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A rare case of Non-Union Lateral condyle Hoffa fracture- Case report

Dr. M. Pardhasaradhi M.S. Ortho, Dr. B. Soyal Rao M.S. Ortho,
Dr. P.G. Abhishek M.B.B.S. (junior resident of orthopaedics)
Department of Orthopaedics, S.V. Medical College, Tirupati, Andhra Pradesh, India.

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I. INTRODUCTION –

Isolated Hoffa fracture is uncommon and is often seen in younger age group following a high energy trauma. Isolated unicondylar fracture of femur consists of about 0.65% of all distal femur fractures of which Hoffa's fracture constitutes a small portion.(1) Out of which non-union of a Hoffa's fracture is even rare.

Letenneur et al. proposed classification for Hoffa fracture which consists of 3 types – Type 1, where fracture line is parallel to posterior cortex of femur and involve entire condyle; Type 2, where fracture horizontal to base of posterior condyle with fracture line located posterior to attachment point of lateral collateral ligament; Type 3, which is oblique fracture o f femoral condyle with fracture line located anterior to joint capsule, Anterior cruciate ligament, lateral collateral ligament, popliteal tendon and lateral head of gastrocnemius.(2)

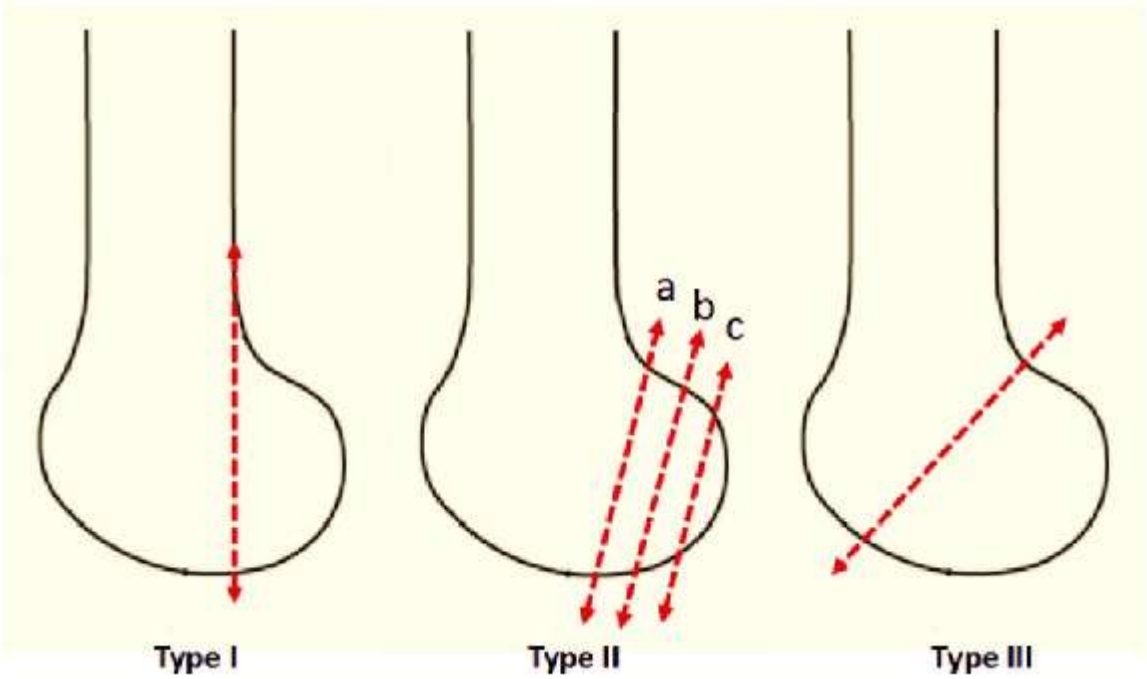

Figure 1 - Letenneur classification of Hoffa fracture. The dotted lines represent fracture lines. In Type II fracture, the dotted lines are horizontal to the base of the posterior condyle. For fractures located posterior to dotted line a, the popliteal tendon or gastrocnemius muscle attached to the fragment. For those located posterior to dotted line b, only a part of popliteal tendon or gastrocnemius muscle attached to the fragment. There is no soft tissue attachment to the fracture fragments located posterior to dotted line c.

Letenneur Type 1 and 3 Hoffa fractures have good prognosis due to soft tissue attachment to the fragment and adequate blood supply, whereas Type 2 fractures are at high risk of non healing or delayed healing because of poor adhesions and poor blood supply.

The lateral aspect of knee mainly consists of following structures i.e. Iliotibial band, Fibular

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collateral ligament, Popliteus tendon along with popliteofibular ligament.

