Primary Total Elbow Replacement in a Patient with Old Unreduced Complex Posterior Elbow Dislocation

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Abstract
A 65-year-old female presented with history of a fall on an outstretched hand 2 months back and with complaints of pain, limitation of movement of right elbow, and inability to carry out her daily routine activities. On examination, there was swelling and tenderness at the elbow, three point relation was altered, had fixed flexion deformity of 50° with range of motion from 50° to 60°. Radiographs showed neglected old unreduced posterior elbow dislocation, fractures of radial head, and coronoid process. Patient was treated with total elbow replacement using 3rd generation sloppy hinged elbow prosthesis. At 3 weeks, range of motion was from 30° to 120°. At 6 weeks follow-up, patient was able to do her routine activities independently with ROM of 20° to 140° and minimum pain.

In the normal elbow joint, stability is maintained by the combination of joint geometry and congruity, capsuloligamentous integrity, and balanced intact musculature. There are many ways to treat chronic dislocation or fracture-dislocation of the elbow, including ORIF, excision arthroplasty, replacement arthroplasty, arthrodesis, and hinged external fixators. There has been considerable disagreement about the impact of such variables as the duration of the untreated dislocation, the age of the patient, the method of repair or reconstruction of the collateral ligaments, the performance of triceps or biceps-lengthening, and postoperative mobilization.

ORIF may lead to mediolateral instability, which is due to failure to reconstruct the collateral ligaments or due to lack of tissue healing. An attempt to achieve greater stability by prolonged immobilisation or by reconstruction of collateral ligaments will lead to stiff elbow. Although open reduction with soft-tissue reconstruction or minimal fixation has been successfully reported by a few investigators, most of the patients in these studies were less than 60 years of age. Naidoo reviewed a series of 23 patients with a mean age of 30 years (range: 10 to 60 years) who had untreated posterior dislocations of the elbow. The duration of the dislocations ranged from 1 month to 2 years. Open reduction was performed in all cases with release of contracture and pinning of the ulno-humeral joint. Only 10 of the 23 patients achieved an arc of movement greater than 90°.

While open reduction can be effective for relief from pain, the functional results are unpredictable and often unsatisfactory because patients are unable to perform the essential activities of daily living. There have been very few reports of treatment by primary total elbow arthroplasty for chronic dislocation, despite the fact that elbow arthroplasty after trauma or nonunion is well accepted. We report a primary semiconstrained total elbow arthroplasty in an elderly patient with chronic unreduced posterior dislocation of the elbow.

Case Report
A 65-year-old female presented with history of a fall on an outstretched hand 2 months back and with complaints of pain, swelling, and limitation of movement of right elbow (dominant hand). She was not able to carry out her daily routine activities such as eating, taking a bath, or combing her hair. On examination there was swelling, deformity, and tenderness around the elbow. There was a fixed flexion deformity of 50° with range of motion from 50° to 60°. Radiographs showed neglected old unreduced posterior elbow dislocation. Patient was treated with total elbow replacement using 3rd generation sloppy hinged elbow prosthesis. At 3 weeks, range of motion was from 30° to 120°. At 6 weeks follow-up, patient was able to do her routine activities independently with ROM of 20° to 140° and minimum pain.

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Coronoid process was displaced anteriorly and proximally (Figs. 1 and 2). She was treated with primary total elbow replacement using third generation sloppy hinged elbow prosthesis (Fig. 3). This implant is a semi-constrained prosthesis and has no polyethylene component. A posterior approach was used, and no lengthening of triceps was done. Immediately postoperatively an above elbow plaster-of-Paris slab was put in place. From day 3 to 3 weeks, a flexion extension control hinged elbow brace was applied and the elbow was alternated between 90° flexion for 6 hours and maximum achievable extension for 6 hours. After 3 weeks, the brace was discontinued, and ROM physiotherapy was advised. At 3 weeks, patient had a range of motion from 30° to 120° and minimum pain. At 6 weeks follow-up, patient had no pain and ROM of 20° to 140°.

She was able to carry out her routine activities of daily living. At 6 months and 1 year follow-up, patient is doing extremely well and has no new complaints.

Discussion

The final outcome in our patient shows that a primary total elbow arthroplasty in a patient with neglected old unreduced elbow fracture dislocation results in a significant decrease in pain and a dramatic increase in function and ROM. Naidoo reviewed a series of 23 patients who underwent open reduction for unreduced chronic elbow dislocation. Only 10 of 23 patients achieved ROM of greater than 90°. The mean age was 30 years in this study group, so aggressive physiotherapy can be carried out in immediate postoperative period. But in elderly patients, there is a risk of iatrogenic fracture because of senile osteoporosis. Moreover, elbows may remain painful following open reduction. Therefore, neglected old unreduced elbow dislocations in elderly patients can be managed with primary total elbow arthroplasty.

Various studies have shown the efficacy of primary elbow arthroplasty in elderly patients for other indications such as failed ORIF, nonunion, acute fracture-dislocation, and fracture of the distal humerus.6,9
While other treatments may also reduce pain, total elbow arthroplasty provides immediate stability and allows patients greater and faster functional recovery and a quicker return to activities of daily living.¹,¹⁰

A semiconstrained hinged elbow prosthesis is able to compensate for incompetent collateral ligaments associated with chronic fracture dislocations.

**Conclusion**

A semiconstrained total elbow arthroplasty is a predictable and effective method for decreasing pain and restoring function in elderly patients with chronic elbow dislocation or fracture dislocation. The rapid functional improvement provided by this procedure allows patients to return to activities of daily living early.

**Disclosure Statement**

The author has no financial or proprietary interest in the subject matter or materials discussed, including, but not limited to, employment, consultancies, stock ownership, honoraria, and paid expert testimony.

**References**