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Comprehensive study of surgical treatments of fracture of patella

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Abstract

Introduction: Fracture patella is seen in all age groups but less common below 20 years of age. The most common cause of patellar fractures is road traffic accident, direct trauma or forcible pull of quadriceps. Fracture of patella accounts approximately 1% of all skeletal injuries.
Materials and Methodology: The study was a randomized, comparative study conducted from July 1st 2014 to December 31st 2015, at Tertiary center on 50 consenting patients who came to the department of orthopedics and on evaluation was diagnosed to have patellar fractures following which they were randomized to one of the following treatment modality
Conclusion: We concluded that tension band wiring was better as it yielded steady and consistent results

Keywords: Patellar fracture, patellectomy, conservative treatment, tension band, biomechanics

Introduction

Fracture patella is seen in all age groups but less common below 20 years of age. The most common cause of patellar fractures is road traffic accident, direct trauma or forcible pull of quadriceps. Fracture of patella accounts approximately 1% of all skeletal injuries.
In a country like India where the social habits and needs, require full range of knee flexion the patella plays an important role. The most significant effect of patella fracture are loss of continuity of extensor mechanism of knee. So it becomes necessary to preserve the whole or part of the patella.
Historically, the need to salvage or excise a fractured patella has been debated by many surgeons. Closed reduction yielded poor results, including non-union and loss of extensor mechanism strength. The secondary effects of prolonged immobilization accompanied their outcome.
Later, internal fixation with percutaneous pinning was developed but was abandoned due to pin tract infection.
The advantage of modified tension band wiring is that it gives rigid fixation and the patient is made to walk and bear weight as tolerated on the first postoperative day. Several surgeons

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report well to excellent results ranging from 50-80%. Therefore, this study has been undertaken to evaluate the results and outcome of different modes of treatment of fracture of patella.

Materials and Methodology

The study was a randomized, comparative study conducted from July 1st 2014 to December 31st 2015, at Tertiary center on 50 consenting patients who came to the department of orthopedics and on evaluation was diagnosed to have patellar fractures following which they were randomized to one of the following treatment modality.

a) Partial patellectomy
b) Total patellectomy
c) Tension band wiring

Materials and Methods

The present study was carried out in a Tertiary Hospital after obtaining the Ethical committee clearance of the hospital. A pre-prepared case Proforma was used to enter the clinical history, physical examination findings and investigations findings. Those who meet the inclusion and exclusion criteria were included in the study

Inclusion criteria

1. Fracture of patella of any type
2. Fracture patella patients above 20 years of age.
3. Open fracture Gustillo-Anderson type 1&2.

Exclusion criteria

1. Compound or open fracture Gustillo-Anderson type 3.
2. Fracture of patella in children.
3. Pre-existing fixed flexion deformity.
4. Pathological fractures

Results and Observations

Age distribution in our study

Table 1: Age in years

Age in years	Frequency
20-30 years	8
31-40	12
41-50	11
51-60	12
>60	7
Total	50

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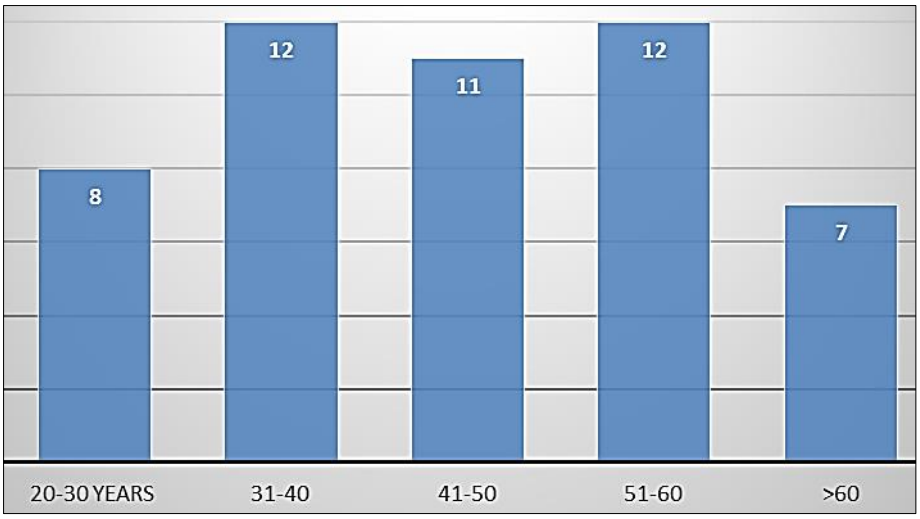

Graph 1: Age in years

The mean age in our study was 45.40 + 14 years the maximum age in our study was 83 years and minimum was 20 years.

Sex			
Surgical treatment fixation method		**Frequency**	**Percentage**
ccs + TBW	Female	2	50.0
	Male	2	50.0
	Total	4	100.0
k wire + TBW	Female	3	18.8
	Male	13	81.3
	Total	16	100.0
Partial patellectomy	Female	2	22.2
	Male	7	77.8
	Total	9	100.0
Cerclage wiring	Female	7	43.8
	Male	9	56.3
	Total	16	100.0
Total patellectomy	Male	6	100.0

Table 2: Distribution of gender variation across the various treatment group

	Frequency	**Percent**
Female	14	28.0
Male	36	72.0
Total	50	100.0

Discussion

The study was a randomized, comparative study conducted from July 1st 2014 to December 31st 2015 at a Tertiary center on 50 consenting patients who came to the department of orthopedics and on evaluation was diagnosed to have patellar fractures following which they were randomized to one of the following treatment modality, Partial patellectomy, Total patellectomy, cerclage wiring.

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Comparison of our study with other studies
Comparison of age distribution

The mean age in our study was 45.40 + 14 years the maximum age in our study was 83 years and minimum was 20 years most cases belonged to 30-60 years, in a study by there had findings similar to our study in the age range of 19 to 99 years (mean age 49 years).

Comparison of gender

Most cases in the study 72% were males.
In a study by there had findings similar to our study in which males were 44 and 33 women.

Comparison of mechanism of injury

In our study 50% each consisted of slip and fall and 50% consisted various type of vehicular accidents and road traffic accidents, in our study 50% each were direct and indirect injuries.

Comparison of type of procedure and results

In our study 20 cases underwent tension band wiring in 16 cases underwent k wire fixation with tension band wiring and 4cases underwent ccs fixation with tension band wiring. 5 underwent total patellectomy comminuted fracture and 9 underwent partial patellectomy. Which 16 cases cerclage wiring was done?
In our study we found that tension band wiring had reliable and better results than the rest of the type of treatment options these findings are similar to studies by Gardner Michael J *et al*. who concluded that anterior tension band fixation has reliable results with simple Yang KH, Byun *et al*. who proved the same.
Chen A *et al*. who showed that tension band fixation for patella fractures can be used as A Treatment options Fairbank (1945), 1971 Kaufer, repeating Haxton's, Scandinavia by Bstman, showed that patellectomy was not better in treating patellar.

Conclusion

After a fracture of the patella, the best results are obtained by accurate reduction and stable fixation, probably by tension band wiring. If accurate reduction and stable fixation cannot be achieved, then patellectomy seems preferable. Especially with comminuted fractures. However, after patellectomy patients must accept an intensive and prolonged rehabilitation programme and understand that the knee will not reach its maximum function in under two years. Its always better to avoid patellectomy and preserve patella. We concluded that tension band wiring was better as it yielded steady and consistent results.

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