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To study the total duration of union following fixation with titanium elastic nail

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Abstract

Result: Union was seen at 12-18 weeks postoperatively with mean 13 weeks postoperatively in study. "P value" less than 1 that suggest that union time is not associated with type of reduction.

Conclusion: Titanium elastic Nail is a safe, effective and valuable technique for selected cases. Titanium elastic intramedullary nailing techniques have advantages like less soft tissue injury, shorter operating time and hospital stay, more cosmetic satisfaction and minor surgery needed to remove the implant.

Keywords: Fixation, titanium, elastic nail & duration

Introduction

Fractures of the shaft of humerus are commonly encountered by orthopaedic surgeons, representing 1-2% of all fractures [1-3]. This fracture can be treated by either conservatively using functional braces/plaster support or surgically. The two modalities of internal fixation in fracture shaft of humerus are plate osteosynthesis and intramedullary nailing. Nails are subjected to smaller bending loads and are less likely to fail due to fatigue. They act as load sharing and stress shielding devices [1, 2]. Cortical osteopenia that occurs right adjacent to the ends of plates is rarely seen with intramedullary nails; thus, refracture after implant removal is seen less often.

The femur (Thigh bone) is the longest, strongest, largest and heaviest tubular bone in the human body [1, 2], and one of the principal load-bearing bones in the lower extremity [2]. Femoral shaft fractures, typically caused by blunt trauma, are the most common major pediatric injuries treated by the orthopedic surgeon [3] and representing about 1.6% of all fractures in the pediatric population.

Material and Method

This study was carried out at Ailevel; 1 trauma Centre, Amaltas Institute of Medical Sciences, Dewas, M.P. [1, 2] India.

This prospective Study will include 50 skeletally; matured patients (18-70 years of age) presented consecutively in the Department of Orthopaedics with a fracture of middle third of the clavicle during the period of January 2018 to Dec 2018. Fractures classified according to OA/OTA classification.

Inclusion criteria

Relative indication for Fixation of mid shaft Clavicle fractures are:

1. Age group

- a. 18-70 years#>

2. For fracture

- a. Displacement >2cm#/
b. Shortening >2 cm{;
c. Duration <2 weeks
d. Segmental fractures

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- e. Increased comminution Patient with clinical deformity
- f. Open fracture
- g. Threat of skin perforation at the fracture site
- h. bilateral clavicle fractures
- i. fracture of middle 1/3 displace (Allman type 1, Carig type 1, Neer type 1, Robinson Type 2)
- j. Angulation >45; degree)

3. Associated injuries

- a. Multiple ipsilateral upper rib fractures
- b. Floating shoulder
- c. Vascular injury requiring repair
- d. Progressive neurological, deterioration

4. Patient factors

- a. Patient wants to early return of function
- b. Polytrauma patient,

Exclusion criteria

- a. Cases with high anaesthesia-risk
- b. Cases with marked comminution
- c. Cases with mental retardation or any psychiatric illness
- d. Pathological fracture
- e. Patient won't give consent
- f. Fracture more than 2 weeks duration
- g. Medial part of clavicle fracture
- h. Lateral part of clavicle fracture
- i. criteria that not involved in inclusion

Results

1. Operating time was I mean 54.2 mins in hour study, highest time of operation needed in open reduction of fractures range from 70mins-95 mins.
- Operating time was start recording from incision taken to complete application of lskin sutures, except time taken for induce in general-anesthesia, painting, Drapping and extru bation time.
2. Mobilization was started at mean 2-5 weeks postoperatively in all patients. Initially pendulumi exercises with gentle; range of motion exercises and graduallyl over head abduction and weight bearing was started. Full range of lmotioni was achievedby 8-10 weeks postoperatively in allc aseslafter-surgery.

Union time

- Unioni was seen at 12-18 week sipostoperatively with-mean 13 weeks postoperatively in study.
- "P value" less than 1 that suggest that union time is not associated with type of reduction.

Table 1: Union Time

Type of reduction	Union upto 12 weeks	Union >12 weeks	Total
Close	11	20	31
Open	2	12	14
Total	13	32	45
Yate's chi-square	1.204		
P value	0.27		
chi square	2.11		
P value	0.14		

Discussion

Operating time in our study, mean; time of 54.2 mins, 80% of; patients discharge within 3 days of operation on oral antibiotic drugs. Srivastav *et al.* [53] reported in their study, the average

operative time was 45 min (range 20-75 minutes), Nidhi Narsaria *et al.* [19] reported average time of surgery was 40.2 mins (28-55), Jubel *et al.* [33] reported, average time of surgery was 46 mins (25-55 mins). As sobhi *et al.* [7] in Comparative study reported duration of surgery time of plating group mean 68.1 min and surgery time of nailing group mean 144.min that is less than plating group. Our study results match with other literatures.

Nidhi Narsaria *et al.* [19] reported, in her study that EIN is-a safe, minimally invasive surgical technique with a lower-complication rate, faster return to daily activities, excellent; cosmetic and comparable; functional results, and can be used as an equally effective-alternative to plate fixation on displaced mid shaft clavicle fractures. Length of incision, operation time, blood loss and-duration of hospital stay-were significantly less for the EIN group. American-Shoulder and Elbow Surgeons (ASES) and Constant Shoulder scores were significantly higher ($p < 0.05$) in the plating group than the EIN group for the first 2 months but there was no significant difference found between the two groups-regarding functional and radiological outcome at the 2-years follow-up. Significantly higher rates of refracture, after implant removal ($p = 0.045$) in the plating group was observed. Infection and revision surgery rates-were also higher in the plate-group, but this difference was insignificant ($p > 0.05$).

Conclusion

Titanium elastic Nail is a safe, effective and valuable technique for selected cases. Titanium elastic intramedullary nailing techniques have advantages like less soft tissue injury, shorter operating time and hospital stay, more cosmetic satisfaction and minor surgery needed to remove the implant.

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