1.6mm, 30.8±2.9mm and 12.4±1.2mm. There were no side-to-side statistically significant differences. 8 patients included in the study and average follow-up was

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Abstract no.: 42438

COMPARATIVE STUDY ON THE ENDOBUTTON DEVICE FIXATION AND RECONSTRUCTION PLATE FIXATION IN THE TREATMENT OF PUBIC SYMPHYSIS DIASTASIS

Jianjun HONG

Objective: To make a comparative analysis on the clinical curative effects of Endobutton device fixation and reconstruction plate fixation in the treatment of pubic symphysis diastasis . Methods: The medical records of 32 patients with pubic symphysis diastasis treated from January 2009 to January 2012 were analyzed retrospectively . Twelve cases in group A were administrated with Endobutton device fixation , while the others in group B were administrated with reconstruction plate fixation . The operation time , amount of blood loss , incision length , and complications of patients were recorded and compared between the 2 groups , and the curative effects were evaluated according the functional evaluation standards which we made . Results: There was no significant difference between the two groups in incision length, operation time and amount of blood loss (t = 5.92 , P = 0.12 ; t = 5.43 , P = 0.19 ; t = 1.91 , P = 0.24). And there was no statistical difference in the curative effects between the 2 groups(Z =0.42 , P =0.59) . There were no pubic symphysis rediastasis in both the two groups. And 1 case with pain in the place of pubic symphysis was found in group A; while 3 cases with mild pain in the back zone of pubic symphysis and 2 cases with loose screws were found in group B . There was no statistical difference in the complications between the 2 groups(P =0.89) . Conclusion: Endobutton device for the treatment of pubic symphysis diastasis has advantages such as simple minimally invasive, no need of second operation for implant removal, recover the ligament of the pubic symphysis and less complications,which should be popularized and applied to clinical widely. Pubic symphysis diastasis; Pelvis;Fractures

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Abstract no.: 42437

THE SIGNIFICANCE OF DOUBLE-OBLIQUE MPR OF THE TREATMENT DECISION-MAKING IN SACRAL FRACTURE WITH SACRAL NEUROLOGICAL DAMAGE

Lifeng DING, Jun YANG, Wang WEI, Wang ZHAN, Gao XUDONG, Qiu SHIYANG

Object:To study diagnostic and surgical significance of the multiplanar reconstrudion (MPR) of spiral CT in sacral fracture with sacral neurological damage. Methods : From April 2010to April 2014, 10 cases of sacral fracture with sacral neurological damage in SHENGJING Hospital of China Medical University were examined by double-oblique MPR of sacrum to show a total length of the sacral neural tube ,and observate course of sacral neural tube and the relationship between fracture and the neural tube. There were 7 males and 3 females, aged 30-55 years. The time from injury to hospitalization varied from 1 day to 1 months. The injury was caused by traffic accident in 6 cases, smash of heavy object in 3 cases and crush in 1 cases. All patients were examined with double-oblique MPR (coronal oblique 45 degrees and 30 degrees oblique-shaped bit lost)to display the course of sacral neural tube and the condition of clearly, which was confirmed by operation and clinical validation. Results : The clinical manifestations and international standards for Neurological Classifi cation of Spinal Cord Injury recommended by American Spinal Injury Association International Spinal Cord Society were the basis for clinical diagnose. Nerve injury diagnosed by clinical manifestation were S1 (6 cases), S2 (2 cases) , S1 and S2(2 cases).After double-oblique MPR in patients ,we found 3 patients have fractures in sacral neural tube of S1, 1 patients in S2,and 2 patients both in S1 and S2,whom recovered average 12 month after operation (S1 and S2 nerve were pressed by fractures according to operating observation) ;And there were no fractures in sacral neural tube of other patients(3 cases in S1,1 cases in S2),these were contund, whom were recoverd average 13 month after expectant treatment. Conclusion : Double-oblique MPR of sacrum has important clinical significance

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Abstract no.: 42436

LUMBOPELVIC FIXATION AND SACRAL DECOMPRESSION FOR U-SHAPED SACRAL FRACTURES: SURGICAL MANAGEMENT AND EARLY RESULTS

Lin CAI, Yuanlong XIE, Ansong PING, Jun LEI, Zhouming DENG, Chao HU, Bing RAN

Objective: To evaluate the injury characteristics, management and quality of life of U-shaped sacral fractures. Methods: Ten consecutive patients with U-shaped sacral fracture were retrospected in our trauma center from 2009 to 2013. Associated injuries, demographics, fracture classification, mechanism of injury and operative treatment and deformity angle were recorded. All the patients were treated with lumbopelvic fixation or (and) sacral decompression. EQ-5d score was applied to evaluate the patients' quality of life. Results: There were three female and seven male patients. The mean age was 29 years.The mechanism of injury included suicidal jumping (n=2), accidental falls from heights (n=5), vehicle accidents (n=3). Six patients received lumbopelvic fixation and sacral decompression. One received lombosacral fixation. Three patients merely received sacral decompression for they were delayed diagnosis or surgery. The post-operation deformity angle (29.0±28.4°) of sacrum was significantly smaller than pre-operation (36.5±24.5 °) (p < 0.05). At the last follow-up visit, bladder and bowl function of all patients recovered. Eight patients were able to care for themselves and undertake some daily activities. Five patients had returned to work full time. Conclusion: Lumbopelvic fixation is an effective method for stabilization of U-shaped sacral fractures with little complication. Effective reduction and firm fixation are the prerequisite of early mobilization and neurological recovery. Sacral decompression effectively promotes neurological recovery even in patient with old U-shaped sacral fractures. lumbopelvic fixation; sacral decompression; U-shaped; sacral fractures; neurological deficit; surgical management

Date: 2015-09-19
Session: Short Oral Communications Trauma Pelvis & Miscellaneous
Time: 08:30 - 10:00
Room: Shantou Hall

Abstract no.: 42435

THE EFFECT OF THREE DIMENSION PRINTING MODELING FOR TREATING COMPLEX ACETABULAR FRACTURES-A RANDOMIZED PROSPECTIVE STUDY

Hu WANG, Kun ZHANG

Background/Purpose: Treating complex acetabular fractures present a risk of malreduction due to difficulty in conceptualizing the fracture orientation and recreating the normal anatomy, there is also a risk of inadvertent penetration of the joint by the screws used during instrumentation , inadequacy pre-operation planning can increase the times and blood loos during the operating. Fracture modeling using three dimension printing can precisely replicate the three-dimensional osseous structures. This is not only helpful in understanding the fracture configuration, but also preoperative templating and contouring of the plates and planning various screw trajectories. So we using the three dimension printing modeling for pre-operation planning and surgery simulation, our goal was to evaluate the effect of three dimension printing modeling for treating complex acetabular fractures through a randomized prospective study, especially focus on operating time、blood loos、reduction、positon of internal fixator. Methods: This study tests the hypothesis that the use of the three dimension printing can significantly improve technical ability on complex acetabular fractures. Fifty cases with complex acetabular fractures were randomly and equal divided into two groups, the group one using conventional X-ray, three-dimensional CT for pre-operative planing; group two using conventional X-ray, three-dimensional CT and three dimension printing modeling for pre-operative planning and simulation surgery by the surgeon and the first assistant; recording operative time, blood loss, reduction, internal fixation position,satisfaction of the surgeon by an investigator who didn’t attend the process from pre-operation planning to the end of operating. The accuracy of reduction was evaluated with postoperative CT scans. Results: All operations were completed by the same senior surgeon and assistor. The time of operation, statistically significant difference was determined between group one and group two, respectively are 202±50 minutes, 179±62 minutes. The blood loss, statistically significant difference was determined between group one and group

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 41160

THE INFLUENCE OF THE -1997 G/T POLYMORPHISM OF COLIA1 GENE ON THE BIOCHEMICAL FUNCTION OF OSTEOBLASTS

Fei CAO, Bin SHEN

The study was to find out how the -1997 G/T polymorphism lead to the change of BMD in postmenopausal women. Obtained the spongy bone to culture osteoblasts primarily during the total hip or knee replacement surgery. Used PCR-RFLP method to identify the genotype of osteoblasts, to detect the GG, GT and TT genotype osteoblasts .Then measured the expression level of COLIA1mRNA and content of collagen type I, the amount of the matrix calcium and calcium nodules, then compared the difference among the three genotype osteoblasts. Constructed COLIA1gene expression adenovirus vector and infected TT genotype osteoblasts. Detected the above indicators and compared with uninfected TT genotype osteoblasts. The expression level of COLIA1 mRNA and the amount of collagen type I, the calcium matrix and calcium nodules were lower in TT genotype than GG and GT genotypes ($P<0.01$) , while there no difference between GG and GT genotypes ($P>0.05$) . After the infection of COLIA1cDNA over-expression adenovirus vector in TT genotype osteoblasts, there was an obvious augment in the expression level of COLIA1 mRNA ,the content of collagen type I ,the amount of the matrix calcium and calcium nodules ($P<0.01$) . The lower amount of collagen type I synthesized by TT genotype osteoblasts can decrease the cell matrix which result in insufficient site for calcium deposition .And that maybe the cause of lower BMD in TT genotype patients.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 39857

ROLES OF MICRORNA-381 IN LATE STAGE CHONDROGENESIS AND INTERLEUKIN-1-β INDUCED CHONDROCYTE RESPONSES

Ziji ZHANG, Changhe HOU, Weiming LIAO

Objective: The pathways that regulate cartilage degradation are still unclear. We previously identified miR-381 as a putative regulator of chondrogenesis related genes. Therefore, the aim of this study was to determine the role of miR-381 in chondrogenesis and cartilage degeneration. Methods: miR-381 expression was assessed in vitro by qRT-PCR in response to IL-1β stimulation in primary human (PHC) and mouse (PMC) chondrocytes, and the chondrocyte-like ATDC5 cell induced to differentiate to chondrocytes with insulin, transferrin, and selenous acid (ITS) + premix. miR-381 expression was assessed in vivo in mouse embryos and osteoarthritic cartilage by in situ hybridization. The effect of miR-381 on chondrogenesis was assessed using a synthetic RNA mimic or inhibitor. Luciferase assays were used to assess the role of miR-381 in regulating NF-kB signaling. Upstream regulators were probed using siRNA or overexpression plasmids for Sox9 and Runx2. Results: miR-381 expression was elevated in chondrogenic and hypertrophic ATDC5 cells. IL-1β-induced miR-381 expression in ATDC5 cells, PMCs, and PHCs. miR-381 was also expressed areas of cartilage degradation absorption in mouse embryos and human osteoarthritic cartilage. miR-381 expression was increased in ATDC5 cells overexpressing Runx2 or Sox9. miR-381 suppressed the expression of Col2a1 (collagen, type II, alpha 1) and enhanced the expression of metalloproteinase-13 (MMP-13), but did not regulate NFKBIA and NKRF activity. Conclusion: miR-381 is highly expressed during chondrogenesis and in arthritic cartilage. It is likely regulated by Sox9 and Runx2. miR-381 may contribute to absorption of the cartilage matrix by repressing collagen II and inducing MMP-13.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40294

CARTILAGE OLIGOMERIC MATRIX PROTEIN AND HYALURONIC ACID ARE SENSITIVE SERUM BIOMARKERS FOR EARLY CARTILAGE LESIONS IN THE KNEE JOINT

Qiang JIAO, Xiaochun WEI, Lei WEI

The purpose of this study was to evaluate the relationship between five previously established serum osteoarthritis biomarkers and the severity of cartilage lesions in the knee. Cartilage damage (classified according to the Outerbridge scoring system) and serum concentrations of cartilage oligomeric matrix protein (COMP), cartilage type II collagen C-telopeptide (CTX-II), matrix metalloproteinase-3 (MMP-3), type III collagen N-propeptide, (PIINP), and hyaluronic acid (HA) were determined in 79 patients who underwent knee arthroscopy or total knee replacement. Serum concentrations of all five biomarkers increased with cartilage damage. HA concentration was significantly higher in the Outerbridge score 1 group than in the score 0 group (339.05 ± 149.69 vs. 197.47 ± 92.17 ng/mL; $P < 0.05$). COMP concentration was significantly higher in the Outerbridge score 2 group than in the score 1 group (5,986.6 ± 2,162.97 vs. 3,965.77 ± 1,934.12 ng/mL; $P < 0.05$). COMP ($r = 0.721$, $P < 0.001$) and HA ($r = 0.527$, $P < 0.001$) were strongly and moderately correlated with lesion severity, respectively. Serum concentrations of all biomarkers were significantly higher in the Outerbridge score 4 group than in the score 0, 1, 2, and 3 groups. CTX-II, MMP-3, and PIIINP were not significantly different among the score 0, 1, 2, and 3 groups. Serum COMP and HA can be used to predict early cartilage lesions in the knee.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 39950

ENDOGENOUS STEM CELL CHEMOTATIC HOMING FOR IN SITU CARTILAGE REGENERATION

Li JIANG, Jianyuan JIANG

The cartilage damage is the most common joint disease and the current treatment is quite limited. In this study, we propose to engineer bioactive silk fibroin scaffold with controlled release of MGF and TGF-β3. Its effect on cartilage repair will be evaluated by using both in vitro and in vivo experiments. Specifically, a rabbit cartilage defect model will be used to determine its therapeutic effect. The MGF and TGF-β3 immobilized silk fibroin scaffolds will be transplanted to recruite and promote the differentiation of endogenous bone marrow mesenchymal stem cells into chondrocytes, thus achiving in situ funcitonal cartilage recovery. The proposed study will evaluate the feasibility of cartilage repair by using chemotatic cell homing, thus providing new perspective in this field.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40102

INJECTABLE CITRATE-BASED BIOADHESIVE BONE IMPLANTS FOR COMMINUTED BONE FRATURE

Denghui XIE, Xiaochun BAI

Various injectable bone implants have been widely developed for bone repairs. However, most of injectable bone implants available are not suitable for complex comminuted bone fractures (CBF) due to their weak tissue adhesion strengths and minimal osteoinduction. Citrate has been recently reported to promote bone formation through enhanced bioceramic integration and osteoinductivity. Herein, a novel injectable citrate-based mussel-inspired bioadhesive hydroxyapatite (iCMBA/HA) bone substitute was developed for CBF treatment. iCMBA/HA can be set within 2-4 minutes and the as-prepared (wet) iCMBA/HA possess low swelling ratios, compressive mechanical strengths of up to 3.2±0.27 MPa, complete degradation in 30 days, suitable biocompatibility, and osteoinductivity. This is also the first time to demonstrate that citrate supplementation in osteogenic medium and citrate released from iCMBA/HA degradation can promote the mineralization of osteoblastic committed human mesenchymal stem cells (hMSCs). In vivo evaluation of iCMBA/HA in a rabbit comminuted radial fracture model showed significantly increased bone formation with markedly enhanced three-point bending strength compared to the negative control. Neovascularization and bone ingrowth as well as highly organized bone formation were also observed showing the potential of iCMBA/HA in treating CBF.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40997

FABRICATION AND SPECIAL FUNCTIONS OF ANTI-TUBERCULOSIS DRUG CARRIED SCAFFOLD

Dawei LI, Yuanzheng MA

Introduction:To treat bone tuberculosis, a novel long-term drug delivery system was designed and prepared to satisfy the needs of both bone regeneration and antituberculous drug therapy. Methods:The antituberculous drug was loaded into porous scaffold composed of b-PLGC and β-TCP by combination of particle-leaching and phase separation/freeze-drying techniques. Drug release behaviors were performed both in vitro and in vivo. Cytotocixity of scaffolds were evaluated using in vitro culture of osteoblasts. The osteogenic potential was evaluated by using a model with segmental defect in forelimbs of rabbits. Results:The releasing results demonstrated that drug could be steadily released for as long as 12 weeks both in vitro and in vivo. Within the in vivo experimental period, the drug concentrations in blood were detected higher than the effective value to kill mycobacterium tuberculosis. And the local drug concentrations in tissues surrounding implants could achieve even higher values. Osteoblasts proliferated well in extracting and on composite scaffolds, indicating good biocompatibility and cell affinity of scaffolds. In comparison with the control group, both composite scaffolds with and without drug demonstrated significant enhancement in bone regeneration in vivo, suggesting the incorporation of drug having minor adverse effect on osteogenesis. Antituberculous drug - loaded inorganic-organic composite scaffolds thus could be envisioned potential and promising substrates in clinical treatment of bone tuberculosis.

Date: 2015-09-19
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Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40590

EXPERIMENTAL STUDY ON THE SUSTAINED RELEASE PERFORMANCE OF LOAD ANTITUBERCULOSIS DRUGS ACID ARTIFICIAL RELEASE MATERIAL ON SPINAL TUBERCULOSIS MODEL

Qian WANG, Zili WANG, Xiaoming CONG, Jiang Dang SHI, Guang Qi GENG, Hai Tao LIU

Objective:To investigate drug release properties of load triple antituberculosis drugs HRZ calcium sulfate / poly amino acid artificial release material on rabbit model of spinal tuberculosis lesions. Methods:36 New Zealand white rabbits were assigned into three groups, 12 in each group. Group A is tuberculosis model group. After removing the rabbit spinal tuberculosis lesions, load triple antituberculosis drugs HRZ calcium sulfate / poly amino acid artificial material in the defect. Group B was control group. After removing the rabbit spinal tuberculosis model L4-5 lesion, calcium sulfate / poly amino acid artificial material was implanted. Group C was control group with health rabbits. After operation 2, 4, 8 and 12 weeks, 3 animals were collected in each group. Then collecting 2 copies of the inferior vena cava blood, bone at the psoas muscle as experimental specimens. After processing specimens, detecting drug concentration in tissue samples through high performance liquid chromatography. Results:In group A, three drugs exist in the ill vertebrae and psoas major. MBC is still there after operation 4 weeks, and MIC is there after operation 8 weeks. In venous blood, the drug concentration is lower than in the ill vertebrae and psoas major at the same time. In the above period, drug concentration is not detected in group B and group C, determination results for baseline correction. Conclusion:After implanting the triple antituberculosis drugs HRZ calcium sulfate / poly amino acid artificial sustained-release materials into vertebral defect spinal tuberculosis rabbit, anti tuberculosis drugs can be released sustainably and slowly.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40336

IN VIVO STUDY OF A NOVEL MAGNESIUM COMPOSED PLGA/TCP POROUS SCAFFOLD FABRICATED BY 3D PRINTING FOR BONE REGENERATION

Ye LI, Hui-Juan CAO, Long LI, Xin-Luan WANG, Yu-Xiao LAI, Ling QIN

Background: Bone regeneration is a crucial event in bone tissue engineering,and there has been anincreasing interest in studying bone substitute biomaterials. An innovative Mg associated bioactive porous scaffold composed of poly (lactide-co-glycolide, PLGA), b-tricalcium phosphate(TCP) and magnesium(Mg) with well-defined biomimic microstructure for bone regeneration was fabricated by low-temperature 3Dprinting technology. In this study, we aim to investigate the in vivo osteogenetic ability of PLGA/TCP/Mg porous scaffold. Methods: 16-week-male rabbits of 2.5-3 kg were used to establish SAON models. Under general anesthesia, core decompression was conducted on the femoral condyle of the rabbit by drilling a 3.0 mm tunnel transversely through the distal femur. The distal femurs were randomly divided into three groups: (i) control group without any treatment, (ii) PLGA/TCP group with PLGA/TCP scaffold implanted into the bone tunnel, and (iii) PLGA/TCP/Magnesium group with PLGA/TCP/Magnesiumimplanted into the bone tunnel. After 4,8,12 weeks, the rabbits were sacrificed and both femurs were removed. Micro-CT scanning was used to analysis the in vivo osteogenetic effect of the PLGA/TCP/Magnesium.Bone tissue volume density (BV/TV, %), connectivity density (Conn.D, 1/mm3), trabecular number (Tb.N, 1/mm), in bone tunnel were measured.Results:Micro-CT data analysis showed that at week 12, the BV/TV, Conn.D and Tb.N ofPLGA/TCP/Magnesium group increased significantly than those in control group ($p<0.05$).Conclusion:Our study shows that the PLGA/TCP/Mg scaffolds have good osteogenetic effect and the scaffold is a promising biomaterial for bone regeneration. Acknowledgements: The authors are grateful for the financial supports from funding NSFC-DG-RTD Joint Scheme (51361130034), NSFC grant (51203178), and Shenzhen Fundamental Research Foundation (JCYJ20120617114912864).

