

Posterolateral Rotatory Instability Following Radial Head Excision: A Prospective Study

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1. Introduction

The radial head is a important structure that is crucial to the stability of both elbow and forearm. Radial head excision is a common procedure for the treatment of comminuted fractures of the radial head (1-2). While radial head resection is associated with a high success rate when performed for appropriate indications, a number of well-defined biomechanical complications have been reported following this procedure, including proximal migration of the radius, the development of valgus deformity and recurrent elbow instability (3-4). With improvement of implant technology and prosthetic design more and more radial fractures are either plated or replaced with prosthesis. While the absence of the radial head makes the diagnosis difficult, we have identified a series of patients with posterolateral rotatory instability following radial head resection.

2. Materials and Methods

This study was conducted in M S Ramaih medical college and hospitals, Bangalore which is a tertiary health care centre between March 2006 to July 2011. A total of 15 patients with Mason type 3 and type 4 radial head fracture were involved in the study. Thirteen out of 15 patients were males and the average age was 44.9 yrs. All these patients underwent radial head excision by same team of surgeons. All these patients were followed these pts were evaluated clinically for any symptoms of pain or instability of the elbow at 6 months and 1 yr. The functional outcome was evaluated using Mayo elbow scoring system the average score was 92.7. Clinical evaluation included testing for posterolateral rotatory instability using lateral pivot shift test of elbow and valgus stress test Lateral Pivot-Shift Test of the Elbow.

3. Results

Total 15 patients were taken into the study of whom 13 were males. Their age ranged from 20 to 70 years. Of the 15 patients 4 presented to us with persistence of pain and five presented with complaints of instability of the elbow while lifting heavy weights. Mayo elbow scoring was done to assess the functional status of the patient. The Mayo elbow scoring system is based on four components namely stability of the elbow, the range of movements of the elbow, the intensity of pain and functional Activities like

combing, wear shirt etc. As per the scoring system score of > 90 is excellent, 75 to 89 is good, 60 to 74 is fair and < 60 is poor. The average Mayo elbow score was 92.7 and the lowest was 70 Of a 55 yr female. Clinical evaluation by pivot lateral shift was done seeing for dimpling of the skin.

Proximal to the remnant stem of the radius, or any signs of apprehension. Pivot shift test was found to be positive in 5 individuals and all of them belong to the 50 to 70 age group. Radiological signs of instability were seen for namely an increase in ulnohumeral joint space, loss of alignment between capitellum and the radius. Positive radiological sign was seen in only 1 patient.

4. Discussion

Medial collateral ligament is the primary and radial head is the secondary constraint to valgus displacement of the elbow (Morre's). Valgus instability is significant only if radial head excision is done where the MCL is incompetent (1-4). The articular surfaces of coronoid and radial head are viewed as a combined buttress, resisting translation in many planes by virtue of their articulation to distal humerus. Schneeberger et al. evaluated the role of the radial head and coronoid as posterolateral rotatory stabilizers of the elbow on the basis of their clinical observations of posterolateral rotatory instability following elbow dislocation associated with radial head and coronoid fractures(5). In a cadaveric study, they found that excision of the radial head significantly increased the mean posterolateral rotatory laxity to 18.6°, compared with 9° prior to the excision (p = 0.0001). Jensen et al. postulated that the increase in external rotation and varus displacement of the elbow that is seen following resection of the radial head is a result of decreased tension in the lateral ulnar collateral ligament, which induces laxity(6). Thus, in isolation, the intact radial head contributes to posterolateral elbow stability, probably through proper tensioning of the lateral ulnar collateral ligament.

Recently, Sanchez-Sotelo et al. reported the intermediate-term results of lateral ligamentous repair or reconstruction for the treatment of posterolateral rotatory instability of the elbow in a study of forty- four patients who were followed for a mean of six years. One patient had previously undergone radial head resection and subsequently was diagnosed as having posterolateral rotatory instability. The authors noted the difficulty of diagnosing the condition in the setting of a radial head resection. A high index of

suspicion is essential for the diagnosis of posterolateral rotatory instability after radial head resection.

Historically, treatment of radial head fractures primarily involved excision of the fracture fragments as well as the remaining pieces of the intact radial head. Since this created instability, movement restriction, proximal migration of radius and distal radio ulnar joint disruption. In young patients with minimal comminution open reduction and internal fixation is the treatment of choice. In comminuted fracture where radial head is comminuted prosthetic replacement of radial head is the option (7-11).

5. Conclusion

Posterolateral rotatory instability following radial head excision was seen in 5 patients (33%) and all these patients were belonged to > 50 years of age group. Of these only one had sustained dislocation of the elbow. Open reduction and internal fixation or prosthetic replacement of the radial will prevent these complications.

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