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THE NEW MODALITY OF PATELLA FRACTURE FIXATION WITH PLATE OSTEOSYNTHESIS, COULD IT BE A SUPERIOR TREATMENT MODALITY

Orthopaedics

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ABSTRACT

The patella is the largest sesamoid bone in the body.Represent 1% of all skeletal injuries, Most common age group 20 to 50 years old. The function of the patella is to increase the mechanical advantage and leverage of the quadriceps tendon, aid in nourishment of the femoral articular surface, and protect the femoral condyles from direct trauma. 1 Mechanism of injury described here is a indirect as secondary to forcible eccentric quadriceps contraction while the knee is in a semiflexed position 2. A 51 yr old man sustained injury to his right knee joint.x ray radiographs were taken and patient was diagnosed to have post traumatic closed comminuted patella fracture of the right knee joint without neurovascular deficit. Patient underwent patella plate osteosynthesis and post-operative period was uneventful. Patient had no complaints following surgery.

KEYWORDS

Patella, fracture, comminuted, quadriceps mechanism, fixation failure, tension band wire, patella plating

INTRODUCTION

Patella fracture is a common problem, representing approximately 1% of all fractures. Comminuted and displaced patella fractures or those which disrupt the extensor mechanism are usually managed operatively. Numerous techniques of fracture reduction and fixation emerged, but stable fixation was difficult to achieve. Materials used for fixation included percutaneous pins, metal loops, kangaroo tendon xenografts, fascial strips, and screws. The greatest advance in patellar fracture fixation, however, occurred in the 1950s with presentation of the anterior tension band technique by Muller et al [3].The current standard remains a tension band wire (TBW) construct, with the option of additional cerclage wiring or TBW through cannulated screws. Very often elderly patients and particularly those with comminuted patella fracture are "difficult patella fractures" as their osteopenic bone often lacks the strength to support a TBW and/or cerclage, resulting in fixation failure prior to bone union. Partial or total patellectomy or nonoperative management is an option; however, it often results in poor functional outcomes.

Recently, there has been a trend to plate or mesh-augmented fixation with good outcomes reported. We present the evidence on the management of "difficult patella fractures," additionally; we describe a novel method of fixation, one easily implemented within any tertiary center. The method used here is the patella plating as an adjunct to the TBW construct to reduce the incidence of cutout and failure.[4]

CASE REPORT

A 51 year old male presented in SBMCH orthopaedic out patient department with severe pain associated with swelling over the right knee joint since 10 days following a h/o fall 10 days back at his residence. Patient apparently underwent native splinting for 10 days and was bought to hospital later. Patient was unable to bear weight and walk or flex or extend the knee joint following fall. Pain was sudden in onset, continuous and gradually progressive associated with swelling and not associated with radiculopathy or numbness. On examination, no external injuries, tense swelling over the right knee joint, unable to do straight leg raising test,unable to flex or extend the knee joint. No neurovascular deficit. X-ray showed comminuted patella fracture. CT was done which showed the pattern of comminution as well and better fracture anatomy.

Fig1-AP view

FIG 2- LAT view

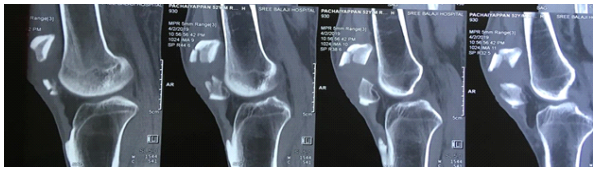

Fig 3- CT patella

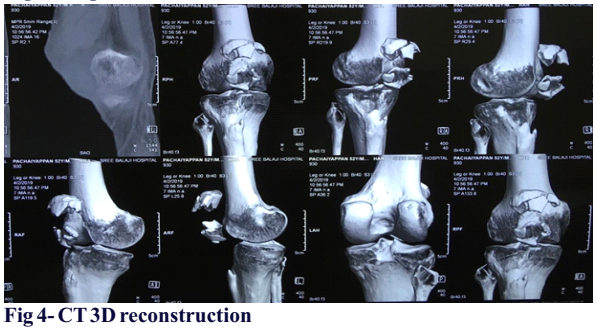

Fig 4- CT 3D reconstruction

Surgical fitness was obtained and pre anesthetic check-up was done.

Patient in supine position under SA,TQ control, parts painted and draped Mid line longitudinal approach was used from superior pole of the patella to tibial tubercle. Full thickness flap was used. Fracture site was visualized and thorough wound wash was given. Hematomas was evacuated. Fracture fragments were reduced using reduction clamp.With the help of 2 K-wire of 1.5 mm the displaced fragments were held in place which was passed diagonally.A circulage wire was circumferentially passed that held the fragments in place. A locking 3.5 mm plate (Arthrex) was used and with the help of screws it was secured in place. Following the placement of plate, C-arm x ray were taken to make sure the joint/ articular space was clear and reduction was found to be satisfactory. Thorough wound wash was given,wound closed in layers.sterile dressing applied.crepe applied and Long knee brace used. Standard post operative protocols were followed.

