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Original Research Article

Difficult, Different, Unusual Fixation of Comminuted Fracture Inferior Pole Patella with Pinless Tension Band Technique - Will it Work?

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Abstract:

Patellar fractures accounts for about 1% of all the fractures and inferior pole account to 9-22 % of surgically treated cases Preservation of Distal pole of patella using Osteosynthesis would have better results compared to Excision and tendon repair with the main fragment. Here in this case, Infero lateral portion of patella is comminuted with a fracture at lower 2/3 and 1/3 junction of patella. This fracture pattern is not suitable for traditional Tension band wiring or plating techniques. Here we did a Pinless Tension Banding, Cerclage with CCS for fixation of this fracture pattern which is unusual mode of fixation.

Keywords: Osteosynthesis, Tension Band Wiring, Cerclage, Comminuted Fracture Inferior Pole Patella, Cannulated Cancellous Screws.

Key Messages: Fixation of this difficult fracture pattern with CCS, Pinless Tension Banding, Ceclage with Suture fixation is a complex type of fixation with different principles.

Introduction

Patellar fractures accounts for about 1% of all the fractures and inferior pole account to 9-22 % of surgically treated cases. Extensor Mechanism would be disrupted and should be repaired or Reconstructed for proper Outcomes. Preservation of Distal pole of patella using Osteosynthesis would have better results compared to Excision and tendon repair with the main fragment.

Here in this case, infero lateral portion of patella is comminuted with a fracture at lower 2/3 and 1/3 junction of patella. This fracture pattern is not suitable for traditional Tension band wiring or plating techniques.

Basket plating is an effective way of fixation but availability is a major concern. Here we did a Pinless Tension Banding, Cerclage with CCS for fixation of this fracture pattern which is unusual and rare mode of fixation. We performed Pinless tension Band wiring, Ceclage and CCS and Suture Fixation of Inferior pole comminuted fracture Patella.

Case History: Our patient was 28 years old Gentleman who is a Daily Wager by Occupation sustained an injury which was a direct fall on R knee 2 days back. After the Injury he cannot able to bear weight over the affected extremity. No external injuries or injuries elsewhere.

On examination, Swelling was present over R knee, with redness. Tenderness and Joint effusion was present. On palpating patella, fracture can be palpated with fragments separated by each other. ROM- painful. No distal neuro vascular deficit. Femur, tibia, Hip and Ankle was palpated and was normal. No chest, spine, pelvic tenderness.

Investigation and Management:

We investigated the patient with routine Radiographs of Knee. It showed comminuted Fracture inferior pole patella which was displaced with loss of Articular congruity. We splinted the patient in a Knee extension brace with compression dressing. We advised the patient regarding the need for surgical fixation for better outcomes and early Mobilization.

After the patient accepted we proceeded with routine blood investigations and we operated the next day.

Our procedure planned was Tension Band Wiring with Cannulated Cancellous Screw fixation.

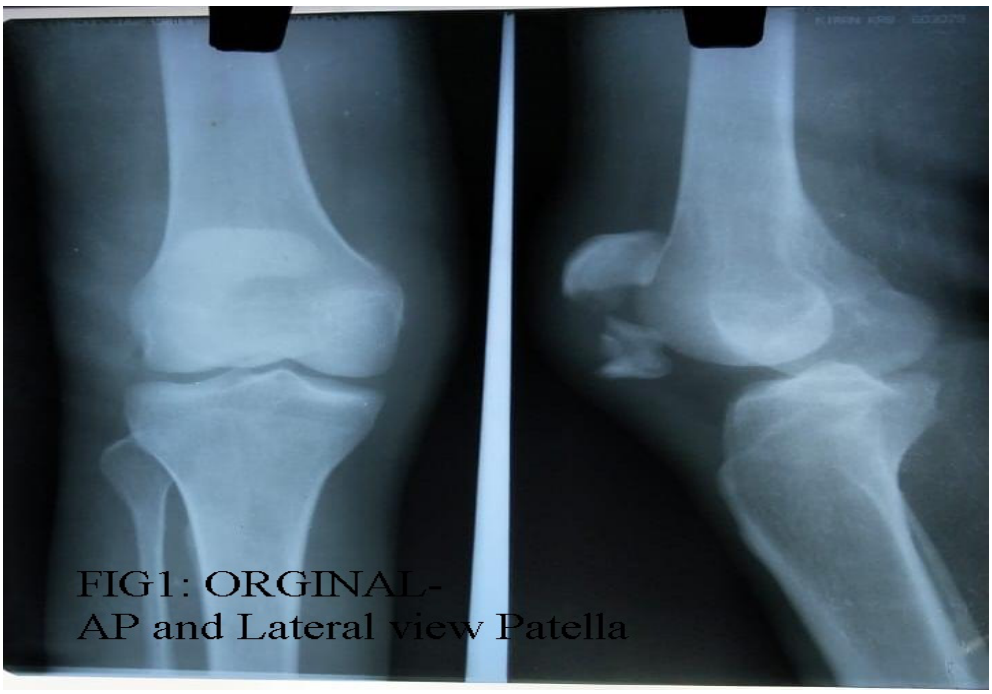

Figure 1: preoperative Inferior pole patella Fracture

Surgical Procedure:

Under SAB, Supine, TQ, Vertical Incision over the patella. Flap created at medial and lateral stage. Retinacular rent created over the medial aspect to palpate the articular surface of patella. Reduction attempted, with major fragments. Medial fragments were then fixed with Cannulated Cancellous Screw After drilling guide wire. Comminution of Inferolateral patella made Lateral CCS Screw not useful.

