

NON-UNION OF PROXIMAL POLE SCAPHOID FRACTURE TREATED WITH RETROGRADE HERBERT SCREW FIXATION TECHNIQUE

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Abstract

Treatment of proximal pole Scaphoid fractures warrants urgent attention as they are prone to osteonecrosis and non-union with an incidence of 53%-92%. We report a case of proximal pole scaphoid fracture which was initially treated conservatively and presented 8 months later with fibrous non-union. The patient was treated with Herbert compression screw through dorsal approach. There were no signs of recurrence at 2 years follow-up. Herbert screw without bone graft can give adequate and required compression with good functional outcome.

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INTRODUCTION

Scaphoid fractures accounts for about 60% of all carpal bone fractures and 11 % of all hand injuries^[1]. It acts as the link between the proximal and distal row of carpus and thus pays a pivotal role in wrist biomechanics. Its unique anatomy, precarious blood supply and intra-articular nature, makes the treatment of this fracture a challenge for the treating physician. Theoretically, undisplaced scaphoid fractures have been treated with immobilization and plaster cast application. However, displaced fractures are usually treated with either closed reduction or open reduction internal fixation with screw^[2,3]. The incidence of non-union, especially in fractures with more than 1mm displacement can be between 53% and 92%^[3,4]. Treatment of scaphoid fractures, open reduction with correction of the deformity, bone graft and internal fixation^[5,6]. Internal fixation modality can be Herbert screw, AO scaphoid screw, Richard's navicular screw or Huene scaphoid screw. We hereby report a case of scaphoid waist non-union treated with non-vascularized bone grafting and Herbert screw.

CASE REPORT

A 46 year old male Right handed dominance, manual labor by occupation presented with complaints of pain in right wrist since past 8

months. Patient had a fall and was diagnosed with proximal pole scaphoid fracture 6 months ago for which he was treated conservatively with cast immobilization for 6 weeks. Patient continued to have pain even after cast removal and was then referred to our hospital. On examination, there was tenderness at the anatomical snuff box with mild swelling at the dorsal aspect of wrist. There was a lag of 10 degrees of dorsiflexion and 5 degrees of radial deviation as compared to the contralateral side. Palmar flexion and ulnar deviation were within normal limits. There was some loss of grip strength as compared to the left side which affect ted his activities of daily living. There was no evidence of instability of scapholunate level which was ascertained by the provocative tests. A preliminary investigation in the form of hematology and radiology (Fig. 1) was done which confirmed the diagnosis of proximal pole scaphoid non-union. It was a class III fracture as per the Geissler and Slade classification system^[7].

The patient was operated under general anaesthesia combined with interscalene block in supine position under tourniquet coverage. Dorsal approach was used starting distally from the Lister's tubercle 4cm distally. The dorsal sensory branch of the radial nerve was isolated and retracted laterally with the skin flap. Extensor retinaculum over the Extensor

pollicis longus was incised and the third extensor compartment was exposed. Plane between the first and second compartment on the radial side and fourth compartment on the ulnar side was used.



Fig 1: Pre-operative radiograph



Fig 2 : Intra-operative view

The capsule was opened longitudinally and the proximal pole of the scaphoid was exposed (Fig 2). The ends were curetted and reduction was held with the help of guide wire. A Herbert screw was then passed in a retrograde

fashion and final reduction was achieved in appropriate manner (Fig. 3). The reduction was checked in C arm in both the views and found to be adequate. Post-operatively, a slab was given for 6 weeks following which gradually assisted mobilization was started. The patient was completely asymptomatic at 2 years follow-up.



Fig 3: Post-operative radiograph

Discussion

Fractures of the proximal pole accounts for about 20% of the scaphoid fractures. The proximal half of the scaphoid is usually covered by articular cartilage with few perforating vessels and precarious blood supply makes it more susceptible for non-union which warrants surgery in the form of open reduction and rigid internal fixation^[8-11]. Excision of the proximal pole has been proposed by few authors in the past with varying success^[12,13].

The fibrous non-union is one of the commonest type in proximal pole fractures which occurs due to the halt in the healing process and also due to the micromotion at the fracture site because of inadequate immobilization. Non-unions with minimal or no sclerosis and gap <1mm requires only compression and rigid fixation for healing^[14-16]. The same was true in the present case where the fracture gap was less and there was mild sclerosis. A decision to do open reduction and rigid internal fixation without augmentation with bone graft was thus made. Although the diagnosis of the non-union is clinical, MRI and also CT scan helps in knowing the vascular anatomy and presence of sclerosis. In the present case no further imaging was done due to financial constraints. Moreover, there was no evidence of sclerosis, arthritis which were evident on the radiograph. Although dorsal approach has been associated with risk of devascularization of the proximal pole, this approach is useful and helps in proper exposure of the fragment. The present case was operated using the dorsal approach. Earlier treatment options for proximal pole non-union fractures were excision alone, excision followed by silicon rubber implant, scaphoid arthroplasty and K wire with bone graft^[17]. DeMaggd et al^[18] in their series of 12 patients observed 92% union rates using

retrograde Herbert screw instead of K wire. No bone graft was used in the present case due to smaller fragment size.

CONCLUSION

Non-union of proximal pole of scaphoid are not uncommon to encounter in day to day practice. Adequate approach with early intervention retains the biology and prevents osteonecrosis and non-union. Retrograde compression Herbert screw fixation without bone graft gives fairly good results.

Conflict of Interest Statement-

There is no conflict of interest.

Informed consent was taken from the patient.

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