Answers and Additional Information for the Orthopaedic Quiz

Quiz 1

A. Double posterior cruciate ligament (PCL) sign.
B. The double PCL sign is associated with bucket-handle tears of the medial meniscus that occur in the presence of an intact anterior cruciate ligament (ACL).
C. Another reason for this abnormal finding is the presence of a normal accessory meniscofemoral ligament that is known as the ligament of Humphrey. The presence of the oblique menisco-meniscal ligament.
D. If the bucket handle tear of the meniscus is stable after repair, repair of the meniscus followed by rehabilitation is possible. Otherwise, partial/ total meniscectomy should be performed.

Double PCL sign
The double PCL sign is associated with bucket-handle tears of the medial meniscus that occur in the presence of an intact anterior cruciate ligament (ACL). A bucket-handle tear is a longitudinal tear of the meniscus that results in a displaced but attached meniscal fragment. The fragment may become displaced into the notch between the PCL and the medial tibial eminence in the midline, with the fragment oriented parallel to the PCL. Since ligaments and menisci demonstrate a hypointense signal with all pulse sequences, the displaced fragment will mimic a second PCL that is anterior and inferior to the true ligament, hence the name "double PCL sign"

Quiz 2

A. The radiograph shows type 3 dislocation of the right acromioclavicular joint.
B. Non- surgical treatment – arm sling and NSAIDs.
C. Surgery may be indicated if the shoulder is still painful and there is still some functional loss at about 3-6 months after the injury.
D. Reconstruction of AC joint ligaments

Acromioclavicular dislocation
Acromioclavicular dislocations (separated shoulders) often occur in people who participate in sports such as football, soccer, horseback riding, hockey, parkour, combat sports, rowing, rugby, snowboarding, 'crack the whip', and wrestling. There are 6 classification types, with I through III increasing in severity, and IV through VI being the most severe. The most common mechanism of injury is a fall on the tip of the shoulder or a fall on an outstretched hand (FOOSH). In falls where the force is transmitted indirectly, often only the acromioclavicular ligament is affected, and the coracoclavicular ligaments remain unharmed.

AC dislocations are classified into 6 grades I- VI
Grade I is a sprain of the AC ligament
Grade II is tear of the AC ligament but the coracoclavicular (CC) ligament is only sprained (subluxation).
Grade III indicates AC separation and both acromioclavicular and coracoclavicular ligaments are torn. A significant bump is formed by the lateral end of the clavicle. This bump is permanent.
Grade IV to VI based on severity and separation gap of the dislocation
Management of acromioclavicular injuries;

Nonsurgical Treatment
Nonsurgical treatments, such as a sling, cold packs, and medications can often help manage the pain of acromioclavicular injuries. Sometimes, a doctor may use more extensive supports to decrease AC joint motion and decrease pain. Most people return to near full function with this injury, even if there is a persistent, significant deformity. Some people have continued pain in the area of the AC joint, even with only mild deformity.

This may be due to:
1. abnormal contact between the bone ends when the joint is in motion
2. development of arthritis
3. injury to a disk-like piece of cushioning cartilage that is often found between the bone ends of this joint It is often worthwhile to wait and see if reasonable function returns without surgical treatment.

Surgical Treatment
Surgery can be considered if pain persists or the deformity is severe. A surgeon might recommend trimming back the end of the collarbone so that it does not rub against the acromion. Where there is significant deformity, reconstructing the ligaments that attach to the underside of the collarbone is helpful. This type of surgery works well even if it is performed long after the problem started. Whether treated conservatively or with surgery, the shoulder will require rehabilitation to restore and rebuild motion, strength, and flexibility.

Quiz 3

A. Multiple and variable sized calcific joint bodies are present.
B. Synovial chondromatosis
C. Removal of the loose bodies is necessary to alleviate symptoms and prevent secondary joint changes. The importance of complete synovectomy has been debated as well. Synovectomy is more extensive than simple removal of loose bodies, and it may be associated with increased morbidity (e.g., arthrofibrosis).
D. Some authors report a higher recurrence rate with simple removal of loose bodies versus partial or complete synovectomy. Recurrence (0-31%) can consist of loss of range of motion (ROM), arthrofibrosis, arthritis, transition to synovial chondrosarcoma (rare, typically associated with multiple recurrences)

Synovial chondromatosis is a rare condition in which foci of cartilage develop in the synovial membrane of joints, bursae, or tendon sheaths as a result of metaplasia of the sub-synovial connective tissue. These ectopic foci of cartilage can result in painful joint effusions and, the generation of loose bodies leading to mechanical symptoms.

Discussion:
Patients report pain and limitation of motion;
Location:
- over one-half of cases occur in the knee, followed by the elbow;
- other common sites include the hip, shoulder, wrist and ankle;
- when located in the foot or ankle the term "soft tissue chondroma" may be used;
Classification:
- early: no loose bodies but active synovial disease;
- transitional: active synovial disease, and loose bodies;
- late: loose bodies but no synovial disease;

Quiz 4

A. Extensive bruising of the posterior medial aspect of thigh with obvious loss of muscle bulk.
B. Proximal avulsion of hamstring muscle.
C. Early diagnosis and intervention are important components of a positive outcome in this type of injury.
D. Early intervention with surgical repair is considered the treatment of choice for patients desiring a good outcome with functional return to activity.

Injuries of the hamstring muscle
Injury to the hamstring origin usually occurs when sudden forcible contraction of the hamstring muscles against resistance causes excessive eccentric overload, as in sporting activities such as gymnastics and sprinting. However, the nature of the injury to this area of the hamstring muscles and the adjacent skeleton depends on the skeletal maturity of the patient. The ischial apophysis, a secondary ossification centre, appears at puberty and does not fuse until the late teenage years or early twenties.

During this interval between the appearance of the apophysis and its fusion, a sudden forcible hamstring contraction may cause avulsion of the apophysis itself, at a time when the link between apophysis and bone is weaker than that between tendon and apophysis. After skeletal maturity has been reached, an avulsion is more likely to occur at the tendon–bone interface. In rare instances, a skeletally mature patient may avulse a significant fragment of ischium.

Quiz 5

A. Lateral subluxation and tilt of the patella.
B. Tilting of the patella. The lateral patellofemoral joint space is narrow with medial opening. Narrowing of the bones (patella and lateral trochlea) demonstrates hypercompression with thinned cartilage.
C. Lateral patella hypercompression (overload)
D. Patients with severe lateral hypercompression are in most cases not good candidates for conservative treatment and physical therapy. Surgery such as lateral retinacular release or lengthening is recommended to release the hypercompression.

Quiz 6

A. Localized cartilage destruction in the centre of trochlea.
B. Chondral damage in the centre of the trochlea along with presence of partially detached chondral flap.
C. Isolated damage to the central area of the trochlea occurs relatively late in a sports career. Arthroscopy consists of general inspection of the joint and washing out the effusion. A precise evaluation of the amount of cartilage is performed and the unstable chondral flaps are removed with care. To enhance chondral resurfacing, the microfracture technique is a common and successful procedure.
D. Protection of the immature clot by microfracture is the cornerstone of postoperative care. Avoidance of axial, torsional and shear stress to the defect is important. Non-weight bearing is required for 6 weeks postoperatively. The use of a brace is recommended to avoid the compression of the regenerating surfaces.