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 40963
ORTHOPAEDIC SIMULATION; PAST, PRESENT AND FUTURE
Christopher O'DOWD-BOOTH

Introduction: The demands on surgeons and trainees alike are changing, and hence the methods of training need to adapt. The introduction of stricter working hours and the increasing pressures upon global healthcare have lead to a reduction in intra-operative training opportunities. Is simulation training the answer and what future does it have within the field of orthopaedics Aim and method: Through a critical review of current literature and appraisal of current training Discussion: The idea of simulation within orthopaedics is not new, it has been in use to train in basic fracture management by the AO foundation , and in the management of trauma patient through ATLS training. These have led to the development of virtual reality and hepatic trainers, with evidence showing a significant improvement in operative performance, improving speed and reducing mean errors. Junior trainees, when compared to specialist trainees, achieving a greater improvement. There has been little research into the use of simulation in non-technical skills, such as team work, communication and crisis resource management, within the field of orthopaedics. However with a safe environment, more conducive to effective learning, as well as reducing the patient's exposure to risk, these non technical skills are ideal for simulation training. There is a distinct lack in high quality trials, with sufficient power and correction for bias, to allow full appraisal. Virtual reality training, cognitive simulation techniques and the improvement of crisis resource management will prove vital in the future of orthopaedic training.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 42413

INTERLEUKIN-18 INDUCES INFLAMMATORY RESPONSE OF CHONDROCYTES AND OSTEOARTHRITIC CHANGES IN KNEE JOINTS

Zhaozong FU, Zhongxian CHEN, Hongjun LEI, Chaohua FU, Ying QIN

Objective Interleukin-18 (IL-18) is a pro-inflammatory cytokine with similar structure to interleukin-1β which has been demonstrated to be an important promoter in osteoarthritis (OA). The level of IL-18 increased in OA synovia, and IL-18 receptors can be detected in serum and synovia. The objective of this study was to find out the effect of IL-18 on chondrocytes in vitro and the articular cartilage in vivo. Methods Chondrocytes were collected from 10 osteoarthritic patients and cultured at different levels of IL-18 for 48 hours. Genes and proteins of the cartilage matrix (collagen II and aggrecan) and inflammatory factors (PGE2, TNFα, COX-2 and MMP-13) were identified using Real-Time PCR and ELISA. In the in vivo study, IL-18 was injected into knee joints of Sprague-Dawley rats (n=20) up to 12 weeks while saline into the contralateral joints. The joints were observed on X-rays, and analyzed with safranin O/fast green staining. Furthermore, collagen II, aggrecan, and COX-2 in the cartilage were evaluated using immunohistochemistry. Results High level of IL-18 enhanced the gene expression of TNFα, and COX-2 IL-18, but not MMP-13 and collagen II. PGE2 and TNFα proteins were dose-dependent on IL-18. Narrower joint gaps, rough joint surfaces and shrinkage of cartilage on the femur condyles were observed in the animal study. There was significant decrease of aggrecan and increase of COX-2 in the IL-18 group at 12 weeks, but not at 6 weeks. Conclusions IL-18 could enhance the inflammatory response of chondrocytes, and may lead to osteoarthritis.

Date: 2015-09-19
Session: Short Oral Communications Research II
Time: 10:30 - 12:00
Room: Shantou Hall

Abstract no.: 42412

PROTEOMIC ANALYSIS OF SYNOVIAL FLUID: INSIGHT INTO THE PATHOGENESIS OF KNEE OSTEOARTHRITIS

Weixiong LIAO, Zhongli LI, Hongli WANG, Jie WANG, Yangmu FU, Xiaowei BAI

Purpose: We conducted a proteomic analysis of synovial fluid (SF) to identify differentially expressed proteins and analyse their correlation with osteoarthritis (OA) severity. Furthermore, our primary purpose is to gain insight into the pathogenesis of OA. Materials and methods: SF samples were acquired from 12 knee OA patients and 12 non-OA controls (10 had a meniscus injury; 2 had a discoid meniscus, and all exhibited intact articular cartilage) and sequentially subjected to two-dimensional electrophoresis (2-DE). The radiographic grading of knee OA was performed using the Kellgren-Lawrence criteria. Differentially expressed proteins were identified by matrix-assisted laser desorption/ionisation– time of flight/time of flight mass spectrometry (MALDI-TOF/TOF MS). Proteins of interest identified from SF were detected using Enzyme-linked immunosorbent assay (ELISA). Results: 31 protein spots showed significant differences ($P<0.05$) between the sample groups, 25 of the 31 spots (80.6%) were identified as proteins of interest. Among them 20 corresponded to up-regulation and 5 to down-regulation in OA samples. HLA-DR was one of the proteins up-regulated, this was confirmed by ELISA. Conclusion:These observations have implications in delineating the protein expression underlying the pathogenesis of OA and facilitate further elucidation of molecular mechanism involved in disease progress. Substantial alterations of protein profile in SF may be associated with OA severity.

Date: 2015-09-19
Session: Short Oral Communications Research III
Time: 14:00 - 15:30
Room: Shantou Hall

Abstract no.: 39710

DIFFERENTIATION OF HUMAN AMNIOTIC EPITHELIAL CELLS INTO SCHWANN-LIKE CELLS VIA INDIRECT CO-CULTURE WITH SCHWANN CELLS IN VITRO

Shuang ZHU, Xiaolin LIU, Jianping XIANG, Qintang ZHU, Xiang ZHOU, Jiachun LI, Bo HE

Human amniotic epithelial cells (hAECs) have multi-lineage differentiation ability. To study the possibility that human amniotic epithelial cells (hAECs) possess the potential to differentiate into Schwann-like cells using an indirect co-culture approach in vitro. hAECs were isolated via enzymatic digestion. Immunocytochemistry and flow cytometry were performed to identify the hAECs. The hAECs were co-cultured with Schwann cells (SCs) to differentiate hAECs into Schwann-like cells via induced proximity. Expression of the typical SC markers S-100 in the co-cultured hAECs was determined via immunocytochemistry. For functional studies, RT-PCR was performed to measure the expression of NGF, BDNF and GDNF. Neurite outgrowth was measured in PC12 cells after co-culturing with differentiated hAECs. The hAECs converted to a spindle-like morphology after co-culturing with SCs for 21 days. The immunocytochemistry results revealed that the co-cultured hAECs expressed S-100, indicating differentiation into Schwann-like cells. RT-PCR revealed that NGF, BDNF and GDNF expression was up-regulated upon differentiation. The average axon length of PC12 cells increased from 21.32±5.45 μm to 51.32±8.56 μm after co-culturing with differentiated hAECs. These results demonstrate that this indirect co-culture microenvironment could induce hAECs to differentiate into Schwann-like cells that exhibited morphologic, phenotypic, and functional characteristics of SCs. In addition, the use of differentiated hAECs that exhibit the characteristics of SCs provides a promising alternative to the present techniques used for peripheral nerve regeneration.

Date: 2015-09-19
Session: Short Oral Communications Research III
Time: 14:00 - 15:30
Room: Shantou Hall

Abstract no.: 39809

C-JUN GENE-MODIFIED SCHWANN CELLS: UP-REGULATING MULTIPLE NEUROTROPHIC FACTORS AND PROMOTING NEURITE OUTGROWTH

Liangliang HUANG

Genetically modified Schwann cells (SCs) that over-express neurotrophic factors (NFs) hold great potential for promoting nerve regeneration. Currently, only one NF can be up-regulated in most genetically modified SCs, and simultaneously up-regulating multiple NFs in SCs remains challenging. In this study, we found that over-expression of c-Jun, a component of the AP-1 transcription factor, effectively up-regulated the expression and secretion of multiple NFs, including glial cell line-derived neurotrophic factor (GDNF), brain-derived neurotrophic factor (BDNF), artemin (Artn), leukemia inhibitory factor (LIF) and nerve growth factor (NGF). The c-Jun-modified SCs showed enhanced proliferation and migration abilities compared with control cells. We established the coculture systems to imitate the in vivo conditions in which transplanted SCs might influence native SCs and neurons. We found that the c-Jun-modified SCs enhanced native SC migration and promoted the proliferation of native SCs in the presence of axons. Further analysis revealed that in the c-Jun group, the average length and the total area of neurites divided by the total area of the explant body were 1180 ± 25 μm and 6.4 ± 0.4, respectively, which were significantly greater compared with the other groups. These findings raise the possibility of constructing an optimal therapeutic alternative for nerve repair using c-Jun-modified SCs, which have the potential to promote axonal regeneration and functional recovery by up-regulating multiple NFs. In addition, these cells exhibit enhanced migration and proliferation abilities, enhance the biological functions of native SCs and promote neurite outgrowth.

Date: 2015-09-19
Session: Short Oral Communications Research III
Time: 14:00 - 15:30
Room: Shantou Hall

Abstract no.: 41713

CORTICAL EVALUATION BY MIRCO-CT OF HIGH-QUALITY BONE REGENERATION IN RAT FEMORAL DISTRACTION OSTEOGENESIS MODEL TREATED WITH NELL1

Aiyuan WANG, Jing XUE, Jiang PENG, Mei YUAN, Quanyi GUO, Xinli ZHANG, Shibi LU

Objective: NELL1 was used to specifically promote osteogenic differentiation and mineralization in rat femoral distraction osteogenesis (DO) model. Methods: Thirty SD rats were randomly assigned to 3 groups for treatment (n=10 each): adenovirus-green fluorescent protein (Ad-GFP)-NELL1 or Ad-GFP in saline, or saline alone. The femurs were distracted at a speed of 0.25 mm every 12 hours for 14 days. At the first day of consolidation period (day 21 post-op) , the steel external fixiators were substituted by radio-transparent polymer splint material made fixiators for micro-CT imaging. The bone regeneration was assessed quantitatively at days 21, 28, 42, and 56 by Radiography and live micro-CT, and animals were sacrificed at day 56 for biomechanical testing and histological analysis. Results : Exogenous NELL1 was expressed in the distracted gap for at least 14 days after Ad-GFP-NELL1 transfection. The BV/TV and BMD with Ad-GFP-NELL1 transfection was significantly lower than with the 2 control treatments. The micro-CT images showed less callus but more mature cortical bones formed with Ad-GFP-NELL1. The expression of Runx2, BMP2,and BMP7 did not differ among groups at day 56, whereas the expression of osteocalcin and osteopontin was slightly higher with Ad-GFP-NELL1 transfection. The biomechanical properties of femur samples with Ad-GFP-NELL1 transfection were better than samples with Ad-GFP transfection or saline treatment. Conclusion: Micro-CT is a useful tool for dynamical observing and evaluating bone formation status in DO model. NELL1 can promote cortical bone regeneration effectively in the process of femur distraction osteogenesis.

Date: 2015-09-19
Session: Short Oral Communications Research III
Time: 14:00 - 15:30
Room: Shantou Hall

Abstract no.: 40603

STUDY OF THE GEOMETRY OF FEMORAL TROCHLEAR GROOVE WITH COMPUTED TOMOGRAPHY

Bin SHEN

Objective: To explore the geometry of femoral trochlear groove and the difference between normal males and females, in order to provide anatomical basis for prosthesis design based on sexual difference . Methods: 80 healthy volunteers were recruited, including 42 males and 38 females with an average age of 36.2 years (range, 21 ~ 55 years). All the volunteers have no knee unstablization, pain and wound. CT scan of right femurs were performed and 3-D model were reconstructed. Each anatomical parameters of right femoral trochlear groove, which include transepicondylar axis, medial and lateral length of trochlear groove,medial and lateral condyle height, sulcus angle, depth of trochlear groove, transcondylar axis, anterior femoral condylar angle, trochlear groove position were measured, and then compared the morpholgic difference of trochlear groove between males and females. Results: The average width of transepicondylar axis (TEA) was 79.21±3.80mm for males and 70.73±2.91mm for females (t=-53.40,P < 0.05) . The medial length of trochlear groove was increased with the increasing flexion angle of knee. On the other side, the lateral length of trochlear groove was decreased with the increasing flexion angle of knee. Besides the lateral condyle height was first increased then decreased, the maximum height was acquired at 12°flexion for males and 6° flexion for females. Conclusions There is no significant difference between male and female trochlear morphology, however there is a significant difference in sizes. Therefore, in the design of knee replacement, close approximation of size is essential, while gender differences in morphology need not be considered too much.

Date: 2015-09-19
Session: Short Oral Communications Research III
Time: 14:00 - 15:30
Room: Shantou Hall

Abstract no.: 41596

ORTHOPEDIC SPINAL DEFORMITY IN THE REPUBLIC OF BELARUS: PROSPECTS FOR DIAGNOSIS AND TREATMENT

Darya TESAKOVA, Alexandr BELETSKI, Dmitry TESAKOV, Alyaksandar MUKHLIA, Leonid LOMAT

According to official statistic data the number of spinal deformities over the last 10 years in the Republic of Belarus increased from 337,0 to 538,2 per 100 thousand of the children population under the age of 18 years. The prevalence and structure of various spinal deformities forms among children and young people in the Republic of Belarus were examined during 2013 and 2014 years. The electronic database for these patients was created. As a result of the research it was found that scoliotic spine deformities are more common in females, in general, the ratio is 5.5:1. Kyphotic and kyphoscoliotic spinal deformities are more frequent among boys in 2.7 times. In addition, it was revealed that more than half of the patients (52%) were with combined spine scoliotic deformities. It was determined that the most unfavorable was the right-sided thoracic scoliotic spinal deformity, in which the second arc (left-sided) was formed in 69,9% of cases. Requirements and production tasks were developed to create an electronic database on patients with various types of spinal deformities in the form of an automated information and analytical system (AIAS register “Spinal deformity”). The expected results could increase the diagnostic and therapeutic effectiveness and significantly improve the quality of life of patients with spinal deformities.

Date: 2015-09-19
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Room: Shantou Hall

Abstract no.: 39389

SUPPRESSION OF INFLAMMATION AND OXIDATIVE STRESS BY TETRAHYDROCURCUMIN PROTECTS AGAINST SKIN FLAP ISCHEMIA-REPERFUSION INJURY VIA NF-KAPPAB SIGNALING PATHWAY

Heng YU, Dingsheng LIN

Introduction: The mechanism of skin flap ischemia reperfusion injury after surgery involves a myriad of distinct molecular signaling and cytokines pathways. Among these factors, abnormal activation of the signal transducer nuclear factor-kappaB (NF-kappaB) can promote the transcription and expression of proinflammatory mediators. In this study, we investigated the effects of tetrahydrocurcumin (THC) treatment in a rat model of McFarlane skin flap to determine if it can reduce flap ischemia/reperfusion injury via NF-kappaB signaling pathway. Methods: Under isoflurane gas anesthesia, the McFarlane flap model was established in 20 male SD rats (specific pathogen-free (SPF), approximately 2 months old, 200-250g) and evaluated within two groups. Postoperative celiac injection was given for 7 days in the two groups: THC was applied in Group 1, and the same volume of DMSO was applied in Group 2. Flap necrosis was measured on day 7 by cellophane in all groups. NF-kappaB was determined using western blot analysis on tissue samples taken after 7 days of injections. SOD and MDA contents were examined according to the Kit (reagent instructions). Results: THC significantly reduced necrosis area in Group 1 ($p < 0.05$). SOD contents were significantly increased in Group 1 compared with Group 2 ($p < 0.01$), whereas MDA level was reduced ($p < 0.05$). The activation of NF-kappaB was inhibited by THC treatment compared with DMSO treatment ($p < 0.01$). Conclusions: This experimental study has shown that THC can increase random skin flap survival. Meanwhile, THC may reduce ischemia/reperfusion injury involving NF-kappaB pathway.

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Session: Short Oral Communications Research III
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Room: Shantou Hall

Abstract no.: 40732

PRECISE SURGERY OF COMPLICATED TIBIAL PLATEAU FRACTURE ASSISTED BY 3D IMPLANT LIBRARY AND 3D-PRINTED NAVIGATIONAL TEMPLATE

Huajun HUANG, Canjun ZENG, Hanbin OUYANG, Wenhua HUANG

Introduction: This study is aimed to improve the accuracy of 3D-printed navigational template for plating and screwing during surgery for complicated tibial plateau fracture. Methods: Five normal cadaveric knee specimens were computed tomography (CT) imaged and 3D reconstructed. Virtual Schatzker classification V tibial plateau fractures were modeled based on the geometric models, which were used to perform personalized preoperative planning of plating and screwing procedures assisted by the 3D models library of implants. According to the optimal personalized planning, we constructed patient-specific navigational templates produced by 3D printer in order to guide the real cadaveric surgical implantation. The analysis of fixation efficacy in terms of the deviations of screw placement between preoperative and postoperative screw trajectories were measured and compared, including the screw lengths, entry point locations and screw directions. Results: With preoperative planning, we have achieved optimized and accurate fixation results in a real cadaveric surgery. The deviations of screw length was 0.89±2.94mm, $P>0.05$. The displacements of entry point in the x-, y-, and z-axis were 1.19±1.31mm, 1.73±1.31mm, and 1.22±0.88mm, respectively, $P>0.05$. The deviations of projection angle in the coronal (x-y) and cross (x-z) planes were 2.99±2.98° and 1.57±5.13°, respectively, $P>0.05$. The accuracy of screw placement with respected to deviations of screw length, entry point and projection angle between the ideal and actual screw trajectories did not reveal any significant difference.