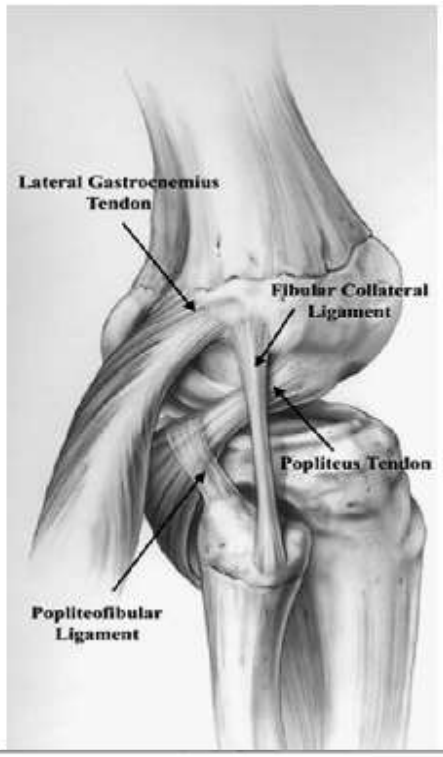

Figure 2 : The primary posterolateral corner static stabilizers include the fibular collateral ligament, popliteofibular ligament, and popliteus tendon

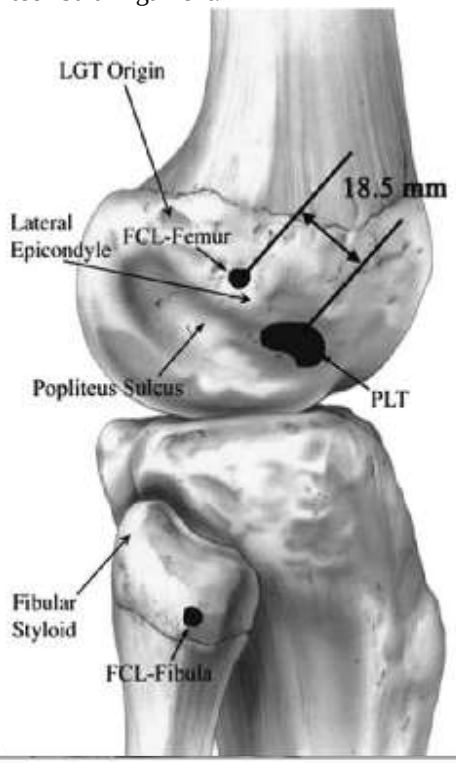

Figure 3 : An illustration of the attachment locations of the fibular collateral ligament (FCL), popliteofibular ligament (PFL), and popliteus tendon (PLT) attachment sites. LGT indicates lateral gastrocnemius tendon

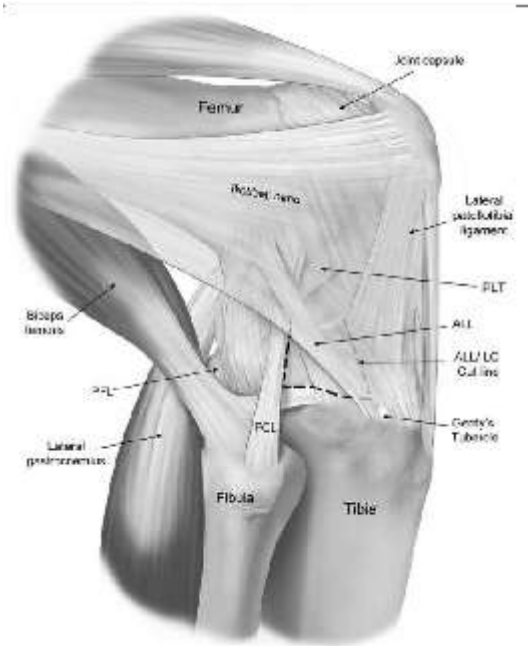

Figure 4 : Lateral view of a right knee illustrating the anterolateral corner structures. anterolateral ligament and

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lateral capsule (ALL/LC). PLT – Popliteal tendon. PFL – Popliteal fibular Ligament. FCL – Fibular collateral ligament

Missing of Hoffa fracture is often seen due to its rarity and limitation of routine radiographs. And as it is shear fracture, surgical fixation would be a better option of management. To our best of knowledge, 19 cases have been reported of which 11 case reports and 1 case series which were fixed in different ways using screws, plates and their combinations whereas some even opted Total Knee Replacement. In view of different treatment plans and low level of evidence establishing definitive treatment we are hereby to share our experience and surgical technique for management of Letenneur -2C type Lateral Condyle of Hoffa's Non-Union.(2)

II. CASE PRESENTATION

A 20 year old male came to our Outpatient with complaints of pain and swelling of Right knee since 1 year 6 months. Patient had history of Road traffic accident one and half year back for which He was diagnosed with Lateral condyle fracture of Femur after reviewing the radiolographs and treated conservatively with an above-knee slab for 2 months followed by rehabilitation at some local hospital. From then patient the above complaints. On Examination, prominent bony swelling of 3*3cm present at 0 to 50 degrees of flexion at the lateral aspect of knee whereas swelling was prominent from 60 to 120 degree of flexion at anterolateral aspect of knee just lateral to patella with a snapping motion. No sgns of knee instability was observed. Because of the persistent knee pain patient presented to our centre.

