National Journal of Clinical Orthopaedics

ISSN (P): 2521-3466
ISSN (E): 2521-3474

www.orthoresearchjournal.com
2019; 3(4): 94-97
Received: 10-08-2019
Accepted: 12-09-2019

Dr. Pratikkumar Bhabhor
Resident Doctor, Dept of Orthopaedics, B J Medical College, Ahmedabad, Gujarat, India

Dr. Kerul Ninama
Resident Doctor, Dept of Orthopaedics, B J Medical College, Ahmedabad Gujarat India

Corresponding Author:
Dr. Pratikkumar Bhabhor
Resident Doctor, Dept of Orthopaedics, B J Medical College, Ahmedabad, Gujarat, India

6.5 mm cancellous screw with washer vs tension band wiring for fractures of the olecranon

Dr. Pratikkumar Bhabhor and Dr. Kerul Ninama

DOI: https://doi.org/10.33545/orthor.2019.v3.i4b.184

Abstract
Background: Olecranon fractures are one of the most commonly seen orthopaedic injuries in the emergency room. The K-wire which is used in the AO Tension Band Wiring (TBW) technique resists the shear better than the figure of eight wire alone, but, it does not add compression to the fixation strength. But, the cancellous screw provides the strength of fixation i.e., by converting the tensile force to a compressive force at the fracture site, with additional resistance to the displacement due to the lag screw compression

Objective

- To clinically evaluate the result of the 6.5 mm cancellous screw with washer V/s tension band wiring for fractures of the olecranon.
- To assess the elbow joint motion and stability after the procedure.

Material and Methods: sixteen cases of fractures of the olecranon which were treated by using 6.5mm AO cancellous screws with a screw length of 80-105mm and 6.5 mm washer and 18 cases are treated with a 16 gauge TBW, were evaluated. All the cases were followed up and the results were analyzed by using a 19 point scale.

Results: Excellent results were achieved with 6.5mm CCS with Washer in 13 (38.23%) patients while with TBW K wire 12(35.29%) patients, good results were achieved with 6.5mm CCS with Washer in 2 (5.88%) patients while with TBW K wire 4(11.76%) patients fair results were achieved 6.5mm CCS with Washer in 1 (2.94%) patients while with TBW K wire 2(5.88%) patients There were no poor results

Conclusion: The technique of close reduction and internal fixation with 6.5 mm CCS is better than open reduction and internal fixation with TBW.

Keywords: Olecranon fractures, cancellous screw, tension band wiring

Introduction

Olecranon fractures are one of the most commonly seen orthopaedic injuries in the emergency room. When they are displaced, open reduction and internal fixation are usually required to obtain an anatomical realignment or the articular surface and to restore the normal elbow function. The fixation should be stable, it should allow an active elbow flexion and extension and it should promote union of the fracture.

In the past, closed reduction and a plaster cast application was the treatment for fractures of the olecranon. But, a prolonged immobilization, with its own complications, increased the morbidity and the mortality of the patients. So, considering this, it has become important to intervene surgically. The active mobilization after surgery will restore the patient to normal functions as early as possible. The early and active movement not only prevents the tissue from fracture disease, but it greatly influences the quality and the rapidity of the fracture union.

Many methods which have been described are tension band wiring, intrafragmentary screws with or without wires, wires alone, plates, rush pin with tension band wiring, intramedullary screws with or without tension bands and bone fragment excision with reattachment triceps. AO tension band wiring is the most common method which is used; it involves the use of a tension band and two K wires. But it is not free of complications, the most common being hardware prominence which requires removal, loss of motion and loss of fixation. The K-wire which is used in the AO tension band technique, resists the shear better than the figure of eight

wire alone, but, it does not add compression to the fixation strength. But, a cancellous screw provides the strength of fixation i.e., by converting the tensile force to a compressive force at the fracture site, with additional resistance to the displacement due to the lag screw compression.

Materials and Methods

The present study consisted of 34 cases of fractures of the olecranon of which 16 were treated with 6.5mm AO cancellous screws with washer, screw length of 80-105mm and 18 were treated with a with a 16 gauge TBW, which were treated at the B J Medical College Civil Hospital Ahmedabad during the period from Sept 2018 to sept 2019, after taking ethical committee clearance from the hospital authorities.

Immediately, on the arrival of the patients, if he/she was in shock, the level of the shock was noted and it was managed accordingly. An X-ray of the part was taken and the elbow was immobilized in whatever position the patients presented, in a A/E POP posterior slab. The affected limb was kept elevated. Analgesics and antibiotics were given if necessary. The necessary investigations were carried out. All the patients were informed regarding the procedure and their informed consents were taken. The patients were then prepared for surgery and anaesthesia after their pre anaesthetic check ups.