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Abstract no.: 41424

INTRA-ARTICULAR HYALURONIC ACID THROUGH PATELLA MEDIAL APPROACH PREFERABLE FOR CHONDROMALACIA PATELLAE

Jun XIAO, Zhanjun SHI, Yuqiang LUO

Objective To compare the efficacy of HA for chondromalacia patellae (CP) administered through different injection site. Methods 160 patients with CP were divided into two groups (group I: FCW ≤ 7.5cm, n=80; group II: FCW> 7.5cm, n=80; FCW, femoral condyle width; based on previous research) and were further randomized into a patella media (PM) approach or a medial joint line (MJL) approach with five injections of HA (2.5ml) at 1-week intervals. WOMAC, Lequesne scores, time for 30 stairs' climbing and 30 meters' walking were evaluated at weeks 0, 1, 2, 3, 4, 5 and 17. Repeated measures data of ANOVA were performed to evaluate efficacy of HA administered through different injection sites. Results At the endpoint, statistically significant changes from baseline of both groups were observed in all efficacy parameters. For group I, there were no statistically significant differences between PM and MJL subgroups at all observation points. However for group II, the two subgroups had similar efficacy at weeks 1, 2 and 3; and PM subgroup demonstrated a more remarkable remission of symptoms at weeks 4 and 5. At week 17, PM subgroup presented a significantly lower WOMAC (P=0.001), Lequesne (P=0.002) scores and shorter time of task-completion (P=0.001; 0.003) compared with MJL subgroup. Conclusion Repeat injection of HA (2.5ml*5 times) was effective in treating CP with improved outcomes for population with a small bodily knee (FCW ≤ 7.5cm). The PM approach may be more preferential for patients with a big bodily knee (FCW > 7.5cm) rather than MJL approach.

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Abstract no.: 40075

EFFECTIVENESS AND SAFETY OF ENDOSCOPIC VERSUS OPEN CARPAL TUNNEL DECOMPRESSION

Long CHEN, Zhou XIANG

PURPOSE: To evaluate the effectiveness and safety of endoscopic carpal tunnel release (ECTR) and open carpal tunnel release (OCTR) using a meta-analysis of data from randomized controlled trials. MATERIALS AND METHODS: Electronic searches of the Cochrane Register of Controlled Trials (CENTRAL, 2012), PUBMED (Dec 2012), and EMBASE (Dec 2012) were used to identify randomized controlled trials that evaluated endoscopic vs open methods for treatment of carpal tunnel syndrome. The methodological quality of the studies was assessed by the Cochrane Collaboration tool for assessing risk of bias. RESULTS: Fifteen randomized controlled trials involving 1,596 hands were included. Based on the Cochrane Collaboration tool for assessing risk of bias, four studies were rated as high quality, five studies were rated as moderate quality, and six were rated as low quality. Our meta-analysis indicated that ECTR resulted in better recovery of pinch strength, earlier time of return to work, but a higher rate of reversible nerve problems than OCTR. ECTR also resulted in a lower rate of irreversible nerve damage ($P > 0.05$), wound problems (including wound infection, wound hematoma and wound dehiscence) and reflex sympathetic dystrophy ($P > 0.05$) compared with OCTR. Our meta-analysis revealed no obvious statistical differences in relief of symptoms (pain and paraesthesia), recovery of grip strength and reoperation rate. CONCLUSION: Our meta-analysis of available randomized controlled trials demonstrated that ECTR and OCTR were similar in relief of symptoms, but ECTR resulted in better recovery of function and earlier return to work and was safer than OCTR.

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Abstract no.: 39385

A CRITICAL ROLE OF ABNORMAL LEPTIN BIOAVAILABILITY IN THE ETIOLOGY OF ADOLESCENT IDIOPATHIC SCOLIOSIS

Weiguo ZHU

Background : There have no agreed conclusions that whether the level of leptin, sOB-R, and adiponectin could be changed in AIS patients, since the first study claimed the lower level of leptin of AIS patients.Purpose: To validate the differences of the level of leptin, sOB-R and adiponectin between AIS patients and controls.Methods: 324 AIS patients and 286 healthy adolescent volunteers were recruited. Anthropometric parameters including age, height, arm span, weight, BMI were measured and biochemical parameters including level of leptin, sOB-R and adiponectin were assayed by ELISA. The anthropometric data and level of biochemical parameters were compared between the two groups. The correlation between the biochemical parameters and anthropometric parameters were analyzed in two groups. Results: The level of sOB-R was found to be significantly higher than that in normal controls (31.6±7.5 ng/ml vs. 20.6±6.8 μg/mL, P <0.001) and the level of leptin and adiponectin between the two cohorts did not show significant differences. Conclusions: This study could confirm findings that level of sOB-R is higher in AIS patients than controls, while concentration of leptin and adiponectin remains unchanged in AIS patients.Key words: adolescent idiopathic scoliosis, leptin, soluble leptin receptor, adiponectin, leptin bioavailability

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Abstract no.: 41546

CSF2 INCREASES THE OSTEOBLAST PROLIFERATION INDUCED BY IL3 THROUGH AKT/PI3K SIGNALING

Yang LIU, Fu-Guo HUANG

Introduction: Inflammation is an important part of the pathophysiology of traumatic brain injury.Colony-stimulating factor (CSF2) is found at sites of inflammatory response. It is an important cytokine stimulates the growth of various cells. A growing body of evidence suggests that CSF plays key role in emergency hematopoietic in the bone marrow. Methods : Blood samples were collected from 59 patients suffered brain traumatic injuries with fracture and patients had fracture for 7 days.Results : Our results show that IL3 and CSF2 increased sharply within the first three days. Real-time PCR and Western blot results exhibited that over-expressed IL3 in human osteoblast hFOB1.19 increased the expression level of CSF2 and silence of IL3 decreased the expression level of CSF2.Western blot analysis also showed that phosohorylated AKT was increased in cells after trans-infection of CSF2. Thus, our results revealed the CSF2 mediated osteoblast proliferation at least partly via activation of PI3K/AKT signaling and may help to treat the delay of bone fracture healing.

Date: 2015-09-19
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Room: Shantou Hall

Abstract no.: 41270

TAP73 SWITCH AUTOPHAGY ROLE ON OSTEOSARCOMA CHEMOSENSITIVITY

Hai LU, Zhongmin ZHANG, Qing-Chu LI, Dadi JIN

The role of autophagy in tumor seems to be complex, with reports indicating both pro-tumor and anti-tumour roles. Here the effect of autophagy inhibition on chemosensitivity was studied in human osteosarcoma cell lines, including SaOS2 (p53-null), U2OS (p53-wild), and MG63 (p53-mutant). While doxorubicin promoted autophagy in all osteosarcoma cell lines studied, pharmacological (3-Methyladenine, 3-MA,) inhibition of autophagy failed to influence chemosensitivity in p53 mutant MG63 cells, and p53-null SaOS2 cells. The cytoprotective autophagy by doxorubicin was confirmed by the observation that doxorubicin induced autophagy was nonprotective in p53-null SaOS2 cells, but was converted to the cytoprotective form with induction of TAp73. TAp73, which rarely mutated, is a member of the p53 tumor suppressor family. We recently reported that anti-tumor function of TAp73 was increased by inhibition of its phosphorylation. Conversely, whereas p53 wild type U2OS cells did show sensitization to doxorubicin upon autophagy inhibition, U2OS cells where p53 was knocked down using siRNA failed to be sensitized by autophagy inhibition (3-MA). Taken together, these findings indicate that cytoprotective or nonprotective functions of autophagy were related to the presence or absence of function p53. TAp73, which was more stable and can be activated by dephosphorylation, can substitute p53 to switch this functional difference of autophagy. Alternatively, these findings show that inhibition of autophagy increases chemosensitivity through a mechanism that requires TAp73. These observations are likely to have direct implications with respect to clinical efforts to modulate the response of malignancies to chemotherapeutic drug through autophagy inhibition.

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Abstract no.: 41267

CK2 PROMOTE OSTEOSARCOMA CANCER STEM CELLS BY PHOSPHORYLATION OF TAP73

Hai LU, Qing-Chu LI, Zhongmin ZHANG, Haomiao LI, Dadi JIN

Osteosarcoma is the most common primary osseous malignancy. The p53 mutation is a common genetic alteration in osteosarcoma. Recently a p53 family member, TAp73, was found have the similar anti-tumor function as wild type p53. In the current study, we found that TAp73 was phosphorylated and functional inhibited by Polo like kinase 2 (PLK2), PLK2 is a serine/threonine protein kinase that are involved in the regulation of the various stages of the cell cycle. Here we observed that classical stem cell genes Sox2, Oct 4, and Nang are over expression in osteosarcoma cell SaOS2, with p53 null and inactivated TAp73. However, the potential relationship between TAp73, osteosarcoma cancer stem cell, and PLK2 still remain unknown. We reveal that inhibition of PLK2 by specific siRNA or pharmacologic inhibitor inhibits the expression of CSC protein expression and the side populations (SP). Bioinformatic analysis uncovered a single predicted PLK2 serine phosphorylation site (S48) within the N-terminal transactivation domain of TAp73. Co-immunoprecipitation found a physical binding between PLK2 and TAp73 was attenuated by a S48A point-mutation of this predicted PLK2 serine phosphor-acceptor sit of TAp73. S48A mutation attenuatd phosphorylation and, increasing TAp73 function in decreasing the CSC gene expression and SP cells. Taken together, our previous data unveils a novel regulatory mechanism whereby PLK2 inhibits TAp73 antitumor function and promote the expression of osteosarcoma CSC genes and phenotype.

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Abstract no.: 41058

BRAIN PLASTICITY OF PATIENTS WITH ANTERIOR CRUCIATE LIGAMENT RECONSTRUCTION

Dongliang SHI, Yan QI, Xuan YANG

Objective: The objective of this study was to investigate brain plastic changes of patients with anterior cruciate ligament reconstruction. Methods: Fifteen right leg–dominant male participants with right anterior cruciate ligament reconstruction participated in this study. Brain activation was examined by using functional magnetic resonance imaging technique. The data during motion of right knee was regarded as test group; the data during motion of left knee was regarded as control group. Results: Patients with right anterior cruciate ligament reconstruction had diminished activation in primary sensorimotor area and premotor area, increased activation in secondary somatosensory area compared with controls ($P< 0.05$) .Conclusion: Anterior cruciate ligament reconstruction cannot restore the activation of central nervous system. Understanding the pattern of brain reorganization after anterior cruciate ligament reconstruction leads to new standards in rehabilitation.

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Room: Shantou Hall

Abstract no.: 40727

NATIONAL REPRESENTATION IN THE SPINE LITERATURE: A BIBLIOMETRIC ANALYSIS OF HIGHLY CITED SPINE JOURNALS

Fan DING

Introduction: Significant progress has been seen in the field of spine in recent years as a consequence of worldwide contributions. However, the national productivity to the field of spine is still unclear. The aim of this study was to investigate the national contributions in the filed of spine. Methods: Web of Science was searched for articles published in the 5 highly cited spine journals from 2009 to 2013, including The Spine Journal, European Spine Journal, Spine, Journal of Neurosurgery: Spine, and Journal of Spinal Disorders and Techniques. The number of total articles, the per capita numbers, impact factors, and citations were analyzed to assess the contribution of different countries. Results: A total number of 6920 articles were published in the 5 journals from 2009 to 2013 worldwide. North America, East Asia, and West Europe were the most productive world areas. High-income countries published 83.97% of articles, middle-income 16.01%, and lower-income just 0.01%. The United States published the most number of articles (35.79%), followed by China, Japan, South Korea, and Canada, and had the highest total impact factors and the highest total citations. However, when normalized to population size, Switzerland had the highest number of articles per million population, followed by Netherlands and Sweden. Conclusions: The majority of the spine articles is published by authors from high-income countries while few publications from low-income countries. The United States is the most productive country in the field of spine. However, some European countries may be more productive when normalized to population size.

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Room: Shantou Hall

Abstract no.: 41163

THE EFFECT OF THE -1997G/T POLYMORPHISM OF COL1A1 GENE ON THE BMD OF THE POSTMENOPAUSAL WOMEN IN SOUTH WEST OF CHINA

Fei CAO, Bin SHEN

The aim of the study was to investigate the association between COLIA1 gene polymorphism and BMD of the postmenopausal women in south west of China. 212 postmenopausal women were recruited and their BMD were measured by DEXA at lumbar spine. Two SNPs, that is -1997G/T (rs1107946) and SP1 (rs1800012) of COL1A1gene, were analyzed by PCR-RFLP method. Obtained the cancellous bone from those patient s we recruited to culture osteoblast primarily. Detected the expression level of COLIA1mRNA and the biochemical function of osteoblasts. We hadn't detected the sp1 polymorphism site, only found the -1997G/T polymorphism site in COL1A1 gene in south west China postmenopausal women. The BMD in TT genotype patients was lower than GG and GT genotype (P<0.01) .Compared with GG and GT genotypes ,the expression level of COL1A1 mRNA、 the content of collagen type I、 the extracellular matrix calcium and the amount of calcium nodules were lower in TT genotype (P<0.01) . There only exist the -1997G/T polymorphism in south west china postmenopausal women. TT genotype patients have lower BMD than GG and GT genotypes. The lower content of collagen type I synthesized by osteoblasts with TT genotype can decrease the cell matrix which result in insufficient site for calcium deposition .And that maybe the cause of lower BMD in TT genotype patients.

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Abstract no.: 40605

NOVEL EXPERIMENTAL SCOLIOSIS MODEL IN IMMATURE RAT BY MODIFIED HEMICIRCUMFERENTIAL EPIPHYSIODESIS

Jun YAN, Yanping ZHENG, Ka LI, Jianmin LI

Objectives: To create rat tail scoliosis model by performing the modified hemicircumferential epiphysiodesis under microscopy. Methods: Modified hemicircumferential epiphysiodesis on the tails was performed in 24 three-week-old male Wistar rats under microscopy. The rats were divided into 3 groups: experimental group (n = 16) with 8 growth plates excised from 4 adjacent vertebrae, sham group (n = 6) and control group (n = 5). Radiographs were taken every other week after operation, micro-CT was performed in the end follow-up of 8 weeks after operation. Intervertebral disc tissues were embedded and prepared for histological review. Results: Scoliosis was induced in experimental group. A mean maximum Cobb angle of 44° (± 7.7) and a mean maximum vertebral wedge angle of 14.1 (± 4.8) were obtained at the end point of follow-up. The sham group underwent no growth alterations when compared to the control group. Histological analyses of the intervertebral discs in the operated segments from all the groups showed no evidence of difference in histological examination. Conclusion: Microscopic modified hemicircumferential epiphysiodesis sparing the intervertebral discs could induce a significant and controlled scoliosis in the rat tail. The novel technique may serves as a promising alternative to current fusionless scoliosis correction techniques, and deserves further investigation.

Date: 2015-09-19
Session: Short Oral Communications Research IV
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Room: Shantou Hall

Abstract no.: 39216

ASSOCIATION OF GENE POLYMORPHISMS IN COL1A1 AND COL12A1 GENES WITH ACL TEARS-A STUDY IN THE INDIAN POPULATION

Rakesh JOHN, Mandeep Singh DHILLON, Sharad PRABHAKAR

Context: Gene polymorphisms have increasingly been identified in white populations as a risk factor predisposing an individual to an ACL tear. This is the first study in a non-Caucasian population to look into genetic risk factors in ACL tear. Objective: To evaluate if there are SNPs in COL1A1 and COL12A1 genes that result in an ACL tear phenotype. Design: Case control genetic association study. Participants: 50 patients with ACL tear taken up for arthroscopic ACL reconstruction and 52 age matched patients with unilateral closed fractures of upper limb served as controls (Age: 18-45 years). Interventions: Venous blood samples taken from cases and controls while ACL tissue samples taken from cases only. Lymphocytes extracted from blood. ACL remnant tissue was removed at the time of arthroscopy and stored for DNA extraction. DNA isolated from lymphocytes and ACL tissue using commercial kits. By using RT-PCR amplification, COL1A1 and COL12A1 genes analyzed for SNPs using specific primers. rs970547 (AluI polymorphism), rs240736 of COL12A1 and rs1800012 and rs1107946 of COL1A1 gene tested. The RT-PCR amplification products were imported by Sequence Detection System (SDS) for the detection of SNP. Results: 1) AG, GG genotypes of rs970547 of COL12A1 significantly under-represented in the study group (p=0.0361 for AG and p=0.0374 for GG). 2) No significant difference in genotype and allele distributions in rs240736 of COL12A1 gene (p=0.712), rs1800012 (p=0.5163) and rs1107946 (p=0.9711) of COL1A1 gene. Conclusions: AG and GG genotypes of rs970547 of COL12A1 were significantly under-represented in ACL tear patients in the Indian population.

Date: 2015-09-19
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Abstract no.: 40698

THE EFFECT OF POST-INJURY HYPERGLYCEMIA ON FUNCTIONAL RECOVERY AFTER SPINAL CORD INJURY IN RATS

Xiaoliang WU, Femke STREIJGER, Jie LIU, Wolfram TETZLAFF

Currently there are no convincing effective treatments for spinal cord injury (SCI), meanwhile, factors that adversely affect functional recovery are not fully understood. Previously, we reported that strictly limiting carbohydrate intake effectively improved functional recovery and reduced lesion size in rodent models of SCI. In contrast, the role of hyperglycemia in SCI is still unclear, despite that glucose solution is widely used for SCI patients after injury. So the purpose of this study was to evaluate the effect of post-injury hyperglycemia on functional recovery after SCI. A C5 hemi-contusion injury was induced in male Sprague-Dawley rats, which were then randomized into control and acute hyperglycemia group. In the experimental group, after injury, hyperglycemia was induced by intraperitoneal injection of 25% sucrose solution (total amount 10ml/Kg) twice daily for 4 days followed by another 10 days of 25% sucrose solution oral administration. Over a 10 weeks post-injury period, we assessed functional recovery through gross and skilled behavior tests of forelimb function, and then the spinal cords were harvested for histological analyses. As expected, administration of 25% sucrose led to short-term hyperglycemia in the treated rats. We found that when acute hyperglycemia was induced 4-hours post-injury over a period of 14 days, there was little change in functional performance of the forelimb. The histological analysis showed no significant difference in lesion size, spared gray/white matter. Taken together, the observations reported here show that transient hyperglycemia for a short period of time may not be harmful or negatively influence SCI outcome.

