CASE REPORT

Non-Operative Management of a Failed Olecranon Fracture Fixation Leading to Functional Recovery: A Case Report

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Abstract

An 85-year-old female walker dependent presented with a displaced olecranon fracture following a fall. Open reduction and internal fixation (ORIF) using an anatomic olecranon locking plate was performed. Two-week postoperative X-rays revealed fixation failure with persistent fragment displacement and a wide fracture gap. To manage this condition, non-operative management, including sling immobilization for 4 weeks and progressive physical therapy, was pursued with the elbow at 90 degrees flexion. At the 6-month follow-up, the elbow was pain-free with functional range of motion (ROM) being achieved, and functional independence was observed in daily activities including using a walker. This case highlights the potential for successful functional recovery through non-operative management in geriatric patients as an initial treatment or after a failed ORIF, emphasizing the importance of tailoring treatment to patient-specific factors and functional goals over radiographic outcomes.

Level of evidence: V

Keywords: Bone plate, Case study, Conservative treatment, Elderly, Olecranon fractures, Treatment failure

Introduction

Olecranon fractures account for approximately 10% of upper extremity fractures and 20% of proximal forearm injuries, with a high incidence in geriatric patients due to falls, poor balance, and osteoporosis. These fractures often compromise elbow function, impairing routine daily activities.[1]

Surgical treatment in geriatric patients is complex due to comorbidities, osteoporosis, and variable functional demands, which increase the risk of postoperative complications.[2-4] Open Reduction and Internal Fixation (ORIF) with locking plates is a standard approach surgeons employ to restore the articular surface, maintain joint congruency, and enable early mobilization. Despite its benefits, ORIF is still questioned for its suitability and outcomes for geriatric patients due to the wide variability in patient health status and functional goals.[5-7]

This case report describes an 85-year-old female with a failed ORIF of an olecranon fracture who achieved functional recovery through non-operative management, highlighting the importance of individualized treatment strategies.

Case Presentation

An 85-year-old right-hand-dominant female with a medical history of osteoporosis and kyphoscoliosis presented to the emergency department after sustaining a fall at home complaining of pain, swelling, ecchymosis, and superficial lacerations over the right elbow. Physical examination revealed complete limitation of elbow range of motion due to pain. However, neurological examination was unremarkable, with no sensory or motor deficits, and a palpable radial artery pulse was noted.

Plain radiographs of the right elbow demonstrated a displaced olecranon fracture without comminution [Figure 1]. After discussing treatment options, the patient opted to undergo open reduction and internal fixation (ORIF) using a locking plate to optimize the restoration of elbow function [Figure 2A and Figure 2B].

Postoperatively, the elbow was immobilized in a sling to allow a gentle range of motion as the patient felt comfortable. Early occupational therapy started at the hospital, focusing on grip strengthening, hand-eye coordination, and gentle shoulder and elbow range-of-motion exercises. At the 2-week follow-up in the office, the postoperative radiographs revealed a fixation failure with a 4-cm displacement at the fracture site [Figure 3].

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Figure 1. Preoperative lateral radiograph of the right elbow demonstrating a displaced, noncomminuted olecranon fracture

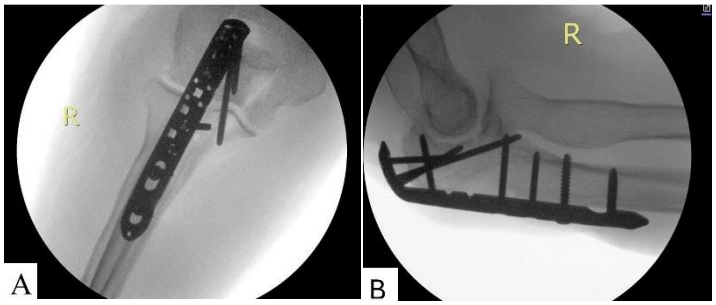

Figure 2. Anteroposterior (A) and lateral (B) views of intraoperative fluoroscopy showing fixation with anatomical olecranon locking plate

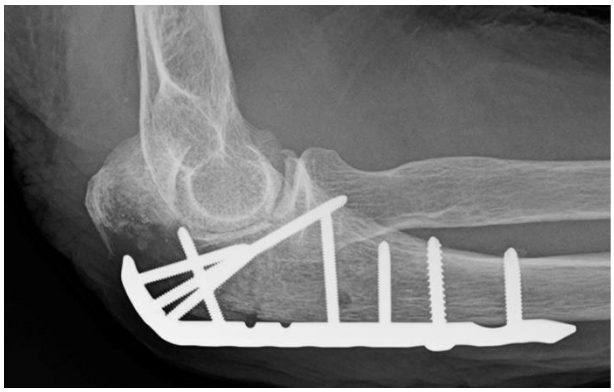

Figure 3. Two-week postoperative radiograph demonstrating fixation failure and proximal migration of the olecranon fragment

Revision surgery versus nonoperative management was discussed extensively with the patient and her family. Given the patient's low pain levels and the risks with revision surgery, the patient opted to proceed with non-operative management. Sling immobilization was continued along with a structured outpatient physical therapy program for two months. The patient then transitioned to a home exercise regimen, which she continued independently for an additional three months.

