

Total Elbow Arthroplasty in an Older Patient with a Forearm Amputation: A Case Report in a Spastic Elbow

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Learning Point of the Article:

Total elbow arthroplasty should be offered to all older patients with forearm amputation, after comminuted distal humerus fractures, as long as there is a functional demand.

Abstract

Introduction: Total elbow arthroplasty is a common procedure in older patients after comminuted distal humerus fractures. However, in patients with a forearm amputation, this treatment indication is less obvious.

Case Report: We report the case of an older spastic patient with bilateral forearm amputation for whom we performed a total elbow arthroplasty for a complex left distal humerus fracture. At 1 year follow-up, our patient was satisfied with the outcome as she had recovered her previous range motion and autonomy. There was no sign of implant loosening or migration on radiographs.

Conclusions: Given that this treatment has the same benefits as in the typical target population and that any complications that may occur could be less devastating in a patient with forearm amputation. We think that elbow arthroplasty should be offered, in case of complex articular fracture, to all older patients with forearm amputation who has functional demands.

Keywords: Elbow replacement arthroplasty, humeral fractures, elderly, spasticity, amputation, forearm.

Introduction

Distal humerus fractures make up 5% of all fractures in adults over 60 years of age [1]. Surgical treatment of supra- and intercondylar fractures that are complex, comminuted or in the osteoporotic bone, can be long and difficult [2, 3, 4, 5, 6, 7], if an open reduction and internal fixation (ORIF) are performed, and the outcomes can be poor. In older persons with moderate functional demands, total elbow replacement following complex distal humerus fractures yields very good outcomes, allows early mobilization, and meets their functional demands [8, 9, 10, 11, 12, 13, 14, 15].

Distal humerus fractures can also occur in patients with hand or forearm amputations. The treatment indication for these fractures is less obvious to some surgeons, making the treatment choice difficult. And yet, these patients may have appreciable functional demands, even if they have not been fitted with a

prosthetic, since they use their elbow during daily living [16].

Thus, we felt that it was relevant to report on an older female patient with bilateral forearm amputation, in whom we did a total elbow replacement for a complex supra- and intercondylar fracture of the left humerus. This case report aimed to help surgeons in their treatment decision if faced with a similar situation.

Case Report

We report the case of a 72-year-old female patient, retired, right-handed, and non-smoker 1.62 m tall – 54 kg. This patient resided in an assisted living facility accommodating those with mental health disorders, presented with a history of osteoporosis, known chronic psychiatric illness with well-controlled symptoms, along with attempted suicide 12 years

Author's Photo Gallery



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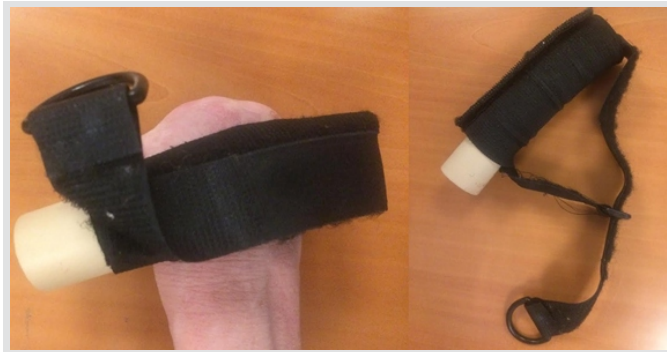


Figure 1: Technical "custom-made" aids used for two stumps. Left: Use for the right stump.

prior that led to forearm amputation in her left upper limb and transmetacarpal amputation of the right one (she threw herself under a train). Despite this disability, the patient used her arms every day to eat or do her hair, employing technical aids fabricated by an occupational therapist, which allowed her to secure cutlery, combs, and other items to her forearm (Fig. 1). Due to the psychotic medication, she had a pre-operative estimated lack of extension of the elbow of 80° due to spasticity (fixed flexion deformity with further flexion).

She came to the emergency room after a fall from her standing height led to a complex, non-complicated, and supra- and intercondylar fracture of her left humerus (Fig. 2). The treatment decision was difficult to make, and there was initially disagreement among our team. Since the fracture was not suitable for ORIF and difficult for spastic patients, one part of our team proposed conservative treatment, while the other part proposed arthroplasty. The arthroplasty procedure was done 5 days after the accident, under general anesthesia, in the right lateral decubitus position, with a tourniquet at the base of the limb. We used a single posterior approach, lifting the triceps through a reverse-V incision, the radial head was resected. We inserted the latitude total elbow prosthesis (Tornier, Montbonnot-Saint-Martin, France) which was cemented all at once. Passive rehabilitation was initiated since day one, and after 21 days of immobilization, active rehabilitation was initiated. Elbow flexion beyond 0° was not allowed for 6 weeks.