Date: 2015-09-19
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Room: Shantou Hall

Abstract no.: 40091

PLATE FIXATION FOR EXTRA-ARTICULAR DORSALLY COMMINUTED DISTAL RADIUS FRACTURE: A BIOMECHANICAL COMPARISON BETWEEN VOLAR PLATING AND DORSAL PLATING

Zhou XIANG

Objective: To investigate the biomechanical differences in the aspects of anti-compression and anti-torsion of plate fixation applied through volar or dorsal approaches in the treatment of extra-articular distal radius fracture. Methods: Dorsally comminuted distal radius fracture was created in 12 fresh cadaver radius specimens. The specimens were then randomly assigned to volar plating group and dorsal piing group, with 6 eack Plate fixation of the fracture was done via a volar approach and a dorsal approach respectively. Subsequently. Each group was further divided into 2 subgroups to undergo axial compression and horizontal torsion test using MTS machine. The following parmneters were measured: axial compression strength axial compression rigidity, horizontal torsion strength, and horizontal torsion rigidity. Results: The compression test showed statistically significant difference of compression strength between the volar and dorsal groups, that of the dorsal group being stronger. Similarly, there was statistically significant difference in the compression rigidity between these two groups, that of the dorsal group being stronger. In the torsion tests, however, we have noticed that although the torsion strength and rigidity of the volar group were slighfly stronger than those of the dorsal group, the diitemnce was not statistically significant. Conclusion: Dorsal plating of dorsally corraninuted distal radius fracture yields significantly stronger anti-compression features comparingto volar plating. The anti-torsion features between volar plating and dorsal plating are comparable although the parameters of volar plating are slightly stronger.

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Abstract no.: 41293

CITRATE MECHANISM IN CARTILAGE MINERALIZATION AND BONE FORMATION BY REGULATING MTORC1 SIGNALING

Denghui XIE, Xu LI, Dadi JIN, Xiaochun BAI, Jian YANG

Introduction: Citrate, an essential intermediate in the Tricarboxylic Acid Cycle (TCA) regulating fatty acid synthesis and glycolysis process, is found abundant in bone tissue. However, its biological role and underlying mechanism in cartilage and bone formation are still unclear. Recent study revealed that citrate plays significant role in bone formation and herein we further investigated its osteogenic effect and associate mechanism regulating mTOR signaling pathway. Methods: Osteoblast and chondrocyte were respectively cultured in DMEM media supplemented with various citrte concentration (20uM, 200uM and 2000uM). At various timepoints (6h, 12h, 24 h), the cell lysis was collected to conduct Western Blot and ELISA test to determine the mTOR activity and osteogenic effects by measuring the expression level of pS6K and associate bone markers(Runx2, ALP and OCN). Results: Based on the findings in Western Blotting and ELISA, citrate was confirmed to accelerate osteogenic differention and bone formation and biomineralization by upregualting mTORC1 signaling activity. Conclusion: Citrate plays a crucial role in chondrocyte biomineralization (endochondal ossification) process as well as enhancing osteogenesis by upregulating mTORC1 signaling activity.

Date: 2015-09-19
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Time: 16:00 - 17:30
Room: Shantou Hall

Abstract no.: 41130

ANALYZING THE BEHAVIOR OF A POROUS NANO-HYDROXYAPATITE/POLYAMIDE 66 (N-HA /PA66) COMPOSITE FOR HEALING OF BONE DEFECTS

Hong DUAN

The aim of this study was to analyze the behaviour of the porous nano-hydroxyapatite/polyamide 66 composite grafted for bone defect repair through a series of biological safety experiments, animal experiments, and a more than 5-year long clinical follow-up. The biological safety experiments revealed that porous n-HA/PA66 composite had no cytotoxicity, no sensitization effect, no pyrogenic reaction, and that its hemolysis rate was 0.59%. Rabbit models of tibia defects with grafted porous n-HA/PA66 composite were established. After 2 weeks, the experiment showed that osteogenesis was detected in the porous n-HA/PA66 composite; the density of new bone formation was similar to the surrounding host bone at 12 weeks. After 26 weeks, the artificial bone rebuilt to lamellar bone completely. In the clinical study, a retrospective review was carried out for 21 patients who underwent serial radiographic assessment after treatment with porous n-HA/PA66 composite grafts following bone tumor resection. All wounds healed to grade A. No postoperative infections, delayed deep infection, nonspecific inflammation, rejection, or fractures were encountered. At a mean follow-up of 5.3 years, the mean Musculoskeletal Tumor Society’s 93 score was 29.3 points and mean radiopaque density ratio was 0.77±0.10. The radiologic analysis showed that porous n-HA/PA66 composite had been completely incorporated with the host bone about 1.5 years later. In conclusion, this study indicated that the porous n-HA/PA66 composite had biological safety, and good biocompatibility, osteoinduction, and osseointegration. Thus, the porous n-HA/PA66 composite is an ideal artificial bone substitute and worthy of promotion in the field.

Date: 2015-09-19
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Time: 16:00 - 17:30
Room: Shantou Hall

Abstract no.: 41103

KNOCKDOWN OF SOX18 EXPRESSION SUPPRESSED THE PROLIFERATION AND METASTASIS, BUT INDUCED THE APOPTOSIS OF OSTEOSARCOMA CELLS

Fan ZHANG

In recent years, SOX18 has also been found to be overexpressed in various tumors. However, the molecular mechanism underlying the biological function of SOX18 in osteosarcoma is still unclear. This study was aimed at elucidating the roles of SOX18 in regulating the biological behaviour of osteosarcoma cells. In this study, we found that SOX18 was elevated in osteosarcoma compared with normal bone tissue. Then, we found that knockdown of SOX18 in osteosarcoma cells, U2OS or MG63 cells inhibited cell proliferation and significantly increased cells population in S phase. Additionally, suppressing SOX18 expression in osteosarcoma cells dramatically induced cell apoptosis. We also found that down-regulation of SOX18 significantly inhibited cell adhesion and invasion. The expression of transforming growth factor-□, PDGF-A, PDGF-B and RhoA was also remarkably impaired by SOX18 silencing. These results indicates that SOX18 could work as an oncogene and may serve a promising therapeutic strategy for osteosarcoma.

Date: 2015-09-19
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Abstract no.: 39371

DOSE-RESPONSE ESTROGEN PROMOTES OSTEOGENIC DIFFERENTIATION VIA GPR40 (FFAR1) IN MURINE BMMSCS

Bo GAO, Ya-Qian HU, Liu YANG, Zhuo-Jing LUO

Estrogen plays an essential role in bone formation, and estrogen modulation dysfunction is tightly associated with postmenopausal osteoporosis (PMOP). The underlying mechanisms of estrogen-mediated osteogenic differentiation have not been well defined. In this study, murine bone marrow mesenchymal stem cells were induced to undergo osteogenic differentiation, and gene expression analysis or GPR40 expression manipulation was performed. Bilateral ovariectomized or sham-operated C57BL/6 mice were administered GPR40 agonist (GW9508) for bone mineral density analysis. We identified GPR40, a long chain unsaturated fatty acid receptor, to be regulated by estrogen and involved in osteogenic differentiation in vivo and in vitro. Mechanistically, the Wnt/β-catenin signalling pathway is essential for GPR40 to promote osteogenic differentiation. Furthermore, in vivo GW9508 administration rescued estrogen-deficient bone loss, indicating the essential role of the GPR40 receptor. To our knowledge, this is the first study that provides evidence for GPR40 as a positive regulator of osteogenesis and Wnt/β-catenin signalling. These results indicate that GPR40 may function as an endogenous promoter of estrogen-induced osteogenic differentiation through Wnt/β-catenin signalling activation. Therefore, as the global population of ages and the prevalence of metabolic-related disorders, especially PMOP, increases, our findings suggest that GPR40 is a key in understanding the link between bone and fat. It may also be a useful target for the treatment of bone complications in the future.

Date: 2015-09-19
Session: Short Oral Communications Spine Fracture & Infection
Time: 08:30 - 10:00
Room: Yunfu Hall

Abstract no.: 40130

INSTRUMENTATION IN SPINAL INFECTION SURGERY OVER A 15-YEAR PERIOD IN SOUTHERN CHINESE: WHAT HAVE WE LEARNT

Andrew Siu-Leung YIP, Kam-Kwong WONG, Tik-Koon KWOK, Wing-Cheung WONG

“Hong Kong Operation – Radical debridement and anterior spinal fusion” from 1960’s was successful in the treatment of TB spine, later extended to pyogenic spinal infection. With the advances of spinal instrumentation, particularly with Titanium implants, we are using more instrumentation in the management of spinal infection. We review our results of surgically treated patients with spinal infection over 15-year period (1997 to 2012), and to assess the outcomes in patients with instrumentation of actively infected spines. 100 consecutive surgically treated infective spondylitis patients were reviewed. 72 were pyogenic; 28 were tuberculosis. 25% of each group required instrumentation (Pyogenic 18; TB 7). Indications for instrumentation included 1) Circumferential decompression for anterior and posterior abscesses, 2) Gross instability after anterior or posterior debridement. There were 3 cervical, 10 thoracic, 12 lumbar. Ten patients were intravenous drug abusers. Approach of surgery in these 25 instrumented cases: 10 anterior; 13 posterior; 2 anterior + posterior instrumentation. All were Titanium implants. There were 3 instrumentation failures in pyogenic group. All were pedicle screws, 2 loosening and 1 breakage. Two patients in pyogenic group required a second surgery (posterior irrigation and debridement) during the same admission for persistent wound drainage due to extensive para-spinal muscle involvement. Among the 10 instrumentation in IVDA, all healed up at the index level. There was no late recurrence of deep infection at latest follow up. Spinal instrumentation with titanium implant is a viable option when managing actively infected spondylitis, both in pyogenic and tuberculosis.

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Abstract no.: 40478

CLINICAL RESEARCH OF SPINAL CANAL DECOMPRESSION THROUGH THE INTERLAMINAR APPROACH COMBINED WITH LOCAL CHEMOTHERAPY IN SPINAL TUBERCULOSIS TREATMENT

Huadong YANG, Xifeng ZHANG

Introduction Spinal tuberculosis (TB) is the most common extrapulmonary form of TB and is a major public-health problem in developing countries and a growing hazard worldwide with an aggressive behaviour of profound vertebral destruction and severe complications. Our study aimed to investigate the clinical characteristics, efficacy, and the management of spinal canal decompression through interlaminar approach and minimally invasive incision combined with local chemotherapy in patients with spinal TB of thoracic canal oppression or lumbar spinal canal abscess. Methods: A retrospective evaluation of 11 cases of spinal TB (7 males, 4 females; 9 thoracic TB, 2 lumbar TB) betweenDecember 2007 to June 2014 was conducted. All patients underwent a minimally invasive surgery including spinal canal decompression, focus debridement and catheter drainage through posterior interlaminar approach. Postoperatively, a short-course (2 weeks to 2 months) of local chemotherapy and drug administering was performed. The Neurological function (ASIA grade), Cobb angle and hematologic results were investigated. Results: All patients were followed with an average of 1.8 (range, 0.9-3.5) years and were successfully treated without any residual instability, radiculopathy or neurological complications. According to the neurological function ASIA scores, the grade of each patient was improved. As for kyphosis deformity, Patients show an increase in deformity of about 4.6°.And erythrocyte sedimentation rate (ESR) recovered to normal. Conclusions: The interlaminar approach focus debridement through a small incision combined with local chemotherapy is an effective treatment for the thoracic TB patients who suffered spinal canal oppression and spinal cord compression.

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REVISION SURGERY FOR SPINAL TUBERCULOSIS WITH SECONDARY DEFORMITY AFTER TREATMENT WITH DEBRIDEMENT, INSTRUMENTATION, AND FUSION

Tingxian LING, Limin LIU

PURPOSE: to discuss the cause and clinical efficacy of revision surgery for secondary deformity after treatment of spinal tuberculosis with debridement, instrumentation, and fusion. METHODS: From September 2007 to March 2013, 15 patients with postoperative secondary deformity after treatment of spinal tuberculosis were enrolled. All patients underwent revision surgery. The clinical and radiographic data from before and after previous surgery, before and after revision surgery, and after a minimum follow-up of 9 months were retrospectively reviewed. RESULTS: Among 15 cases of secondary deformity, there were 8 recurrences of spinal tuberculosis. Anterior instrumentation was used in 9 patients, and posterior instrumentation in 6. Regarding previous surgery, a mean of 4 vertebral bodies were fused; the mean preoperative scoliosis of 14.5° was corrected to 6.5°; the mean preoperative kyphosis of 56.4° was corrected to 28.9°. Before revision surgery, the mean kyphotic angle increased to 58.6° and the mean scoliosis angle increased to 19.6°. New deformity occurred at the primary levels in 11 patients and at the level adjacent to fused segments in 4. After revision surgery, a mean of 8 vertebral bodies were fused; at final follow-up, the mean kyphotic angle was corrected to 26.7° and the mean scoliosis angle was corrected to 2.4°. CONCLUSIONS: Recurrence of spinal tuberculosis, incorrect choice of internal fixation strategy, unsuitable fused segments, and poor achievement of sagittal and coronal balance after surgery may lead to secondary deformity postoperatively.

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A NEW TREATMENT APPROACH FOR SIMPLE THORACOLUMBAR COMPRESSION FRACTURES

Guo HUA, Hao DINGJUN

Purpose: In the treatment of simple thoracolumbar compression fractures, posterior pedicle screws instrumentation is considered to be an appropriate surgical choice. We reported a new technique simplified and optimized the previous surgical treatment by eliminating the need for using pedicle screws. Methods: Between December, 2011 and February, 2013, 16 patients with simple thoracolumbar compression fractures were surgically treated by the new technique, which employed minimally invasive interventional radiology technique and involved the fluoroscopically guided injection of auto-solidification calcium phosphate cement (ACPC) through pedicle into the fractured vertebral body to restore the normal structure of thoracolumbar spine and relieve the pain. Results: With the use of this technique, all patients obtained successful reduction and satisfactory anatomic sagittal alignment. No complications were observed owing to the use of this technique. Follow-up data was obtained from all patients. The mean follow-up time was 28.7 months (ranged 24-38). In the postoperative CT scanning of 6 month, the artificial bone (ACPC) disappeared and was replaced by new bones in 14 patients. This phenomenon was observed in the remaining 2 patients 9 months postoperatively. At the final follow-up, no patient suffered from resetting height loss. Conclusion: The new technique is an efficient and safe way for the treatment of simple thoracolumbar compression fractures.

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TREATMENT FOR ACUTE OR SUBACUTE OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURES: PERCUTANEOUS VERTEBROPLASTY VERSUS FACETS BLOCKING (A CLINICAL RANDOMIZED STUDY)

Guo HUA, Hao DINGJUN

Purpose: In our treatment center, we use percutaneous vertebroplasty (PVP) and facets blocking (FB) both approaches to treat acute or subacute osteoporotic vertebral compression fractures (OVCFs), and both ways all achieve satisfactory clinical results. However, until now which one is batter is unknown. We use a RCT to compare the efficacy and safety of both ways. Methods: Between January 2009 and January 2013, 206 patients were included in this study. Patients were aged 55 years or older, had VCFs on radiograph, with BMD score of less than -2.5, and intractable back pain for 8 weeks or less. Patients were randomly allocated to PVP group or FB group. The outcome of pain relief was measured by VAS score, and the physical and mental outcomes were measured by ODI, RMD questionnaires, and Medical Outcome Short-Form 36 (SF-36) at preoperative and postoperative of 1 day, 1 week, 1, 3, 6 and 12-months.Results:We found a significant improvement in VAS, ODI, RMD at postoperative 1 day and 1 week in PVP group compared to FB group ($p<0.05$), but there was no difference in VAS, ODI, RMD and SF-36 between two groups at postoperative 1, 3, 6, 12-months follow-up ($p>0.05$). During the follow-up, 13 new fractures in PVP group and 11 in FB blocking group were registered respectively, and the difference was not significant ($P=0.558$).Conclusion: PVP has the capability of faster and greater pain relief than FB in short time, but as time growing, PVP and FB have the same curative efficacy in pain relief and physical and mental functions recovery.

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TRANSVERSE SACRAL FRACTURE ACCOMPANIED BY NEUROLOGICAL SYMPTOMS: A CASE STUDY

Jun OKAMOTO, Masafumi KISHIMOTO

Background: Although high-energy pelvic fractures are often encountered in daily clinical practice, sacral fractures are likely to be overlooked; among these, transverse sacral fractures are rarely diagnosed. The experience gained in diagnosing and treating a transverse sacral fracture is reported here.Case:28-year-old male, who sustained an injury during a collision with a stationary truck. During the first visit, we found weakness of the tibialis anterior and gastrocnemius muscles on both legs, pain and numbness from the buttocks to the facies posterior cruris, and bladder and bowel dysfunction. Using CT, fractures to Zones I and II of the sacrum (Roy-Camille Type2) were found; proximal bones were dislocated to the rear where it was bent and deformed; stenosis of the sacral canal was also documented and MRI revealed damaged to the cauda equina. Due to the neurological symptoms, the patient underwent emergency surgery (depressurization and fixation) the same day. During decompression, damage to the nerve at the same site was found. Postoperatively, bladder and bowel dysfunction remained but motor and sensory failure of both lower limbs showed improvement. Discussion: Only 3-5% of sacral fractures are transverse sacral fractures, with 96-100% occurring with neurological symptoms. Diagnosis of a transverse sacral fracture is difficult, especially with only X-ray imaging. When the cause of the neurological symptoms was identified to be damage to the cauda equina, immediate diagnosis of the transverse sacral fracture was possible through MRI and CT scans (especially in the sagittal plane).

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Abstract no.: 39932
NEURAL FUNCTION RECOVERY AFTER SPINAL CORD INJURY: DON'T IGNORE THE BRAIN

Tiansheng SUN

Objective: To investigate the structural changes during the early stage of SCI, and the relationships between these structural changes and patients' motor recovery. Methods Twenty-five SCI patients were split into two groups (Good recoveries group & Poor recoveries group) according to the clinical outcome of motor recovery at 6 months follow-up. Structural MRI was used to investigate the brain structural changes among the three groups. Pearson correlation analysis was used to explore the relationships between these structural changes and patients' motor recovery. Results Compared to healthy controls, both poor recoveries and good recoveries showed decreased cortical thickness in the bilateral primary motor cortex. Poor recoveries exhibited more serious and widespread structural damages, in addition to reduced cortical thickness in the primary motor cortex, poor recoveries also showed decreased cortical thickness in the right SMA and premotor cortex when compared to healthy controls. Compared to the healthy controls, poor recoveries showed white matter abnormalities in the right primary motor cortex and posterior limb of the internal capsule; good recoveries showed no significant difference in white matter microstructure. Furthermore, these structural changes at the internal capsule and primary motor cortex were associated with the motor recovery rate at 6 months follow-up. Conclusions: Our findings suggest that SCI causes significant anatomical changes in the human sensorimotor system in the early phase of SCI, and these structural changes directly affect the motor recovery of SCI. Future treatment aimed at promoting neural function recovery of SCI patients should pay close attention to the injured brain.

