



# SICOT

## e-Newsletter

### SICOT Exam Corner

#### Anatomy

*Prepared by Asif Parkar & Ahmed El-Bakoury*

- 1) The clavicle is the first bone in the body to ossify and last to fuse. Which of the following is true regarding the clavicle?**
  - a) Ossifies at five weeks of gestation and medial end fuses at 25 years of age
  - b) Ossifies at five weeks of gestation and lateral end fuses at 25 years of age
  - c) Ossifies at eight weeks of gestation and medial end fuses at 30 years of age
  - d) Ossifies at eight weeks of gestation and lateral end fuses at 30 years of age
  - e) Ossifies at birth and lateral end fuses at 30 years of age
  
- 2) The most common musculoskeletal birth injury is:**
  - a) Fracture of the skull
  - b) Fracture of the clavicle
  - c) Fracture of the proximal humerus
  - d) Shoulder dislocation
  - e) Knee dislocation
  
- 3) Posterior dislocations of the shoulder are more common than anterior dislocations after electrical shock and seizures because:**
  - a) Internal rotators are stronger than external rotators
  - b) External rotators are stronger than internal rotators
  - c) There is no difference in the strength of internal and external rotators
  - d) This is the result of an associated Bankart lesion
  - e) This is the result of associated Hillsachs lesion

- 4) Which of the following ligaments is important for superoanterior restraint in rotator cuff deficiencies and should be preserved during debridement of painful massive rotator cuff tears that cannot be surgically repaired?**
- a) Coracohumeral ligament
  - b) Superior glenohumeral ligament
  - c) Middle glenohumeral ligament
  - d) Inferior glenohumeral ligament
  - e) Coracoacromial ligament
- 5) The cords of the brachial plexus (posterior, medial and lateral) are named based on their anatomic relationship to which of the following structures?**
- a) Axillary artery
  - b) Axillary vein
  - c) Axillary nerve
  - d) Pectoralis major
  - e) Pectoralis minor
- 6) Deficiency of the lateral ulnar collateral ligament (LUCL) of the elbow results in which of the following?**
- a) Anterolateral rotatory instability
  - b) Posterolateral rotatory instability
  - c) Posteromedial instability
  - d) Anteromedial instability
  - e) LUCL is not an essential stabilizer of the elbow
- 7) Which of the following is primarily involved in tennis elbow?**
- a) APL
  - b) EPB
  - c) ECRB
  - d) ECRL
  - e) EPL
- 8) The last muscle to return to function after Posterior Interosseous Nerve (PIN) compression is the most distally innervated muscle which is:**
- a) APL
  - b) EPB
  - c) EIP
  - d) ECU
  - e) EDM

**9) Space of Poirier is a weak area within the palmar radiocarpal ligament and is associated with scapholunate dislocation. It is located:**

- a) Radial side of the palmar radiocarpal ligament
- b) Dorsal side of the palmar radiocarpal ligament
- c) Ulnar side of the palmar radiocarpal ligament
- d) Dorsal and ulnar side of the palmar radiocarpal ligament
- e) Dorsal in the centre of the palmar radiocarpal ligament

**10) The posterior interosseous nerve is contained within the floor of which dorsal compartment of the wrist?**

- a) 1<sup>st</sup>
- b) 2<sup>nd</sup>
- c) 3<sup>rd</sup>
- d) 4<sup>th</sup>
- e) 5<sup>th</sup>

**11) The major supply of the peroneal division of the sciatic nerve is through:**

- a) L4
- b) L5
- c) S1
- d) S2
- e) S3

**12) The main arterial blood supply of the femoral head comes from:**

- a) The ascending branch of the medial circumflex femoral artery
- b) The deep branch of the medial circumflex femoral artery
- c) The ascending branch of the lateral circumflex femoral artery
- d) The transverse branch of the lateral circumflex femoral artery
- e) The artery of ligamentum teres

**13) In the posterolateral approach to the ankle joint; the deep dissection is carried out between:**

- a) The fibula and the peroneus brevis
- b) The peroneus brevis and longus
- c) The peroneal tendons and the flexor hallucis longus
- d) The flexor hallucis longus and the flexor digitorum longus
- e) None of the above

**14) The strongest ligamentous stabiliser of the pelvic ring is:**

- a) Sacrospinous ligament
- b) Anterior sacroiliac ligament
- c) Sacrotuberous ligament
- d) Posterior sacroiliac ligament
- e) Interosseous sacroiliac ligament

**15) In Smith-Peterson approach to the hip, the superficial dissection is carried out between the following muscles:**

- a) The Sartorius and Pectineus
- b) The Sartorius and Tensor Fascia Lata
- c) The Tensor Fascia Lata and the Gluteus Medius
- d) The Rectus Femoris and the Gluteus Medius
- e) The Rectus Femoris and the Iliopsoas

