

## Original Research

### Functional outcome in Olecranon fracture managed by tension band wiring

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#### ABSTRACT:

**Background:** Word olecranon literally means elbow (olene) + head (kranion) derived from Greek. Tension band wiring (TBW) which was introduced by Weber and Vasey remains the most widespread method for fracture osteosynthesis. Hence; the present study was conducted for assessing functional outcome in Olecranon fracture managed by tension band wiring.

**Materials & methods:** The present study was conducted for assessing functional outcome in Olecranon fracture managed by tension band wiring. Open fractures were irrigated thoroughly with normal saline, cleaned with povidone iodine solution, suturing will be done if possible otherwise loose stitches were applied. Tension Band wiring was done in all the patients. The patients were then discharged and called up for follow up and suture removal at 10- 14<sup>th</sup> post operative day. All patients were followed up for 6 months. Functional assessment was done using Mayo Elbow Performance Score. All the results were analyzed by SPSS software. **Results:** Mean age of the patients was 45.8 years. 75 percent of the patients were males. 65 percent of the patients were of rural residence. Excellent results were seen in 55 percent of the patients while good results were seen in 25 percent of the patients. Mean duration of surgery was 38.4 minutes. Mean range of motion on follow-up was 104.3°. **Conclusion:** Excellent results are obtained in Olecranon fracture managed by tension band wiring.

**Key words:** Olecranon fracture, Tension band wiring

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#### INTRODUCTION

Word olecranon literally means elbow (olene) + head (kranion) derived from Greek. Trauma to the adult elbow can be challenging to treat by virtue of the complex articular structure, complex capsular ligament and musculotendinous arrangements, and the proximity of neurovascular structures. The fracture of the olecranon is an intra-articular injury with loss in the extension mechanism of the elbow joint; therefore its treatment is almost operative.<sup>1</sup>

Fractures around the elbow represent approximately 5.5% of fractures of the entire skeleton of which radial head fractures are seen most frequently (2.8%), followed by fractures of the olecranon and radial neck (1% each), the distal humerus (0.5%), and extra-articular fractures of the proximal radius and ulna (0.2%). The common causes of Olecranon fractures are mostly due to self-fall, motor vehicle crash, fall from a height, or a direct blow to the elbow and are

commonly observed orthopedic injuries in the emergency room.<sup>2</sup>

Tension band wiring (TBW) which was introduced by Weber and Vasey remains the most widespread method for fracture osteosynthesis. However, a number of complications such as infection, non-union, malunion and ulnar nerve palsy could compromise the effect of operative treatment in up to 10% of cases. Moreover, the subcutaneous placement of K-wires and their potential migration may be responsible for local pain, secondary displacement and wound healing problems.<sup>3-6</sup> Hence; the present study was conducted for assessing functional outcome in Olecranon fracture managed by tension band wiring.

#### MATERIALS & METHODS

The present study was conducted for assessing functional outcome in Olecranon fracture managed by tension band wiring. Open fractures were irrigated

thoroughly with normal saline, cleaned with povidone iodine solution, suturing will be done if possible otherwise loose stitches were applied. This was followed by primary treatment in form of splintage to affected limb(s), analgesics, intravenous fluids, antibiotics and prophylaxis for tetanus. The limb was initially immobilized with a long arm/above elbow posterior POP slab. Initial radiographs were done taking true antero-posterior and lateral views of the elbow. The fracture pattern was then classified according to the mayo classification. Tension Band wiring was done in all the patients. The limb was kept elevated in posterior slab for the first two days. After subsidence of swelling and subjective decrease in pain the slab was removed and put on an arm pouch. With this, gradual flexion extension exercises were started

within the limit of tolerance of pain. The patients were then discharged and called up for follow up and suture removal at 10- 14<sup>th</sup> post operative day. All patients were followed up for 6 months. Functional assessment was done using Mayo Elbow Performance Score. All the results were analyzed by SPSS software.

## RESULTS

Mean age of the patients was 45.8 years. 75 percent of the patients were males. 65 percent of the patients were of rural residence. Excellent results were seen in 55 percent of the patients while good results were seen in 25 percent of the patients. Mean duration of surgery was 38.4 minutes. Mean range of motion on follow-up was 104.3°.

