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Original Research Article

A Novel Treatment of Clavicle Fractures Treated by Open Reduction and Internal Fixation by K Wires

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Abstract

Background: Fractures of clavicles are most commonly managed by conservative method. However, management displaced clavicle fracture is always a dilemma. In our study we are showing results of clavicle fractures managed by k wire fixation.

Materials and Methods: This is a prospective study of 20 patients managed by open reduction and internal fixation by k wire by minimal invasive approach.

Results: In our study 30 patients male female in a ratio of whom the right side clavicle and left side clavicle fracture. Excellent outcome shown in patients and good results in. No intraoperative compilation and no postoperative complications. All patients had a full range of movements of the ipsilateral shoulder post operatively.

Conclusion: we recommend k wire fixation for clavicle fracture in view of results in our study.

Keywords: Clavicle fracture , k wires.

Introduction

The clavicle is a long dual curve bone that forms a direct link between axial and appendicular skeleton. The clavicle is the first bone in the human body to show intramembranous ossification with exception to rare pathological fracture due to metastatic and metabolic disease. The clavicle fracture are most commonly due to trauma. Traditionally mechanism of injury was due to fall on outstretched hand but clavicle fracture most commonly due direct compression force on shoulder. Its prevalence is high among the young population even if also shows a bimodal age distribution with distribution rate high among the female after the sixth decade of life as a result of osteoporosis and difference in life expectancy. The mean age has been reported to be 29.3% and incidence appears to be significantly decreased after the second decade of life. Males are affected approximately twice as much as females. The first widely accepted classification system for clavicle fracture was described by Allman in 1967. Fracture was classified according to anatomical location. Type 1 fracture within middle third of clavicle Type 2 fracture involving lateral third and type 3 fracture involving medial third. A more detailed fracture classification was given by robison {edinburg classification} which are primarily classified based and anatomical location and which are further divided based on amount of fracture fragments displacements

Type 1 medial fifth clavicle fracture type 1a non displaced[extra articular, intraarticular] type 1b displaced [extra articular,intra articular] type 2 middle third fracture type 2a non displaced angulated type 2b displaced comminuted or multifragmentary type 3lateral fifth fracture type 3a nondisplaced[extra articular,intra articular] type 3b displaced [extra articular,intra articular].

Treatment for type 1 and type 3 are not debated, most of them treated by conservative methods by most surgeons by immobilization in sling and physiotherapy. However, middle fractures are a dilemma. There are various methods of treatment by open reduction and internal fixation. Several methods were suggested but none were considered to be gold standard.

Materials and Methods

We conducted a prospective study on 30 patients who are managed by open reduction and internal fixation by k wire and we compared our study with clavicle fracture which are managed by open reduction and plating to clavicle. We conducted our study in government medical college suryapet from November 2020 to October 2021.

Inclusion criteria

1. Age between 25 to 65 years
2. Sex both male and female
3. Middle third fracture including both displaced and comminuted fractures

Exclusion criteria

1. Below 18 years age.
2. Skeletally immature patients.
3. Patient who are not willing for procedure.

All the baseline blood investigations were performed preoperatively and patients were assessed for fitness to undergo surgery. The surgery was performed under brachial block with patient in supine position. A sandbag was placed in the interscapular region. The requisite area was thoroughly scrubbed, painted and draped.

Surgical approach

Patient kept in a supine position . under the brachial block. Fracture site was identified with help of fluoroscopy and a skin incision of 3 cm given over fracture site and fracture site was opened. Retrospectively 1.8 mm k wire passed through lateral end retrieved through supraspinatus muscle from back and guided to medial fragment under c arm. If fracture is comminuted we reduce the fracture and suture them with vicryl. Postoperatively arm sling pouch was applied.

Figure 1

These are pictures showing the procedure of k wire fixation. Picture 2 shows opening of fracture site and retrograde passage of k wire and retrieving it through the supraspinatus muscle. Post operative picture shows the alignment of fracture site.

Observation

Our study included 30 patients age 25 to 45 years.

Table 1

Age	Number of patients
25 to 30	15
31 to 40	10
41 to 45	5
total	30

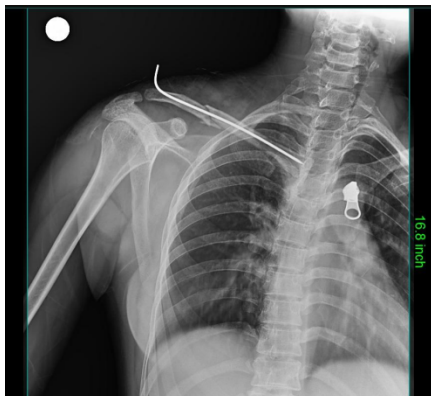
Table 2

Age	Number of patients	Male	female
25 to 30	15	10	5
31 to 40	10	7	3
41 to 45	5	3	2
total	30	20	10

CASE 1

Pre op xray

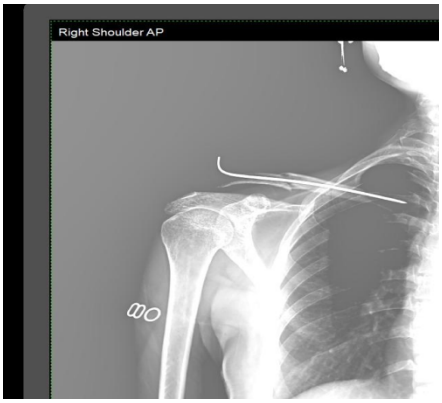
Post op xray



Follow up xray

CASE 2
Pre op xary

Post op xray



Follow up

Discussion

Clavicle fractures traditionally undisplaced fracture are managed by conservative method problems that arise during treatment of displaced fractures. Traditional non operative methods show higher rates of non union and symptomatic malunion and unsatisfactory outcomes with patients treated by non operative methods for displaced clavicle fractures and displaced fractures treated by clavicular plating shows high rate of implant prominent and infection rates and cosmetic issues.

We in our study managed clavicle fracture by open reduction and internal fixation by k wire showed less rate of nonunion and malunion no cosmetic issues. In our study there are 24 cases with union of fracture without any complication and there 6 cases reported k wire migration and in these where fracture fragments with alignment we waited for 2 months and these fractures were malunited and had good functional outcome.

By this method

1. There will early pain control in spiked fragments protruding under skin compared to non operative method.
2. High rates of union.
3. No second surgical procedure required for implant removal.
4. Minimal scar support.
5. Cost effective treatment.

We in our study compared our patients with patients on whom clavicle plating was performed. Patients with clavicle plating had better union rates but patients were unsatisfied with their cosmetic appearance and second surgery required for removal of implant. Clavicle fracture treated by plating shows good union rates but there are several associated issues like implant prominence leading to cosmetic defect, scar formation and secondary surgery for implant removal. To overcome all these issues which are seen by plating are reduction by k wire fixation to clavicle fractures.

Conclusion

Open reduction internal fixation of clavicle fracture by k wire is novel treatment in clavicle fracture with high rates of union and less scar and cost-effective.

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