ISSN: 2581 – 3633
PubMed - National Library of Medicine - ID: 101745081

International Journal of Medical Science and Advanced Clinical Research (IJMACR)

Available Online at: www.ijmacr.com

Volume – 2, Issue – 4, July - August - 2019, Page No. : 25 - 27

Efficacy of Combination of Cancellous Screw Fixation and Tension Band Wiring In Fractures of Lower Pole of Patella

[1]Dr. Sachin Kumar, Senior Resident, Orthopedic Department, JLN Medical College, Bhagalpur

[2]Dr. Dilip Kumar Singh, Professor, Head Of Department, Orthopedic Department, JLN Medical College, Bhagalpur

Corresponding Author: Dr. Sachin Kumar, Senior Resident, Orthopedic Department, JLN Medical College, Bhagalpur

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

Introduction: The fracture of the lower pole of the patella is a common type of fracture of the patella. The treatment involves internal fixation or excision of the lower fragment. This study was undertaken to study the efficacy of cancellous screw fixation combined with tension band wiring in the treatment of these fractures.

Materials and Methods: thirty patients with lower pole patellar fractures were treated by this technique and evaluated by Gaur's criteria for knee evaluation. **Results:** Excellent good results were noted in 19 cases and fair result in one case. There were no poor results and there were no major complications.

Conclusion: Hence it was concluded that cancellous screw fixation combined with tension band wiring is a good method for treating lower pole patellar fractures.

Keywords: Cancellous Screw, Encerclage, Fracture, Patella

Introduction

Fracture of the patella constitutes almost 1% of all skeletal injury[1]and fracture of the lower pole of the patella is a common type of fracture patella. The fracture patella occurs as a result of direct or indirect force.[2] .Fracture of the lower pole is commonly an avulsion injury as a result of violent contraction of the quadriceps muscle or as a result of subluxation or dislocation of patella[4] especially as a sports injury occurring in young individuals. Hence there is more likelihood of extensive retinacular tear.[2] This retinacular tear precludes conservative treatment and operative treatment is the mainstay of lower pole patellar fractures.

Various treatment modalities have been advocated for fracture of the lower pole of patella including Magnusson wiring, cancellous screw fixation, tension band wiring, cerclage wiring, fixation of the lower pole augmented by a patellotibial SS wire loop, basket plate fixation and excision of the lower pole of the patella.[1-3, 5-8]

However in spite of having these various options for treatment there is no consensus about the treatment of choice for these fractures. Some surgeons prefer excision of the lower pole with fixation of the patellar tendon to the upper fragment by non-absorbable sutures and others swear by internal fixation as the better method of treatment[5]. This study was undertaken to evaluate the efficacy of cancellous screw fixation combined with tension band wiring in fractures of lower pole of patella.

Materials and Methods

30 patients with lower pole patellar fractures were included in the study. There were 25 men and 5 women. The age range was 20-55 years. Right patella was fractured in 17 cases and the left patella was fractured in

13 cases. The mean duration between injury and surgery was 2 days.

Patients with ipsilateral lower limb fractures, extremely comminuted lower pole fractures and patients above 55 years of age were excluded from the study.

Surgery was performed under spinal anesthesia in all patients. Vertical midline approach was taken and the fracture was reduced and fixed with a 4 mm cannulated cancellous screw over a guide wire, this was augmented with a stainless steel tension band wire in figure of 8 fashions passing through the quadriceps tendon above and the patellar tendon below.

The retinaculae were repaired on the medial and lateral sides and the wound was closed over a drain. A posterior slab was applied until suture removal after which mobilization of the knee was started. Results of the surgery were evaluated by **Gaur's criteria** for knee function evaluation[9]. The results were graded as Excellent, Good, Fair and Poor.