**Table 1: Demographic data**

Variable		Number	Percentage
Age group	Less than 30	5	25
	30 to 50	11	55
	More than 50	4	20
Gender	Males	15	75
	Females	5	25
Residence	Rural	13	65
	Urban	7	35

**Table 2: Function outcome**

Outcome	Number	Percentage
Excellent	11	55
Good	5	25
Fair	3	15
Poor	1	5

## DISCUSSION

The typical presentation for a patient with an olecranon fracture is with elbow pain and swelling and inability to extend the elbow against gravity. Diagnosis of any upper extremity injury begins with a thorough physical examination of the entire extremity, including observation, palpation, and complete neurovascular examination. A palpable defect can be appreciated if there is substantial displacement of the fracture. It is extremely important to closely examine the skin for any openings given the subcutaneous location of the ulna.<sup>6-8</sup>

Isolated olecranon fractures can be identified appropriately with standard AP and lateral radiographs of the elbow. It is essential to obtain a true lateral radiograph of the elbow to evaluate the extent of the fracture, degree of displacement and comminution, and the degree of articular surface involvement. Radiographs should be examined carefully for evidence of coronoid process fracture, dislocation of the elbow, and radial head injury. More advanced imaging rarely is indicated for isolated olecranon fractures. Treatment involves immobilization of the elbow in a posterior splint, orthosis, or long-arm cast in approximately 90° flexion for approximately 3 weeks, followed by

progressive active elbow ROM and strengthening. Operative fixation should be performed when there is articular incongruity or disruption of the extensor mechanism. Tension-band wiring usually provides stable fixation with a high union rate for simple noncomminuted transverse olecranon fractures. A tension-band construct converts the tensile distraction force of the triceps into a compressive force at the articular surface.<sup>8-11</sup> Hence; the present study was conducted for assessing functional outcome in Olecranon fracture managed by tension band wiring.

In the present study, mean age of the patients was 45.8 years. 75 percent of the patients were males. 65 percent of the patients were of rural residence. Excellent results were seen in 55 percent of the patients while good results were seen in 25 percent of the patients. Parate A et al assessed the functional Outcome of Olecranon Fractures Managed with Tension band Wiring Using K Wires with Tension Band Wiring Using Cancellous Screws Fixation. 20 patients of olecranon fractures were enrolled randomly. In the K wire category, 5 patients (50%) had excellent results, 3 patients (30%) had decent results, and 2 patients (20%) had fair results. In both categories, there were no negative repercussions. In the cancellous screw category, excellent results were

found in 8 patients (80%), nice in 1 patient (10%), and fair in 1 patient (10%). For displaced olecranon fractures as per Mayo's II A classification fixed by using cancellous screw with tension band wiring gives better clinical outcome. When compared to tension band wiring, K-wire fixation keeps costs down, time, and the chance of implant removal complications.<sup>10</sup>

In the present study, mean duration of surgery was 38.4 minutes. Mean range of motion on follow-up was 104.3°. Hsu KL et al conducted retrospective cohort study recruited consecutive patients underwent surgical fixation for patellar fractures using modified tension band technique. The study included 170 patients with patellar fractures. Regarding the bending method, similar results were obtained with bilaterally or proximally bent Kirschner wires. Regarding length, the tension band was placed closely (within 25% of the patella length) in 124 patients and distantly in 46 patients. The rates of loss of reduction and implant breakage were significantly higher in the distantly placed tension bands. Regarding depth, 37 patellar fractures were fixed with the Kirschner wires at the superficial one third of the patellae while the K-wires at the middle layer of patella were used in the remaining 133 patellar fractures. A significantly higher rate of minor loss of reduction was obtained using the superficial Kirschner wires. They concluded that the modified tension band technique for transverse patella fractures provides favorable clinical outcomes, with low failure (5%) and infection (2%) rates. Implant irritation is the major complication, and almost half of cases require implant removal.<sup>11</sup>

## CONCLUSION

Excellent results are obtained in Olecranon fracture managed by tension band wiring.

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