ORIGINAL ARTICLE

PLATE FIXATION OF FRESH DISPLACED MIDSHAFT CLAVICULAR FRACTURES

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ABSTRACT: Between 2005 to 2010, twenty-eight fresh displaced midshaft clavicular fractures in adults with an average age of 36.4 years were treated with primary internal fixation using reconstruction plates. The fractures were completely displaced with or without comminution. Patients less than 20 years of ages, those with associated complex fracture of the shoulder girdle and with neurovascular compromise were excluded from the study. The follow up period varied from 6 to 24 months. Superficial infection developed in 4 (14.2%) patients and deep infection in one (3.5%). The average time to union was 10 weeks. There was no metal work failure. Nonunion occurred in two patients (7.1%), 4 patients (14.2%) complained of occasional pain associated with activity. 6 patients (21.4%) developed skin numbness. There was no impairment shoulder of shoulder movement. 90% of patients were happy with the outcome.
KEYWORDS: Midshaft clavicle fractures, plating.

INTRODUCTION: Clavicle fractures occur commonly in young active individuals due to a direct blow to the shoulder that produces axial compression of the bone.[1] They account for approximately 2.6% of all fractures and are seen in large numbers in our fracture clinics.

The most common type of fracture is the fracture of the mid-shaft of the clavicle.[2] This accounts for 80% of all clavicle fractures. Even when significantly displaced mid shaft fractures are traditionally treated conservatively. The basis of above treatment was because of early reports which suggested that clavicular nonunion was extremely rare after non operative treatment with an incidence of 0.1% to 1%.[3] Clavicular non-union was described as being of radiological interest without any clinical significance.[4] Much change has been noted in studies made in recent times that are restricted to midshaft clavicular fractures which are completely displaced in adults that use patient oriented outcome measures and which have improved follow up studies. Non-union rates can be as high as up to 11% to 21%.[5] Also patients in whom fracture have healed have ongoing symptoms. Thus it appears that clavicular nonunion is a definite clinical entity with characteristic clinical and radiographic features.[6]

Enough evidence now exists to conclude that the results of closed treatment are much inferior to what has been reported previously[7].There are a number of studies that support the primary operative treatment of completely displaced mid shaft clavicular fractures.

Fig.1: Showing fracture clavicle

MATERIALS AND METHODS: From the period of 2005 to 20010 twenty eight patients with fracture mid shaft of the clavicle which was completely displaced were treated by open reduction and internal fixation. Patients older than 20 years with a fresh displaced or comminuted fracture of the shaft of the clavicle were operated upon. Patients with scapular or complex shoulder girdle injuries were not included. Ten cases were caused by motorcycle injuries, other vehicular injuries were the cause in four cases. The rest were caused by sporting injuries or by direct violence. Six patients had associated injuries, five cases were type 1 open fractures, and eight had marked skin tenting with abrasion that threatened skin integrity. All cases were operated within three days of injury. The indication of operation was displacement of bone ends by more than 100% of the diameter of the clavicle and or presence of comminution.

The operation was performed under general anesthesia or interscalene block, the patient being in supine position. The skin incision was made parallel to the long axis of the clavicle centered over the fracture along the superior border. The fracture was plated with a 3.5 reconstruction plate. The length of the plate was determined on the fracture and the amount of comminution. The aim was to restore clavicular length and get six cortices of fixation on either side of the fracture. No bone grafting was carried out in any case. Postoperatively the limb was maintained in a sling for 2-3 weeks. No other form of support was used. Motor cycle riding and sports were not allowed for one month. Patients were seen in the follow up clinic in 6 weeks, 12 weeks, 6 months and 1 year.

The outcome was reviewed on symptoms of pain, difficulty in lifting, pain on sleeping on the affected side, local tenderness on palpation, impaired range of movement, impaired strength, and signs of nerve compression cosmetic abnormality, return to work and over all patient satisfaction.

RESULTS: There were twenty two men and six females. The average age was 36.4years (Range 20-65). The right clavicle was involved in 19 patients. There were no cases of bilateral fractures. No patients developed neurovascular or pulmonary complications due to surgery. Pain subsided rapidly in about one week. One patient (3.5%) developed deep wound infection which needed

removal of metal work while four (14.2%) had superficial infection which responded to intravenous antibiotics. The incidence of deep infection was in a patient with open fracture. Removal of implant lead to a non-union which was however painless and needed no further treatment.

The average time to union was ten weeks. No case of metal work failure occurred. Healing with obvious angulations occurred in two (7.1%) of patients. Nonunion occurred in two (7.1%) patients including the case discussed previously. 4 patients (14.2%) complained of occasional pain associated with activity.6 patients (21.4%) complained of skin numbness along the incision site. No patient developed impaired shoulder movement or shoulder strength. Two patients (7.1%) complained of transient numbness of the hand. The time off taken from work was from one to six months. This depended on the type of work. On a whole 90% patients were satisfied with the outcome. Though our study was small operative treatment of midshaft clavicle fracture had many advantages. The patients benefited rapidly from post-traumatic pain, improvement of shoulder function, good cosmetic appearance and early return to daily activities.

Fig. 2: Showing post-operative X-rays

DISCUSSION: The clavicle does have several important functions each of which can be expected to be altered in non-union or ma union. The clavicle helps the placement of the shoulder in a more lateral position so that the hand can be placed in an effective manner to deal with three dimensional environment.[8] Neer's non-union rate of 1% is misleading perhaps as the population was mixed as regards age, fracture site and severity of fracture.[9]

Operative fixation allows earlier rehabilitation and return to normal activities. Pain relief was fast and there was no need for shoulder straps. Primary fixation of the clavicle is a relatively easy procedure than treating clavicular non unions and malunions. However the treatment of fresh fractures of displaced clavicular fractures still remains controversial with wide geographical and institutional variation. Our small series have shown encouraging results where the superficial and deep infection rate and hardware failure were at par with other fixation done for trauma. We can conclude that stable operative fixation done in carefully selected clavicle fractures can be a safe and effective method of treatment to restore shoulder function with minimal complications.[10]

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