Selection of the Cases for the Cancellous Screw and Tension Band Wiring:

The following points were considered

- Age of the patient
- The extent of damage to the articular surface
- The degree of comminution

The patients of extreme ages and the patients in whom the operative risk was great, were not taken up for surgery. The severely comminuted fractures with larger articular surface damages, where restoration of the normal anatomy was not possible, were not taken up for the cancellous screw with washer and TBW.

The Surgical Procedure:34 cases of fractures of the olecranon were treated by using 6.5mcancellous screws with a screw length of 80-105mm with washer and a 16 gauge TBW under general anaesthesia or a brachial block. The exposure of the olecranon was achieved by using Campbell's posterolateral approach.

The accuracy of the reduction was checked and its stability was tested by moving the joint.

Postoperatively

- Liberal analgesia and antibiotics were given.
- The affected limb was elevated and the patient was asked to perform finger movements on day one. Elbow movements were advised from the 3rd postoperative day.
- For the minimal comminuted fractures and the unstable fixations, the limb was immobilized in A/E POP posterior slab with the elbow in 90° flexion for 2 weeks. For other fractures, the limb was mobilized by about the 3rd postoperative day.

Follow up

This part of the study should be done very carefully and meticulously. In our study, the patients who were to be discharged were advised to report for follow up after 6 weeks and 12 weeks and thereafter, every 3 months. The result was assessed 12 months after the procedure. At follow up, a detailed clinical examination was done and the patients were assessed subjectively for symptoms like pain, swelling and restriction of the joint motion. On clinical examination, the swelling of the joint, its tenderness, the movements of the elbow joint, prominence of the head of the cancellous screw, nutrition and power of the muscles which were acting on the joint, were noted. The patients were instructed to carry out physiotherapy in the form of active flexion-extension and pronation-supination without loading. Check X-rays were taken and when the final X rays showed union, the implants were removed. In all the patients, the durations after which they returned to their jobs were noted.

Results

Although there are many methods of evaluation of the results, which are given by many authors, for the sake of simplicity and ease, the results of all the fractures of the olecranon which were treated by using a cancellous screw with washer and TBW, were evaluated in our study

There was a significant male predominance in the present study (22 patients-64.70%).

Right side olecranon fractures were common 22 (67.70%) than left side fractures 12(32.3%) in the present study.

In the present study, road traffic accidents were more common 22(67.70%) than indirect injuries.

In the present study chance of

- superficial infection with 6.5mm CCS with washer way less 1 (2.94%) as compared to tbw k wire 4 (11.76%)
- impingement with 6.5mm CCS with washer is less 2 (5.88%) as compared to tbw k wire 3(8.82%)
- Restricted Mobility with 6.5mm CCS with washer less 1 (2.94%) as compared to tbw k wire 4 (11.76%)
- Pain with 6.5mm CCS with washer is less 2 (5.88%) as compared to tbw k wire 6(17.64%)

All the patients were operated between 2-10 days, with an average period of 3.48 days after the injury. All the cases were followed up and the findings were recorded regularly. The results were analysed according to a 19 point scale.

- Excellent results were achieved with
  - 6.5mm CCS with Washer in 13 (38.23%) patients while with TBW K wire 12(35.29%) patients achieved excellent result
- good results were achieved with
  - 6.5mm CCS with Washer in 2 (5.88%) patients while with TBW K wire 4(11.76%) patients achieved good result
- fair results were achieved
  - 6.5mm CCS with Washer in 1 (2.94%) patients while with TBW K wire 2(5.88%) patients achieved fair result
- There were no poor results.
- The complications like superficial infections and a symptomatic metal prominence were, which were treated accordingly.

Discussion

The main aim behind the treatment of fractures is not only achieving a joint union but also preserving the optimum function of the adjacent soft tissues and joints. In the management of intraarticular fractures like fractures of the olecranon, a perfect anatomical reduction of the fragments, for obtaining articular congruity and rigid fixation of the fragments, is of utmost importance, if early movements are to be instituted to prevent complications like traumatic arthritis and joint stiffness. 6.5mm AO cancellous screws with washer V/s TBW K wire, provides

the strength of fixation, that is, by converting the tensile force to a compressive force at the fracture site, with additional resistance to the displacement due to the lag screw compression. In our study, 34 cases of fractures of the olecranon were treated with 6.5mm AO cancellous screws with washer and tension band wiring. Our experience with this method of fixation has given favourable results. The findings, the end results and various other data will be analyzed and compared in the following discussion

