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A Rare Combination of Fractures around the Elbow: Capitellum Fracture Associated with Radial Head Fracture with Fracture – Dislocation: A Case Report

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Abstract: Isolated fractures of capitellum of humerus and radial head are very commonly encountered among fractures of the elbow. But coexistence of these fractures is rare. There are a few case reports about this entity. This is a case report highlighting this combination of fractures along with dislocation in a 32-year-old male patient who was successfully managed.
Keywords: Elbow joint, fractures, surgery, internal fixation

INTRODUCTION

Isolated fractures of capitellum or coronoid are rare. Fracture head of radius constitute about one-third of the elbow fractures [1, 2]. Only a few cases with capitellum and radial head fractures together have been reported [1, 3]. Radial head fractures might be complicated by the presence of associated lesions. One of the less-recognized associated lesions is trauma to the capitellum [4, 5]. The capitellum is at risk because of reciprocal impinging on the head of radius. This can be explained by the importance of the radio- capitellar contact surface: 60% of the axial load at the elbow is transmitted through the radio-capitellar joint. The capitellum is sheared from the humerus by the impact of the head of radius. As a consequence, the capitellum might be fractured [4]. This injury seems to be due to varus force at the elbow joint with direct impact over lateral aspect of the elbow, which first results in a fracture of the capitellum. This force along with the capitellum fragment would have hit the head of radius leading to its impacted fracture [1].

CASE REPORT:

A 32-year-old man with alleged history of road traffic accident was admitted in our hospital, having sustained injury to the right elbow. The patient had complaints of pain and swelling over the right elbow and was unable to lift his right upper limb immediately after injury. Physical examination revealed a generalized swelling of the right elbow along with warmth and tenderness along the lateral ridge. Crepitus was present. Lateral epicondylar prominence was absent and the patient had a prominent olecranon tip in the posterolateral aspect of the elbow joint. Elbow was held in pronated position and varus deformity was present. Range of movements was restricted and painful. Distally, no neurovascular deficit was seen. Anteroposterior and lateral radiographs of the right elbow (Fig.1) revealed lateral dislocation of the elbow joint along with fracture of the head of radius and displaced fracture of the lateral epicondyle and capitellum. A computerized tomographic image (Fig.2) of the right elbow showed lateral dislocation of the joint with coronal slit of lateral aspect of trochlea and fracture of the radial head. A diagnosis of Fracture-dislocation of the right elbow with fracture of capitellum- Bryan & Moorey type IV and fracture of head of radius- Mason type IV was made. Reduction of the elbow dislocation was done (Fig.3) and limb kept in elevated position for 48 hrs. The patient was operated later under supraclavicular block, through posterolateral Kocher's approach (Fig 4(a)). More than one-fourth of the diameter of the radial head fragment was fixed (Fig 4(b)) with countersunk screws and capitellum fixed with recon plate (Fig 5(a), 5(b)). Postoperatively (Fig 6(a), 6(b)), the patient was put on splint for 2 weeks. Physiotherapy was given. We have reviewed the patient after surgery for a period of 6 months by regular follow-up (Fig.7). Patient is normal and full range of movements – both active & passive, is possible. Patient is able to do his daily routine activities.

Fig 1: Anteroposterior and lateral radiographs of right elbow taken after injury

Fig 2: Computed tomographic image of right elbow

Fig 3: Anteroposterior and lateral radiographs of right elbow showing successful reduction of the dislocation

