

Division of Sports and Arthroscopic Surgery,  
Department of Orthopaedics & Traumatology, HKU  
Clinical attachment: 13-17 May 2019

### 1. Biography

I am a fourth year medical student at The University of Hong Kong. As a competitive golfer myself, I understand how devastating injuries can be to an athlete, which have sparked my interest in sports medicine. To gain exposure in orthopaedics and to explore future career paths, I attended a one week clinical attachment at the Division of Sports and Arthroscopic Surgery. I have gained much insight into the scope of work and daily operations in this division, and had a lot of opportunities to examine patients. It was a very rewarding experience and has sparked my interest in orthopaedics.

### 2. Timetable of attachment

	Tues (14 May)	Wed (15 May)	Thurs (16 May)	Fri (17 May)
AM	Ward round Knee and hip clinic	Ward round Post-op clinic Conference	Operation	Ward round Case clerking
PM	Post-op clinic	Self study	Operation	Self study Report writing

### 3. Case summaries

#### Ward case – knee

Miss Chan, a 35 year old social worker and recreational swimmer once every 1-2 weeks, with a history of congenital mitral regurgitation, was admitted on 14 May 2019 for right patella dislocation for one day.

Miss Chan suffered an injury on activities of daily living on 14 May 2019, when she stepped down from a 30cm stool right leg first onto the ground. The mechanism of injury was indirect with the knee in valgus position. The patient heard a pop sound, noticed a lateral dislocation of the right patella, experienced severe pain and noted mild knee swelling. She was unable to walk and was admitted to the Accident & Emergency Department on the same day. She was given analgesics, sedated for closed reduction of the patella and put on a long leg back slab subsequently. There was no history of significant injury in the past.

One day after admission, Miss Chan reported that there was pain over the medial patella, which was mechanical in nature with a severity of 4/10. There was no rest pain or night pain. There was mild knee swelling.

Physical examination revealed that there were no quadriceps wasting bilaterally, but there was mild effusion over the right knee and tenderness over the medial patella and femoral medial epicondyle. The range of motion of the right knee was limited to 70° on active flexion and 80° on passive flexion due to pain. The J sign was negative bilaterally. The q angle was 18 on the right and 15 on the left, which was normal. The patellar glide test was 2 finger breadths medially and 1 finger breadths laterally on the right, and 1 finger breadths both medially and laterally on the left. Tests for collateral laxity and anterior and posterior cruciate ligaments were unremarkable. The Beighton score was 3. The rest of the physical examination was unremarkable.

A set of AP, lateral and skyline x-rays were taken for both knees after closed reduction. The patella was not dislocated and there were no fracture or fragments in the right patellofemoral joint. The alignment of the patella, femur and tibia were good and there were no anatomical abnormalities in the trochlear groove or patellofemoral joint. There was some lateral tilt of the patella observed in the skyline x-ray of the right knee. Further investigation by MRI was arranged.

Conservative treatment was planned for the patient, including applying a long leg cylinder cast for 3 weeks, followed by patella stabilizing orthosis for 3 weeks, then daytime brace for 3 weeks. Physiotherapy would also be necessary to strengthen muscles such as vastus medialis oblique to stabilize the patellofemoral joint.

#### OPD case - knee

Mr. Ng, a 19 year old student and competitive karate player as a member of the university team attended the outpatient clinic for follow-up of ACL reconstruction and medial meniscus repair of the left knee 1 year post-op.

He resumed karate training for 2 times per week since 9 months post-op, and complained of subjective mild instability during karate. However, he did not feel any instability when walking slopes or stairs, nor during running. There was no pain or swelling in the left knee and he did not experience further injury to the knee after the operation. There were no symptoms of locking. Assessment by the physiotherapists 2 weeks ago revealed laxity in the left anterior cruciate ligament.

