

Approach to Manage Post-traumatic Revision Anterior Cruciate Ligament Reconstruction Associated with a Hoffa Fracture of the Medial Femoral Condyle: A Case Report

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Abstract:

We present our experience of managing a case of revision anterior cruciate ligament (ACL) reconstruction associated with a Hoffa fracture involving the medial femoral condyle (MFC). A 37-year-old male patient was referred to our hospital following a road traffic accident. The patient had a history of ACL reconstruction surgery done in the same 6 years previously in our hospital. Preoperative radiology suggested a Hoffa fracture involving the MFC. An magnetic resonance imaging suggested a full thickness tear of the reconstructed ACL and partial thickness tears of both the PCL and MCL. This case was managed with arthroscopic reconstruction of the ACL with an ipsilateral peroneus longus autograft and fixation of the femoral condyle by a paramedial approach with cannulated cancellous screws.

Keywords: anterior cruciate ligament, Hoffa fracture, medial femoral condyle, injury, revision ACL reconstruction

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Introduction

Hoffa fracture involves femoral condylar fracture in the coronal plane. Most commonly Hoffa fractures are the result of a high-velocity trauma and are more common in the lateral femoral condyle (LFC) than the medial femoral condyle (MFC).¹ A Hoffa fracture in association with an ipsilateral complete ACL tear, along with partial tears of the posterior cruciate ligament (PCL) and medial collateral ligament (MCL), is of rare occurrence. We share our experience of managing a case of a Hoffa fracture involving the MFC with an ipsilateral complete tear of the ACL along with partial tears of the PCL and MCL.²⁻⁴

Case report

A 37-year-old male patient with a left knee injury was referred to our hospital 10 days following a road traffic accident. The patient had history of ACL reconstruction surgery done with bio-absorbable interference screw used for aperture fixation of both the femoral and tibial ends of a hamstring auto graft in the same knee in our hospital 6 years previously. The physical examination found swelling and tenderness over the right side MFC. Anterior drawer, posterior drawer, valgus stress and Lachman tests were positive. A plain radiograph of the left knee revealed a Hoffa fracture of the MFC. Magnetic resonance imaging (MRI) further confirmed a complete tear of the ACL along with partial tears of the PCL and MCL. The patient was taken up for surgery 4 days following admission. The old incision scars were used for portal placement. Diagnostic arthroscopy was done and revealed intact menisci and minimal tears of the PCL and MCL, a small Hoffa fragment & minimal cartilage defects. For the previous surgery an ipsilateral hamstring auto graft had been used, so this time we decided to use ipsilateral peroneus longus auto graft. A 9*75 mm graft was prepared. Removal of the torn ACL graft remnants and thorough debridement of the debris and fibrosed tissues was conducted. The femoral tunnel view revealed a fully integrated bio-screw remnant with no

features of tunnel widening. So we decided to use the same tunnel for graft fixation instead of creating a new one. After drilling over the bio-screw the tunnel was refreshed and the graft was passed with the help of a tight rope and fixed by suspensory fixation with an endobutton. The tibial side was fixed with a 10 mm bio-absorbable interference screw and augmented with the previously used suture post. After ACL reconstruction, the fracture site was opened with a medial para-patellar approach and fixed with two 4 mm cannulated cancellous screws.

Post-operatively, static quadriceps exercise were encouraged from day 1. After removal of the drain on day 2, supervised knee-bending exercises were advised. Non-weight bearing mobilization with walker was encouraged for 21 days with active static quadriceps, knee bending, and straight leg raise test exercises in between. Partial weight bearing with a walker was allowed after 3 weeks and after 6 weeks full weight bearing was advised. The patient regained flexion of 0–125 degrees and there were no complaints of instability or pain at the final follow-up (Figures 1 and 2).

Discussion

Conservative management of a Hoffa fracture often results in poor outcomes because of non-union or malunion.^{5,6} The current recommendation is to perform fracture fixation combined with early range of motion exercises for better results in the long run.⁷ An association of a Hoffa fracture of the MFC with a complete tear of a reconstructed ACL is very uncommon.

Vap et al, from Norway reported in a registry-based study that trauma was by far the most common cause of revision after primary ACL reconstruction, with the most common cause of revision being trauma.⁹ There are very few reported cases of bony injury with ligament tear. Baljit Singh et al. reported 2 cases of Hoffa fracture associated with an avulsion fracture of the cruciate ligaments in the year 2014.¹⁰

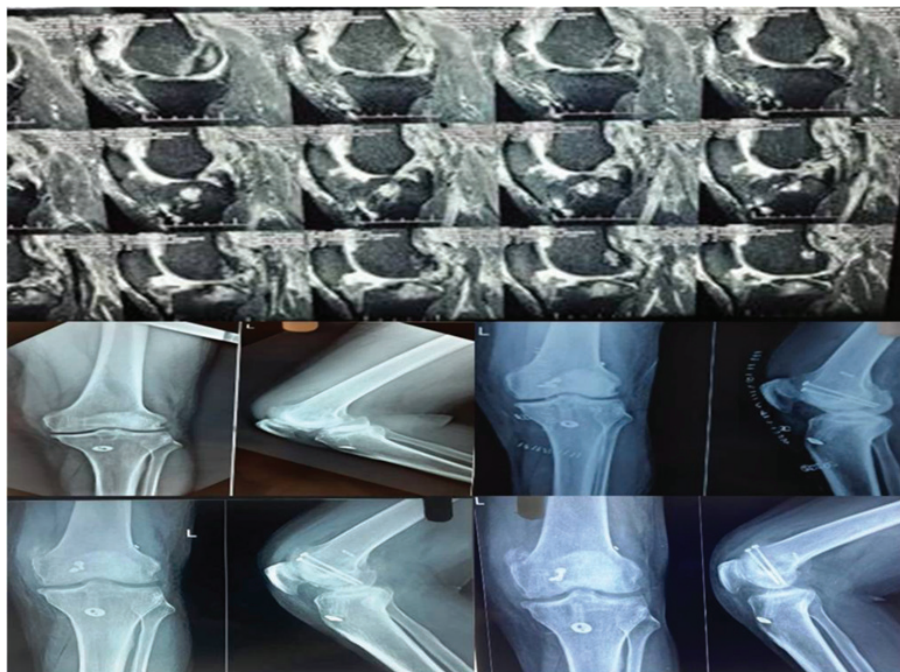


Figure 1 Radiography pre- and post-operative



Figure 2 Follow up clinical pictures

Our dilemmas in this case were:

- 1 stage vs 2 stage procedure
- Graft choice
- All-inside vs transportal approach
- Post-operative rehabilitation protocol
- Duration of non-weight bearing
- Tunnel widening
- Risk of Arthrofibrosis

At the ISAKOS 2011 symposium, Speaker preferred techniques were reported as follows –

- One stage whenever possible
- Single bundle “anatomic” reconstruction
- Retention of hardware whenever possible⁸

So, we decided to carry out a single stage operation with reapplication of the suture post for additional stability of the fixation. The usual post-operative protocols were followed and the intra and post-op periods were uneventful.

Conclusion

An ACL injury with a bony fracture is quite unusual. Simultaneous fracture fixation with ACL reconstruction is a good option with favourable results in good hands.

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