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Abstract no.: 40138

THE COMPARISON STUDY BETWEEN MRI AND IMMUNOHISTOCHEMISTRY IN INFERIOR DISC OF BURST FRACTURE

Xiaodan ZHAO, Hao LIU

Objective: to compare the difference of images of the intervertebral discs and histological changes in burst fractures. To get further understanding of tissue changes in Thoracolumbar burst fractures. Method : to collect the data of 48 cases of thoracolumbar burst fracture including X-ray, CT and MRI. We got the 48 intervertebral disc which are inferior to the involved vertebra during operation. By using immunohistochemistry staining, to observe the expression features of three important inflammation-related antibody: inflammatory mediator interleukin-1(IL-1β) ,NF-Kb and inducible nitric oxide synthase (iNOS) in the inferior disc fi end-plate cartilage. And compare the positive rate between MRI and immunohistochemistry staining results respectively .Results : in MRI imaging 28 of 48 inferior discs have the injuries feature while By using immunohistochemistry .39 of 48 inferior discs IL-1β express positive. 37 of 38 inferior discs iNOS express positive, 35 of 48 inferior discs NF-Kb express positive. Conclusion : there exist difference between immunohistochemistry positive rate and disc injury occurrence of MRI in inferior disc end-plate. Radiology cannot reflect the real injury rate in the involved end-plate.

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COMPARISON OF OUTCOMES BETWEEN UNILATERAL AND BILATERAL APPROACH FOR TREATMENT OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE

Xingkai ZHANG, Yu LIANG

Introduction: Kyphoplasty is broadly used for treatment of osteoporotic vertebral compression fracture, it can relieve pain, avoid complication caused by spinal deformity and long term immobilization. Unilateral extrapedicular approach can save operation time, reduce X-ray exposure, but its effectiveness remains controversy. Methods: Between July 2007 and July 2011, 107 patients with osteoporotic vertebral compression fractures underwent percutaneous kyphoplasty, 33 cases were male, 74 were female, 40 cases were via a unilateral extrapedicular approach, 67 were via bilateral approach. Average patient age was 65.7 years. All affected vertebrae were identified via physical examination, magnetic resonance imaging, and radiographs. Pain relief, kyphosis correction bone cement volume and collapse rate of the fractured vertebrae were compared between 2 groups using the visual analog scale and radiographs. Mean follow-up was 9.5 months. Results: The operation was successful in all patients. Visual analog scale pain score improving rate was 90.7% in unilateral group and was 93.7 in bilateral group; kyphosis correction rate was 18.7% in unilateral and 18.5% in bilateral group. Average injected bone cement volume was 5.5 ml in unilateral group and was 5.3ml in bilateral group. There is no significant difference between two groups in all above observing results. The collapse rate was 10% in unilateral group and 4.5% in bilateral group, there is significant difference between the two groups. Conclusion: Unilateral extrapedicular approach had some limitation in maintain vertebral height, but can obviously improve the symptoms caused by vertebral fracture. Combined use of anti-osteoporosis therapy would reduce re-collapse of fractured vertebra.

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USE OF TERIPARATIDE AS A CONSERVATIVE TREATMENT STRATEGY FOR SPINAL OSTEOPOROTIC FRACTURE

Dehong YANG, Wei LI, Meng YUE, Song HAO, Shaoyu HU, Guojun TONG

Introduction: Osteoporotic vertebral fractures (OVF) is mostly happened in osteoporotic patients. Percutaneous vertebroplasty (PVP) is the common therapy for these patients. Cement leakage, new fracture in other vertebrae and increased fracture rate in adjacent vertebra made PVP under suspicion. Teriparatide, a bone formation medicine that widely used in treating severe osteoporosis, has the potential to enhance bone fracture healing. Teriparatide has been reported effectively relieved the bone pain and reduced new onset fractures in OVF patients. But whether this conservative method could prevent collapse of the injured bone and the deformity of the spinal column is definitely to be clarified. The current study aimed to address the effect of Teriparatide injection to treat acute spinal OVFs instead of PVP. Methods: 12 patients with acute back pain diagnosed as spinal osteoporotic fracture by MRI were included in this study. All of them received Tetraparatide 20 mg daily for 6 months as well as 600 mg of calcium and 400 IU of vitamin D. The pain was controlled by analgesics. A dual X-ray absorptiometry scan, AP and lateral radiography of thorocolumbar spine, MRI and P1NP/CTX measurements were performed at 0 and 6 months of PTH injection. A visual analog scale for pain, and continuously walking time were assessed every month. Results: All the patients finished 6 month follow-up. No analgesic was need at the end of first month, the VAS score reduced from 8+2 to 1+2 at the end of first month after teriparatide injection. ODI scored decreased from 76+12% (before injection) to 20+5% (one month after injection) then to 5+4% (6 month after). The ration of front edge/posterior edge of the fractured vertebra decreased from 80+20% to 60+20%. The BMD increased 20+5%. 5 patients finished MRI rescanning at the end of

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ONE-STAGE LUMBOPELVIC FIXATION IN THE TREATMENT OF LUMBOSACRAL JUNCTION TUBERCULOSIS

Zhengquan XU, Xiyang WANG

Purpose: To investigate the clinical efcacy and feasibility of surgical treatment for lumbosacral junction tuberculosis by one-stage posterior debridement, interbody fusion, lumbopelvic fixation, and postural drainage. Methods A total of 15 cases with lumbosacral junction tuberculosis treated by one-stage posterior debridement, interbody fusion, lumbopelvic fixation, and postural drainage in our center from January 2005 to October 2011 were studied. Lumbosacral angle, visual analogue scale (VAS), and neurological performance were assessed before and after surgery. Results: All patients were followed for 28–56 months post-operation (average, 40.7±7.7 months). No severe complications occurred. Bone fusion occurred in all patients at a mean of 8.4 months (range 6 to 12 months) after surgery. The mean lumbosacral angle was significantly increased from the mean preoperative angle (20.9±1.8°) both postoperatively (26.5±1.6°) and at final follow-up (25.3±1.4°) (both $P < 0.05$). All patients had signicant postoperative improvement in neurological performance and VAS scores. Conclusions: Our results suggest that one-stage posterior debridement, interbody fusion, lumbopelvic fixation, and postural drainage can be an effective and feasible treatment option for lumbosacral junction tuberculosis, offering fewer complications and a better quality of life. lumbosacral junction; spinal tuberculosis; posterior debridement; fusion; lumbopelvic fixation

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THERAPEUTIC EFFECT AND COMPLICATION OF PKP/PVP FOR THE TREATMENT OF OSTEOPOROTIC VERTEBRAL COMPRESSION FRACTURE

Yaonan ZHANG, Liang ZHANG, Chang-Tai SUN

Objective: Vertebral compression fracture is one of the most common complication of osteoporosis, the incidence is 1.23% , the incidence in female is 1.53%.Percutaneous vertebroplasty and Kyphoplasty can relieve the pain caused by fracture and made the patient back to his social life soon. PKP and PVP are controversial for their complications for example PMMP leakage and refracture of the adjacent vertebral body. This paper retrospectively analyze the effect and complications of PKP and PVP in the treatment of osteoporotic vertebral compression fracture. Method: From September 2007 to February 2012, 183 osteoporotic vertebral compression fracture underwent PKP or PVP surgery in our department, 157 of them were completely followed up, totally 182 vertebral body fracture. VAS score and ODI score were evaluated before the surgery. After the surgery, X-ray plain film were taken for the evaluation of the vertebral body height. The VAS score 3 days and 3 months after the surgery were examined. The ODI score 3 months and at the end of the follow-up after the surgery were examined. The leakage of PMMA and the refracture were recorded at the follow-up. Results: Of the total 157 patients 182 vertebral bodies, 96 patients 107 vertebral bodies underwent PKP and 61 patients 75 vertebral bodies underwent PVP. The mean height of the vertebral body in PVP Group before operation was 1.31±0.18cm and in PKP Group was 1.32±0.16cm, there are no statistical difference between the two groups ($P > 0.05$) . After the operation the mean height of the vertebral body in PVP Group was 1.50±0.20cm and 1.66±0.17cm in the PKP Group, there are statistical difference between the two groups ($P < 0.05$) . The mean amount of the PMMA injected into the vertebral bodies in

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A NEW DESIGN FOR CEMENT INJECTION PRESSURE MEASUREMENT DURING KYPHOPLASTY

Linlin ZHANG, Bin MENG, Huilin YANG

Study Design. An experimental biomechanical study conducted on osteoporotic cadaveric vertebrae. Objective. To introduce an injection instrument with load transducers to measure the cement injection pressure during kyphoplasty. Summary of Background Data. Pressure that govern cement flow is an essential component of the cement injection process during kyphoplasty. It been suggested to affect the cement extravasation, but few pressure data of kyphoplasty have been reported. An instrument was designed to measure the injection pressure in the process of kyphoplasty. Methods. Seven thoracolumbar vertebrae were harvested from one osteoporotic spine (T10-L4) and dissected into individual vertebra. Vertebral compression fractures (Denis type B) were created in a servohydraulic testing machine in a displacement control to 50% of the intact anterior vertebral body height. Unipedicularkyphoplasty was carried out and the volume of inflated balloon was controlled to 2 ml. Cement was injected at 420s of elapsed time after start mixing at room temperature (20°). Using a custom made injector instrumented with load transducers, the injection pressure, volume and time were recorded during conventional manual cement augmentation. Results. The average and the maximum pressure of the first and second syringe injections were 0.058±0.045 MPa, 0.179 MPa and 0.249±0.179 MPa, 0.833 MPa, respectively at the ambient temperature of 20°. Conclusion. The injection instrument with load transducers allows the change of injection pressure during kyphoplasty to be easily measured. Practitioners should pay more attention to the cement leakage when the pressure peaks higher than 0.2 MPa and 1.0 MPa for the first and the second syringes, respectively, in kyphoplasty. Vertebral compression fracture, injection pressure, kyphoplasty

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SURGICAL TREATMENT OF THORACOLUMBAR BURST FRACTURES (DENIS-B TYPE) WITH ANTERIOR OPERATION IN ADULTS

Chao ZHENG, Ji WU

Objective: The purpose of this study was to investigate the clinical outcome of anterior corpectomy and fusion for the thoracolumbar burst fracture in adults. Methods Between July 2007 and December 2012,a total of 28 patients (mean age 44.3 year old) with single level Denis-B type thoracolumbar burst fractures involving T10-L2 and partial neurologic deficits were treated by using anterior corpectomy and fusion .The mean follow-up period was 37.7 months.Visual analogue Scores(VAS) for persistent pain ,and Oswestry Disability Index(ODI),and American Spinal Ingury Association Sore(ASIS) were recorded to assess neurological recovery. Radiological measurement, including Cobb angle , anterior vertebral height and canal stenosis index ,were used as remodeling of the vertebral body at the time of before and after surgery ,and at final follow-up. Results: The time canal stenosis index was 45.39% at time of injury, and 3.82% at time of final follow—up ($P<0.05$) .All patients with incomplete paraplegia had already shown neurological recovery. The Cobb angle was improved from a mean of 22.89 degrees preoperation to a mean of 10.36 degrees at final fellow—up ($P<0.05$) .The anterior vertebral height was enlarged from an average of 30.29mm to 38.28mm ($P<0.05$) .VAS, ODI and ASIS were significantly improved at the end of follow-up, but there was no significantly difference for ASIS was noted between preoperation and postoperation. There was no instrumention failure. Conclusion The anterior operation under indect vision provided better rigid fixation,prefect correct deformity, complete decompression, and the early rehabilitation training for patinets. On the basis of good surgical technique of thoracic and general surgery, a long period of learning curve is necessary for the anterior operation.

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EFFECT OF BONE CEMENT VOLUME FRACTION ON ADJACENT VERTEBRAL FRACTURES AFTER UNILATERAL PERCUTANEOUS KYPHOPLASTY

Dasheng LIN, Hui LIU, Zhenqi DING, Kejian LIAN

Summary of Background Data: Complications of the bone cement used in vertebroplasty and kyphoplasty procedures have received increasingly more attention, especially for bone cement volume. Objective: The aim of the study was to retrospectively assess the relationship between bone cement volume fraction and adjacent vertebral fracture (AVF) after unilateral percutaneous kyphoplasty (PKP). Materials and Methods: Between 2006 and 2011, 495 patients with single level osteoporotic vertebral compression fracture (OVCF) were surgical treated by unilateral PKP and had completed 12-month follow-up in our hospital. According to the new OVCF, they were divided into three groups: AVF group, non-AVF group and normal group (who were not new OVCF). Based on the value of the plain radiography, the cement volume fraction for the vertebral body was calculated, and cement leakage, bone mineral density (BMD), visual analog scale (VAS), and Cobb angle of preoperative and postoperative were analyzed. Results: During the follow-up, 110 (22.2%) patients had new OVCF, and others were normal (n = 385). 52 cases were AVF, and 58 were non-AVF. The cement volume fraction of AVF group, non-AVF group and normal group were 32.5% ± 5.5%, 27.3% ± 1.8%, and 27.1% ± 2.6%, respectively. The 95% confidence interval of volume fraction were (31.0, 34.1), (26.8, 27.7), and (26.9, 28.5), respectively. The AVF group showed higher cement volume fraction in three groups ($p < 0.05$), and there were no significant difference between non-AVF and normal group ($p > 0.05$). There were 19 (36.5%) patients with cement leakage in AVF group, 12 (20.7%) in non-AVF group, and 68 (17.7%) in normal group. The AVF group showed higher cement leakage ($p < 0.05$). Compared with AVF group and normal group, non-AVF group had lower BMD in preoperation. All groups

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RETENTION VERSUS SACRIFICE OF THE POSTERIOR CRUCIATE LIGAMENT IN TOTAL KNEE ARTHROPLASTY FOR TREATING VARUS OSTEOARTHRITIS

Alaa EL TAHAN, Atef MORSY, Emad EL BANA, Nehad EL MABOUB, Mina HAKIM

The decision to save, sacrifice, or substitute for the posterior cruciate ligament (PCL) during total knee replacement continues to be debated among knee surgeons with strong advocates for each. Early advocates of PCL retention proposed that retaining the PCL would result in increased femoral rollback, better knee stability, decreased stress at the bone-cementprosthesis interface, and decreased wear. The surgical technique for PCL retention during total knee arthroplasty is less forgiving than for PCL substitution. Preservation of the joint line is more critical. In addition to the balancing of flexion and extension gaps and collateral ligaments, balancing of the PCL is required. 106 consecutive primary total knee arthroplasties were included in 2 groups. Group I included 53 Press Fit Condylar total knee replacements in which the posterior cruciate ligament was completely released and posterior cruciate-substituting device used. In Group II, there were 53 Press Fit Condylar total knee replacements in which the posterior cruciate ligament was retained. All patients were observed at least 5 years and evaluated by the Knee Society's Clinical and Functional Scoring System, including a radiographic evaluation. No differences were found between the posterior cruciate ligament sacrificed group and the posterior cruciate ligament preserved group.

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INTERNAL FIXATION TREATMENT OF HOFFA FRACTURE: HOLLOW CANCELLOUS BONE TENSION SCREW COMBINED WITH SUPPORT PLATE

Bangbao LU, Yong ZHU

Objective: to observe the clinical curative effect of internal fixation treatment of Hoffa fracture with hollow cancellous bone tension screw combined with support plate. Methods: in March 2008 to March 2012, by the support steel plate internal fixation treatment of patients with Hoffa fracture were 16 cases combined with cannulated cancellous bone tension screw, 12 cases were male, female in 4 cases. Age were 28 to 58 years old, a median of 45.5 years. The lateral femoral condyle fracture were in 13 cases and in 3 case were the medial condyle femoral fracture. Combined with anterior cruciate ligament rupture was in 1 case. A knee joint X-ray, CT and MRI Were getted in all cases preoperation. Fracture healing, complications and limb function recovery were observation during postoperative follow-up. Results: all patients were followed up, follow-up time were 12 ~ 18 months, a median of 16.5 months. Fractures are all healing, no complications such as internal fixation loosening and fracture again, All patients with knee joint range were greater than 105 °, the knee Letenneur criteria evaluation of curative effect are good. Conclusion: internal fixation treatment of Hoffa fracture using hollow cancellous bone tension screw combined with support plate are a fixation could early functional exercise with little postoperative complications and the curative effect are good. This way of surgery is worth clinical application

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ARE WE COMPROMISING ON OUR TKA COMPONENT DIMENSIONS? A PROSPECTIVE STUDY ON DISTAL FEMUR DIMENSIONS IN INDIAN PATIENTS

Melvin George IRIMPEN, Jai Thilak KAILATHUVALAPPIL

Introduction: The correct sizing of the components in both AP and ML dimensions is crucial for the success of a Total Knee Arthroplasty (TKA). The size of the implants selected is based on the AP dimension of lateral condyle obtained intra-operatively using the company provided sizer. The currently used TKA implants available to us are based on morphometric measurements obtained from Western / Caucasian population. So, the risk of component ML oversizing is more common in asian sub-population, as they are of a smaller built and stature. This study aims to look into the following aspects. 1) Magnitude of the mediolateral (ML) mismatch between the femoral component and the patient's anatomical dimension. (2)Evaluation of gender variations in distal femur dimensions. (3) Gender-wise and implant-wise and correlation of medio-lateral mismatch. Methods: Intra-operatively, the distal femoral dimensions were measured using sterile calipers after removing the osteophytes and compared with the ML dimension of the implant used. ML Mismatch length thus obtained is correlated with the various parameters. Results: Males showed larger distal femoral dimensions when compared to females. Males had larger ML mismatch. None of the implants used, perfectly matched the patient's anatomical dimensions. Discussion: Implant manufacturers needs to design more options of femoral implants for better fit in our subset of patients. Those patients with larger mismatch lengths are being followed up to assess for any functional limitations developing in long term.

