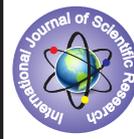


Open reduction and internal fixation of 3 month old fracture middle one third clavicle non-union with precontoured locking plate and bone grafting - A Case Report



Orthopaedics

KEYWORDS: Atrophic non-union, Callus, Precontoured locking plate, Iliac crest bone graft

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ABSTRACT

Clavicle fracture is a very common fracture encountered in orthopaedic practice. Traditionally it is treated conservatively and most of them unite uneventfully with minimal loss of function. But recent literature suggest increased rate of non-union and poor functional outcome with conservative management. We report a case of 3 month old middle one third clavicle fracture in a young adult with symptomatic atrophic non-union (no callus with persistent pain, decreased mobility and gross shortening) managed successfully with open reduction and rigid internal fixation with precontoured locking plate and autogenous iliac crest bone grafting. The fracture united with abundance of callus and patient achieved excellent functional recovery at 3 month. Hence we conclude primary open reduction and internal fixation of middle one third clavicle fracture with significant displacement in young patient for union and excellent functional recovery.

Introduction :- The prevalence of clavicle fracture is 2.6% to 5% of all adult fractures and 35-44% of all shoulder girdle fracture. The incidence is 29-64 per 100,000 population per year [1]. Allman classified fracture clavicle into three types. Group 1 having fracture middle one third, most common (76-82%). Group 2 having fracture distal one third (10-15%) and Group 3 with medial one third least common with 3-6% [2]. Traditionally most fracture middle one third clavicle treated conservatively with arm sling/figure of 8/clavicular brace. Till recently literature showed that more than 95% achieved union with acceptable cosmesis and functional results [3]. But now it has been documented that fracture clavicle does not perform well in young adults with conservative management [4]. Conservative management is frequently associated with non-union, shoulder discomfort, unsightly cosmetic bump and huge patient dissatisfaction interfering his employability [5,6]. We want to report a case of fracture middle one third clavicle in a young adult managed conservatively landed in atrophic non-union with poor shoulder range of movement which led to job problems. He was successfully managed with open reduction and internal fixation with precontoured locking plate and iliac crest bone grafting.

Case Report :- 25 year old male presented to orthopaedic opd with pain and decreased movement of right shoulder since 3 months. He had history of road traffic accident 3 month back and suffered fracture middle one third clavicle. It was managed conservatively with clavicular brace for 6 weeks. Patient continued to have pain and decreased movement for 3 months. On examination there was a cosmetic bump over clavicle and shoulder range of movement was grossly decreased and painful. Plain radiograph of right shoulder AP view done which was suggestive of old fracture middle one third clavicle with atrophic non-union and significant displacement & shortening (Fig 1). Operative management of fracture was planned with open reduction and internal fixation with precontoured locking plate & iliac crest bone grafting. Patient supine on OT table under general anaesthesia with bolster between spine and medial border of scapule. About 8-10 cm anterior incision taken over clavicle in a S-shaped manner centring over fracture site. Subcutaneous tissue and platysma muscle dissected. Fracture site exposed. Fibrous tissue around fracture fragments removed. Fracture edges refreshed. Medullary cavity of medial and lateral fragment opened up. Fracture reduced and with reduction in hold 7 hole precontoured locking plate applied on superior surface of clavicle and fixed with 3 proximal and 3 distal screws. Tricortical iliac crest bone graft harvested and bone graft was not only interposed between refreshed fracture fragments but also packed around it (Fig 2). Meticulous hemostasis achieved. Wound was closed in layers. Patient was kept in arm sling post-operatively. Elbow & wrist range of movement was begun immediate day 2 post-operatively. Shoulder range of movement except overhead abduction started day 5 post-operatively. Overhead abduction at shoulder started at 6 weeks once callus started to appear on follow up radiograph (Fig 3). At 3 months after vigorous physiotherapy full

range of movement at shoulder achieved and fracture site fully united with abundance of callus (Fig 4).

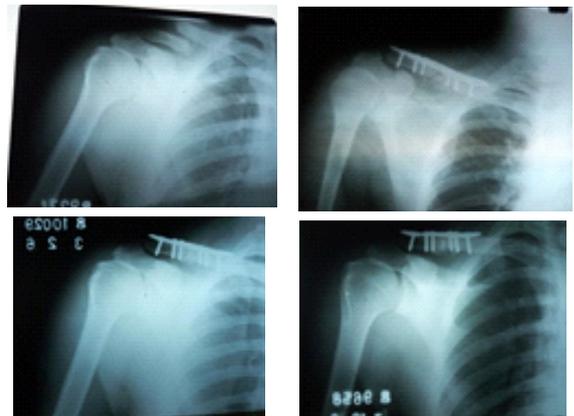


Fig 1:- Pre-op Xray showing non-union. Fig 2:- Immediate post-op Xray Fig 3:- 6 weeks follow up Xray Fig 4:- 3 month follow up xray.

Conclusion :- Clavicular fractures are conventionally treated conservatively and most literature have showed they unite with acceptable cosmesis and functional result, but now it has been documented that grossly displaced middle one third fracture in young physically active adult do poorly with non-operative management. It is frequently associated with non-union and poor shoulder function. 90% of the non-union of middle one third clavicular fracture have significantly displaced and shortened (more than 2 cm) fracture fragments [7]. Persistent wide separation of fragments with interposition of soft tissues also leads to non-union. Primary open reduction and rigid internal fixation of grossly displaced fracture middle one third clavicle with precontoured locking plate not only allows early mobilization and excellent functional recovery but also union in young physically active adult patient.

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