Table 1: sex incidence

Sex/procedure	Male	Female
6.5mm CCS with washer	10 (29.41%)	6 (17.64%)
TBW K wire	12 (35.29%)	6 (17.64%)

Table 2: Side Incidence

Side/procedure	Right	Left
6.5mm CCS with washer	12 (35.29%)	4 (11.76%)
TBW K wire	10 (29.41%)	8 (25.53%)

Table 3: mechanism of injury

Mechanism of Injury/procedure	Road traffic Accident	Direct Blow	Fall from Height
6.5mm CCS with washer	12	2	2
TBW K wire	10	5	3

Table 4: Post operative Complications

Post op complications/pocedure	6.5mm CCS with Washer	TBW K wire
Superficial Infection	1 (2.94%)	4(11.76%)
Impingement	2(5.88%)	3 (8.82%)
Implant loosening	0	2(5.88%)
Restricted mobility	1 (2.94%)	4(11.76%)
Pain	2(5.88%)	6 (17.64%)

Table 5: Results of the Procedure

Results/Procedure	Excellent	Good	Fair
6.5mm CCS with washer	13(38.23%)	2(5.88%)	1(2.94%)
TBW K wire	12(35.29%)	4(11.76%)	2(5.88%)

Fig 1: pre op xray

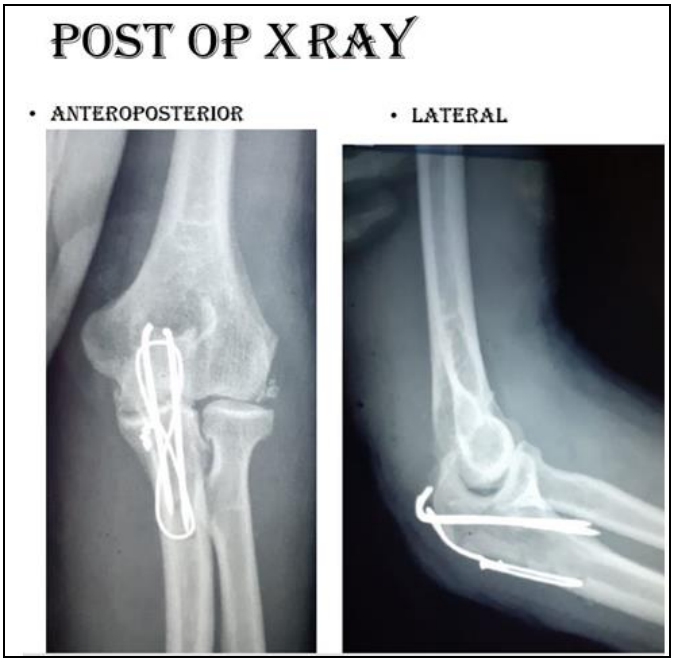

Fig 2: post op TBW x ray

Fig 3: Post op 6.5mm CCS with washer Xray

Conclusions

- It is concluded that there is reduced chances of infection with 6.5 mm ccs with washer as compare to tbw k wire
- Reduced chances of mobility restriction in 6.5 mm ccs as compared to TBW k wire
- Reduced chances of impingement as compared to tbw k wire
- Early mobilization of elbow with reduced pain with 6.5 mm ccs as compared to tbw k wire

References

1. Hak DJ, Gollady GJ. Olecranon fractures: treatment options. J Am Acad Orthop Surg. 2000; 8:266-75.
2. Heim U, Pfeiffer K. Small fragment set manual: technique recommended by the ASIF-Group. New York: Springer; 1974, 743.
3. Murphy DF. Displaced olecranon fractures in adults -

Biomechanic analysis analysis of fixation methods Clin Orthop. 1987; 224:210-14.
4. Murphy DF, Green WB, Damerson TB. Displaced olecranon fractures in adults. Clinical evaluation" Clin Orthop. 1987; 224:215-23
5. Xieyuan J. Operative treatment of olecranon fracture associated with anterior dislocation of the elbow Chinese J of Orthop. 2000; 20(3):154-56.
6. Hume, Mary C, Wiss Donald A. Olecranon fractures Clin Orthop. 1992; 285:229-35.
7. Wolfgang G. Surgical treatment of displaced olecranon fractures by TBW. Clin Orthop. 1987; 224:192-204.
8. Ahmed AR, Sweed T, Wanas A. The role of cancellous screw with tension band fixation in the treatment of displaced olecranon fractures, a comparative study European Journal of Orthopaedic Surgery and Traumatology. 2008; 18:571-76.