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SURGICAL RESULTS AFTER TOTAL KNEE ARTHROPLASTY FOR POSTTRAUMATIC KNEE ARTHRITIS

Miroslav HASPL

INTRODUCTION: During primary knee arthroplasty we sometime need to be prepared for much difficult further surgical procedures, bone grafting, the use of modular or more constrained endoprostheses. AIM: To determine the number difficult posttraumatic complex primary total knee arthroplasty, analyze possible complications and assess the outcome of treatment compared to standard primary knee arthroplasty. MATERIAL AND METHODS: In a period 2008-2013, we performed 595 primary knee artrhoplastyes, 23 (3,86%) was difficult posttraumatic cases, F 13(56,5%) and M 10 (43,5%) , age 22-83 (60,82). At 4 extraarticular femoral malunion and one tibia, et 6 lateral tibial condyle, at 4 medial tibial condyle, in 3 bicondylar tibial malunion and in one lateral femoral condylar, one patient have had posttraumatic knee fusion, and 3 knee dislocations. At 5 (21,73%) knees we used bone grafting, at 5 (21,73%) stem augmentation, mostly CR and CS prosthesis, in one case hinge prosthesis. For result analysis we used KSS and WOMAC scoore. RESULTS: FU 39 (6-77) months. Full weight bearing at first 6 – 12 weeks. We haven´t noted any septic or aseptic endoprothesis loosening so far. KSS score improved from 37 to 89 and WOMAC score from 40 to 85. CONCLUSION: During primary knee arthroplasty in a relatively small number of knees we can expect increased intraoperative difficulties, particularly after posttraumatic osteoarthritis . It needs to recognize that on time. It is necessary preoperative planning procedures, to have proper surgical instruments, and particularly a wide range of implant, although it is a primary knee arthroplasty

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CLINICAL AND RADIOLOGICAL RESULTS IN TOTAL KNEE ARTHROPLASTY USING A MODIFIED MIDVASTUS APPROACH WITH MINIMAL INVASIVE TOOLS

Procyk PROCYK

Minimally invasive midvastus approach is associated to a minimized vascular and muscular disruption and a better operative exposure. However, controversy still exists between mini-midvastus and medial parapatellar approach concerning clinical results. Our objective was to analyze and evaluate the preliminary clinical and medical imaging results of 50 consecutive total knee replacements using the minimally invasive midvastus approach. Type of study: Case series. Methods: All procedures were performed with a specific instrumentation. All 50 knees had 6 months follow-up. The patients included 36 females and 14 males with a mean age of 72.2 years (range, 52 to 87 years). The mean body mass index in our cohort (BMI) was 29. . The mean hospital stay was 5,8 days (range, 3 to 12 days). The knees were evaluated using the Knee Society Score (KSS) and radiographs. Results: Before discharge, 98% of patients had full weight-bearing. KSS increased from a preoperative average of 68 to a postoperative average of 158 and 165 at 2 and 6 months respectively. There were no postoperative complications directly related to the surgery. Postoperative radiographic analysis revealed centered mechanical axis in 49 patients, no changes related to prosthesis positioning and 2 cases of peri prosthetics bone modifications. The minimally invasive midvastus approach resulted in improved KSS. The minimally invasive midvastus approach when coupled with instruments designed specifically for small incision surgery is reliable and safe.

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HETEROPTOPIC OSSIFICATION FOLLOWING TOTAL KNEE ARTHROPASTY

Rohit BANSAL, Deepak KAKI, Chitta Ranjan SAHU, Jagadesh GUDARU

Introduction: Heterotopic ossification is less spoken and heard about it following TKA, but the incidence is increasing with rising number of knee replacements being undertaken. It is important to identify the condition and follow the patients. In this study an effort has been made to know incidence of heterotopic ossification following TKA in south Indian population and the natural history of disease. Though managed non operatively for majority of the cases we have excised mass to prevent functional deterioration in one case. Materials and methods: 871 knees of 521 patients (63% males), mean age of 60.4, fourteen patients diagnosed with heterotopic ossification. The heterotopic ossification was classified as per Rader's system. Regular physiotherapy and symptomatic treatment administered to them. Results: All patients had excellent knee score. Patients with heterotopic ossification had initial worsening of the function which gradually recovered. Out of eleven, ten resolved but one patient had to undergo the excision of mass because of progressive deterioration in knee function. She improved dramatically after surgery. Conclusion: heterotopic ossification is less commonly seen following TKR than THR. In majority of the cases it is self-limiting but needs active intervention wherever it persistently affects the function and rehabilitation.

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VALIDATION OF TRANSEPICONDYLAR AXIS AS AN ACCURATE MEASURE FOR FEMORAL COMPONENT ROTATION IN TOTAL KNEE ARTHROPLASTY

Saurabh GUPTA, M. Shantharam SHETTY, M. Ajith KUMAR

Methods – A prospective and retrospective study done from december 2010 to december 2012 at tertiary centre. A total of 55 knees in 50 patients were included (41 females and 9 males). Group 1 navigated consist of 16 knees and group 2 non navigated included 39 knees in 34 patients. Navigation was choosen for patients who were affordable and willing to give consent. All patients undergoing primary total knee replacement were included and all revision cases were excluded. The mean age in navigated group is 62 ± 6.3 years and mean age in non navigated group is 67.74 ± 6.1 years. In 1 patient, navigation procedure was abandoned intraoperatively due to difficulty in marking correct axis in view of osteophytes over medial epicondyle, and so was excluded from study. Postoperative Transepicondylar axis was assessed by taking CT scans, measuring condylar twist angle (CTA) and posterior condylar angle (PCA). Results – The mean degree of femoral component rotation in group 2 non navigated was around 4.09° ± 0.61° with surgical Transepicondylar axis as reference and 3.38° ± 0.28° in group 1 navigated knees, both of which were within normal limit. The difference in two groups was not statistically significant. Only 3 patients required an additional lateral release. No statistical difference was noticed between male and female patients. No postoperative patellar maltracking was seen.Conclusion – TEA is an accurate reference for femoral component rotation in patients undergoing primary TKA. Key words – Transepicondylar axis, total knee arthroplasty, femoral component rotation,

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THE EFFECT OF PAIN AND FUNCTION IN PATIENT SATISFACTION FOLLOWING TOTAL KNEE REPLACEMENT

Zenat KHIRED

Despite substantial advances in primary TKA, numerous studies using historic TKA implants suggest only 82% to 89% of primary TKA patients are satisfied. In our study we use Oxford Knee Scores as a preoperative Questionnaires and six questions for assessing postoperative satisfaction. From the 50 subjects, 49 would do the surgery again, which shows a very high satisfaction rate (98%, P-value < .001). Regarding pain, the surgery has shown highly significant effects in decreasing pain for 48 out of the 50 subjects (96%, P-value < .001). Also, there was a significant improvement in regards to participating in leisure activities and shopping [27 out of 50] (54%, P-value < .001), when scores were compared before and after the surgery. Furthermore, there was a significant improvement in pain relief and function after the surgery, when compared to the pain before the surgery, where 41 out of the 50 subjects experienced less pain (82%, P-value < .001). So we found that improvement in pain and functional activity of patients are important factors in determining patient satisfaction after total knee replacement

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USE OF ANTI-GRANULOCYTE SCINTIGRAPHY WITH 99MTC-LABELED MONOCLONAL ANTIBODIES FOR THE DIAGNOSIS OF PROSTHESIS INFECTION IN PATIENTS AFTER TOTAL JOINT ARTHROPLASTY: A DIAGNOSTIC META-ANALYSIS

Dan XING, Xinlong MA, Yang YANG

The accurate diagnosis of prosthetic joint infections (PJI) is crucial for therapy and the prevention of complications. No diagnostic test of PJI is 100% accurate. The aim of this study was to assess the use of anti-granulocyte scintigraphy using 99mTc-labeled monoclonal antibodies to diagnose PJI after total joint arthroplasty. A systematic search of all relevant studies published through January 2013 was conducted using the MEDLINE, EMBASE, OVID, and Science Direct databases. Observational studies that assessed the accuracy of the anti-granulocyte scintigraphy with monoclonal antibodies or antibody fragments labelled with technetium 99m in diagnosis for PJI and provided data on specificity and sensitivity were identified. Standard methods recommended for meta-analysis of diagnostic accuracy were used. Nineteen studies were eligible for inclusion. The results demonstrated that the area under the summary receiver operator curve was 0.88, and the diagnostic accuracy (Q*) was 0.81. Additionally, the diagnostic odds ratio (DOR) was 18.76 with a corresponding 95% confidence interval of 10.45-33.68. The pooled sensitivity and specificity of the diagnostic method for the diagnosis of PJI were 83% and 79%, respectively, while the pooled positive likelihood ratio (PLR) was 3.56, and the negative likelihood ratio (NLR) was 0.26. Anti-granulocyte scintigraphy using 99mTc-labeled monoclonal antibodies has a reasonable role in the diagnosis of PJI after total joint arthroplasty. Due to the limitations of the present meta-analysis, additional high-quality original studies are required to confirm the predictive value.

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THE USE OF RECEIVER OPERATING CHARACTERISTICS ANALYSIS IN DETERMINING CUT-OFF VALUE OF D-DIMER FOR PREDICTION OF CALF INTERMUSCULAR DEEP VEIN THROMBOSIS AFTER TOTAL HIP ARTHROPLASTY

Qinsheng HU, Bin SHEN

Objective: D-dimer testing is suggested as a recommended option for predicting of suspected DVT, but no clear cut-off values about calf intermuscular DVT have been defined. The current study aimed to determine the cut-off values of D-dimer for prediction of calf intermuscular DVT after THA and evaluate its clinical significance. Methods: 108 patients underwent primary THA by the same surgeon were included in current study, using the same incision and prosthesis. Color duplex ultrasonography (US) was performed preoperatively and 5 d postoperatively in order to detect any evidence of DVT of the lower limb. All the preoperative US results were negative. All patients were grouped into thrombosis (n=28) and not thrombosis groups (n=80) according to the 5 d US results. Plasma D-dimer was measured preoperatively and 1 d, 3 d, 5 d postoperatively. Receiver operating characteristics (ROC) analysis was performed according to the results. Results: Comparing with the not thrombosis group, postoperative D-dimer value of thrombosis group increased significantly at each time point ($P < 0.01$), and the peak value got at postoperative 1 d: the not thrombosis group 4.94 ±1.27 mg/l, the thrombosis group 8.96 ±1.67 mg/l ($P < 0.01$). Conclusion: Calf intermuscular DVT should not be ignored, appropriate cut-off values of D-dimer is useful for the prediction and exclusion of calf intermuscular DVT after THA surgery. D-dimer in Calf intermuscular DVT patients is different from the theoretical cut-off values. Cut-off value analyzed in this study has high sensitivity and specificity for detecting Calf intermuscular DVT.

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Abstract no.: 41565

BIOLOGICAL PLATING OF PERIPROSTHETIC FRACTURES AROUND KNEE PROSTHESES: INDICATIONS, RESULTS AND COMPLICATIONS IN 31 CASES

Rajiv THUKRAL, Sks MARYA

Background: Comminution, bone loss and osteoporosis make supracondylar periprosthetic femoral fractures difficult to treat. Open reduction internal fixation (ORIF) usually necessitates additional bone grafting to prevent delayed union. Biological plating using minimally invasive surgical (MIS) technique is possible occasionally, and minimizes morbidity. However, good patient selection and technique are paramount. Material & Methods: 21 patients with comminuted periprosthetic distal femoral fractures were operated over 7-years (Oct 2006 – Sep 2014) using the Synthes™ distal femoral locking compression plate (DF-LCP), by MIS techniques. Primary bone grafting was not performed in any patient. Clinicoradiological assessment was done regularly upto an average 24 months & results were assessed and analysed. Results: Average time to union for the group was 4.6 months. One patient had a poor result due to valgus malunion, but he refused surgery. No patient needed re-surgery for any cause. Knee scores were 85 and 84 (pain and function) at 6 months and 88 and 90 (pain and function) at 12 months, with an eventual ROM of 0 to 110 degrees. Conclusions: Locked plating of comminuted periprosthetic distal femoral fractures permits stable rigid fixation and early mobilization. Biological plating (MIS) minimizes morbidity and may obviate need for primary bone grafting. Based on our results, a new treatment algorithm was developed so as to clearly treat such fractures.

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Abstract no.: 42403

NO CLEAR BENEFIT TO USE OF CLOSED SUCTION DRAINAGE AFTER PRIMARY TOTAL KNEE ARTHROPLASTY

Hai-Bo SI, Zeng YI, Bin SHEN

Purpose: Closed suction drainage after primary total knee arthroplasty (TKA) have been used routinely for many decades, but controversies have arisen in recent years regarding whether closed suction drainage after primary TKA have any benefit. We aimed to examine the efficacy and risks of closed suction drainage after primary TKA. Methods: Electronic databases (PubMed/Medline, CENTRAL, Embase and Web of Science) were systematically searched for randomized controlled trials (RCTs) investigating the efficacy and risks of the closed suction drainage after primary TKA. Two investigators independently reviewed studies for eligibility, assessed the risk of bias and extracted the data. A meta-analysis was then performed using Review Manager Software. Results: Twelve RCTs including a total of 889 TKAs were identified. No differences in the infection and blood loss were found between the group with closed suction drainage and the group without drainage, but the patient number and mean volume of blood transfusion were statistically higher in the group with closed suction drainage. Additionally, the incidence of wound prolonged oozing and soft tissue ecchymosis were significantly higher in the group without drainage, but there were no significant differences in operative time, wound haematoma formation, deep venous thrombosis, postoperative VAS score and ROM between the two groups. Conclusions: There appears to be no clear benefit to use of closed suction drainage after primary TKA, more studies with high-quality and large sample size to provide more evidence on this topic are still required.

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Abstract no.: 42402

USE OF BARBED SUTURES FOR CLOSURE IN TOTAL JOINT ARTHROPLASTY : ASSESSMENT AND OUR EXPERIENCE-A PROSPECTIVE, RANDOMIZED，DOUBLE-BLIND CLINICAL TRIAL

Rui LI, Ming NI, Zhuo ZHANG, Peng REN, Peng XIN, Jiying CHEN

Objective : Our study performed a prospective, randomized, double blind clinical trial to estimate the use of Barbed Sutures for Closure in Total Joint Arthroplasty on closure time, poor outcomes and costs. Methods：We chose 80 patients (hip 44，knee 36) who need to replace their joint of both sides at one time. Barbed sutures are used on one side and successive chain shaped sutures (VICRYL) are used on the other. Results : In total hip arthroplasty, mean closure time of Barbed Sutures group is 10.37min, poor outcomes 2 cases; mean time of Traditional group is 19.63min, Poor outcomes 2 cases. Time saving is significant and poor outcomes are similar. In addition , our institution have recorded incision condition after operation since 2013. There are 853 integrated and available records about Barbed Sutures (522 cases) and Traditional sutures (VICRYL) (331 cases) . The rates of Poor outcomes are also similar between two groups, though the rates are a little higher than that of this trail. This can add weight to the safety of Barbed Sutures. Barbed Sutures cost 548.9 RMB, 191.4 RMB higher than stander suture 357.5 RMB (178.75×2) , not accounting too much for the whole operation cost. Moreover, it can save money in some places where the cost is associated with operation time. Conclusion : Using barbed sutures is a safe and time-saving approach in Total joint Arthroplasty.

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BARBED VERSUS STANDARD SUTURES FOR CLOSURE IN TOTAL KNEE ARTHROPLASTY: A RETROSPECTIVE STUDY

Guanglei ZHAO, Jun XIA, Yibing WEI, Siqun WANG, Gangyong HUANG, Feiyan CHEN, Jingsheng SHI, Liangda HUANG

OBJECTIVE :Barbed suture has extended its application to wound closures in total knee arthroplasty surgery minimizing complications and increasing efficiency in knee arthroplasty reconstruction .However, weather the barbed suture would be associated with a shorter closure times and similar closure-related perioperative complication rates is controversial. This study aimed to evaluate the role of barbed suture in total knee arthroplasty. METHODS: We retrospectively compared two closure techniques in primary TKA with either barbed or knotted sutures. The barbed group consisted of 70 primary TKAs closed with running barbed suture. The standard group consisted of 76 primary TKAs closed with interrupted suture. Clinical data such as the mean wound closure time, hospital stays and perioperative complication were recorded within the 6-week perioperative period. RESULTS: The average estimated closure time was shorter with barbed suture (25.8 vs. 28.5 min, $p<0.001$)The closure-related perioperative complication rates and outcomes were similar between the groups. Evaluation of overall primary outcomes showed a lower rate of wound complications using barbed sutures ($P < 0.001$) CONCLUSION: The use of barbed suture in TKA is associated with a shorter estimated closure time, similar outcomes and complications when compared with standard sutures.

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Abstract no.: 41201

EFFICACY OF TRANSFORAMINAL ENDOSCOPIC NERVE ROOT DECOMPRESSION IN THE TREATMENT OF DEGENERATIVE LUMBAR SPINAL STENOSIS

Zhengrong YU, Chunde LI

Objective: To evaluate the feasibility of transforaminal endoscopic nerve root decompression for degenerative lumbar spinal stenosis (DLSS). Methods: From July 2011 to August 2014, 42 cases of single segment DLSS were separated into transforaminal endoscopic surgery group and open surgery group. Leg pain VAS, ODI, intraoperatve blood loss, operation time, drainage, complications, ambulation time and discharge time were recorded. Results: VAS and ODI of different group in different time had no significant difference ($P>0.05$). VAS and ODI of followup within each group were improved relative to baseline, the difference was statistically significant ($P<0.01$). The drainage of open operation group was 335.24±101.67ml, while the transforaminal endoscopic sugery group had no drainage. Each group had 1 case with complication, postoperative epidural hematoma was found in 1 case of transforaminal endoscopic sugery group and poor wound healing was found in 1 case of open surgery group. The difference of intraoperatve blood loss, operation time, ambulation time and discharge time between different group was statistically significant ($P<0.001$). Conclusion: We can apply transforaminal endoscopic decompression for the patients of lumbar spinal stenosis with unilateral nerve root irritation. Patients can obtain similar good therapeutic effect with open surgery, while get less surgical trauma and quicker recovery.