**16) The nerve supply to the skin of the leg below the knee joint is predominantly by the branches of the sciatic nerve except:**

- a) The lateral aspect of the leg innervated by a branch from the femoral nerve
- b) The lateral aspect of the leg of the leg innervated by a branch of the obturator nerve
- c) The medial aspect of the leg innervated by a branch of the obturator nerve
- d) The medial aspect of the leg innervated by a branch of the femoral nerve
- e) The posterior aspect of the leg innervated by a branch of the femoral nerve

**17) The superior gluteal nerve originates from the following roots:**

- a) L1, L2 and L3
- b) L2, L3 and L4
- c) L3, L4 and L5
- d) L4, L5, S1
- e) L5, S1 and S2

**18) All the followings are true about the inferior gluteal artery except:**

- a) It exits the pelvis through the greater sciatic foramen
- b) It passes inferior to the Piriformis muscle
- c) It gives a branch to supply the sciatic nerve
- d) It originates from the posterior trunk of the internal iliac artery
- e) None of the above

**19) The main arterial blood supply of the body of the talus is by:**

- a) The medial calcaneal artery
- b) The anterior medial malleolar artery
- c) The medial tarsal arteries
- d) The first dorsal metatarsal artery
- e) The artery of the tarsal canal

**20) All the following statements are true about the knee menisci except:**

- a) The medial meniscus is attached to the medial collateral ligament
- b) The lateral meniscus is more mobile than the medial meniscus
- c) The anterior horn of the lateral meniscus lies anterior to that of the medial meniscus
- d) The lateral meniscus is connected to the popliteus tendon
- e) Both menisci are connected anteriorly by the transverse ligament of the knee

**Answers:**

- 1) Answer – a) Ossifies at five weeks of gestation and medial end fuses at 25 years. Clavicle is the first bone to ossify in the fifth week in utero and its medial end is the last physis to close in the body at about 20 to 25 years.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 145

- 2) Answer – b) Fracture of the clavicle. Clavicle fracture is a relatively common birth injury with an incidence of about 1 to 2%

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 145

- 3) Answer – a) Internal rotators are stronger than external rotator

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 147

- 4) Answer – e) Coracoacromial ligament. It is important to identify this ligament and avoid iatrogenic damage during arthroscopic debridement.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 146

- 5) Answer – a) Axillary artery

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 148

- 6) Answer – b) Posterolateral instability. LUCL injury results in posterolateral elbow instability.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 153

- 7) Answer – c) ECRB. The pathophysiology of tennis elbow also known as lateral epicondylitis shows micro tears of the origin of ERCB which is precipitated by repetitive wrist extension and forearm pronation.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 159

- 8) Answer – c) EIP. PIN innervates the supinator, extensor carpi ulnaris, extensor digitorum, extensor digiti minimi, abductor pollicis longus, extensor pollicis longus, extensor pollicis brevis and extensor indicis proprius (EIP) in that order. Therefore during regeneration EIP is the last muscle to return.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 161

- 9) Answer – a) Radial side. Space of Poirier is known as an anatomic defect or weak spot in the palmar radiocarpal ligament. This space expands in wrist dorsiflexion and closes down in palmar flexion. This leads to lunate dislocation in forced dorsiflexion.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 167

- 10) Answer – d) 4<sup>th</sup> Compartment. PIN is the continuation of the deep branch of the radial nerve. At the back of carpus it forms a gangliform enlargement to give multiple branches and passes in the floor of 4<sup>th</sup> compartment.

Reference: Miller Review of Orthopaedics, 6<sup>TH</sup> Edition, P 167

- 11) Answer: – b) L5. Because the major supply to the peroneal division of the sciatic nerve is the L5 root, it may be difficult to determine clinically whether the injury is to the nerve as it passes through the greater sciatic notch behind the hip joint or to the root in the clinical setting of pelvic and acetabular trauma.

Reference: Tile, Marvin, Helfet, David L., Kellam, James F. and Vrahas, Mark. (2015). Fractures of the Pelvis and Acetabulum Two Volume Set, 4e, 11.

- 12) Answer: – b) The deep branch of the medial circumflex femoral artery which crosses posterior to the tendon of obturator externus and anterior to the tendons of the superior gemellus, obturator internus, and the inferior gemellus. It perforates the capsule of the hip obliquely just cranial to the insertion of the tendon of the superior gemellus and distal to the tendon of piriformis where it divides into two to four terminal branches.

Reference: Gautier, E., Ganz, K., Krugel, N., Gill, T., & Ganz, R. (2000). Anatomy of the medial femoral circumflex artery and its surgical implications. *J Bone Joint Surg Br*, 82(5), 679-683.