Figure 5 – Clinical image of Swelling over lateral aspect of knee in flexion and extension of knee.

The routine Anteroposterior and lateral views of the Right knee joint and also Computed Tomography of Right knee joint were taken indicating non union lateral condyle Hoffa fracture.

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Figure 6 – X ray of Right knee showing Non union of Lateral condyle Hoffa fracture.

Figure 7 – Axial, Saggital, Coronal and 3D reconstruction of CT knee showing Non union of Lateral condyle Hoffa of Femur.

Surgical Technique

Patient was placed in lateral decubitus position and through lateral approach around 7cm incision was given centered over lateral epicondyle, just posterior to and in line with head of fibula was given. The Iliotibial band (ITB) was incised along the line and retracted exposing the breech in capsule with the fracture ends visible. Then LCL (lateral collateral ligament) complex was retracted anteriorly and obliquely running popliteus inferiorly. The ununited lateral conyle Hoffa fragment was totally exposed and the

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capsuloligamentous structures present medially to the fracture fragment was undisturbed.

The fracture end were curetted and freshened and reduction was achieved and held with help of K- wires.

Then an inverted precontoured 4.5mm 'T' plate was placed over the distal Femur and fixed with 2 screws proximally and 2 screws distally. A 6.5 mm Cannulated cancellous screw was passed through the k- wire which was placed for reduction and k- wire removed. Soft tissue closure done in layers and skin suturing done.

Post Operative care

Primary dressing was done on second post operative day without any discharge. Range of Motion exercises were started from 2 nd postoperative day. Suture removal was done on 10 th post operative day. The patient was advised non-weight bearing and mobilisation exercises for 6 weeks. After that partial weight bearing was applied and gradually made to full weight beaing by 12 weeks. At the last followup i.e. 6 months after the surgery, the patient had a Knee society score (KSS) of 90 with range of motion 0° to 97° and the knee is stable and was able to walk and climb stairs with mild and occasional pain.

INTRA OP

IMMEDIATE POST OP

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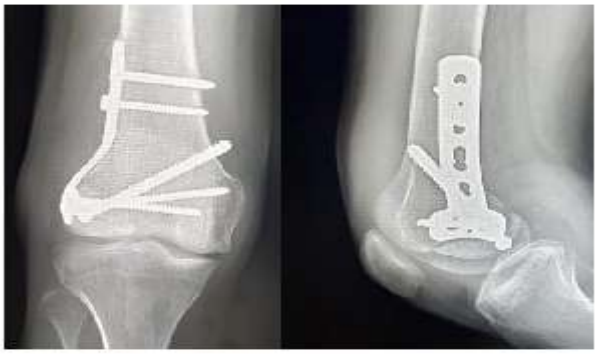
4 WEEK POST OP

6 MONTH POST OP



III. DISCUSSION

Hoffa fracture is often missed on standard radiographs of knee i.e Anteroposterior and lateral views. So, CT knee is recommended to properly identify and classify the Hoffa fracture. Letenneur type 2 is more prone for non-union as it is completely free in the joint without any soft tissue attachments and is to be fixed surgically. In present case, the Hoffa fracture which is Letenneur type 2 was treated conservatively previously owing to non-union of the fracture fragment. In this case, the fracture ends needs to be freshened and fixed with screws which should be anteriorly and medially directed.

In a study by Ajay Pal Singh et. Al the Hoffa fragment was fixed with CC screws and an inverted T plate after freshening the ends showing the range of motion between 6° to 96° in a 5-month-old fracture non-union in a 32year male. (3) Our case has also shown almost same range of motion.

In this case, the fracture to be exposed clearly and for proper access for the placement of compression screws, lateral approach had been a better option which helps in visualising the entire fragment clearly and give access to place the CC screws. Similarly in the study by Orapriyakul et. Al. and Lewis et. Al. lateral approach is recommended to go around the collateral ligament and allow placement of screws.

In this case, union was enhanced by freshening of the ends and placement of compression lag screw of 6.5mm in anteromedial direction which is perpendicular to the fracture direction and then enhancing the stability by fixing the fragment to proximal part of femur with 'T' plate.

After 8 months post operative period, the patient was advised for implant removal. The patient had range of motion of upto 97° and with KSS being 90 with no functional problems. Application of multiple Herbert screws in the same direction would have increased the range of motion as seen in studies by Soni et al. and Chouhan et al. Further comparative studies on various treatment options of Non-Union Lateral condyle Hoffa fracture of Femur is to be looked into such as Multiple Herbert screw fixation, fixation with CC screws, Fixation with both CC screws and plates and Total Knee arthroplasty for standardising the treatment for Non-Union Lateral Condyle Hoffa fracture of Femur especially Type 2 Letenneur. (2)

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