Parameters	**Result**			
	Excellent	**Good**	**Fair**	**Poor**
Quadriceps Wasting	Nil	<1.5cm	Upto 2.5cm	>2.5cm
Quadriceps Power loss	Nil	<10%	Upto 25%	>25%
Extension lag	No	No	$<10^{o}$	$>10^{0}$
Knee range of motion	Full	$0\text{-}110^{0}$	Upto 90^{0}	$<90^{0}$
Knee pain	No	Minimum	Moderate	Severe
Function	Normal	Normal	Restricted	Incapacitated

Table 1: Gaur's criteria for knee function evaluation

Results

Among the 30 patients in our series the result were excellent in 11 cases, good in 8 cases and fair in one case (Table 2). No major complications were seen in our series. One patient needed removal of the tension band wire at 8 months due to irritation by the implant.

Grading as per Gaur's Criteria	**No. of patients**
Excellent	18
Good	11
Fair	01
Poor	Nil

Table 2

Discussion

Displaced fractures of the lower pole of the patella usually need surgical treatment. Improper treatment can lead to significant morbidity including impaired joint mobility, decreased range of motion, decreased muscle power and development of osteoarthritis (patello-femoral). Significant symptomatic complaints and functional deficits persist even years after successful treatment.[10]

Excision of the lower pole of the patella with repair results in tendon to bone healing which requires prolonged immobilization. From study of literature and our surgical experience we know that good functional results depend on our ability to achieve early pain free motion and restoration of normal anatomy.[2,6,11,12]

Cannulated cancellous screw fixation augmented by tension band wiring restores normal anatomy and allows early range of motion. The consistent excellent and good results in our series show that this technique is an excellent modality in the treatment of lower pole patellar fractures.

Conclusion

Cannulated cancellous screw fixation combined with tension band wiring is a very effective method in the treatment of distal pole patellar fractures. This is a technically less demanding technique which can be done with easily available implants and results in consistent excellent functional results to the patient without much complications.

References

1. Canale ST, Campbell's Operative Orthopaedics 10th edition Mosby, Philadelphia 2003: 2786-2705.

2. Harris R M. Fractures of the patella in: Bucholz R W, Heckmann J D editors, Rockwood and greens fractures in adults, 2nd edition, New York, Lippincott William J and Wilkins 2001[CD ROM].

3. Bruce D Browner, Alan M Levine, Jesse B Jupiter, Peter G Trafton, Christian Krettek, Skeletal Trauma, 4th edition, Saunders, Philadelphia 2008.

4. James D Heckemen, Carey C Alkire. Distal patellar pole fractured. A proposed common mechanism of injury. Am J sports Med 1984; Vol 12, no 6: 424-428.

5. Singh R P, Shah R R, Srivatsava M P. Treatment of inferior pole avulsion fractures with pole resection and patellotibio cerclage wire. Nepal Med Coll J, 2007 Jun; 9(2): 93-5.

6. Kastelac M. Inferior patellar pole avulsion fractures: osteosynthesis combined with pole resection Veselco M. J Bone Joint surgery Am, 2004 Apr; 86-A (4): 696-701.

7. Jakobren J, Christensen H S, Rasmusen O S. Patellectomy- A 20 year follow up. Acta Ortho Scand 1985; 56: 430-432.

8. Burvant J G, Thomas K A, Alexander R, Harris M B. Evaluation of methods of internal fixation of transverse patellar fractures a biomechanical study. J Orthop Trauma 1994; 8 (2): 147-53.

9. Gaur S C, Verma A N, Kulshreshtra, A K Katiyan, R K Sinha. Late outcome of patellectomy. Ind J Orthop 1997; 33(2):103-6.

10.Le Bran C T, Langford JR, Sagi H C. Functional outcomes of operatively treated patellar fractures. J Orthop Trauma 2012; 26(7): 422-6.

11.M Krovic, D Bombac, M Balazic, F Kosel, M Hebernic, V Senekovic, M Brojan. Modified precurved basket plate reconstruction of the proper length and position of the ligament- A biomechanical analysis. The Knee 14(2007); 188-193.

12.Hvang H C, Sujy, Cheng Y M. Modified basket plate in inferior patellar pole avulsion fractures. A report of three cases. Kaohsuing J Med Sci 2012 Nov; 28 (11): 619-23.