When routine Tension band wiring was tried by drilling K wires, Comminuted Inferolateral Part seems to more comminuted when K wire was drilled and hence Routine Tension banding was avoided. 18 gauge SS wire was passed below Quadriceps Tendon and Brought to Patellar tendon with Figure of Fashion over the surface of the patella. Cerclage was done later for additional stability with 18G SS wire. Stability was assessed after this procedure with flexion and extension of knee up to 90 degrees. Fracture was stable and fragments didn't dislodge and hence reduction accepted and remaining comminuted fragments was sutured back to main fragment with 2-0 Vicryl. With the retinacular rent, joint surface was palpated continuously during the procedure and it was anatomically reduced. Layered closed was done after achieving haemostasis.

Compression dressing was done. Post-operative was uneventful.

Post op x-rays showed good articular congruity with aligned fracture fragments.

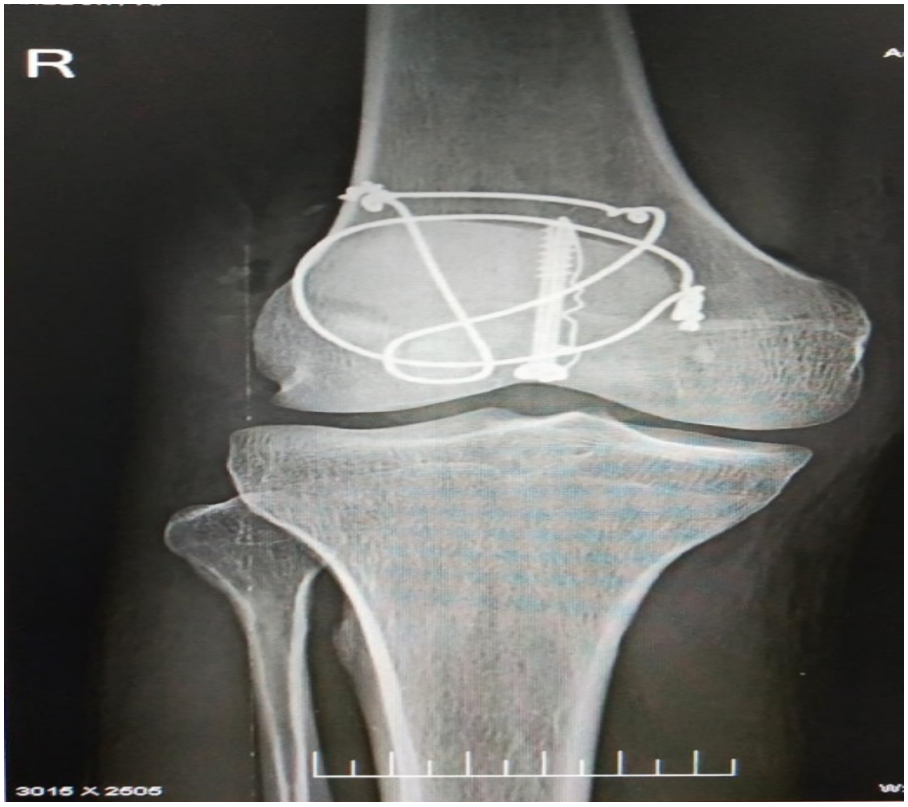

Figure 2: Ap view Patella fracture Fixation with Pinless TBW

Figure 3: Laterla view of Pinless tension Band Technique

Literature Review:

Fixation of Inferior pole of patella shows better results compared to Partial Patellectomy. The conventional course of treatment for a comminuted fracture was removing the inferior patellar pole (partial patellarectomy) and repairing the patellar tendon to the proximal fragment of the patella. However this leads to reduction of Patellar height and loss of efficiency of extensor mechanism. So this should not be advocated as the treatment of choice. [6]

Early motion is permitted and excellent functional outcomes are seen when the ipsilateral semitendinosus tendon is supplemented with suture anchors in the treatment of extra-articular fractures of the inferior pole of the patella. [3].

Fracture fixation with Cerclage and Tension Band is highly difficult procedure, which can obtain accurate reduction, early ROM and Mobilization.[4].

Extra Articular Fractures can be treated with a Needle Stainless Steel suture wire methods [5].

The patella and tibia can be wired in a figure-eight pattern to protect the patellar tendon repair, however doing so carries the risk of the wire loop breaking. Also the wire loop may cause anterior knee joint pain because of the tenting during knee movement [4]].

Kumar et al [7] Used suture anchors for repair of comminuted inferior pole fractures of patella in five patients. They used a figure-eight, a load-sharing wire or cable, or prolonged immobilization to shield the repair from the strong stresses produced by the quadriceps mechanism. Despite adding to the patella and tibial tubercle's stress risers, the cable transports loads straight from the quadriceps tendon or proximal pole of the patella to the tibial tubercle. One to two years following the procedure, the cable or wire needs to be removed.

Conclusion:

Management of Different fracture patterns is cumbersome and ideal management is still on a doubtful equation. Inferior pole patellar fractures are one among them. Management options are varied but, we can perform a combination of these methods for a satisfiable fixation which is stable.

Inferior pole comminuted Fracture Patella fixed with Pinless Tension Banding, CCS and Cerclage is a suitable method for reduction and fixation.

FIG1: ORIGINAL AP and Lateral View of Patella R showing Comminuted Inferior Pole Fracture

FIG2: ORIGINAL AP Image Post-Operative Showing Pinless Tension Band, CCS fixation and Cerclage

FIG3: ORIGINAL Lateral View Post-operative showing Pinless Tension Band, CCS fixation and Cerclage

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