On physical examination, there were no quadriceps wasting bilaterally. There was no swelling or erythema over the knee joint. On palpation, knee tenderness and effusion were absent. The Lachman test, anterior drawer test and pivot shift test were grade 2 on the left and grade 0 on the right. Posterior sag was absent bilaterally. Posterior drawer test, McMurray test, varus and valgus stress tests were negative bilaterally.

Given the symptoms of instability during karate playing, together with the progressive laxity demonstrated in the Lachman, anterior drawer and pivot shift tests as compared to the previous follow-up, the patient was advised to monitor his symptoms closely for any further instability and be cautious of further injuries, especially during karate. An MRI was booked to assess the integrity of the anterior cruciate ligament.

#### OPD case - shoulder

Miss Yeung, a 42 year old lifeguard presented to the outpatient clinic for follow-up 6 months after left shoulder arthroscopy and rotator cuff repair following a left shoulder injury on duty.

She reported mild rest pain, and pain that worsened on movement of the left arm. The pain severity reached 4/10 and she took analgesics as needed around 3 times per week. She had difficulties performing activities of daily living with her left arm. She was not able to perform combing, dressing, washing back with her left arm. Also, she could not lie lateral on the left side and could not perform overhead activities. There was gradual increase in range of movement of her left shoulder since the surgery although she still complained of marked weakness. As such, she was still on sick leave and could not return to work.

On physical examination, the range of motion of the left shoulder was limited to 110° active flexion, 150° passive flexion, 90° active abduction, 120° passive abduction due to pain. Internal rotation of the left shoulder measured by hand behind back was at L4. There were positive shoulder impingement signs including positive painful arc and Neer's test. There were also evidence of impaired supraspinatus and subscapularis function as the Jobs test, lift off test, bear hug and Napoleon test were all positive. Physical examination of the right shoulder was unremarkable.

The patient was advised to continue physiotherapy to increase range of motion of the left shoulder and improve muscle strength. She was also prescribed analgesics to be taken as needed and will be followed up 3 months later.

### OT Case 1 – knee

Mr. Lau, a 37 year old truck driver who was a recreational football player 1-2 times per week, was diagnosed with right anterior cruciate ligament reconstruction graft re-rupture. He received arthroscopic surgery on 16 May 2019.

Mr. Lau's history dated back to 7 years ago when he sustained an ACL rupture while playing football with subsequent ACL repair. He reported subjective laxity after the surgery but was able to return to playing football. He did not suffer from any injuries until one episode of injury on duty half a year ago. It was an indirect injury to the right knee. While getting out of the seat of the lorry which was 1m in height, he jumped and landed on his right feet. He heard a pop sound and noticed mild knee swelling and pain. The pain was anterior in location, mechanical in nature and there was no night pain. There were no symptoms of locking. He attended A&E the day after, the diagnosis of ACL graft re-rupture was made and surgery was subsequently arranged. Meanwhile, he was able to continue with activities of daily living and abstained from sports. He did not require any analgesics and did not receive further treatment including physiotherapy.

Intra-operatively, examination under anesthesia of the right knee revealed full range of motion, medial collateral laxity of 2° at 0° flexion, 5° at 20° flexion, absence of lateral collateral laxity, lachman test grade 2, anterior drawer test grade 1, pivot shift grade 2 and reversed pivot shift grade 2, which corresponded with the clinical picture of ACL rupture. Posterior sagging was absent. Diagnostic arthroscopy of the right knee revealed complete mid-substance graft re-rupture of the ACL, unstable full thickness chronic 15mm longitudinal tear over the posterior horn of the medial meniscus at the red zone, and grade 1-2 chondromalacia of articular cartilages at the knee joint.

During the operation, the ipsilateral bone-patella tendon-bone (BPTB) autograft for anterior cruciate ligament reconstruction and ipsilateral central one third of iliotibial band autograft for anterolateral ligament reconstruction were first harvested. Secondly, the right medial meniscus posterior horn tear was repaired by stitches. Thirdly, a femoral tunnel and tibial tunnel was created and the BPTB autograft was passed through the tunnels and fixed. Fourthly, a tibial tunnel for ALL reconstruction was created and the iliotibial band autograft was fixed. Finally, a drain was inserted, the wound was closed and circulation was checked.

