



MULTI-FRAGMENT HOFFAS FRACTURE WITH IRREDUCIBLE POSTERIOR DISLOCATION KNEE A CASE REPORT.

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Abstract : Coronal plane fracture of femoral condyle is a rare injury, of which both condyle involvement in coronal plane in adolescent has been reported only once . We are reporting a case of polytrauma where both femoral condyles were fractured in coronal plane with knee dislocation ,which was managed by open reduction and internal fixation.

Keyword : Hoffas fracture. Knee dislocation. Epiphyseal injury. Neglected knee injury. Surgical fixation of Hoffas fragment. Multi fragment fractures.

A 17 year old boy presented to us with injury right wrist and knee sustained 6weeks ago. He was a pillion rider in a two wheeler collided head on with another two wheeler and it was managed with applying mid tibial skeletal action elsewhere for the knee and 'k' wire fixation for the forearm.



fig.1 clinical knee dislocation



On examination of the knee revealed posterior sagging of knee joint with fixed flexion deformity of knee around 45%. Skin over the knee was intact. There was no vascular deficiency distally. (fig.1). Xray and MRI revealed coronal fractures of distal femur – Type 4 epiphyseal injury medial femoral condyle, Type 3 epiphyseal injury of lateral femoral condyle and posterior subluxation of knee joint.(fig.2)

fig.2. pre-op x-ray

We decided to do open reduction and internal fixation to obtain congruous articular surface of femoral condyle and a stable knee. Surgical procedure: Through midline vertical incision and through medial parapatellar arthrotomy distal femur was exposed. Medial femoral condyle was found fractured in coronal plane in two places. One fragment malunited with the shaft without much articular incongruity. Posterior fragment of medial femoral condyle was found displaced postero superiorly(fig.3).

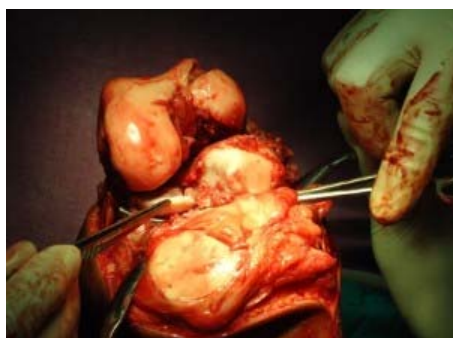


fig.3



Lateral femoral condyle articular surface was very small and hence it was excised. Intra articular fibrous tissues were cleared. Displaced medial femoral condyle fragment was released knee joint reduced and condylar fragment initially stabilised with 'k' wires. Fixation done with two 7mm cannulated cancellous screws and counter sunk. Though the knee joint was reduced it was found unstable. Hence a 3mm 'k' wire was passed across the joint to stabilise the joint (fig.4). After securing the haemostasis wound was closed.

fig.4

An above knee POP slab was given. immediate post operative picture. A 4 weeks follow up 'k' wire was removed and knee was found stiff and stable.



fig.5.follow-up knee flexion

fig.6.follow-up knee extension

DISCUSSION: The so-called Hoffa's fracture refers to an isolated, coronally-oriented fracture of either femoral condyle, with intra-articular extension². This rare injury corresponds to the orthopedic trauma association type 33-B3 fracture (frontal, partial articular fracture of the distal femur)³. These injuries have previously been classified. Type 1 fractures extend from an extraarticular location at the junction of the posterior femoral shaft and the proximal aspect of the femoral condyle superiorly to the posterior aspect of the condylar articular surface inferiorly, such that the popliteus tendon insertion and the lateral head of gastrocnemius origin remain attached to the condylar fragment. The anterior cruciate and lateral ligament insertions may be attached to either the condylar or shaft fragment. Type 2 originate posterior to the posterior femoral shaft-condylar junction, and are therefore potentially entirely intra-articular. Compared to type 1 fractures, the aforementioned ligamentous insertions are less likely to be attached to the condylar fragment. Type 3 fractures all of the ligamentous insertions remain attached to the condylar fragment. The mechanism of injury of this fracture pattern is controversial. A fall from a height appears to be the most common scenario^{2,3,4}. Some authors have postulated direct impact with the knee in a flexed position as the mechanism of injury, while others have attributed the fracture to simultaneous vertical shear and twisting forces. Lewis² proposed that direct impaction leading to axial loading force to the femoral condyle with the knee in 90° or more of flexion possibly with an element of abduction results in typical Hoffa's fracture. The normal riding posture of the motor cyclist involves sitting with the knee flexed at or beyond 90°. In our patient the exact mode of injury was that the patient was riding a motorbike when he got an axial collision with another vehicle

. Medial impact directly to the medial femoral condyle with the knee in more than 90° flexion, with an element of adduction and internal rotation has led to medial Hoffa's fracture. Both medial and lateral condyle involvement has also been previously reported^{2,3,5} in adults, but only once before the closure of epiphysis. In one case, the avulsed patellar tendon became incarcerated between the fragments of a Hoffa fracture of the lateral femoral condyle, precluding closed reduction⁶. Coronal fractures of the femoral condyle (Hoffa's fractures) are uncommon injuries that have a better outcome when treated surgically. Posterior fracture dislocation of the knee is rare as compared to anterior fracture dislocation^{7,8,9}. Posterior dislocation may be complete or incomplete. The incidence of neurovascular damage associated with acute fracture dislocation of the knee is very high. Incidence of vascular damage (i.e. to popliteal artery) can range from as low as 10% to 40%.^{10,11}

The treatment of Hoffa's fracture is similar to that of any intra articular fracture. Open reduction is mandatory for good long-term function. The articular surface is exposed through a medial or a lateral approach, depending on which condyle is involved. Anatomic reduction of joint is essential and temporary fixation with k-wire is followed by permanent fixation with interfragmentary lag screws of size either 6.5 mm partially threaded cancellous screws^{2,5}. A minimum of two screws is mandatory to provide rotational stability. Insertion of screws through articular cartilage is necessary to achieve the lag effect and should be placed as far laterally as possible, while it should be medial for medial Hoffa's fracture. Following surgery,

full knee range of motion is encouraged, but weight bearing must of course be delayed until fracture union occurs (up to 12 weeks in most cases). But in our case ROM exercise could not be started immediately as the case presented to us after a delay of 6 weeks and the need for extensive release to achieve reduction which necessitated the transarticular K wire fixation and immobilization. Since these fractures do not heal by formation of much external callus and vascularity of these fractures is impaired because of large bone surface covered with articular cartilage, delayed union, nonunion or avascular necrosis are not unexpected complications of these fractures.

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