13) Answer: – c) The peroneal tendons and the flexor hallucis longus. This approach utilises the inter-nervous plane between the tibial nerve (supplies the flexor hallucis longus muscle) and the superficial peroneal nerve (supplies the peroneal muscles).

Reference: Abdelgawad, A. A., Kadous, A., & Kanlic, E. (2011). Posterolateral approach for treatment of posterior malleolus fracture of the ankle. *J Foot Ankle Surg*, 50(5), 607-611. doi: 10.1053/j.jfas.2011.04.022.

14) Answer: – e) Interosseous sacroiliac ligament. The interosseous sacroiliac ligaments, the strongest in the body, unite the tuberosities of the ilium and sacrum, and confer stability on the posterior sacroiliac complex.

Reference: Tile, Marvin, Helfet, David L., Kellam, James F. and Vrahas, Mark. (2015). Fractures of the Pelvis and Acetabulum Two Volume Set, 4e, 11.

15) Answer: – b) The Sartorius and Tensor Fascia Lata. The Smith-Peterson “Hueter” approach is an anterior approach to the hip joint which utilises the inter-nervous plane between the superior gluteal and the femoral nerves. The Superficial inter nervous plane is between the Sartorius (Femoral nerve) and the Tensor Fascia Lata (Superior gluteal nerve) muscles. Then, more deeply the dissection is between the Rectus Femoris (Femoral nerve) and the Gluteus Medius (Superior gluteal nerve) muscles.

References:

- Hoppenfeld, S., De Boer, P. G., & Buckley, R. (2009). Surgical exposures in orthopaedics: the anatomic approach (4th ed. / Stanley Hoppenfeld, Piet de Boer, Richard Buckley. ed.). Philadelphia, Pa. ; London: Lippincott Williams & Wilkins.
- Rachbauer, F., Kain, M. S., & Leunig, M. (2009). The history of the anterior approach to the hip. *Orthop Clin North Am*, 40(3), 311-320. doi: 10.1016/j.ocl.2009.02.007.

16) Answer: – d) The medial aspect of the leg is innervated by a branch of the femoral nerve. The terminal branches of the sciatic nerve supply the skin of the leg below the knee except the medial aspect of the leg which is supplied by the saphenous nerve (branch of the femoral nerve)

Reference: Rigoard, P. a., Gondran, P. e., & Lahellec, P. e. *Atlas d'anatomie des membres : Nerfs périphériques*. English translation "ATLAS OF ANATOMY OF THE PERIPHERAL NERVES- The Nerves of the Limbs".

17) Answer: – d) L4, L5 and S1. The superior gluteal nerve is a branch of the lumbosacral plexus which originates from L4, L5 and S1. It exits the pelvis through the greater sciatic notch to supply the abductors and Tensor Fascia Lata muscles.

References: Tile, Marvin, Helfet, David L., Kellam, James F. and Vrahas, Mark. (2015). Fractures of the Pelvis and Acetabulum Two Volume Set, 4e, 11.

18) Answer: – d) It originates from the posterior trunk of the internal iliac artery. The inferior gluteal artery is a large terminal branch of the anterior trunk of the internal iliac artery. It passes between the anterior rami S1 and S2 or S2 and S3 of the sacral plexus and leaves the pelvic cavity through the greater sciatic foramen inferior to the piriformis muscle. It enters and contributes to the blood supply of the gluteal region and anastomoses with a network of vessels around the hip joint.

Reference: Drake, R. L., Vogl, W., & Mitchell, A. W. M. (2012). Gray's basic anatomy. Edinburgh: Churchill Livingstone.

19) Answer: – e) The artery of the tarsal canal. The talus is supplied by the 3 main arteries of the leg (peroneal, anterior and posterior tibial arteries). However, the main arterial blood supply to the body of the talus comes from the artery of the tarsal canal which is a branch of the posterior tibial artery.

Reference: Mulfinger, G. L., & Trueta, J. (1970). The blood supply of the talus. *J Bone Joint Surg Br*, 52(1), 160-167.

20) Answer: – c) The anterior horn of the lateral meniscus lies anterior to that of the medial meniscus. As the medial meniscus is C-shaped, the anterior horn of the medial meniscus is attached more anteriorly compared to that of the lateral meniscus. The medial meniscus is attached around its margin to the capsule of the joint and to the tibial collateral ligament, whereas the lateral meniscus is not attached to the capsule. Therefore, the lateral meniscus is more mobile than the medial meniscus. The menisci are interconnected anteriorly by a transverse ligament of the knee. The lateral meniscus is also connected to the tendon of the popliteus muscle, which passes superolaterally between this meniscus and the capsule to insert on the femur.

Reference: Drake, R. L., Vogl, W., & Mitchell, A. W. M. (2012). Gray's basic anatomy. Edinburgh: Churchill Livingstone.