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Original Article

Prospective study of management of old # capitellum orif with screws fixation-a review of 8 cases treated by open reduction and internal fixations with screws

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Abstract

Eight patients with displaced fractures of the humeral capitellum were treated by open reduction and internal fixation of the capitellar fragments with Herbert/ 4mm cc screws. As per Bryan and Morrey classification, there were five type I fracture and three type II fracture evaluated using the Mayo elbow performance score. Follow up period till 1 year. All patients had a stable pain free elbow with acceptable range of motion at last follow up. There was no evidence of avascular necrosis or degenerative change.

Keywords: Prospective study, old # capitellum orif with screws fixation-a review

Introduction

Fractures of the humeral capitellum are rare and account for 1% of elbow fractures [1, 2]. Injuries to the capitellum are usually a result of axial loading of the capitellum by forces transmitted through the radial head, the lateral trochlear ridge and the lateral half of the trochlea [3, 4]. As the complex nature of capitellar fractures has become better appreciated treatment options have evolved from closed reduction, immobilisation and fragment excision to a preference for open reduction and internal fixation with kirshner wire (K- wires), cannulated cancellous screws and Herbert screws [5, 6]. The screw fixation offers distinct advantage over other mode of fixation. It provides excellent compression at the fracture site and stable fixation with the least damage to articular surfaces. Moreover early mobilisation can be started and the hardware need not to be removed later [7].

We report a prospective study of 8 cases of capitellum fractures taken between 2014-2017 and few were taken before 2014 treated by 4mm screw fixation over a period of 1year with a follow up till 1 year.

Material and Methods

Eight patients between age 16 and 45 yrs (mean 33 years) with capitellar fractures were treated by open reduction and screw fixation. One patient present to us after six months of conservative treatment underwent open reduction of displaced capitellum. Three patients had fracture after falling on out streched hand, four fell on a flexed elbow. None of the patient had any concomitant injury. Fractures were classified on anteroposterior and lateral radiographs according to the classification of Bryan and Morrey [8]. A careful preoperative plan was executed in each case with regards to reduction and implant fixation. CT was done in case with comminuted fracture to define the fracture to define the fracture better and to aid in preoperative planning.

Surgical Technique

All cases were operated under regional anesthesia the injured elbow was assessed clinically for ligamentous stability. A sterile tourniquet was used in all cases the elbow handled through an extensile lateral approach. A skin incision was centred over the lateral epicondyle extending from the anterior aspect of the lateral column of the distal end of the humerus to approximately

2 cm distal to the radial head following dissection through the subcutaneous tissue layers, the a flap was raised by elevating which allow visualisation lateral column was palpated. The forearm was pronated to move the radial nerve away from the surgical field. Common extensor origin along with the anterior capsule and connected to the Kocher interval distally. This resulted in a continuous full thickness anterior soft tissue flap. The fracture site was debrided of haematoma and soft tissue debris to allow visualisation of the fracture fragment saline irrigation was used to achieve greater clarity.

Post operatively, the elbow was immobilised in a splint for four to six days following which range of motion exercises were initiated under supervision patients were followed up to at regular intervals clinicoradiologically evaluation was done. the condition of bone union, evidence of avascular necrosis on radiographs, wound healing problems or other problems, if any were recorded stability pain and range of motion of elbow joint were evaluated according to the mayo elbow performance score.



Preop

follow up

Discussion

Patients with capitellar fractures usually presents with pain and swelling of the elbow after injury. Fractures of the capitellum are frequently missed on first examination. They are not obvious on anteroposterior radiographs because the fracture line may not be recognised the background of the distal humerus. They are best seen on true lateral view [7]. In type IV injuries on lateral view, a double arc sign representing the subchondral the subchondral arc of bone of the capitellum and the lateral trochlear ridge is considered pathognomic [4]. We did not find double arc sign in any of the three patients of capitellum and trochlear fractures with comminuted lateral condyle fracture. This sign may not be radiographically apparent in all type IV fractures because of the presence of internally rotated capitellum and trochlea fragment [6, 9]. Radiographs must be carefully assessed for the presence of medial trochlear extension, metaphyseal comminution, and associated radial head and neck pathology exact morphology of the capitellar fracture is often difficult to ascertain from preoperative plain radiograph alone [4, 6, 10, 11]. CT scan with sagittal and coronal plane reconstruction is recommended to define the medial extent of the fracture articular impaction, and metaphyseal and condylar comminution [12]. CT also aids in preoperative planning with regard to the choice of internal fixation implants. Concomitant lateral and /or medial collateral ligament disruptions or their osseous functional equivalents must be recognised and repaired in order to restore elbow stability. An untreated displaced capitellar fragment undergoes changes resulting from bony absorption to bony absorption to bony

Results

Five patients were male and three were females. The right side was involved in three cases and left side was involved in five cases. The dominant limb was involved in three and the non-dominant in five cases. The mean operative time was 1.25 hrs (1-1.50hrs). Preoperatively, in two cases capitellum fragments were found free and devoid of soft tissue attachments. These were replaced fixed and showed good union in due course. No intraoperative or postoperative complication was encountered. The mean extension of elbow was 7.5*(range 0*-20*) and the mean flexion was 130*(range 128*-135*). All patients had limited pronation and supination. All patients had good stability, and non-had residual pain. Over all eight results were found to be excellent.

All patients were satisfied and the operative outcome and returned to their previous level of activity. All fractures healed well no evidence of avascular necrosis of the fragments was noted and no incidence of osteoarthritis has been noticed so far.

proliferation and obliterates the radial fossa [7]. Eventually arthritic degeneration of the elbow joint ensues limiting range of motion [13, 14]. A variety of methods of treating capitellum fractures have been described these include closed reduction, excision, and open reduction, with or without internal fixation. Closed reduction of type I capitellar fractures has been reported in a few series [14, 15]. Disadvantages of this treatment are the long period of immobilisation and unsatisfactory functional results [4, 16]. excision of the capitellar fragment, the remaining raw bone surface predispose the elbow to capsular adhesions and results in restricted elbow mobility, instability, valgus deformity of elbow and risk of subsequent ulnar neuritis [7].

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