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TREATMENT OF VOLAR BARTON'S FRACTURES OF THE DISTAL RADIUS WITH T-BUTTRESS PLATE

Orthopaedics

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ABSTRACT

With an incidence of about 2–4 per 1,000 residents per year, the distal radial fracture is the most common fracture in the human skeleton.[1]
Displaced fractures of the distal radius are difficult to treat successfully by traditional nonoperative methods. The goal in the management of these fractures is to achieve extraarticular alignment and an articular step off of less than 2 mm. Cast immobilization has been supplemented with pins and plaster technique and external fixators [2]
Main objective is to restore articular integrity as perfectly as possible. Attention to meticulous surgical technique will facilitate good results.[3]
PURPOSE : The purpose of this study was to investigate the efficacy of a fixed-angle locking plate applied through a single volar approach in maintaining the radiographic alignment of unstable intra-articular fractures as well as to report the clinical outcomes.[4]
The Disabilities of the Arm, Shoulder, and Hand (DASH) score was 8.
CONCLUSION : Irrespective of the direction and amount of initial displacement, a great majority of intra-articular fractures of the distal radius can be managed with a fixed-angle volar plate through a single volar approach.
Treatment of volar Barton's fractures of the distal radius with a 3.5mm T-buttress plates leads to satisfactory results, provided the operative technique is carefully performed to prevent complications.

KEYWORDS

Volar Barton's fracture, open reduction, internal fixation, T-buttress plate.

INTRODUCTION :
Intra-articular fractures of the distal radius represent a therapeutic challenge as compared with unstable extra-articular fractures. Apart from being more difficult to reduce and stabilize with internal fixation, these injuries frequently result in malunion, which may result in a less satisfactory long-term functional outcome, if not anatomically reduced. In the past, these fractures were managed with external fixation or a combination of limited open reduction, Kirschner wire (K-wire) augmentation, and bone grafting. However, with the recent development of specifically designed locking implants for the distal radius, fragment-specific fixation has emerged as an option. Open reduction and internal fixation (ORIF) using volar fixed-angle plates has also shown to be a valid treatment option for unstable, dorsally displaced distal radial fractures.

The purpose of this study was to investigate the efficacy of a fixed angle locking plate applied through a volar approach in maintaining the radiographic alignment of unstable simple intra-articular fractures as well as to report the clinical outcomes.

CASE REPORT :
A 52 yeear old male patient presented to us to the emergency department with a fall from bike and sustained injury to his left wrist.
Post the fall patient was unable to dorsiflex or palmar flex his wrist joint with complains of pain and swelling in the wrist post the fall. According to the mode of injury that the patient elicited, was FOOSH (fall on the outstretched hand).

The injury was 2 days old, and some kind of primary splinting done at the first center of visit for the patient.

When the patient presented to us, a complete work up was done with primary x ray of the wrist joint and a CT scan of the left wrist joint with screening examination of all other joints.

With appropriate investigations and work up, the patient was deemed fit for surgery and the patient was taken up for surgery under general anaesthesia and regional block for a volar plateosteosynthesis using a modified approach.

On pre operative examination of the patient, he didn't have any symptoms suggestive of median nerve entrapment or impingement.

The patient complained of tenderness and swelling in the distal end of radius along with the ulnar styloid region.

The plan for the same was decided based on the pre operative CT and x ray as the patient was said to have a comminuted volar barton type of fracture which was intraarticular with volar displacement of the carpal bones and dorsal angulation.

The classification system applied for the same was FRYKMANN classification for distal radius fracture. The fracture was of FRYKMANN type VIII with ulnar styloid fracture and disruption at distal radioulnar joint and distal radius and carpal bones.

Intraoperatively- under sterile aseptic precautions, through a modified Henry's approach, an 8 cm incision was made between the radial artery and the flexor carpi radialis. Plane was developed by retracting flexor carpi radialis tendon medially and fascial bed of the tendon released to expose the flexor tendons; this was then retracted medially to protect the median nerve.

Pronator quadratus identified and the muscle was cut and retracted using an L shaped incision and the fracture site reached.

Fracture was reduced and a 3 holed titanium plate fixed with 4 locking screws and 1 cortical screw.

Reduction checked under c arm and found to be satisfactory. The wound was closed in layers and drain placed in situ.

Post operative protocol followed :- A above-elbow plaster splint was applied for 1-3 weeks; passive and active range-of-motion exercises started during the next 1-3 weeks. Patients were followed up initially at 3-week intervals up to 6 weeks, then every 6 weeks for 3 months and every 3 months for one year.

DISCUSSION :-
The primary goal in treatment of volar Barton's fractures of the distal radius is to achieve proper reconstruction of the disrupted anatomy and allow the quick return of hand function without complications. Volar plate fixation is effective in buttressing a volar Barton's fracture of the distal radius.

The fracture healing process is not hindered due to the cancellous bone character. The success rate is therefore high.

Volar plate fixation of unstable distal fractures has been described recently in literature. Our report are comparable to the radiological evaluation and functional assessments presented.

The course of the flexor pollicis longus tendon is close to the palmar rim of the distal radius. The plate placed very close to the wrist joint can support the palmar aspect of the articular surface. However, it sometimes causes flexor tendon impairment. To avoid rupture of the flexor pollicis longus tendons, care has to be taken especially in very distal fractures, type C3 fractures. Adequate image intensifier control to verify the extra-articular and subchondral position of screws and plate is also quite important.

Based on the review of the study made by MUHAMMAD NASIR ALI at. Al. the result is consistent with the union rate of the volar barton fractures treated with open reduction and internal fixation with distal radius buttress plate with locking screws.

CONCLUSION :-

T-buttress plate provides fracture stability and early mobilization in all displaced volar Barton's fractures. By using T-buttress plates, joint motion and daily activities is recovered in short span of time.

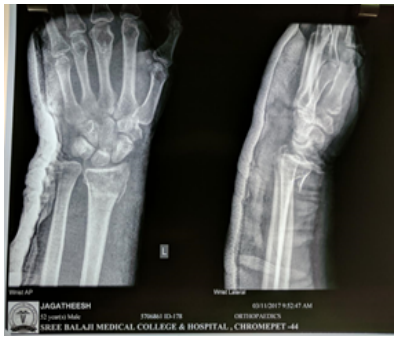

Fig. 1 - Pre-op x ray. Left wrist AP lateral view

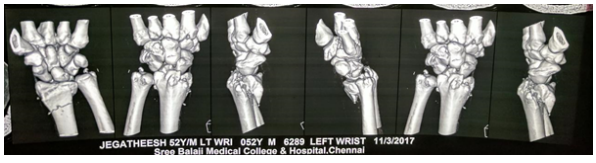

Fig. 2 - Pre- op CT scan left wrist with 3 -D reconstruction

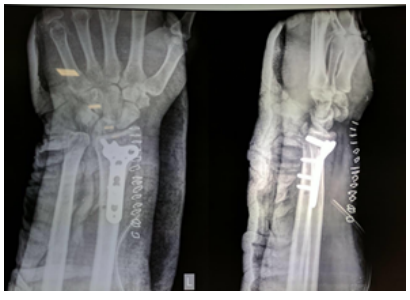

fig. 3 - Post op. X-ray left wrist ap and lateral view

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