Radiographic follow-up at one month and three months showed stable fragment displacement. By 6 months postoperatively [Figure 4], radiographs demonstrated persistent displacement; however, partial bone bridging was also visible. Clinically, the patient reported minimal discomfort (VAS 1/10) but no pain and demonstrated near-full elbow function with an arc of motion of 36°–140° extension to flexion, 75° of pronation, and 72° of supination. She resumed all daily living activities independently and achieved a Mayo Elbow Performance Score of 95/100, reflecting excellent functional recovery. The patient resumed using the walker with no discomfort.

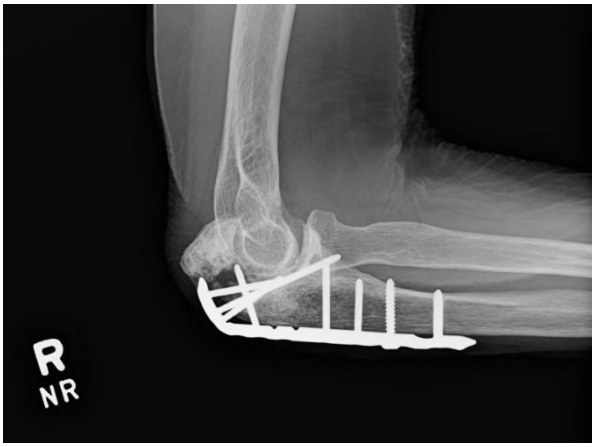

Figure 4. Six-month postoperative radiograph demonstrating evidence of persistent displacement with partial bone bridging

Discussion

This case report describes a failed olecranon fracture fixation in an 85-year-old female who sustained an olecranon fracture treated with ORIF using a locking plate. Fixation failed after 2 weeks, which was managed nonoperatively, resulting in an excellent functional recovery at 6 months, with near-full ROM, despite persistent radiographic displacement.

We initially pursued surgical fixation to restore elbow extension and strength and ensure stability in this walker-dependent elderly patient. According to Bateman et al., loss of active extension in the elderly can significantly impair mobility and independence, such as using assistive devices or rising from a seated position.[8] Also, non-operative management was less appealing initially due to concerns about prolonged immobilization leading to stiffness, particularly in a patient with kyphoscoliosis, which could exacerbate mobility limitations by restricting trunk motion and increasing reliance on the upper extremities for functional tasks such as walker use, transfers, and daily activities. Fixation using plate is often chosen over tension-band wiring in the elderly due to its superior mechanical properties in osteoporotic bone.[1]

The fixation failure in this case was most likely due to inadequate compression of the fracture fragments, as evidenced by the gap at the proximal fragment–plate interface, with inadequate implant conformity and insufficient screw fixation further contributing to early failure. [Figure 1]. In general, fixation failure may occur due to several factors. Narrowing of the trochlear notch can occur if overcompression is applied during fixation,

particularly when using a plate to construct a non-comminuted fracture. This can lead to articular incongruity and increased strain on the implant. Avoiding overcompression, especially in osteoporotic bones, is critical. Failure of fixation of small proximal fragments is common in elderly patients due to inadequate screw purchase. In such cases, the plate should be placed as proximally as possible and augmented with a tension band construct or triceps suture to counteract the pull of the triceps tendon and enhance fragment stability.[9,10] Also, a tension band or triceps suture augmentation can neutralize deforming forces, particularly in osteoporotic bone.[11] Additional measures such as capturing the proximal fragment with adequate screw fixation and ensuring that the implant conforms well to the posterior ulnar contour are essential for construct longevity.[9]

Despite appropriate technique, fixation failure rates remain high in the elderly. A recent population-based study by Bouchard et al. reported a 28% reoperation rate after precontoured plate fixation, with hardware failure accounting for 5.3% of these cases.[9] Following fixation failure, non-operative management was chosen as our patient demonstrated a favorable clinical status with minimal pain and reasonable function. Considering her preserved elbow motion and low symptom burden, we elected to continue with nonoperative care rather than pursue revision surgery.

Emerging evidence supports nonoperative management of displaced olecranon fractures in elderly, low-demand patients, even in cases of nonunion. A systematic review found that non-operative management yields functional outcomes comparable to surgical fixation, with a mean arc of motion of 138° and a mean DASH score of 17, despite a 75% nonunion rate.[3] In this case, the patient achieved a 104° arc of motion, a QuickDASH score of 17.5 and a MEPS of 95/100, consistent with excellent functional recovery despite radiographic nonunion. Non-operative management avoids anesthesia and surgical risks, including wound complications, infection, and implant-related irritation.[11]

Aibinder et al. reported that non-operative treatment in 28 medically unwell patients with a mean Charlson Comorbidity Index of 6.4 ± 2.6 resulted in a final mean ROM of 28° ± 21°extension to 127° ± 15° flexion. Eighteen (64%) cases reported no pain, while severe pain was noted in only one patient, with no patients requiring reoperation for symptomatic nonunion.[12] Similarly, Chen et al., in their systematic review and meta-analysis, evaluated 120 patients and noted that non-operative management in geriatric patients achieved a mean flexion arc of 122° and a DASH score of 12.3, with no subsequent surgeries.[11] These outcomes support non-operative management as a viable option after fixation failure, particularly when functional stability is preserved.

Conclusion

This case illustrates that non-operative management can achieve excellent functional outcomes after failed olecranon fracture fixation in elderly patients. Surgical pitfalls, such as trochlear notch narrowing and fixation failure, highlight the need for careful technique including triceps repair augmentation to hardware fixation. Non-operative management is a valuable alternative when revision surgery risks outweigh benefits, offering comparable outcomes with fewer complications in low-demand patients.

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