

## AN EXPERIENCE OF TREATMENT OF CLOSE PATELLAR FRACTURES WITH TENSION BAND WIRING

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### ABSTRACT

Patellar fractures accounts for approximately 1% of all fractures. Prevalence rate is high within the age group of 20 to 50 years and males are twice more commonly affected than females. Transverse fractures are the most common accounting for 50-80% of the patellar fractures whereas comminuted fractures account for 30-35% and the vertical ones for 12-17%.<sup>1</sup> The purpose of this study was to find out the results of operative treatment of transverse fractures of patella with tension band wiring. **Results:** Fifteen cases of transverse close fracture of patella included in the study. Meantime union was 8-10 weeks. Range of movement was excellent in 9 patients (60%) while 4 patients (26.6%) having fractures with comminuting element had good range of movement. Remaining 2 patients (13.3%) had poor results who failed to follow up. **Conclusion:** Tension band wiring in fracture of patella with greater than 2 mm displacement or articular step allows early motion and rehabilitation.

**Key words:** Fracture Patella, Tension band wiring, Displacement

### Introduction :

The patella or knee cap is a triangular sigmoid bone about 5 cm in diameter, which is embedded in the tendon of insertion of quadriceps femoris muscle. The tendon of quadriceps femoris in continuation from lower pole is inserted to upper end.<sup>2</sup> The injury mechanism in patellar fracture may be either direct the most common or indirect. Patellar fractures are classified regarding trace as: transversal, apex, basis, comminuted, vertical and osteochondral, and regarding

degree as: deviated and non-deviated.<sup>3</sup> Patellar fractures result from direct or indirect forces. The majority of patellar fracture results from direct injury, a fall on knee or a direct blow sustained in vehicular trauma are common aetiologies. Although patellar fracture appears to be simple injury, they do have an important bearing on subsequent, knee functions.<sup>4</sup>

There are no universally accepted treatments for patellar fractures. Treatment options include reconstruction

of the entire patella, partial patellectomy and tendon repair or total patellectomy with extensor mechanism repair. Currently reconstruction and preservation of patella with restoration of extensor mechanism is preferred over patellectomy.<sup>1</sup>

### Material and Methods:

The study was undertaken in BPKIHS, Dharan, Nepal. during August, 2012 to December, 2013. In 15 cases of transverse close fracture of patella tension band wiring was performed and the results were analysed.

The indication of surgery included fracture fragment displacement of >2 mm and articular surface incongruity of >2mm. Open fractures, comminuted fractures, transverse fractures with fragment displacement of >2 mm, articular surface incongruity of >2 mm and children were excluded from the study cases were operated within one week of trauma with AO tension band wiring.

Post operatively, patients having fractures with stable fixation and limited retinacular tear were encouraged to have passive motion from 1<sup>st</sup> post operative day while those with unstable fixation and

extensive retinacular tear were placed in a plaster back slap. Active knee motion was allowed only when healing occurred both clinically and radiologically.

The results of surgery were evaluated using the Gaur criteria for knee function. Evaluation based on quadriceps wasting, quadriceps power less, extension lag, knee range of motion, knee pain and functional status and results were graded as excellent, good, fair and poor.

Quadriceps wasting was measured by measuring high circumference 15 cm above knee joint level on both sides and deficit noted in centimeters. Quadriceps power was tested by using spring dynamometer. Quadriceps power of both the knees was calculated as the percentage of quadriceps power loss. Extension lag was calculated by actively extending the knee and noting the amount of loss of active extension knee pain and function were evaluated subjectively (Table-1).

**Table-1:** Gaur criteria for knee function evaluation

Parameters	Excellent	Good	Fair	Poor
Quads wasting	Nil	<1.5 cm	Upto 2.5 cm	>2.5 cm
Quads. Powerless	Nil	<10%	Upto 25%	>25%
Extension lag	No	No	<10	>10
Knee ROM	Full	0-110	Upto 90	<90
Knee pain	No	Minimum	Moderate	Severe
Function	Normal	Normal	Restricted	Incapacitated

### Results:

In this study 15 patients were included, 10 were males and 5 were females. Age at the time of fracture was from 25-55 years. The mean age was 40 years. The main cause of injury

was road traffic accident in 9 (60.0%) cases and 4 cases (26.66%) were direct injuries due to slip while climbing stairs, 2 cases (13.33%) were due to assault, tied with a rod (Table-2).

**Table-2:** Final outcome

No. of Patients	Range of Motion	Status	%
9	100-110	Excellent	60.00
4	80-90	Good	26.66
2	50-55	Poor	13.33

There were no cases of non-union. Range of motion was excellent in 9 patients (60.0%), while 4 patients (26.66%) fractures with some communication element had good range of motion, 2 patients (13.33%) had a poor result regarding motion as they were non-cooperative came for follow up after 3 months. There was marked atrophy of quadriceps and stiffness of the knee joint. There were no cases of wound infection.

### Discussion:

Patella fractures may be treated either conservatively or operatively non-operative treatment is recommended for those cases in which the displacement is less than 2 cms with intact extensor mechanism. If the displacement is more than 2 cms, then it needs open anatomical reduction and internal fixation.<sup>5,6</sup> In this study, we fixed all displaced fractures with open reduction and internal fixation by Weber's technique of tension band wiring.<sup>7,8</sup> Union was achieved between 8-12 weeks time which is comparable with other studies.<sup>8,9</sup>

Rehabilitation for return of quadriceps strength and knee range of motion is absolutely necessary after surgery. In this study, quadriceps strength and knee motion was excellent in 9 (60.0%) patients while 4 patients had good results because of communication and other elements and 2 patients had poor results because of non-efficient physiotherapy. Similar results have been reported in other studies as well.<sup>10,11</sup>

### Conclusion:

Tension band wiring in fracture of patella with greater than 2 mm displacement or articular step allow early motion and rehabilitation.

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