ORIGINAL RESEARCH PAPER

Orthopaedics

POST OPERATIVE ANALYSIS OF PATELLA FRACTURE CORRECTED WITH MODIFIED TENSION BAND WIRING

KEY WORDS: Post operative analysis, Modified tension band wiring, fracture patella, knee joint

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ABSTRACT

A patella fracture is an injury to the kneecap. The kneecap is one of three bones that make up the knee joint. The patella is coated with cartilage on its undersurface and is important in providing the strength of extension of the knee joint. Patella fractures should be seen in the emergency room. X-rays will determine the type of fracture and the amount of displacement of the fracture. One of the critical factors in determining treatment is a thorough examination. The objective of the study is to clinically evaluate the modified tension band wiring technique for fracture of patella and to assess knee joint motion, stability and mode of injury after the procedure.

INTRODUCTION

Patella fractures are caused by directly by trauma or a compressive force, or indirectly as the result of quadriceps contractions or excessive stress to the extensor mechanism. Indirect injuries are commonly associated with tears of the retinaculum and vastus muscles. Patella fractures make up about 1% of all skeletal injuries. The type of treatment as well as the optimum timing of surgical intervention depends on the underlying fracture type, the associated soft tissue damage, patient factors (i.e. age, bone quality, activity level and compliance) and the stability of the extensor mechanism. Regardless of the treatment method an early rehabilitation is recommended in order to avoid contractures of the knee joint capsule and cartilage degeneration.

For non-displaced and dislocated non-comminuted transverse patellar fractures modified anterior tension band wiring is the treatment of choice and can be combined – due to its biomechanical superiority – with cannulated screw fixation. In severe comminuted fractures, open reduction and fixation with small fragment screws or new angular stable plates for anatomic restoration of the retropatellar surface and extension mechanism results in best outcome. Additional circular cerclage wiring using either typical metal cerclage wires or resorbable PDS/non-resorbable FiberWires increases fixation stability and decreases risk for re-dislocation.

MATERIALS AND METHODS

The present study consists of 20 cases of fractured patella treated by modified tension band wiring at the Mahavir Medical College. The details of the cases were recorded as follows: The name,age ,sex, occupation, address, family history and past history were noted.

The history was elicited from the patients. The nature of trauma, whether due to direct or indirect history violence was noted. Whether trauma due to Rood traffic accidents, assault,fall in the same plane or fall from height were specifically asked. Enquiry was made to note pin,swelling its rate of increase and if the patient was able to bear weight on the affected limb and was able to do active movements of the affected joint. General condition was examined as to his build. Nutritinal status, the condition of respiratory and cardio-vascular systems and for associated injuries.

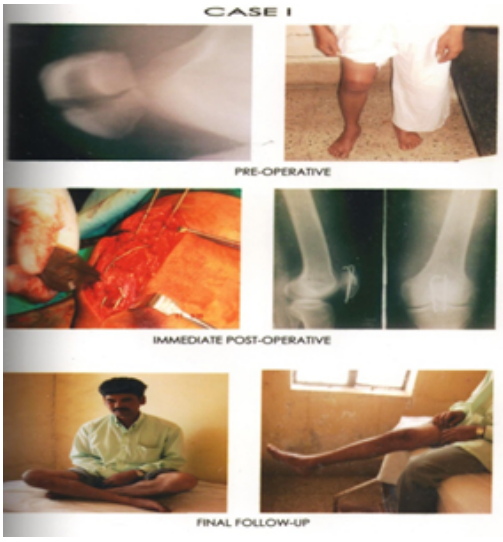
Local examination was done in the following steps:

a) On inspection the following points were noted. Whether the knee was swollen.if so the size and excent of the swelling,condition of the skin over the swelling and presence of any contusion, abrasion or laceration. Whether any sulcus present in the middle of the swelling. b) On palpation the following points were noted. Any local rise of temperature, tenderness over the bone a palpable transverse Sulcus. crepitus ,fluctuation and broadening of patella. c) Active extension movements of the affected knee noted compared with normal side. It was also noted whether the patient was able to stand on his injures limb. d) The circumference of both the thighs were measures to note any reduction in the bulk of the quadriceps.

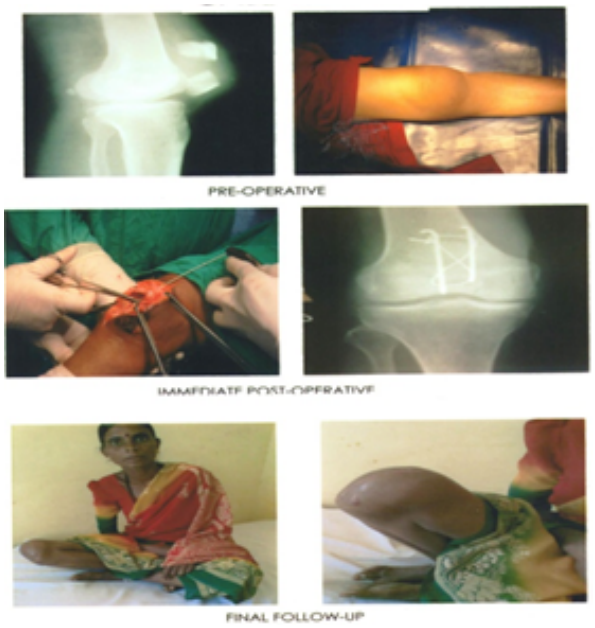
Before surgical repair of the patella a brief preoperative planning should be obtained. This includes the choice of implants, surgical approach and a drawing of the fracture pattern with the estimated implant position. Thereby the surgeon gets acquainted with the fracture pattern and the required equipment can be chosen in advance. The procedure is performed under epidural or general anaesthesia with the patient placed in a supine position. Perioperative antibiotics should be administered approximately 30 minutes before skin incision. An intraoperative thorough physical examination – especially focussed on the ligamentous structures of the knee – should be performed prior to placing a tourniquet to the patient's thigh.