Fig 4(a): Posterolateral Kocher's incision

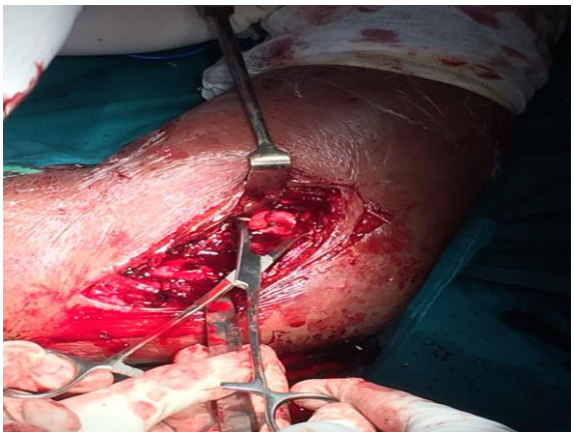

Fig 4(b): Fixation of radial head being done

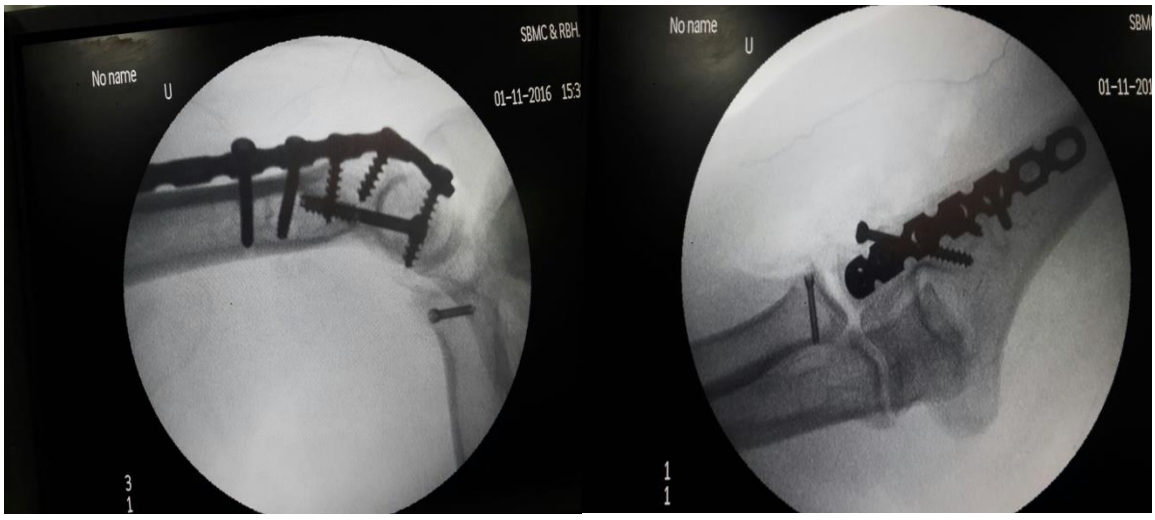

Fig 5(a) and (b), Lateral and anteroposterior views in C-arm taken intraoperatively

Fig 6(a) Lateral view radiograph of right elbow taken postoperatively, showing successful reduction of fracture with countersunk screws and recon plate

Fig 6(b): Anteroposterior and lateral radiographs of right elbow postoperatively on splint with drain in-situ

Fig 7: Anteroposterior and lateral radiographs of right elbow taken 4 months after surgery

DISCUSSION:

There are four types of Capitellum fractures according to Bryan and Moorey classification with McKee modification: Type I (Hahn-Steinthal fracture) contains a greater portion of capitellum with the fracture line going down to the lateral part of trochlea. Type II (Kocher-Lorenz) consists of anterior cartilaginous portion of capitellum with some of

subchondral bone. Type III (Boberg-Morrey fracture) is comminuted fracture of capitellum [6]. Type IV (McKee modification) is coronal shear fracture that includes the capitellum and trochlea.

Head of radius fractures are classified according to the Mason classification: Type I is a non-displaced marginal fracture; Type II is a displaced marginal fracture; Type III is comminuted fracture; Type IV is fracture with dislocation of the elbow [6]. Our patient had Type IV capitellum and Type IV head of radius fractures. Detailed radiological examination is necessary for planning of surgery. In fact, standard radiographic evaluation of head of radius fractures includes anteroposterior and lateral views of the elbow. 3-dimensional CT images may be taken if necessary. Because of the typical mechanism of injury (i.e., a load applied from distal to proximal), wrist views are advisable and, of course mandatory, if there are symptoms present at the wrist [7].

Nondisplaced and minimally displaced fractures of radial head can be treated with a sling or splint for a few days followed by an early range of motion (ROM) [7, 8]. Although closed reduction and immobilization with cast may be performed for treatment, open reduction and internal fixation is suggested as better options [7, 9], as in the present case, where open reduction and internal fixation was done. Thus, internal fixation of the radial head is technically demanding, due to the small and most often comminuted nature of the fragments and also the circumferential articular cartilage on the head. For simpler fracture patterns involving impaction of a portion of the head of radius, a limited approach might be effective. It must be noted that the traditional Kocher interval (i.e. Extensor carpi ulnaris-anconeous interval) is well posterior to the axis of the radial head [10].

Treatment of displaced fractures is based on the extent of displacement and size of the fragments. When the radial head fractures are comminuted, resection or replacement of radial head is recommended more commonly because the comminuted fragments are not amenable to fixation [7]. In fractures of capitellum, stable internal fixation using different kinds of materials including Kirschner wires, recon plates or AO-compression screws combined with early ROM exercises can achieve excellent results [11, 12]. The mode of fixation largely depends on fragment size and comminution. Fixation with screw enables rigid stability and early movement [13]. Thus, from the results of our case, we attribute our successful outcomes to the suitable size of the capitellar osteo chondral fragment fixed with recon plate and fragment of the radial head for countersunk screw fixation.

CONCLUSION:

Knowledge about the treatment of fractures of the elbow is still under debate. This case demonstrates that good functional and anatomic results can be achieved by open reduction and fixation with countersunk screws and recon plate allowing early mobilization and a good recovery of elbow.

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