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Abstract no.: 40464

PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY FOR ADOLESCENT LUMBAR DISC HERNIATION UNDER LOCAL ANESTHESIA

Xifeng ZHANG, Ningdao LI

Objectives: To investigate the clinical efficacy of percutaneous endoscopic lumbar discectomy (PELD)for adolescent lumbar disc herniation. Methods: We retrospectively reviewed the medical records of 18 adolescent patients (aged 14–18 years old) with LDH from November 2008 to April 2012, including 11 males and 7 females with an average age of 15.9years.The clinical findings and MRI were the main diagnostic methods. The operation time, intraoperative blood loss and length of incision were all recorded. The results were evaluated according pre- and post-operative Oswestry Disability Index (ODI) and low limp pain visual analog scale (VAS) .The clinical outcome was determined by modified Macnab criteria at the final follow-up. Results: The average operation time of each patient was 45min (ranged 30min--65min), the mean length of incision was 7mm (ranged 6--8mm), the mean Intraoperative blood loss was 5ml(ranged 3-10ml) . No complications such as infection and the injury of blood vessels and nerves occurred. Preoperative and the last follow-up VAS scores were (7.8±0.73) and (1.0±0.69) respectively, which showed significant improvement compared with preoperative score, as well as the ODI (Preoperative80.0±9.32 VS The last follow-up 5.1±4.93) , were significantly improved. The clinical outcomes were determined using a modified Macnab criteria, which revealed that all patients had excellent result. Conclusions: Percutaneous endoscopic lumbar discectomy (PELD) provides a new choice for adolescent lumbar herniation and provides satisfactory clinical results. PELD is safe and effective for adolescent lumbar disc herniation. [Keywords] Adolescent Lumbar disc herniation) percutaneous endoscopic lumbar discectomy minimally invasive spine surgery

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PERCUTANEOUS ENDOSCOPIC LUMBAR DISCECTOMY FOR TREATMENT OF DIFFERENT TYPES OF LUMBAR DISC HERNIATION USING LATERO- POSTERIOR APPROACH

Haoran GAO, Jixian QIAN

Objective To explore safety methods and surgical technique of percutaneous endoscopic lumbar discectomy (PELD) in treating different types of lumbar disc herniation under strictly patients selection. Methods: 65 patients who with lumbar disc herniation after failed conservative treatment were treated by PLED. All cases were verified both via clinical examination, CT and MRI images or discography, all cases were treated by PELD. Painful VAS and ODI was performed at the preoperative, postoperative and final follow-up. The clinical efficacy was evaluated at the last follow-up according to the modified Macnab criteria. Results 65 cases were followed up for 3-15 months, the mean operative time was 48min; postoperative hospital stay 4.2 days. In total of 65 cases, there was 1 case suffered with L5 nerve root palsy and recovered to normal after two months. One case occurred the same symptoms with preoperative at one week after the surgery, and diagnosed lumbar disc herniation recurrence via MRI images at the last follow-up. The related complications include infection, complete paralysis of the nerve root, dural rupture and others were not occurred in our group. VAS were significant differences between preoperative and postoperative final follow-up. ODI were significant differences between preoperative and postoperative final follow-up. According modified Macnab criterion, 31 cases was excellent, 24 cases was good, 8 cases were moderate, 2 cases was bad, and fineness rate was 84.5%. Conclusion It is safety method to treat different types of lumbar disc herniation by percutaneous endoscopic lumbar discectomy (PELD)

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THE CLINICAL STUDY OF PERCUTANEOUS TRANSFORAMINALENDOSCOPIC DISCECTOMY FOR LUMBARDISC HERNIATION

Haoran GAO

Objective: To evaluate the clinical outcomes of percutaneous transforaminal endoscopic discectomy (PTED) in treating lumbar disc herniation. Methods: 194 patients who were admitted in our hospital from 2009 to 2013 and diagnosed as lumbar disc herniation were cured by PTED. Clinical outcomes were evaluated by visual analogue scale (VAS), Lehmann Lumbar function score, modified Macnab criteria and SF-36 before and after operation. Results: All patients were followed up at least 12 months after the operation. The results of postoperative VAS score, lumbar function, quality of life were obviously improved compared with preoperative evaluation (P<0.05) which were got on the day after surgery,3 months after surgery,12 months after surgery. According to the modified Macnab criteria, the outcome showed: excellent:164;good:15;fair:12 and poor:3.The excellent and good rate was 90.2%. Conclusion: PTED is a safe and effective treatment for lumbar disc herniation. The pain was obvious relief and the lumbar spinal function and quality of life were significantly improved.

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Abstract no.: 40154
CLINICAL ASSESSMENT OF REFORMED LUMBAR MICRODISCECTOMY

Tao LI

Abstract: The aim of this study was to evaluate the clinical outcomes of the reformed lumbar microdiscectomy preserving more ligamentum flavum than the traditional microdiscectomy does. A prospective, randomized, controlled clinical study was conducted. Patients with unilateral lumbar disc herniation were randomly divided into two groups. The control group underwent traditional lumbar microdiscectomy, and the test group patients underwent the same procedure but with a curved incision of the lumbodorsal fascia and with more preservation of the ligamentum flavum. Visual analogue scale (VAS) scores and Oswestry scale scores were used to appraise the outcomes. Both groups' clinical parameters were significantly improved after the operation. The VAS scores in the test group showed a less intensity than that in the control group at 3 days, 12 weeks after the operation (P\0.05), while at 1 year, showed no significant difference. Both groups' postoperative leg pain was significantly relieved (P\0.05). The VAS scores for leg pain had no significant difference between the two groups at any testing time point after the surgery (P[0.05). The Oswestry scale scores showed a better lumbar function state in the test group than that in the control group at 12 weeks and 1 year after the operation (P\0.05). In both groups, there was no patient who had a lumbar disc reherniation. Preserving more ligamentum flavum is helpful to improve the clinical outcomes, and this improvement maybe resulted from the prevention of the fibrosis-related complication and the stability of the spine.

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Abstract no.: 40162

MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION AS REVISION SURGERY

Jian WANG

Objective. To assess the effect of minimally invasive transforaminal lumbar interbody fusion on the revision surgery for patients previously treated by open decompression procedure. Methods. 52 patients who had previous discectomy (n = 13), hemilaminectomy (n = 16), laminectomy (n = 12) and facetectomy (n = 11) underwent monosegmental and bisegmental minimally invasive transforaminal lumbar interbody fusion (MiTLIF) (n = 25) or open transforaminal lumbar interbody fusion (OTLIF) (n = 27) by two experienced surgeons at one hospital, from March 2006 to October 2008 (minimum 12-month follow-up). The following data were compared between the two groups: the clinical and radiographic results, operative time, blood loss, X-ray exposure time, postoperative back pain, and complications. Clinical outcome was assessed using the visual analogue scale and the Oswestry disability index (ODI). Results. The operative time and clinical and radiographic results were basically identical in both groups. Comparing with the OTLIF group, the MiTLIF group had significantly less blood loss and less postoperative back pain at the second day postoperatively. The radiation time was significantly longer in the MiTLIF group. Complica- tions included three cases of small dural tear in the MiTLIF group. There were five cases of dural tear and two cases of superficial wound infection in the OTLIF group. Conclusion. Minimally invasive TLIF is a safe and effective procedure for treatment of selected revision patients previously treated by open surgery with some potential advantages.

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Abstract no.: 40158

MINIMALLY INVASIVE TRANSFORAMINAL LUMBAR INTERBODY FUSION FOR OBESE OR OVERWEIGHT PATIENTS

Jian WANG

Objective: To evaluate the safety and e fficacy of technique in overweight or obese patients. Methods: Eighty-one patients with an average age of 55.3 years (43–81y) were prospectively evaluated. The main inclusion criterion was a body mass index > 25. The mean body mass index was 28.9±3.2. All patients suffering from lumbar canal stenosis (n=43), spondylolisthesis (n=29), or postlaminectomy instability (n=9) underwent 1-level minimally invasive TLIF (MIS-TLIF, n=43) or OTLIF (n=39). The following data were compared between 2 groups: operative time, blood loss, x-ray exposure time, clinical and radiographic out- comes, and perioperative complications. The clinical outcome was assessed using the visual analogue scale and the Oswestry Disability Index (ODI). Radiographic evaluation of the lumbar spine was performed at 12 months postoperatively. Results: In comparison with the OTLIF group, the MIS-TLIF group had significantly less operating time, less blood loss, and less postoperative back pain. The radiation time was significantly longer in the MIS-TLIF group. The clinical outcomes (Oswestry Disability Index scores) were basically identical in the 2 groups. Radiographic evaluation showed satisfactory bony union at the fixed level in both the MIS-TLIF group (42/43 cases) and the OTLIF group (38/39 cases). Overall complication rates were slightly higher in the OTLIF group, with 17.9% of over- weight or obese patients having perioperative complications. Conclusions: The minimally invasive technique o ffers sever potential advantages. Although this technique needs a longer x-ray exposure time, it may still be a good option for overweight or obese patients.

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Abstract no.: 40813

PELVIC RETROVERSION IS THE KEY PROTECTIVE MECHANISM OF L4-5 DEGENERATIVE SPONDYLOLISTHESIS

Hui LIU, Zhaomin ZHENG

Purpose: To explore the role of spinopelvic sagittal alignment in the pathological mechanism of degenerative spondlylolisthesis (DS) development. Method: A total of 52 asymptomatic volunteers, 32 single segment L4-5 DS and 29 lumbar spinal stenosis (LSS) without spondylolisthesis patients were enrolled. All subjects had standard lumbar spine X-ray films with standard position along with lumbar spine magnetic resonance image. Comparative analysis of sagittal parameters and disc degeneration grades among asymptomatic volunteers and patients with the two disorders were performed. Results: Compared to normal population (NP) and LSS, DS showed significantly greater pelvic incidence (PI), sacral slope (SS) and lumbar lordosis (LL), while LSS showed significantly smaller PT and PT/SS. DS showed significantly greater L5 slope than NP and LSS. In both Great-PI group and Small-PI group, all above differences between DS and LSS remained. LSS showed significantly higher degenerative grade of each adjacent disc than DS. Population with adjacent segment degeneration showed higher incidence of pelvic retroversion (PT/SS ≥1), and LSS showed greater proportion of adjacent segment degeneration than DS. Conclusions: Lumbar spine morphology of great LL determined by great PI is a risk factor of L4-5 DS. L5 slope is a parameter that can be used to predict the risk of L4-5 DS. Pelvic retroversion is the key protective mechanism from DS. Adjacent segment degeneration is a driving factor of pelvic retroversion for compensation of lumbar sagittal malalignment.

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MISS-TLIF ASSISTED BY QUANDRANT OR PIPELINE TUBE SYSTEM FOR THE MANAGEMENT OF LUMBAR SPONDYLOLISTHESIS

Jiancheng ZENG

PURPOSE: To evaluate the clinical effects of Minimally invasive transforaminal lumbar interbody fusion (MISS-TLIF) assisted by Quandrant or Pipeline tube system for the management of lumbar spondylolisthesis MRTHODS: 21 patients suffering from lumbar spondylolisthesis were treated by MISS-TLIF) assisted by Quandrant or Pipeline tube system and percutaneous or mini-open pedicle screw fixation. There were 12 males and 9 females, with an average age of 58.6. The average operating time was 165min, the average blood loss was 86ml; the surgery effects were evaluated according to ODI and VAS. The results of Interbody fusion were evaluated by postoperative X-ray and three-Dimensional CT. RESULTS: An average follow-up time of 24.6 months. The average VAS scores of all the patients were 7.5, which reduced to 2.6 three months after the surgery and to 1.5 six months after the operation ($p<0.01$).The average ODI scores of all the patients were 63.7, which reduced to 21.3 three months after the surgery and to 13.6 six months after the operation ($p<0.01$).Among the 12 patients who had follow-up investigation for more than 12 months, 11 patients got osseous fusion. There were no cases of internal fixation loosening and breakage. There were no permanent nerve root impairment and infection. CONCLUSIONS: MISS-TLIF assisted by Quandrant or Pipeline tube system is a safe, effective and minimally- invasive way for the management of lumbar spondylolisthesis, which has the advantages of less injury, less blood loss, faster rehabilitation.

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Abstract no.: 40199

MINIMALLY INVASIVE SCOLIOSIS SURGERY IN LENKE 5C ADOLESCENT IDIOPATHIC SCOLIOSIS: A PRELIMINARY RESULT

Zezhang ZHU, Zhen LIU, Weiguo ZHU, Xingyong LIU, Xu SUN, Yong QIU

Recently, the concept of minimally invasive scoliosis surgery (MISS) was put forward and applied to the correction of scoliosis. This study aimed to assess the outcomes of posterior minimally invasive scoliosis surgery (MISS) in Lenke type 5C adolescent idiopathic scoliosis (AIS). Posterior correction with MISS was prospectively performed in 12 patients with Lenke 5C AIS since November 2012. They were 11 girls and 1 boy, with an average age of 17 years. Pedicle screws were percutaneously inserted with the guide of O-arm navigation. Then the rods were introduced inside and were locked to screws upon derotation maneuver. A total of 116 screws were inserted in the current cohort. The average operation time of the current cohort was 4.2h (range, 2.0h-6.5h) and intraoperative blood loss was 245ml on average (range, 100ml-400ml). Immediately after surgery, the correction rate of main curve was 77.8% on average (range, 70.0%-93.2%), in line with improvements in apical vertebral rotation, rotation as well as trunk sift. Average correction loss was 1.9% (0- 6.0%) at a mean follow-up of 8.4 months (in ten patients). According to CT evaluation, 100 screws (86.2%) were fully contained within the cortical boundaries of the pedicle, and 16 screws (13.8%) breached pedicle walls while no screws at high risk. No infection, implant failure and neurologic complications were observed. In conclusion, MISS is a feasible and safe option for patients with Lenke 5C AIS, although technically challenging. However, a large sample with long-term outcome is required for learning curve analysis.

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PERONEAL AND TIBIAL NERVE F WAVES IN L5 AND S1 RADICULOPATHIES

Chao Jun ZHENG, Jian Yuan JIANG, Fei Zhou LU, Xiang JIN

Introduction: F waves might be abnormal in proximal nerve lesions. Peroneal and tibial nerve F waves are routinely tested in many EMG laboratories, although their utility in lumbar radiculopathy has not been well established. The present study is to study the peroneal and tibial nerve F waves provide in a group of the patients with L5 and S1 radiculopathy. Methods: A retrospective analysis was conducted of 58 patients with lumbosacral radiculopathy (age 16 to 70; median 42; male 28; female 30). All subjects were recruited at the Spine Center of Huashan hospital, from 2008 to 2010. The root lesions were confirmed by abnormal EMG findings of denervation porentials in the paraspinal muscles and the L5 and/or S1 myotomes. A delay or absence of the F wave latencies of the peroneal nerve (recorded from extensor digitorum brevis) and tibial nerve (from flexor hallucis brevis). Results: 13 of 38 patients with L5 radiculopathy had abnormal peroneal nerve F wave (sensitivity 34.2%). Peroneal F waves were normal in all the 13 patients with unilateral S1 radiculopathy. 11 of 38 patients with S1 root lesion had abnormal tibial nerve F wave (sensitivity 28.9%). Tibial F waves were normal in all the 20 patients with unilateral L5 radiculopathy. Conclusions: Peroneal nerve F wave is useful in assessing L5 root function, whereas abnormal tibial nerve F wave indicates relatively severe damage of S1 roots.

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Abstract no.: 42408

A PILOT STUDY ON THE TREATMENT OF DEGENERATIVE SCOLIOSIS BY USING MIS-TLIF AND PERCUTANEOUS VERTEBRAL PEDICLE SCREW FIXATION

Zhixun YIN

Objectives: To investigate the operative key points and therapeutic effects of degenerative scoliosis by using mini-tlif and percutaneous vertebral pedicle screw fixation. Methods There were twenty cases with degenerative scoliosis who had underwent mini-tlif and percutaneous vertebral pedicle screw fixation in our hospital from September 2012 to September 2013. All cases were minimally invasive exposure, open the intervertebral space in step by step, implant the cage with bone into the curved side of the intervertebral space, and finally percutaneous vertebral pedicle screw fixation with extending in the curved side and compressing in the convex side of spine. Cobb's angle were measured and compared between radiograpphy at pre-operation, postoperation, and follow up, while intervertebral fusion were detected by radiography and CT scaning, and the clinical effect were assessed according to Nakai methods. Results Bony fusion were surely take placed in 16 cases but not sure in another 4 cases. The final VAS decreased from (7.5±1.2) score in pre-operation to (2.3±1.1) score in leg pain, (6.8±1.3) to (1.7±1.3) in lumbar pain. Cobb's angle were decreased from (33.7±3.5) degree in pre-operation to (10.7±2.4). Clinical effect is excellent in 12 cases, good in 5 cases and so-so in 3 cases, so the excellent and good rate was 85%.Conclusion Mini-tlif and percutaneous vertebral pedicle screw fixation is a minimally invasive technique and good at correcting scoliosis, it is an effective way for the treatment of degenerative scoliosis.

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Abstract no.: 39900

DIFFUSION TENSOR MR IMAGING IN CERVICAL SPONDYLOTIC MYELOPATHY

Chao KONG, Xueming CHEN

Objectives: To analyze the potential of diffusion tensor imaging (DTI) of the cervical spinal cord in the detection of changes associated with cervical spondylotic myelopathy. Methods: The DIT of the cervical spinal cord was performed within a group of 10 patients with cervical spondylotic myelopathy and 10 healthy volunteers on a 1.5-T MRI scanner. The apparent diffusion coefficient (ADC) and fractional anisotropy (FA) of the spinal cord from C2/C3 level to C6/7 level in all patients were measured. ADC and FA values at different cord sections in volunteers were compared. ADC and FA values at the maximal compression level (MCL) in CSM patients were compared with those at the corresponding level in volunteers. We also made a comparison of ADC and FA values of the whole cervical spinal cord between CSM patients and volunteers. Results: There were no significant differences in both ADC values and FA values measured at different cervical cord sections in volunteers ($p > 0.05$). Whole cervical spinal cord ADC values and FA values in CSM patients were not significantly different from those in volunteers ($p > 0.05$). ADC values in CSM patients were significantly increased at the maximal compression level compared with volunteers ($p<0.05$).FA values in CSM patients, however, significantly decreased at the maximal compression level compared with volunteers ($p<0.05$). Conclusions: DTI parameters are sensitive markers of cervical spondylotic myelopathy. Changes in DTI parameters are mostly marked at the maximal compression level and reflect the severity of spinal cord injury.

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Abstract no.: 41481

SURGICAL TREATMENT OF LOWER CERVICAL FRACTURE-DISLOCATIONS WITH SPINAL CORD INJURIES BY ANTERIOR APPROACH (FIVE-TO 15-YEARS FOLLOW-UP)

Guo HUA, Hao DINGJUN

Purpose: Lower cervical fracture-dislocations can cause seriously damage. Up to present, there is no consensus on treatment denominator. In recent years, anterior approach surgery with directly decompression and reduction has been widely accepted. However, large sample size, long-term follow-up study to assess the clinical efficacy of anterior approach is rarely seen in the literature. Methods: From January 2000 to January 2010, 312 patients with lower cervical spine fracture-dislocations treated by anterior surgery were retrospectively analyzed. 218 cases (70%) were data integrity and obtained follow-up . The average age was 41.5 years (ranged 21-72), including 121 males and 97 females. All cases underwent skull traction for cervical immobilization and avoiding the secondary spinal cord injury before surgery, then anterior discectomy and reduction were performed . If the reduction failed, corpectomy was performed for further reduction. Results: The mean follow-up time was 8.3 years (ranged 5-15). Complete reduction was got in 178 cases (81.7%), and 40 cases (18.3%) obtained more than 90% reduction. The postoperative radiologic indexes of all patients were higher than the preoperative ones ($P<0.05$), but there was no statistical difference between post-operation and final follow-up ($P>0.05$). The cervical spine normal intervertebral height and physiological curvature were maintained, and there were no plates or screws associated complications observed during the follow-up. 163 cases (74.8%) presented with neurological functional recovery. Conclusions: For lower cervical fracture-dislocations with spinal cord injuries, satisfied clinical outcomes can be obtained by choosing anterior approach surgery. By restoring the normal structure of cervical spine and promoting neurological functional recovery, anterior approach achieved good long-term curative effect.

