

A Comparative study to assess the functional outcome of tension band wiring versus plating in olecranon fractures.

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ABSTRACT: Background: Olecranon fractures are one of the common fractures around the elbow, they constitute around 37% of all fractures occurring around the elbow joint. Olecranon fractures are common and account for 10% of upper extremity injuries. Simple displaced transverse fractures account for approximately 85% of all adult fractures. These fractures are traditionally managed operatively with operatively with open reduction and internal fixation using tension band wiring. Open reduction internal fixation with plate is advocated in the presence of comminution or fracture dislocation **Objective:** to compare the functional outcome between tension band wiring versus plating in olecranon fractures. **Methods:** A prospective study of 42 patients among which 21 patients were treated with tension band wiring and 21 were treated with plating was conducted in dept of orthopaedics MMCRI, Mysore from February 2021 to August 2022. Before subjecting the patients for investigations and surgical procedures consent was obtained and patients were followed up at 6 months interval and were assessed using Mayo Elbow Performance index. **Results:** Patients were assessed using Mayo elbow performance score. Out of total 42 patients, 21 were operated with TBW and 21 were operated with plating. Out of 21 operated with tension band wiring on follow up 10 showed excellent results 8 had good results and 3 had fair results. 21 Patients operated with plating 14 showed excellent and 3 good results and 4 showed fair results **Conclusion:** Best modality of the treatment for fracture depends upon the type of fracture. We could conclude that both plate and TBW is equally effective for management of olecranon fractures. However, plate has a slight advantage over TBW in terms of early mobilization and less complications.

Keywords: Olecranon, TBW, Olecranon-plating, Fracture

Introduction:

Olecranon fractures are one of the common fractures around the elbow, they constitute around 37% of all fractures occurring around the elbow joint. Olecranon fractures are

common and account for 10% of upper extremity injuries.¹ Olecranon fractures affect both sexes however there is slight male predominance. Olecranon is a part of the elbow joint and hence olecranon fractures cause instability of the joint.² Olecranon fractures most commonly occur following a standing height fall with direct impact to the point of the elbow. Alternative mechanisms include avulsion fractures caused by eccentric triceps contraction and high-energy injuries such as falls from height or road traffic accidents.³

Simple displaced transverse fractures account for approximately 85% of all adult fractures. These fractures are traditionally managed operatively with open reduction and internal fixation using tension band wiring. Open reduction internal fixation with plate is advocated in the presence of comminution or fracture dislocation.³

The aim of the current study is to determine if any difference exist between tension band wiring versus and plate fixation with respect to the functional outcome.

Materials and Methods:

The Present prospective study was done by the Department of Orthopedics at Mysore Medical College and Hospital, Mysore from February 2021 to August 2021.

Inclusion Criteria:

- Patients will be selected upon following criteria
- Greater than 18 years & less than 65 years of age
- Diagnosed with fracture of olecranon and willing for surgery.

Exclusion Criteria:

- Patients aged less than 18 years & more than 65 years of age.
- Patients who are medically unfit for surgery.
- Other ipsilateral fractures of upper limb
- Cerebral palsy
- Open fractures

A total of 42 cases of Olecranon Fracture of both sex belonging to adult age group who met the inclusion criteria were selected for the study and further divided into two groups by computer generated randomized number. In Group A a total of 21 cases of fracture of olecranon were treated by Tension Band wiring and 21 cases in Group B of fracture of olecranon were treated by plating method and followed up for functional outcome .

Patients of both sex belonging to adult age group presenting with fracture of Olecranon admitted to the Department of Orthopaedics, K R Hospital attached to MMC&RI, Mysuru.

Method of collection of Data:

All the adult patients who are willing for surgery admitted during the period of study, they are clinically and radiologically evaluated. Laboratory investigation will be carried out before surgery. Informed and written consent of the patient will be taken for the surgical management. Evaluation of the post-op clinical and functional outcome using the Mayo Elbow Performance Index. Radiological examination will be repeated post-operatively and at the end of 6 months intervals.

The Mayo elbow performance score is used to test the limitations caused by pathology, of the elbow during activities of daily living.

It uses 4 subscales mainly Pain , Range of Motion, Stability , Daily function. The total score were calculated for 100 and grouped into 4 categories >90 as excellent , 75-89:good , 60-74:fair , <60:poor.

Results:

Out of the 42 patients the mean age was years with age range being from 18 years to 57 years. There were 28 males and 14 females thus a 2:1 Male to Female ratio there was male predominance seen. 26 were transverse fractures, 10 oblique and 6 commuted fracture patterns were seen in our study .

Table 1 : Distribution of functional outcome among study subjects

Grading	TBW Group(n=21)	Plate Group(n=21)
Excellent	10	14
Good	8	3
Fair	3	4
Poor	0	0

Patients were assessed using Mayo elbow performance score .Out of total 42 patients, 21 were operated with TBW and 21 were operated with plating. Out of 21 operated with tension band wiring on follow up 10 showed excellent results 8 had good results and 3 had fair results. 21 Patients operated with plating 14 showed excellent and 3 good results and 4 fair results.

Table 2 : Distribution of study subjects based on Complications

Complications	TBW Group(n=10)	Plate Group(n=10)
Superficial Infection	2	1
Symptomatic metal prominence	1	1

The complication was found to be minimum in both the groups with 2 cases of superficial infection in TBW group and 1 case in Plate Group . Symptomatic Metal prominence was seen in single case in both the groups.

Also, when we compared TBW K-wire technique with Plating for treatment of olecranon fractures using statistical data and unpaired t test p value was >0.05 which means there is no significant difference in the outcome

Discussion:

The main aim of treatment of fracture is not only achieving union, a perfect anatomical reduction of fragments to obtain articular congruity and rigid fixation of fragments, if early movements are to be instituted to prevent complications like traumatic arthritis and joint stiffness.

In our study 10 cases of olecranon fractures were treated with TBW and 10 with plate fixation. When we compared TBW and plating in terms of functional outcome there wasn't

much difference. However, plating provides a slight advantage over TBW in terms of less complications and better fixation.

Complications observed in our study were implant impingement, superficial infection. Tension band wiring was associated with implant impingement which eventually needed implant removal.

Plating was associated with movement restriction and implant exposure. Other complications were dealt accordingly on follow up.

The mean age of the study population in our study was around 38.9 years of age which is comparable to the study findings of Schlemann and Rashke et al.⁴ and Macko et al.⁵. In our study there was male predominance which is comparable to the findings of Hume and Weiss et al.⁶, Jiang et al.⁷ study.

The complication seen in our study was found to be comparable to the findings of Murphy et al.⁸ and Tada DC et al.⁹.

Additionally, there was no statistically significant difference in the results when we compared the TBW K-wire approach with plating for the treatment of olecranon fractures using statistical data and an unpaired t test. This outcome is consistent with the research done by Schlemann et al.⁴ and Core et al.¹⁰ and Tada DC et al.⁹. In terms of fewer problems and better attachment, plating offers a modest advantage over TBW k-wire.

Conclusion:

Best modality of the treatment for fracture depends upon the type of fracture. We could conclude that both plate and TBW is equally effective for management of olecranon fractures. However, plate has a slight advantage over TBW in terms of early mobilization and less complications. Comminuted fractures are best treated with olecranon plating whereas non-comminuted are best treated with TBW with k wire.

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