At 12 months post-operative, the patient had no pain (0/10 on a visual analog scale) and used her left arm as she did before her

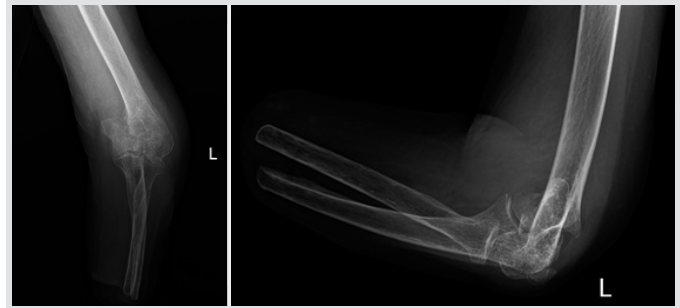


Figure 2: Initial radiographs of the left elbow. Left: Anteroposterior view and right: Lateral view.

fall. QuickDASH score was the same 12 months after the arthroplasty as it was before the fracture (68, 2). The appearance of the scar was satisfactory. The patient had no functional complaints and was extremely satisfied with the outcome, given that she had regained her pre-trauma autonomy. She had the same range of motion as before the fracture: Extension -80°, flexion 140°, and full pronation-supination (80-80°). The implant was in the correct location on X-rays, with no signs of early loosening or periprosthetic fracture (Fig. 3 and 4).

Discussion

It appears to us that this case could help surgeons in their decision-making. To the best of our knowledge, such an atypical case has not been yet found in the literature. There is no consensus or guidelines on the treatment strategy when an older patient with forearm amputation presents with an intra-articular fracture of the upper limb.

Total elbow replacement is a universally accepted surgical option for treating complex distal humerus fractures in older adults [8, 9, 10, 11, 12, 13, 14, 15]. In these patients, who are often osteoporotic, bone healing is often poor, making fracture fixation a bad option, specifically in case of spasticity. Given the intra-articular displacement, conservative treatment may lead to chronic pain and reduced mobility. Nevertheless, joint replacement is associated with several complications, some of which can be severe, such as the risk of nerve damage, infection, implant loosening, or periprosthetic fracture. These complications require revision surgery in 8–10% of cases [17].

Older adults who have an amputation distal to the elbow have the same bone healing and recovery possibilities as older adults in the general population. Thus, post-traumatic stiffness that occurs after conservative treatment of this type of fracture would be an additional disability for this type of patient who is already greatly disabled. Complete elbow ankylosis would probably have doomed our patient to be even more



Figure 3: Active range of motion at 12 months post-elbow joint replacement. Left: Maximal extension and right: Maximal flexion.



Figure 4: Radiographs at 12 months follow-up. Right: Anteroposterior view and left: Lateral view.

dependent. Furthermore, total elbow replacement surgery is less risky since any nerve damage in the elbow would have less of a negative impact. Similarly, the stresses placed on the implant are less, which theoretically reduce the risk of loosening or humeral stem fracture, which is another common reason for surgical revision [17, 18, 19, 20, 21, 22]. Conversely, the risk of infection or post-operative stiffness should be the same as it is in the general population, which means that the patient must still follow our post-operative care instructions.

Conclusions

Overall, the patient is satisfied with the outcome since she has no discomfort or hindrance in her day-to-day activities and has regained her pre-fracture motion and autonomy. This treatment provides the same benefits as in the usual target population, while the potential complications are less harmful in this type of patient. We believe that it should be offered to older adults with

a distal forearm amputation who suffers a distal humerus fracture and have stated functional demands. These recommendations could be extended to other intra-articular fractures in the upper limb whose treatment in older adults is widely accepted, such as replacement of the humeral head after a comminuted intra-articular fracture.

Clinical Message

We think that total elbow arthroplasty should be offered to all older patients with forearm amputation after comminuted distal humerus fractures, as long as there is a functional demand. Given that this treatment has the same benefits as in the typical target population, and that any complications that may occur could be less devastating in a patient with forearm amputation.

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