On post-op day 1, Mr Lau was afebrile, with no epigastric discomfort, chest discomfort or shortness of breath. There was mild pain over the right knee. The right calf was swollen.

There was numbness below the knee on the right side, likely related to the tourniquet applied during surgery. On physical examination, the range of motion of the right knee was 0° on active flexion and 30° on passive flexion. Straight leg raising was achieved. There was no weakness in the tibialis anterior and peroneal muscles.

#### OT Case 2 - shoulder

Mr. Lee, a 71 year old right handed taxi driver who was inactive in sports, was diagnosed with displaced fracture of the left greater tuberosity and rotator cuff tear. He received left shoulder arthroscopic surgery to reduce and fix the fracture on 16 May 2019.

Mr. Lee was admitted on 9 May 2019 for left shoulder weakness for 1 month. He experienced an episode of direct injury to the left shoulder on 14 April 2019 during activities of daily living when he tripped and fell on his left shoulder which left his arm in an awkward position. It was the first time he experienced a left shoulder dislocation. He sought medical advice from a bone setter who performed reduction of the left shoulder, but no shoulder immobilization was prescribed.

At admission, he reported left shoulder pain with a severity of 2/10, which was lateral and posterior in location. The pain was mechanical in nature and there was no night pain. There was no numbness over the left shoulder. He had difficulties in performing activities of daily living with his left arm including mild limitation of combing, dressing, washing back and cleaning perineum, moderate difficulty in lying lateral on the left side, and inability to perform overhead activities. There were no difficulties in performing activities of daily living with his right arm.

Mr. Lee has hypertension and had a past medical history of stroke in 2004. He is a chronic smoker of half a pack per day and is a non-drinker.

On physical examination, there were supraspinatus and infraspinatus wasting on the left. Pseudoparalysis of the left shoulder was present. Active forward flexion, abduction and external rotation with arms on the left was 0°, but full range of motion was present on passive movement. Internal rotation measured by hand-behind-back was at T8 on both sides, which was normal. Range of motion was full on the right side. The muscle power of the deltoid was 1, supraspinatus (open can test) and infraspinatus (arm on side) was 0, subscapularis (lift off test) was 4. Drop arm sign, Popeye sign were positive. The anterior drawer test was grade 2 and anterior load & shift was grade 1. Anterior apprehension and relocation tests were positive. The rest of the physical examination was unremarkable.

X-ray taken at admission revealed loss of the left greater tuberosity. MRI taken before operation showed a recent anterior shoulder dislocation with a large Hill-Sachs lesion and contusion of anteroinferior glenoid labrum. There was also complete full thickness tear of the supraspinatus, and suspected partial tear of subscapularis tendon and long head of biceps.

Intra-operatively, diagnostic arthroscopy of the left shoulder revealed large Hill-Sachs lesion, partially healed fracture of the greater tuberosity, full thickness, full width tear of supraspinatus and infraspinatus, chronic partial thickness tear of subscapularis and spontaneous rupture of the long head of biceps. There was moderate synovitis and moderate bursitis with significant scarring in the subacromial space.

During the operation, the patient was positioned in a beach chair position at 60° with left shoulder positioned by “spider” positioner. The subscapularis tendon partial tear was first debrided. After entering the subacromial space, bursectomy was performed, the supraspinatus and infraspinatus tendon were released and the fracture site was debrided. Subsequently, the displaced fracture of the greater tuberosity was reduced and fixed with 4 titanium suture anchors. Finally, a subacromial catheter was inserted and the wounds were closed.

On post-op day 1, Mr Lee was afebrile, with no epigastric discomfort, chest discomfort or shortness of breath. He reported mild pain over the operation site and no numbness over both arms. On physical examination, there was no weakness in intrinsic muscles of the hand and no biceps weakness. Sensation on both arms were normal and symmetrical.

