



A Rare Variant of Open Patella Fracture Treated with Medial Facetectomy

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Abstract

Patella fractures are relatively uncommon, constituting about 0.5-1.5% of all skeletal fractures. Out of this, vertical Patella fractures make upto 12-17% with open Patella fractures representing 6-30% and the comminuted fractures aggregate to 30-35%. Aim of this case report was to present a unique coalition of these three conditions with 360° articular rotation in one patient as well as treatment modality and successful outcome. A 30 years old female presented to Emergency department with Open injury to Left Knee, Gustilo and Anderson Grade IIIA following motorcycle accident. The X-ray investigation was suggestive of central longitudinal split in Patella with comminuted Medial half and intact Lateral half was rotated 360°. The patient was treated with emergency wound debridement, Medial facetectomy and subsequent suturing of Quadriceps tendon and Medial Retinaculum to remnant Patella resulting in a normal Patellar tracking. With a stable knee, the patient had good range of motion and no extension lag by end of 3 months.

Keywords: Open Patella Fracture; Longitudinal Split; Comminuted; Medial Facetectomy; 360° Articular Rotation

Introduction

Patella fractures are relatively uncommon with 0.5-1.5% of all bony injuries and seen more frequently in men than women [1]. The AO (Arbeitsgemeinschaft für Osteosynthesefragen) - ASIF (Association for the Study of Internal Fixation) has advocated a classification for Patella fractures based on principles of classification of long bone fractures, which primarily divides it into Extra-articular, Partial-articular and Complete articular [2]. These are further classified as avulsion, vertical, transverse and complex [2]. But the fracture pattern described in this case report eludes this classification. The most common fracture pattern presentation in Patella is that of transverse type corresponding to 50-80%, followed by comminuted 30-35% and then vertical 12-17% with open Patella fractures constituting 6-30% [1]. The purpose of this study was to report an uncommon presentation of Patella fracture, i.e., an open

injury with central longitudinal split in addition to comminuted Medial half and complete 360° articular rotation of Lateral half of Patella. The modality of treatment chosen; Medial facetectomy and soft-tissue debridement on urgent basis helped in significantly improving the prognosis and implementing proper suturing technique to reattach the severed Quadriceps tendon to the Lateral half provided a stable knee with gradual knee mobilisation that resulted in good range of motion with no extension lag.

Case Report

A 30 years old female, previously healthy sustained injury to her Left knee following a road traffic accident on a Motorbike (pillion passenger). She presented to the hospital with complaints of severe pain and bleeding in her Left knee along with inability to bear weight on her left leg. On initial examination, an approxi-

mately 11cm wound, bone deep was noted on anterior aspect of knee with restricted movement in the knee. The wound was grossly contaminated with exposition of soft tissues and a fractured Patella. No neurovascular injury was observed and the injury was classified to Gustilo and Anderson Grade IIIA type of Open injury. Superficial abrasions with no clinical importance were also noted in other parts of body. After initial examination, primary wound care in the form of superficial debridement under the cover of anti-tetanus and intravenous antibiotic prophylaxis with cefazolin, gentamicin and metronidazole and analgesics was performed in the Emergency Department and patient was shifted for Radiological investigation. The radiology confirmed a vertical split fracture of Patella with a comminuted Medial facet and remainder half with its articular surface rotated 360 ° (Figure A). The patient was posted for Emergency surgery. The margins of wound were extended, and an adequate debridement with the removal of gross contamination like dirt, specs of paint and necrotic tissue was done and a Medial facetectomy performed with enucleation of loose bony fragments. The debridement was supplemented with 10L of 0.9% physiologic solution. The articular cartilage of Lateral facet was intact with no damage and was rotated back into position (Figure B). Majority of the Patellar Tendon was intact. The Medial half of the Extensor mechanism (Figure C) was debrided with utmost care to preserve as much soft tissue as possible. It was restored to Lateral half of patella by drilling holes with help of a 2.5mm K-wire and Ethibond Number 5 sutures were passed through them and securely anchored to the Medial Extensor mechanism. No Lateral release was done for balancing of forces as there was no Patellar tilt present, intra-operatively. All efforts were taken to reattach some of the frayed fragments of Patellar tendon on to the remnant Patella. Stability of the construct was confirmed by surgeon with tracking of the Patella under direct vision. Primary closure of wound was performed intra-operatively and a drain was used (Figures D-F). Post-Operatively, the patient's knee was immobilized in a long knee brace and was allowed Partial weight bearing with support for 4 weeks. The patient was also encouraged to do frequent Static Quadriceps exercise with Ankle-Toe movements. Patient's in-hospital stay was for 5 days and was kept on same intravenous antibiotics for that period. The drain was removed on second day post-surgery and patient was discharged on oral antibiotics. The wound healed by primary intention with no signs of infection. At end of 4 weeks, passive gradual knee mobilization was started with strengthening of

surrounding muscles. By 6 weeks, patient was allowed to start Full weight bearing and started with assisted active knee mobilization. At the end of 3 months, the patient had good range of motion (110° Flexion) in Left knee with no instability and no extension lag. The patient was full weight bearing without support and was able to return to her daily life activities. (Figures G and H)



Figure A: Radiograph Left Knee Anteroposterior and Lateral View following injury. Note the comminuted medial half of patella and lateral half rotated 360°.



Figure B: Intra-operative picture of the Lateral facet of Patella. Note the articular surface as it is rotated 360° outwards.



Figure C: Intra-operative picture of medial half of the Extensor Mechanism before being sutured to lateral half of patella.



Figure E: Immediate Post-Operative, Lateral Radiograph of Left Knee with drain in-situ. The Lateral facet can be seen at correct height.



Figure D: Immediate Post-Operative, Anteroposterior Radiograph of Left Knee with drain in-situ. Note the central position of Lateral facet in trochlea.



Figure F: 3 Months Post-Operative Axial Radiograph of Left Knee with Lateral facet of patella in position within the trochlea.

Discussion

High energy trauma is mainly responsible for Patella fractures, open and closed both. With direct trauma being the main mechanism, comminution is a common feature [1]. To the best of our knowledge this is an atypical presentation with a Grade IIIA open injury, a vertical fracture, comminution of Medial facet and 360° rotation of Lateral facet as these conditions are usually seen in separate cases.

Open Patella fractures require surgical intervention but surgical technique to be performed depends on fracture classification and physical findings [3]. Due to excessive comminution and difficulty in achieving a good articular reduction, we opted for a salvage procedure in form of Medial Facetectomy. The larger Lateral fragment was preserved for benefit of optimal functioning of the Extensor mechanism. This technique was a modification on conventionally described Partial Patellectomy [3].

Conclusion

Open Patella fractures show higher infection rate of 10.7% in comparison to 3% for closed fractures [1] and immediate intervention in this case benefited infection prevention. The disruption of Medial retinaculum can lead to Lateral subluxation of Patella [3]. But the good functional outcome in this case was multifactorial including urgent and thorough debridement, no associated fractures, young age of patient, meticulous handling of soft tissues and sturdy repair of damaged Extensor mechanism combined with regular and persistent rehabilitation protocol. An exhaustive debridement of the wound with systematic approach to handling of soft tissues and Extensor mechanism - its in-depth repair gave a stable construct overall with minimal post-operative functional limitations.

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