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Case Report

Management of severely comminuted fracture patella: a case report

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ABSTRACT

Fracture patella is a breach in the extensor mechanism of the knee and needs to be fixed. Comminuted fractures of patella are a challenge given the difficulty in restoring the extensor mechanism. Introduction: Treatment options have evolved over the years from sacrifice to salvage i.e., from total or partial patellectomy to patellar preserving surgery. The challenge remains to fix the fragments optimally and also to have a tailor-made physiotherapy and rehabilitation program for the patient to provide a satisfactory functional outcome. A 14-year-old female presented to the casualty with a history of domestic fall, injuring her right knee. X-ray was done which revealed a comminuted fracture of right patella, classified as 34C3 OA/OTA classification. Salvage procedure for severely comminuted patella fracture has a successful functional outcome following a stable fixation of fragment.

Keywords: Patella, Comminuted, Early rehabilitation

INTRODUCTION

Patella fractures account for around 1% of all fractures of which 55% of the surgically treated fractures are comminuted.[1] Patella, the largest sesamoid bone of the body, acts as a fulcrum between the two lever arms of extensor mechanism. Being under enormous stress from both directions, it is the most common failure point of the same. Ever since the role of patella in the knee extensor mechanism has been understood the emphasis is on its preservation and maintaining the length of the patellar tendon.[2] Comminuted patellar fractures can be treated with conservative or partial or complete patellectomy, often resulting in poor functional outcome.[3] Recently the use of basket plates, mesh augmented fixations have been tried with satisfactory functional outcome but their availability and affordability remains a huge constraint in Indian setup.[4-6]

CASE REPORT

Our patient, 14-year-old female presented to the casualty with a history of domestic fall, injuring her right knee. Systemic examination was within normal limits. On local examination she has swelling, tenderness, crepitus over the right knee and pain on bearing weight. X ray was done which revealed a comminuted fracture of right patella, classified as 34C3 OA/OTA classification.

Under spinal anaesthesia, patient was positioned in supine position, tourniquet was applied, and the limb was exsanguinated. Midline incision was made, raising full thickness flaps avoiding any subcutaneous dissection. Patellar retinaculum was found torn with multiple fracture fragments. The fragments were fixed tentatively with K wires and held together to have a congruous articular surface. Four mm cancellous cannulated screws were fixed and cerclage was done with SS wire. The retinaculum was repaired meticulously which further helped the fracture fragments fall into place. On-table stability was assessed with passive flexion and extension and was found to be satisfactory.

Post operatively patient was started was allowed complete weight bearing with walker support and knee brace. Knee range of motion exercises were initiated as tolerated. With the aim to achieve good functional outcome and with the

confidence of a good on-table stability, aggressive rehabilitation was started.

By the end of 2 weeks, sutures were removed, and 90 degrees of active flexion was achieved. Walker and knee brace support was removed at the end of 1 month. Follow up planned at every 4 weeks. Functional outcome using LEFS score and Kujala score, VAS score, Knee Range of motion was recorded at each follow up. The patient at the end of 4 months was able to do cross legged sitting with a ROM of 135 degrees. The VAS score for pain improved from 8/10 to 1/10 at the end of 4 months. Lower extremity functional score (LEFS) and Kujala score were 56/80 (70 %) and 73/80 at the end of 4 months, signifying good functional outcome.

Figure 1: Anteroposterior view of knee showing comminuted fracture of the patella.

Figure 2: Lateral view of the knee showing comminuted fracture of the patella.

Figure 3: Immediate post operative x-ray anteroposterior view.

Figure 4: Immediate post operative x-ray Lateral view.

Figure 5: Clinical photo showing excellent functional outcome.

Figure 6: Clinical photo showing excellent functional outcome.

Figure 7: Clinical photo showing excellent functional outcome.

Figure 8: Four month post operative X-ray Anteroposterior view.

