

# in a 63-Year-Old Man With Isolated, Non-Displaced Ulna Shaft Fracture: A Case Report

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## ABSTRACT

Radioulnar synostosis in adults is a rare pathological fusion of the two forearm bones. When seen in adults, it is an uncommon complication after a minimally displaced ulnar fracture. We describe a 63-year-old man who presented with radioulnar synostosis after closed treatment of a left ulna midshaft fracture sustained 7 months earlier. At 10 weeks after presentation, the patient underwent radioulnar synostosis excision with nonsteroidal adjuvant therapy. At 18 months postoperatively, no pain was noted, with complete degree of flexion. Healthcare professionals should consider treating radioulnar synostosis with an operative excision in adults as initial management when forearm pronosupination is affected.

**Keywords:** Radioulnar, Synostosis, Heterotrophic Ossification

## INTRODUCTION

Synostosis is defined as the fusion of two bones, with radioulnar synostosis involving the fusion of the radius with the ulna. Radioulnar synostosis is a debilitating condition that prevents pronosupination of the forearm. In adults, radioulnar synostosis is an uncommon complication after traumatic injuries to the forearm, with incidence rates reported between 0% and 9.4%.<sup>1</sup>

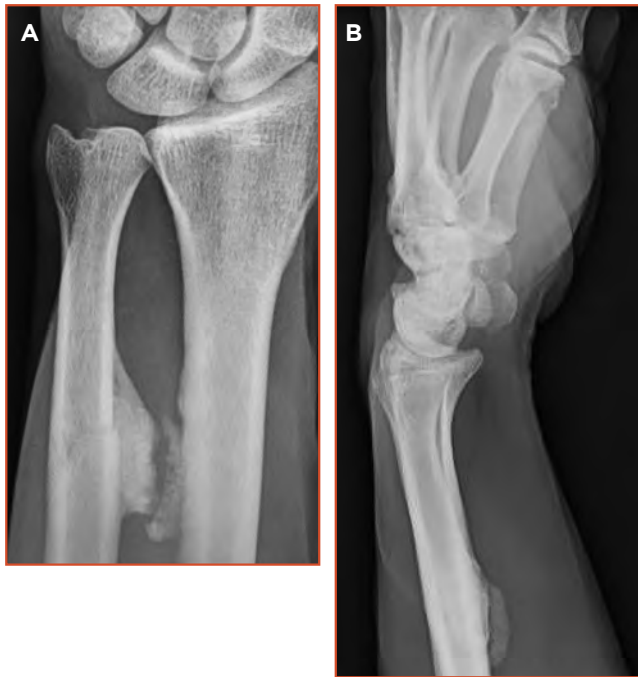
Multiple risk factors have been identified with the initial forearm injury. These factors include fractures to both the ulna and radius at the same level, Monteggia fracture, severe comminution and displaced bone fragments of radius or ulna, extensive soft-tissue injury of the forearm, trauma to the interosseous membrane (ie, penetrating trauma), and hematoma formation in the radioulnar interval.<sup>2</sup> We present a man with an

isolated non-displaced fracture of the distal third of the ulna, complicated by the development of radioulnar synostosis and loss of forearm rotation.

## CASE REPORT

A 63-year-old man was referred to our outpatient orthopaedic clinic owing to radioulnar synostosis after closed treatment of a left ulna midshaft fracture sustained 7 months earlier. Examination findings of the left forearm revealed no obvious deformity or tenderness to palpation. Because of the radioulnar synostosis, he had considerably diminished rotation of the forearm with only 10° of arc motion in supination and pronation from neutral position. Range of motion was normal at the wrist and elbow. Distal circulation, sensation, and motor function were intact. Radiograph findings showed a subacute isolated non-displaced fracture of the distal ulna with extensive regional callus formation (Figures 1A and 1B).

At 10 weeks after presentation, the patient underwent excision to remove heterotopic ossific bone bridging the interosseous membrane of the left forearm. A volar Henry approach was used to allow sufficient exposure of the heterotopic bone. Surgical treatment was decided based on the severely limited motion and the possibility of not regaining motion if the procedure was delayed further. The bone appeared mature on radiographs across multiple imaging studies, with little to no change in radiographic appearance during 4 months. Heterotopic bone bridging the distal radioulnar interval was removed in fragments, and restoration of supination and pronation was achieved with gentle manipulation of the arm. No complications occurred intraoperatively, and the patient was discharged the same day. He was prescribed for 800 mg of oral ibuprofen, three times a day.



**Figure 1.** Radiographs of the left forearm, showing an isolated non-displaced fracture of the distal third of the ulna with extensive callus formation invading the interosseous space. A) Anteroposterior view. B) Lateral view.



**Figure 2.** Radiographs of the left forearm after excision of the radial ulnar synostosis. A) Anteroposterior view. B) Lateral view.

At 10-days postoperatively, improved forearm range of motion was observed with 45° arc motion during pronation and supination. Therapy was started immediately. He had no restrictions and was not splinted. Radiographs at this time showed no interval osseous complication. Ibuprofen use was discontinued. At another follow-up 6 weeks later, he showed marked improvement, with increased range of motion from a 0° to 45° arc of pronosupination. He returned to work full time (Figures 2A and 2B). At 18 months postoperatively, the patient had 60° arc of pronation and supination. He could completely flex the elbow but lacked 15° to full extension. No pain was noted.

## DISCUSSION

Radioulnar synostosis requires aggressive surgical treatment. Failla et al<sup>3</sup> recommended waiting at least 12 months after manifestation to avoid operating on a metabolically active synostosis. Operative treatment may be warranted in patients with compromised range of motion, in which delays may lead to severe, irrecoverable stiffness.<sup>4</sup> Despite excision, range of motion may not be regained.

In the current case, surgical resection of the heterotopic bone was undertaken because the forearm was completely ankylosed. Furthermore, no improvement was noted in 4 months. Study findings have shown that earlier resection of heterotopic bone may be indicated, with better range of motion and no increase in surgical complication or recurrence.<sup>4</sup> Numerous surgical techniques have been documented that involve using intraoperative flaps and grafts to avoid recurrence; however, no method has shown superior results.<sup>2</sup> Surgical success depends on return of sustained forearm rotation, and an arc motion greater than 60° is required to perform nearly all activities of daily living.<sup>5</sup> Nonsteroidal adjuvant therapy is a common treatment after synostosis excision and may decrease heterotopic bone formation after total hip replacement.<sup>6</sup>

Multiple medications can be used to lessen or prevent the development of heterotopic ossification. In the current case, we chose ibuprofen because it is easily obtained over the counter, has manageable side effects, and was tolerated by the patient. The duration of prophylaxis in studies ranges from 6 weeks to 12 weeks.<sup>6</sup> Because no recurrence of heterotopic bone was seen on our patient's follow-up radiographs, the decision was made to stop prescribing ibuprofen. We had promising results with excision followed by 8 weeks of nonsteroidal adjuvant therapy and intense rehabilitation.<sup>7</sup> At 18 months postoperatively, the symptoms were resolved, with a 60° arc of motion, no pain, and return to full-time work.

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