

LOWER POLE PATELLA FRACTURE: A COMBINATION OF CANCELLOUS SCREW FIXATION AND TENSION BAND WIRINGH. D. Veeranna¹, Chaitanya P. R.², Sreekanth R³**HOW TO CITE THIS ARTICLE:**

H. D. Veeranna, Chaitanya P. R, Sreekanth R. "Lower Pole Patella Fracture: A Combination of Cancellous Screw Fixation and Tension Band Wiring". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 31, July 31; Page: 8575-8578, DOI: 10.14260/jemds/2014/3088

ABSTRACT: 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. Twenty patients with lower pole patellar fractures were treated by this technique and evaluated by Gaur's criteria for knee evaluation. 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 hence it was concluded that cancellous screw fixation combined with tension band wiring is a good method for treating lower pole patellar fractures.

KEYWORDS: Distal Pole Patella, Fracture, Cancellous Screw, Encerclage.

INTRODUCTION: Fracture of the patella constitutes almost 1% of all skeletal injury¹ and fracture of the lower pole of the patella is a commonly encountered type of fracture patella. The fracture patella occurs as a result of direct or indirect force.^{2,3} It is twice as common in men as women.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 patella⁴ 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 myriad of 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 treatment⁵. This study was undertaken to evaluate the efficacy of cancellous screw fixation augmented by tension band wiring in fractures of lower pole of patella.

MATERIALS AND METHODS: 20 patients with lower pole patellar fractures were included in the study. There were 15 men and 5 women. The age range was 22-56 years. Mean age was 35.7 years. Right patella was fractured in 13 cases and the left patella was fractured in 7 cases. The mean duration between injury and surgery was 3 days.

Patients with ipsilateral lower limb fractures extremely comminuted lower pole fractures and patients above 60 years of age were excluded from the study.

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Surgery was performed under spinal anesthesia in 18 patients and general anesthesia in 2 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 fashion passing through the quadriceps tendon above and the patellar tendon below.

The retinaculæ 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 evaluation⁹. 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°	>10°
Knee range of motion	Full	0-110°	Upto 90°	<90°
Knee pain	No	Minimum	Moderate	Severe
Function	Normal	Normal	Restricted	Incapacitated

Table 1: Gaur's criteria for knee function evaluation

RESULTS: Among the 20 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	11
Good	8
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 and may result in patellar baja. Patients with patellar baja may have substantially more problems than patients with normal knee¹¹. 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.

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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.

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Fig. 1: Pre-Op

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Fig. 2: Post-Op



Fig. 3: Final Flexion



Fig. 4: Final Extension

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Date of Submission: 17/07/2014.
Date of Peer Review: 18/07/2014.
Date of Acceptance: 22/07/2014.
Date of Publishing: 29/07/2014.