

Successful Elbow Arthrodesis Surgery After Infected Total Elbow Arthroplasty: a case report

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Abstract. The aim of this case is presentation the surgical technique and result of a case in which we performed arthrodesis after infected elbow arthroplasty.

Material and method. A 30-year-old male patient was treated with complex elbow fracture 10 years ago. Total Elbow Arthroplasty (TEA) was administered in 2015 for the cause of post-traumatic arthrosis. Five months after the surgery, he developed a deep infection in his elbow. TEA was removed with surgery again. Without implantation, implant extraction and post-debridement antibiotherapy were applied and the infection was resolved. The patient was scheduled for arthrodesis.

Conclusion. Arthrodesis is recommended as a salvage operation in severe elbow joint diseases. The movement of other joints in the upper extremity compensates for elbow arthrodesis. If there is adequate bone stock and live soft tissue, the compression plate and arthrodesis results are successful. A successful return is expected if fusion occurs in infected cases after total elbow arthroplasty. However, in the literature there is very little data on arthrodesis after TEA.

Key words: *elbow arthroplasty, arthrodesis, infection.*

Introduction

Deep infection therapy after total elbow arthroplasty is difficult and has a bad effect on the result of arthroplasty (1-3). The incidence of deep infection is between 3% and 9% (4,5,3). Two-stage revision, resection arthroplasty and arthrodesis are the surgical options in these patients (6-9,3).

Elbow arthrodesis has been reported as a salvage surgical method. Successful results have been reported in literature with high patient satisfaction if union after arthrodesis occurs (9,10,3). However, there is not enough knowledge in the literature regarding the results of unsuccessful elbow arthrodesis after TEA.

Treatment of deep infection after Total Elbow Arthroplasty (TEA) is difficult. Inclusion of the components often results in severe bone loss and soft tissue malnutrition. Long leverage and high bending forces in the elbow are disadvantageous for arthrodesis.

Case

A 30-year-old male patient was treated with complex elbow fracture 10 years ago. Total Elbow Arthroplasty (TEA) was administered in 2015 for the cause of post-traumatic arthrosis (Figure 1-2). Five months after the surgery, he developed a deep infection in his elbow. TEA was removed with surgery again. Without implantation, implant extraction and post-debridement antibiotherapy were applied and the infection was resolved. The patient was scheduled for arthrodesis. A written informed consent was obtained from patient. The study was conducted in accordance with the principles of the Declaration of Helsinki.



Figure 1-2. Left elbow X-ray/Pre-operation

Surgical technique. The patient was admitted to the supine position and entered the patient's elbow from the old posterior incisor. Incision was expanded, proximal radial nerve and ulnar nerve was found in the incision area. It was explored and protected.

There was a 12-cm bone defect on the elbow. Ulna and humerus intramedullary channels opened. The defect was filled with a 10 cm structural graft perioste from the proximal radius. The 4.5-well plate was bent at an appropriate angle (120 degrees). Bony joints were grafted to the tricortical graft taken from the iliac canthus. The incision was closed and the operation was terminated.

Shoulder, wrist and hand movements started to the extent that pain allowed. Elbow was immobilized.

The patient was followed by a monthly with X-ray for union (Figure 3). After 6 months solid union took place (Figure 4).

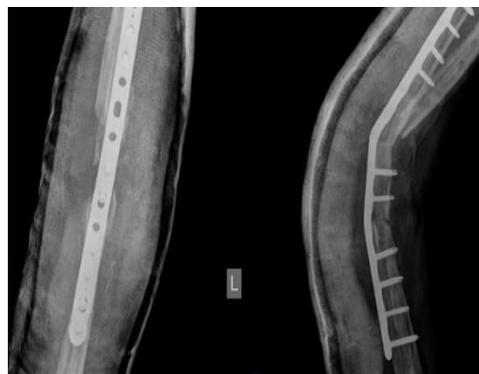


Figure 3. Left elbow X-ray/Post-operation (first day)

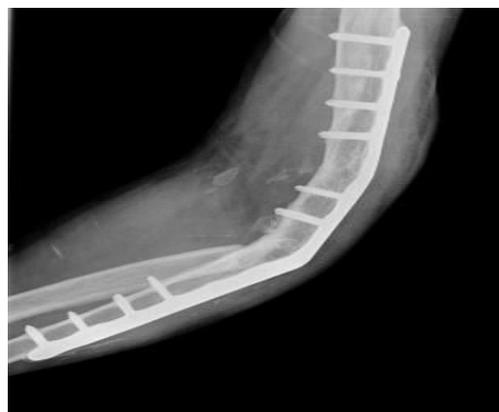


Figure 4. Left elbow X-ray/At 6 months post-operation

Discussion

Arthrodesis is recommended as a salvage operation in severe elbow joint diseases. The movement of other joints in the upper extremity compensates for elbow arthrodesis (2,11,9,12,3).

If there is adequate bone stock and live soft tissue, compression plate and arthrodesis results are successful (11,9,10). If fusion occurs in infected cases after total elbow arthroplasty, a successful return is expected. However, in the literature there is very little data on arthrodesis after TEA.

The standard fusion angle for elbow arthrodesis in the literature is reported as 90 degrees. However, it has been reported that this fusion aspect may vary with age, nationality, belief and dominant hand (13). Consideration should be given to the possibility of massive loss of bone and soft tissue when arthrodesis is resolved after TEA (14). Therefore, preoperative planning is important.

In our patient the fusion angle is 120 degrees. This angle could not be made 90 degrees to maximize bone and autograft fit because of excessive bone defect but the patient did not become dissatisfied. Because of the patient not being a dominant hand and considering religious belief and lifestyle.

It is stated in the literature that it is difficult to union after TEA (15). Wolfe et al, has performed arthrodesis in 2 patients after failed TEA (7). Fibrous union occurred in one patient and pain persisted, union did not occur in the other patient. Chilo et al, performed radio humeral arthrodesis in a patient, thinking that ulnohumeral arthrodesis had failed, and they were unionized (13).

Koller et al, used a fibular structural graft to a patient after infected TEA and they were unionized at 12 months (2,4).

Randall et al performed arthrodesis in 4 cases after failed TEA. In one of these cases they have provided fibrous union. They reported that there were no union in the other three cases. They do not recommend surgery after failed tea. (15)

Our patient also had a bone defect, structural graft needed. However, allografts were not used because of the failure of the TEA and the risk of re-infection of the allograft. The radial structural autograft was used with a 10 cm sized periosteum. The incompatibility at the bone tips was removed with a tricortical graft taken from the iliac canal. Six months later, it was unionized.

We think it is useful in this union with the use of radial periosteum autograft. If arthrodesis is performed in patients with failed bone defect after TEA, it can be used as a structural graft without peeling from the radius autograft periosteum. This fact supports our view of our union. Successful results have been reported in literature in the case of union of arthrodesis after unsuccessful TEA. Arthrodesis may be performed after failed bone and soft defects, and periosteal radial structural autograft may contribute to union.

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