OBSERVATION AND RESULTS

Since the advent of surgical treatment of the fractured patella, opinion has changed from one advocating removal of the patients to one preserving either part or preferably whole of the patella. If the fragments can be realigned and fixed in such a way that once it heals, it is in no way different from its pre-fractured status, it would be the ideal treatment. In this series 20 cases of fractured patella were treated in patients between the age group of 20-50 years by the modified tension band wiring technique, special attention was given to mobilize the knee early as it helps to regain the quadriceps power.



Case No-1



Case No-2

Operation: All cases were operated on our regular operation theatre days , at the earlier possible time. The patients were operated upon within an average period of 3 days after the injury.

Incision: All the cases were operated upon by a vertical lazy 'S' incision. The advantage of a vertical incision is that the patient can be mobilized early, the patients does not hesitate to do active flexion and there is less tension on the suture line during mobilization.

Immobilization: None of the knee was immobilized and active flexion and quadriceps exercises encouraged from the beginning.

Follow Up: Patients were followed up one month after discharged and then every 2 months. In this series the follow up period ranged from 2 months to 18 months. The mean time was 9 months. During each follow-up the patients were questioned about the following subjective complaints and examined for the following deficiencies.

TABLE.NO:1: Subjective Complaints following Modified Tension Band Wiring

Complaints	No.of Cases	Percentage
Pain	6	30
Mild Difficulty In Squatting	6	30
Difficulty In Climbing Stairs	-	-
Difficulty In Stepping Down Stairs	-	-
Sense of Weakness or Giving Way of Knee	-	--

Pain: All the cases had pain during the first 2 weeks. In the present study 14 cases gave excellent results were in the complained of no pain after 2 months. Five cases considered to be good cases with mild pain at the end of 2nd month. One cases complained of persistence of pain even after the end of 2nd month is graded as poor.

Swelling: During the first month swelling was present in all cases. At the end of 2nd month none of the cases had swelling.

Difficulty in Squatting: In this series 5 of the patients had mild difficulty in squatting. But getting up from the squatting position was not difficult and one patient was unable to squat.

TABLE.NO:2:OBJECTIVE DEFICIENCY AFTER MODIFIED TENSION BAND WIRING

DEFICIENCY	NO.OF CASES	PERCENTAGE
LINITATION OF FLEXION	6	30
QUADRICEPS WASTING OF 1CM	6	30
QUADRICEPS POWER OF GRADE IV	6	30
EXTENSION LAG	-	-

In this 10 cases were male and 10cases were female, 15 cases were having indirect injury and 5 were having injury. Fourteen cases graded as excellent, cases graded as good and one case as poor.

Objective deficiency after modifid tension band wiring: In the present study 6(30%) patients had flexion limitation, quadriceps wasting was observed in 6(30%) patients a quadriceps power of grade IV was observed in 6(30%) patients. There was no extension lag in any of the cases. In the present study 14 (70%) had excellent result,5(25%) had good results and 1(5%) had poor results. Dudani, Sancheti [13] in their study also found similar results 11(73.33%) had excellent result and (42.66%) had good result. Marya,Bhan,Dave[15] found 24(80%) had excellent result,4(13.33%) had excellent result,5(35.71%) had good result and 2(14.28%) had poor result. In this study subjective and functional scoring system by Lyshylm and Gillguist at 1981 has been used to access the results. The same scoring system was used by Levack, Patnnagam Hobbs[21] ,Maya Bhan,Dave[15] and Dudani, Sancheti[13].

CONCLUSION:

Maximum number of cases 9(45%) were in the age group of 31-40. There was no sex predomination 10(50%) were males and 10(50%) were females. 15(75%) cases are due to an indirect trauma to the knee joint , direct injury resulted fracture patella in 5(25%) cases. 20(100%) cases are transverse fractures.A subjective complaint like pain was observed in 6(30%) patients and difficulty in squatting was observed in 6(30%) patients. 6(30%) patients had flexion limitation, quadriceps wasting was observed in 6 (30%) patients a quadriceps power of grade IV was observed in 6(30%) patients. Fall in the same plane is the most common cause of fractures of the patella. Vertical incision is more helpful to mobilize the patient early. Early mobilization of the knee restores quadriceps power and range of knee motion within a short period. Excellent range of movement was achieved in 70% of cases.

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