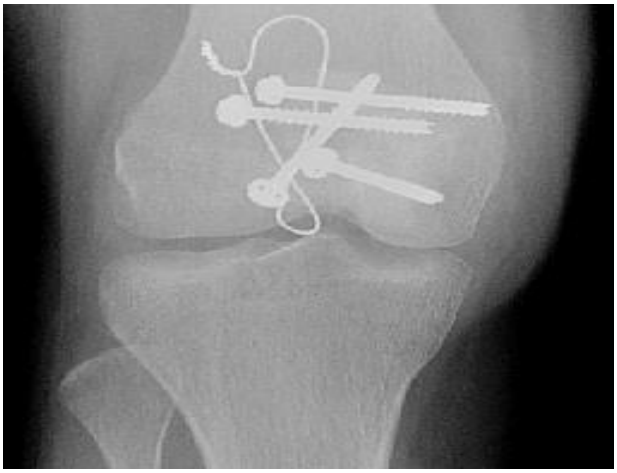

Figure 9: Four month post operative X-ray Lateral view.

DISCUSSION

Fixing comminuted patella fractures is technically demanding. The management of these complex fractures have witnessed a paradigm shift. From total/partial patellectomy the times have progressed to salvaging it. Sacrificing the lower pole in such comminuted fractures have also led to altered patellar tendon length leading to chronic pain and poor outcome.

Different fixation modalities have been tried in the recent years such as basket plate, suture anchors, miniplate along with tension band wiring have been tried but still there remains no consensus for the choice of implant.[3,7,8] In the present study we have tried to meticulously inculcate the fragments together with cannulated screws and tension band wire ending up with a good functional outcome.

Gwinner et al reported reduced range of motion as the most common complication post operatively in these fractures is decreased range of motion. Infection, prolonged immobilisation predisposed to it. Nikiforidis et al found reduced terminal range of motion in most cases, but was well managed by the patients.[9] Boström et al found loss of reduction as high as 20% post-surgery and poor functional outcome.[10,11] The present study emphasises on the role of early aggressive rehabilitation after attaining a stable construct to have. Reduced or no immobilisation of the limb gives way to lesser muscle wasting and ultimately better results.

CONCLUSION

Salvage procedure for severely comminuted patella fracture has a successful functional outcome following a stable fixation of fragment and early rehab and hence may be preferred over patella excision.

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REFERENCES

1. Neumann HS, Winckler S, Strobel M. Long-term results of surgical management of patellar fractures. Unfallchirurg. 1993;96(6):305-10.
2. Massoud EIE. Fractured patella in children: Preservation of the patellar dimensions. Dicle Med J. 2012;39:467-73.
3. Shabat S, Mann G, Kish B, Stern A, Sagiv P, Nyska M. Functionalresults after patellar fractures in elderly patients. Arch Geronto Geriatr. 2003;37(1):93-8.
4. Kastelec M, Veselko M. Inferior patellar pole avulsion fractures: osteosynthesis compared with pole resection. J Bone Joint Surg Am. 2004;86-A(4):696-701.
5. Lorich DG, Warner SJ, Schottel PC, Shaffer AD, Lazaro LE, Helfet DL. Multiplanar fixation for patella fractures using a low-profile mesh plate. J Orthop Trauma. 2015;29(12):504-10.
6. Taylor BC, Mehta S, Castaneda J, French BG, Blanchard C. Platingof patella fractures: techniques and outcomes. J OrthopTrauma. 2014;28(9):e231-5.
7. Kadar A, Sherman H, Drexler M. Anchor suture fixationof distal pole fractures of patella: twenty seven cases an comparison to partial patellectomy. Int Orthop. 2016;40(1):149-54.
8. Zhu W, Xie K, Li X. Combination of a miniplate with tension band wiring for inferior patellar pole avulsion fractures. Injury. 2020;51(3):764-8.
9. Nikiforidis P, Babis G, Tsarouchas J, Koudis G, Korres DS. Patellar fractures: contemporary approach to operative treatment, using different types of the tension band principles. Eur J Orthop Surg Traumatol. 1999;9:21-6.
10. Boström A. Fracture of the patella. A study of 422 patellar fractures. Acta Orthop Scand Suppl. 1972;143:1-80
11. Boström A. Longitudinal fractures of the patella. Reconstr Surg Traumatol. 1974;14(0):136-46.

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