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Abstract no.: 39993

CLINICAL AND RADIOLOGIC COMPARISON OF TWO NON-FUSION TECHNIQUES FOR THE TREATMENT OF SINGLE-LEVEL CERVICAL DEGENERATIVE DISC DISEASE: DYNAMIC CERVICAL IMPLANT ARTHROPLASTY VERSUS CERVICAL TOTAL DISC REPLACEMENT

Shichang LIU, Yueming SONG

Purpose: To compare clinical and radiologic results of dynamic cervical implant (DCI) replacement and cervical total disc replacement (TDR) for the treatment of single-level cervical degenerative disc disease in Chinese patients. Methods: We performed a retrospective review of all patients from a single medical center undergoing DCI replacement or TDR from April 2010 to October 2012. The clinical and radiologic outcomes were evaluated. A total of 152 consecutive patients were included in the review. Group A included 67 patients who underwent anterior cervical decompression and DCI replacement. Group B included 85 patients who underwent anterior cervical decompression and cervical total disc replacement (Prestige LP). Results The most common operative level was C5/C6 (49.3%).The differences in blood loss, operation time and hospitalization time were not statistically significant. The JOA, VAS, NDI, and SF-36 scores improved significantly after surgery in both the DCI and TDR groups. HO was observed in 48.1% of the surgically treated levels (22.4 and 28.2 %, respectively). Conclusions At least 2 years of follow-up, there are no significant difference in clinical results between DCI group and TDR group. The HO occurrence and the rate of ASD is also similar. However, as an effective non-fusion technique, DCI provide a more economical tool. Further prospective, randomized studies with a long-term follow-up periods are needed determine the long-term effects.

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Abstract no.: 40475

THE IMPACT OF MILD OSSIFICATION ON THE RANGE OF MOTION AFTER CERVICAL ARTIFICIAL DISC REPLACEMENT OF CERVICAL DISC HERNIATION PATIENTS

Wei TIAN, Xiao HAN, Bo LIU, Da HE, Yanwei LV, Huadong WANG

Objective: Cervical disc herniation (CDH) is the best indication for cervical artificial disc replacement (ADR). But in the situation that CDH combine with segmental ossification of posterior longitudinal ligament (OPLL), even though OPLL does not compress the spinal cord, it will affect the range of motion (ROM) of the ADR in the long-term, so it would be the contraindication for ADR. The purpose of this study is to evaluate the impact of mild ossification on the long term ROM after cervical disc replacement. Methods: 54 patients who got ADR with the diagnosis of CDH were included. According to the preoperative CT, patients were divided into two groups, CDH with mild ossification (42 cases) or not (12 cases). ROM was compared between two groups. Follow up CT was used to identify whether the mild ossification turns into typical OPLL and whether fusion was occurred at the ADR level. Results: There is no statistical difference of the ROM at ADR level between the two groups whether preoperation or at the last follow up. Of the 42 patients with mild ossification, two patients turn into typical OPLL at the 81 and 96 months follow up. But the ROM at ADR level of those two patients were maintained which were 6.2° and 15.4°. Conclusion: 95.2% of the CDH patient who combine with mild ossification won’t turn into OPLL at the average 55.8 months follow. The mild ossification won’t affect the ROM at ADR level. So it is not a contraindication for ADR.

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Abstract no.: 39937

IMPACT OF INTERVERTEBRAL OVER DISTRACTION ON AXIAL SYMPTOM AFTER ANTERIOR CERVICAL DISCECTOMY AND FUSION (ACDF)

Wei ZHANG, Jiayue BAI

Objective: Retrospective analysis on the impact of intervertebral over distraction on cervical axial symptoms (AS) after anterior cervical discectomy and fusion (ACDF). Methods: A retrospective study was conducted involving a total of 421 patients who underwent 1-2 segments of ACDF in our hospital from January 2010 to October,2012, among of whom,78 cases with complete follow-up data were included in this study. X-ray examination was done for all the patients immediately after surgery, 3 months after and last follow-up. According to whether AS occurred after surgery or not, these patients were divided into two groups namely symptom group(Group S)and non-symptom group(Group N).The ratio of intervertebral distraction, the change of overall cervical curvature and local curvature of surgical segment, cervical total range of motion (ROM) and JOA recovery rate were compared and analyzed. The distribution area of symptom and severity (VAS score) of patients in group S were observed, and the linear regression analysis on the ratio of intervertebral distraction and the VAS score of AS were carried out. Results: The total incidence of the symptom was 33.97%.The ratio of intervertebral distraction of group S was significantly higher than that in group N at last follow-up($p < 0.05$),but the change of overall cervical curvature, the change of local curvature of surgical segment, cervical ROM and JOA recovery rate were not statistically significant ($p > 0.05$).In group S,37% of the patients had the symptoms occurred in chest area and the ratio of intervertebral distraction was significantly positively correlated with VAS score of AS($r = 0.893$). Conclusions: The incidence of post-operative AS will significantly increase if the ratio of intervertebral distraction is over 10% after ACDF.

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CRITERIA FOR OBJECTIVE ASESSMENT OF THE IDIOPATHIC SCOLIOSIS (IS) SPINAL DEFORMITIES SURGICAL CORRECTION RESULTS

Darya TESAKOVA, Helena SOSHNIKOVA, Polina ZUEVA, Dmitry TESAKOV, Sergej MAKAREVITCH

The aim was to determine criteria for objective evaluation of the IS spinal deformities surgical correction results. Materials and methods: The results of surgical treatment of 325 patients with IS, which at the age of 17-48 years underwent dorsal corrective and stabilization surgery by CD methodology with using implantable titanium construction «BelCD». Initial spinal deformity arcs angle was 42-157 degrees. Thoracic deformity type (Lenke I) had 145 cases, combined type (Lenke III) - 109, thoracolumbar type (Lenke V) - in 71. Surgical correction was subjected to pathological 437 arcs. In the range of 41-60 degrees was 184 arcs, 61-90 degrees - 133, 91-120 degrees - 76, more than 120 degrees - 44 arc. Follow-up term after surgery was 5-15 years. Results and discussion: For an objective analysis of the surgical treatment results used criteria were classified into 4 groups. The first group of criteria illustrated external clinical status of the patient on the basis of the body plastic anatomy dynamic changes according to the scoliosis disproportionality syndrome stage. The second group of criteria combined spinal deformity radiographic parameters figures in three dimensions. The third group of criteria indicates the somatic and neurological status in terms of cardio-respiratory, abdominal, digestive and neuromuscular systems. The fourth group criteria reflect the patient opinion by SRS-24 questionnaire.

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HOW MUCH CORRECTION COULD BE EXPECTED WITH HGT IN NEUROMUSCULAR SCOLIOSIS?

Zezhang ZHU

Halo-gravity traction (HGT) has been reported as a viable option for severe scoliosis. In neuromuscular scoliosis patients, however, the outcome of HGT was less documented compared that in congenital scoliosis patients. The present study aimed to evaluate the efficacy of HGT in neuromuscular scoliosis. A total of 17 severe neuromuscular scoliosis patients undergoing pre-operative HGT were recruited. The average overall traction period was 79.7 days. Another 20 moderate neuromuscular scoliosis patients without HGT were also included to serve as the moderate group. All patients were followed for at least 2 years. The Cobb angle averaged 112.93° in HGT group, significantly larger than that in moderate group (63.82°). All of the Cobb angle, apical vertebra translation (AVT), spinal height and space available for lungs were all significantly improved after HGT compared to those of pre-traction conditions (All comparisons $P<0.05$). Pre-operative HGT demonstrated 12.6% correction of the main Cobb angle, with 8.91 mm improvement of AVT. The spinal height increased 4.4 mm as a result of HGT. At the last follow-up, radiographic outcomes demonstrated 42.26% correction of the main Cobb angle, similar to the correction rate obtained in control group using one stage posterior fusion. 10.7 mm correction of AVT and 31.2 mm increase of spinal height were also obtained in patients undergoing HGT, all similar to the outcome improvement of the moderate neuromuscular scoliosis patients. No traction-related complications were noticed in this group of patients. Severe neuromuscular scoliosis patients could be managed successfully by HGT followed by corrective fusion surgery.

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LUNG VOLUME OF SCOLIOSIS ASSOCIATED WITH SYRINGOMYELIA/CHIARI MALFORMATION: COMPARISON WITH ADOLESCENT IDIOPATHIC SCOLIOSIS

Guodong WANG, Jianmin SUN, Zhensong JIANG, Xingang CUI, Tao LI

Objective: This study aims to investigate the lung volume of scoliosis associated with syringomyelia/Chiari malformation and to make a comparison with Adolescent Idiopathic Scoliosis. Methods: 23 consecutive patients with scoliosis associated with syringomyelia/Chiari malformation, and 25 consecutive patients with Adolescent Idiopathic Scoliosis were included in this study between 2006 and 2012. All patients included had a right thoracic curve as the major curve. Detailed radiological examinations including CT scans of the lungs as well as the spine, full length X-ray films and MRI of the spine were performed before surgery. The total, left and right lung volume were measured along with the left and right volume ratio. Scoliotic parameters were obtained, included: the Cobb angle of the thoracic curve, thoracic kyphosis, rotation of apical vertebrae, range of thoracic curve, most cephalad vertebrae and rib hump. Results: No significant difference between two groups was found in the volume of the total lung (p=0.150), volume of right lung (p=0.094), volume of left lung (p=0.272), left/right volume ratio (p=0.334) or Cobb angle of major curve (p=0.185), but in thoracic kyphosis (p=0.001). In both groups, lung volumes (total, right and left) were correlated with height, Cobb angle of thoracic curve, range of thoracic curve, most cephalad vertebrae and rib hump; the left/right volume ratio was correlated with rotation of apical vertebrae. Thoracic kyphosis was not related with lung volumes (total, right and left) or left/right volume ratio in either group. Conclusion: Lung volumes (total, right and left) and left/right volume ratio were not significantly different between the two groups, despite of the increase of thoracic kyphosis in scoliosis associated with syringomyelia. Relationship between lung volumes and scoliosis parameters remained similar between two groups, except the left

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RADIOGRAPHIC COMPARISON OF SELECTIVE ANTERIOR AND POSTERIOR THORACOLUMBAR/LUMBAR FUSION FOR PUMC2D1（LENKE 5C）ADOLESCENT IDIOPATHIC SCOLIOSIS

Shengru WANG, Jainguo ZHANG

Purpose: This study aims to comparing the outcomes of after anterior and posterior selective TL/L fusion for PUMC2d1 (Lenke 5C) adolescent idiopathic scoliosis. Methods Seventy eight patients with PUMC2d1 (Lenke 5C) idiopathic scoliosis were included in the study. 34 patients were treated with selective anterior TL/L fusion, and 44 patients with selective posterior TL/L fusion. The mean age of anterior group and posterior group was 14.9 and 14.6 years. There is no statistical difference in age, Risser's sign, preoperative Cobb angles of lumbar curve and thoracic curve between the two group. Standing anteroposterior and lateral radiographs were obtained in the post-operation and follow-up. Radiographic measurements were taken. And the differences in radiographic parameters between the two groups were analyzed. Results No major complications occurred in both groups. Fused segments in anterior group were less than posterior group (4.1vs6.2, $P<0.05$). Satisfied TL/L correction (85.1%vs82.6%) and spontaneous thoracic correction (49.4%vs42.3%) could be noted in both anterior and posterior group. There was no statistical difference in spontaneous thoracic correction between the two groups ($P>0.05$). However, the anterior group has better TL/L correction (6.5°vs8.4°,$P<0.05$). There was no significant difference in the correction loss of thoracic and TL/L curve in the two groups ($P>0.05$) . The LIVDA of anterior group was larger ($P<0.05$). No significant difference in sagittal and coronal balance was noted between the two group ($P>0.05$) while the anterior group has better shoulder tilt than the posterior group ($P<0.05$). The posterior group has better pelvic tilt than the anterior group during the follow-up ($P<0.05$). Conclusion Both of the selective anterior and posterior TL/L fusion could achieve

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Abstract no.: 42416

ANATOMIC STUDY OF LOWER CERVICAL ANTERIOR TRANSPEDICULAR SCREW FIXATION AND ITS RELATED FACTORS IN CHINESE POPULATION

Xinjia WANG

Objective: To study the related factors to the lower cervical anatomic parameters and further analyze the relationship between these related factors and lower cervical anatomic parameters. Materials and Methods: The study included 122 Chinese patients, who were sampled from the patients' registry. A Lightspeed VCT (General Electric) scanner system was used to obtain images from all the patients. The C3 to C7 vertebrae were scanned continuously with a slice thickness of 0.625 mm. Multiplanar reformation was applied to the original images to obtain the optimal sagittal, transverse and coronal section of the pedicles. Statistical analyses were performed the SPSS 19.0 software to perform the independent T-test. Using Pearson's correlation test to analyze the relationship between lower cervical anatomic parameters and its related factors. Results: No statistically significant differences were found between the right side and left side of the vertebrae for all the measured parameters. 1、The aVBH、mVBD、mVBW、OPW、OPH、PAL were significantly smaller in females than in males (P 2、The pedicle cortical thickness presented a significant negative correlation with the factor of age. 3、The OPW、OPH、PAL presented a significant positive correlation with the factor of body-height. After further multiple linear regression analysis to removing the effects of body height, no statistically significant differences in OPW、OPH、PAL were found between males and females at most levels. 4、The percentage of OPW less than 4.5 mm were as follows : C3 , 38.10% ; C4 , 34.92% ; C5 , 12.70% ; C6 , 9.52% ; C7 , 0%. There was a much higher percentage of pedicle width ≤4.5 mm, ≤4.0 mm and ≤3.5 mm when body-height was less than 160 cm. 5、The entry point of ATPS technology were as follows : The entry point of C3 is in the opposite side of

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Abstract no.: 42415

THE CLINICAL MANIFESTATIONS AND TREATMENT OF ATLANTOAXIAL ROTATORY FIXATION IN ADULTS

Gang CHEN

Objective: To investigate the clinical manifestations and treatment strategy of atlantoaxial rotatory fixations in adults. Methods: Atlantoaxial rotatory fixations are rarely encountered in adults and only a few case reports have been published. Twelve cases of atlantoaxial rotatory fixations in adults were reviewed. According to Fielding classification, there were 7 cases in type Ⅰ, two in type Ⅱ, one in type Ⅲ, two in type Ⅳ. Atlas and axis fractures were found in five cases. Traction was performed as initial treatment. Fusions of the atlas and axis via posterior approach were performed for the patients in Fielding type II-IV, and the patients with non-anatomic reduction or recurrence with traction, unstable altas or axis fractures, or neurological deficit The patients were followed up with an average periods of 51.7 months. Results: Two patients died from severe cerebral trauma and respiratory failure. Closed reductions were obtained in seven patients; four of them received conservative treatments alone. Six patients obtained posterior operations, all of them achieved bony fusion, and the mean fusion time was 3.5 months. The neurological function of one patient with incomplete spinal cord injury was recovered from grade C to E (Frankel Scale) two years after surgery. Conclusions: Atlantoaxial rotatory fixations in adults often caused by trauma, and usually with concomitant injuries. Reduction can be obtained by traction successfully in most patients. Conservative treatments alone are effective for the reduced Fielding type I AARF. For the patients in Fielding type II-IV, and the patients with non-anatomic reduction or recurrence with traction, unstable atlas or axis fractures, or neurological deficit, posterior fusion with transpedicular screw are effective.

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Abstract no.: 42414

THE APPLICATION OF MATH IN DOUBLE-DOOR LAMINOPLASTY

Fei YIN, Ran LI, Kunchi ZHAO, Qing RUAN

Objective: To study how to use math to estimate the change of volume of the cervical canal after Double-door laminoplasty. Methods: Selecting imaging data of 40 segments of 10 patient with cervical spinal stenosis in 2013, and using Geometer's Sketchpad to draw. Double-door laminoplasty canal changes can be abstractively displayed as triangles becoming trapezoid, the posterior line of vertebral as the base line of triangle, and the both sides lamina as the sides of triangle, triangle will become into trapezoid after operation, while he posterior line of vertebral as the bottom base of trapezoid, the both sides lamina as the legs of trapezoid, the distance of two parts which are one spinous process cleaved as the up side of trapezoid. Calculate the triangular area and sagittal diameter of the cervical canal with pre-operation imaging, and estimate the trapezoidal area and sagittal diameter of the cervical canal after operation by math, after operation, calculate the trapezoidal area and sagittal diameter of the cervical canal with post-operation, then comparing the predictive value and the actual value. Result: There is no statistical difference between the predictive value and the actual value. Conclusion: Math is taken into clinic, we can accurately estimate the change of volume of the cervical canal after Double-door laminoplasty by measuring the pre-imaging, and improve the accuracy of surgery and outcome of patient.

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RISK OF ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS) DIAGNOSIS AMONG PATIENTS EVALUATED IN A TERTIARY ORTHOPEDIC SETTING

David ROYE, Benjamin ROYE, Diana LEE, Gregory PACE, Hasani SWINDELL, Hiroko MATSUMOTO, Michael VITALE

Background: This study looks at ways to safely minimize imaging in AIS. We compared the risk of scoliosis in patients referred for evaluation in an urban, tertiary care center to identify low-yield referral sources where pre-exam radiography might be avoided. Methods: We collected retrospective demographic, clinical, and radiographic data for 2,360 patients between ages 9-18 years referred for evaluation of AIS between 1/2003 and 12/2013. 929 were excluded due to non-idiopathic etiology or pre-existing diagnosis. 895 were excluded due to unclear referral source, defined as whoever first noticed the curve. Scoliosis was defined as a Cobb angle >10°. Analysis revealed no difference in age, gender distribution, or diagnosis risk between the study group and those excluded. Results: Mean age at initial visit was 13±2 years. 66.8% were female. 94.5% received x-rays, but only 65.8% were diagnosed with AIS. Referrals were by a HCP in 83.2% of patients, by self in 9.9%, and by school screening in 6.9%. Risk of diagnosis did not differ significantly between patients referred by a HCP (67.5%), a school screening (75.0%) or by self-referral (76.6%). With self-referrals as a reference, school-referrals and HCP-referrals had risk ratios of 0.98 and 0.88, respectively ($p>0.05$). Conclusion: There was no significant difference in the risk of AIS diagnosis at the initial visit between referral groups. While 2 out of 3 referred patients were diagnosed with scoliosis, the 34% rate of negative pre-exam radiographs at initial evaluation is too high. Other risk stratifiers need to be identified.