Chest x-ray, ECG and cardiac enzymes post-op were normal. However, post-op x-ray of the right shoulder revealed 3 of 4 suture anchors were displaced, which may be due to osteoporosis. Further revision surgery by reverse shoulder arthroplasty may be necessary to improve patient’s shoulder function and to allow him to carry out activities of daily living.

#### **4. Conference**

Theme: Management of hip in cerebral palsy

The case presented was a 7 year old boy with a complicated antenatal and postnatal history, first presenting to the Department of Orthopaedics at the age of 4 for spastic quadriplegia.

The patient was born prematurely at 27 weeks with a low birth weight of 1.04kg, and suffered from respiratory distress syndrome which required admission to. Subsequently, he developed complicated bacillus meningo-encephalitis at 2.5 months requiring ventriculoperitoneal shunt with further multiple revisions, and later diagnosed to suffer from cerebral palsy.

At presentation at the age of 4, the patient did not experience any hip pain and was able to sit with postural kyphosis. Physical examination revealed that the patient was GMFCS level 4, with increased tightness of the hamstrings and gastrocnemius. X-ray showed pelvic obliquity and a migration index of 76% on the right and 65% of the left. Night time abduction pillow and physiotherapy stretching was prescribed.

On follow-up at the age of 5, there was no hip pain and the patient was able to sit. However, x-ray showed that the hip migration index worsened to 94% on the right and 76% on the left. Since the patient was asymptomatic, the parents decided against surgery and conservative treatment was continued.

At the age of 6, the child was no longer able to sit unsupported. X-ray showed further progression of hip dislocation and presence of leg length discrepancy. With the aim of improving sitting ability and preventing further hip pain, dislocation and deformity, a staged surgery involving right open hip reduction and pelvic Dega osteotomy, followed by left side operation was performed.

In summary, this conference demonstrated the role of orthopaedics in the management of hip complications in cerebral palsy patients and the various modalities of management. In cerebral palsy, hip subluxation and dislocation may arise due to hip dysplasia and muscle

imbalances across the hip joint. Bi-articular muscles including hamstrings and gastrocnemius are commonly more affected in cerebral palsy. The risk of hip dislocation is inversely correlated with GMFCS level, and literature shows that hip migration index >60% are unlikely to respond to conservative surgery would require early preventive surgery.

In terms of management, treatment goals and modality depend on patients' age of presentation and GMFCS level. For example, the goal of treatment for patients presenting with GMFCS level 1-3 would be to preserve walking ability, while those presenting with GMFCS level 4-5 would be to improve sitting posture and reduce complications from hip dislocation such as nursing problems arising from limitation of hip abduction, hip pain, pressure sores and scoliosis. Surgical options include tenotomy for soft tissue release, bone osteotomies for joint reduction and reconstruction, total hip arthroplasty and salvage surgeries such as proximal femoral resection, valgus osteotomy of the proximal end of femur and hip arthrodesis.

## **5. Summary**

Overall, it was a very rewarding week and I have gained much knowledge, clinical skills and exposure to the field of orthopaedics and sports medicine. I have learnt how to take history for patients presenting with acute and chronic injuries, and perform a detailed physical examination of the shoulder and knee, including the special tests for each muscle in the rotator cuff. I was also more familiar with the anatomy of the shoulder and knee joint through looking at the radiographs under the guidance of Dr Thomas Leung and Dr Gabriel Leung. In particular, the patellofemoral joint and patella dislocation was an entirely new topic to me and I was fortunate to be able to encounter a patient in the ward with such a condition to facilitate my learning. Through observing operations and seeing those patients the next day, I have learnt much about post-op care of patients and what complications to look out for. I found the topic of management of hip complications in cerebral palsy presented at the conference on Wednesday to be very interesting and was a good opportunity for me to learn about orthopaedic conditions outside the division of arthroscopy. All in all, I enjoyed this week thoroughly and look forward to learning more about orthopaedics in the future.

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