Patient regained passive SLRT by the end of two weeks followed with active range of SLRT by 4 weeks with ROM flexion of 80-90 degrees and full extension by end of 6 weeks and patient was made to bear weight and walk by the end of 8 weeks.

Fig 5- fracture site

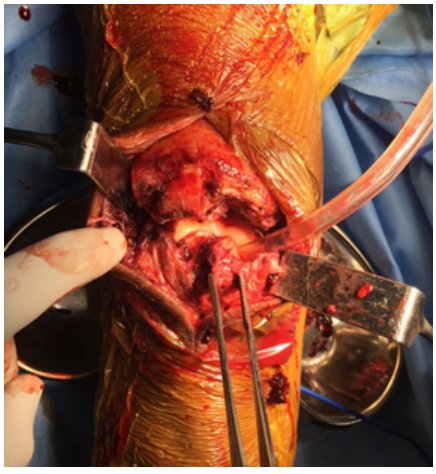

Fig 6 fracture comminution

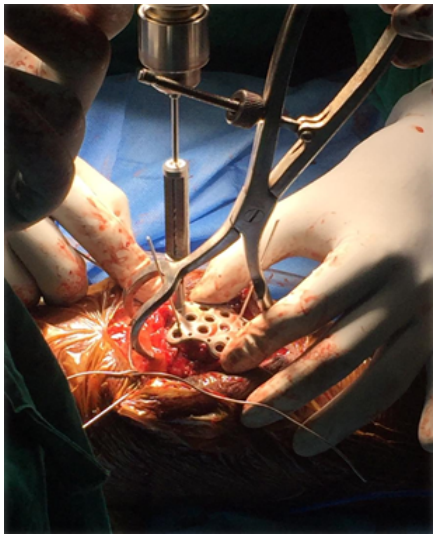

Fig 7- securing the plate

Fig 8- intra-op image1

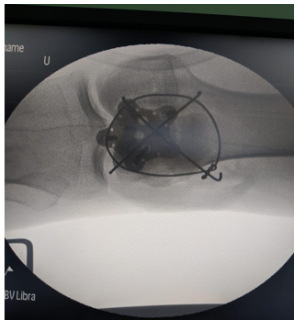

Fig 9 intra-op image 2

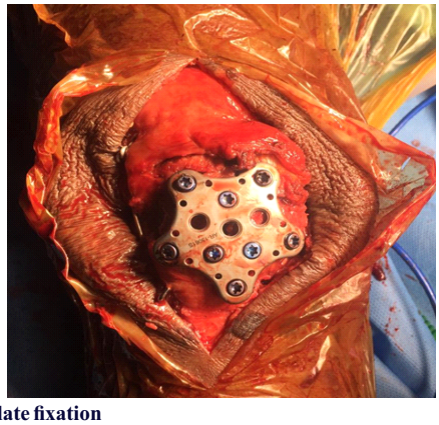

Fig 10 plate fixation

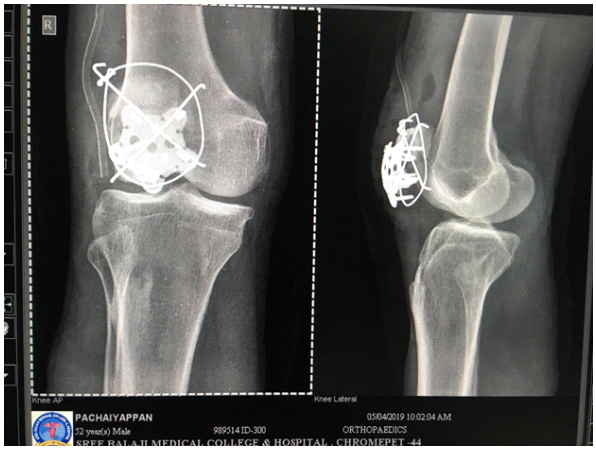

Fig 10 post op x ray with implant in-situ

DISCUSSION

Patella fractures are quite common accounting for around 1% of over all fractures. The most common method being indirect method of stumble and fall especially in the elderly usually causing a comminuted fracture.

- We use a combination of a miniature plate with tension band wiring to treat complex patellar fractures
- It makes it easy to fix small fractures.
- It can fix fractured fragments in the coronal plane that anterior tension wiring cannot fix.
- Because the contact surface of the miniature plate is leveled, it can contribute to fracture reduction and articular surface congruency.
- The operation is simple, and the learning curve is short for an experienced surgeon.
- Biomechanical studies have shown superior fixation strength with plates compared with tension banding.The combination of a miniature plate with tension band wiring can achieve stronger stabilization, and allows the patella to be more evenly stressed and capable of withstanding higher biomechanical loads.
- This can avoid disruption of the fractured site, migration of a K-wire inserted parallel to the patella, and limitation of early motion postoperatively.
- Finally,
- compared to the method of using a combination of lag screws with a tension band, our method can avoid the problem of rotational displacement of the patellar fragment and an uneven joint surface caused when using a lag screw to fix a fragment.

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