

Percutaneous Tension Band Wiring & Encirclage loop for Transverse fracture of Patella

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Abstract:

Introduction: Open reduction of patella fracture is the currently acceptable method for treating these fractures. In this report we describe our experience with percutaneous reduction and fixation of patella fractures.

Case Report: 55 year old male presented with transverse two part fracture of patella. Fracture was reduced percutaneously with help of reduction clamps and reduction confirmed on image intensifier. Percutaneous circlage was done by passing wires below the quadriceps tendon and figure of 8 loop subcutaneously on dorsal patella surface. Double loop was taken to secure reduction. Arthroscopic examination of patella was done to confirm reduction. Fracture united well and patient was walking full weight bearing at 3 months follow up with no complains

Conclusion: Percutaneous tension band wiring for transverse fracture of patella is a semi invasive method of fracture fixation having less convalescence and better cosmesis keeping the principal of tension band & achieving near normal movements.

Keywords: Patella Fracture, Percutaneous fixation

Introduction

Patella fracture is the commonest fracture around knee joint. It is mostly two part fracture, with transverse fracture line, commonly diagnosed by lateral view of knee joint [1]. Male patients are predominant. In very few cases, vertical fracture is seen. It is diagnosed by skyline view of knee joint [1]. Treatment is tension band wiring. Previously for this fracture, transverse incision was taken but it is detrimental in view of future TKR. Then surgeons started taking vertical incision which is in line with TKR incision, which has got its own complications & prolonged rehabilitation[2].

Percutaneous tension band wiring with post operative arthroscopic evaluation of under surface of patella is convincing method for two part transverse patella fracture [3,4] and so the special reason for publishing this case.

Case Report

We report a case of 55 year male. He had a history of trivial fall over knee joint & had pain, swelling, tenderness & was unable to walk with restriction of knee joint movements. The patient is advised x-ray of knee joint, AP & lateral views & diagnosed transverse two part patella fracture with displacement.

→We planned percutaneous tension band wiring instead of open reduction. Fracture reduction achieved with help of pointed reduction clamp percutaneously. Reduction

was confirmed under image intensifier. Then one tension band wire passed under quadriceps tendon with help of wire passer, it was removed & over the dorsal surface of patella the wire has been taken subcutaneously & pushed it under the patellar tendon near the inferior pole of patella. From there wire again taken subcutaneously over dorsal surface of the patella in figure of "8" manner & twisted it at supero-lateral aspect of patella. Then another encirclage loop was made around the patella to give extra stability to the fracture & to avoid lifting of the fracture site at the articular surface. Then reduction was also confirmed under image intensifier[3,4]. After that we did an arthroscopic evaluation of the under surface of patella, whether fracture site was posteriorly (over articular surface of patella) opened up or not. We can also have a quick look of the interior of knee joint. Small articular or bony piece from fracture site can go inside the joint and needs to be removed[5].

Post Operative Regime: brace with partial weight bearing from next day with passive assisted flexion from 7th day onwards. Active knee flexion and extension 15 days onwards. Brace was discarded at 6 weeks and full weight bearing was started.

Discussion

Very few publications are published on semi invasive patellar fracture management. In journal of orthopaedic surgery, 2012 there is paper on arthroscopic assisted tension band wiring. Arthroscopic tension band wiring is time consuming and technically difficult. In our method we do not do arthroscopic wiring. We also do not use k-wires as they may migrate. At the end, we can have quick look inside the joint arthroscopically. So our procedure is less time consuming and simple. To perform this procedure an extra ordinary skill is not required[8].

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Figure 2 : Step-I: Procedure of subcutaneous wiring



Figure 3 : Step-II: Procedure of subcutaneous wiring



Figure 4 : Step-III: wire is twisted at supero lateral aspect of the patella

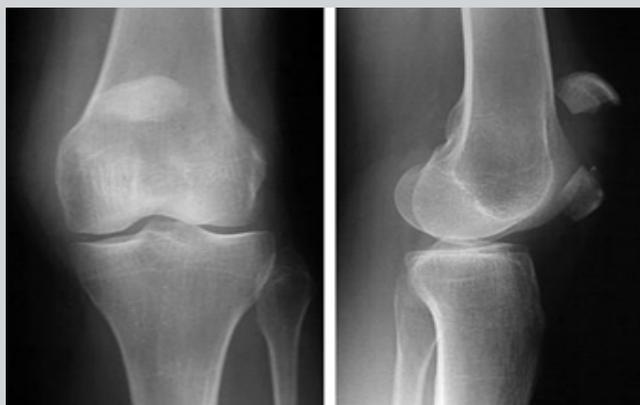


Figure 1 : X-ray showing transverse displaced fracture patella



Figure 5 : Post operative X-ray with double wire loop

In our procedure, encircling loop holds patella in its capsule & avoids distraction of the fragment & figure of “8” loop provides tension band effect. Whenever patient flexes the knee, fracture fragments get more compressed due to figure of “8” loop & its tension band effect. At the same time the circumferential wiring holds the articular surface unlifted.[3,4]. In our method, post operative infection is less likely, procedure is less invasive,, minimal blood loss, no need of drain and would be more acceptable to patient with advantage of less pain and early rehabilitation. Here wires need to be removed after fracture heals radiologically, otherwise there is possibility of breakage or migration of the wires[7]. There is similar procedure reported in which percutaneous cannulated cancellous screws fixation is used. But these screws are less secure than tension band wiring, as it doesn't give compression effect[6].

We have done 5 cases so far, which has given excellent result. Although the utility of the technique may be limited in multifragmented fractures, but we feel it provides a good option for two part transverse fractures. Longer follow up with larger numbers will be needed to study the shortcomings of the technique.

Conclusion

Percutaneous tension band wiring for transverse fracture

of patella is a semi invasive method of fracture fixation having less convalescence and better cosmesis keeping the principal of tension band & achieving near normal movements.

References

1. Lotke PA, Ecker ML. Transverse fractures of the patella. *Clin Orthop Relat Res* 1981;158:180-4.
 2. Hung LK, Chan KM, Chow YN, Leung PC. Fractured patella: operative treatment using the tension band principle. *Injury* 1985;16:343-7.
 3. Leung PC, Mak KH, Lee SY. Percutaneous tension band wiring: a new method of internal fixation for mildly displaced patella fracture. *J Trauma* 1983;23:62-4.
 4. Ma YZ, Zhang YF, Qu KE, Yeh YC. Treatment of fractures of the patella with percutaneous suture. *Clin Orthop Relat Res* 1984;191:235-41.
 5. Appel MH, Seigel H. Treatment of transverse fractures of the patella by arthroscopic percutaneous pinning. *Arthroscopy* 1993;9:119-21.
 6. Tandogan RN, Demirors H, Tuncay CI, Cesur N, Hersekli M. Arthroscopic-assisted percutaneous screw fixation of select patellar fractures. *Arthroscopy* 2002;18:156-62.
 7. Luna-Pizarro D, Amato D, Arellano F, Hernandez A, Lopez-Rojas P. Comparison of a technique using a new percutaneous osteosynthesis device with conventional open surgery for displaced patella fractures in a randomized controlled trial. *J Orthop Trauma* 2006;20:529-35.
- Percutaneous tension band wiring for patellar fractures. *Journal of Orthopaedic Surgery* 2012;20(2):166-9.

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