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(CASE REPORT)

Post-Traumatic Radioulnar Synostosis 17 Years After Forearm Fracture: A Case Report and Literature Review

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Abstract

Post-traumatic radioulnar synostosis (PRUS) is a rare but debilitating complication of forearm fractures, characterized by osseous fusion between the radius and ulna. We report a case of PRUS that developed 17 years after surgical fixation of a forearm fracture. Surgical excision of the synostosis led to excellent functional recovery. This case highlights the long-term risk of heterotopic ossification after forearm trauma and underscores the importance of meticulous surgical technique and early mobilization.

Keywords: Post-traumatic radioulnar synostosis; Heterotopic ossification; Forearm fractures; Surgical excision; Radioulnar fusion; Forearm trauma complications

1. Introduction

Post-traumatic radioulnar synostosis (PRUS) is an uncommon but serious complication following fractures or surgical interventions of the forearm. It leads to an osseous bridge between the radius and ulna, resulting in loss of pronation-supination and significant functional limitation. Incidence rates range from 1% to 6%, and risk factors include high-energy trauma, extensive soft-tissue damage, delayed fixation, and reoperation.

This report describes a case of proximal PRUS in a patient who sustained a forearm fracture 17 years earlier, had hardware removal one year later, and subsequently developed a mature bony synostosis. Surgical excision provided a good functional outcome with restored range of motion.

2. Case Report

A 37-year-old male presented with progressive stiffness of the left forearm. Seventeen years prior, he had sustained a diaphyseal fracture of the radius and ulna, treated with open reduction and internal fixation. The osteosynthesis material was removed one year after fracture consolidation. The patient gradually developed loss of forearm rotation without pain. Clinical examination revealed complete loss of pronation and supination but preserved flexion and extension at the elbow. Neurovascular examination was normal.

Plain radiographs and computed tomography (CT) scans showed a mature osseous bridge between the proximal radius and ulna consistent with a type III post-traumatic synostosis (according to the Vince and Miller classification). Surgical excision was performed under general anesthesia using a posterior approach. The bony bridge was completely resected, taking care to preserve the posterior interosseous nerve. Early postoperative mobilization was initiated, and physiotherapy began on the second postoperative day.

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At follow-up, the patient recovered satisfactory pronation and supination, with no recurrence of synostosis or instability. Histological examination of the resected specimen showed mature lamellar bone without atypia.

3. Discussion

Radioulnar synostosis may occur after high-energy fractures, multiple surgeries, or excessive periosteal stripping. Vince and Miller classified post-traumatic synostosis into distal (type I), diaphyseal (type II), and proximal (type III) types. Our case corresponds to a type III lesion. Surgical resection is the standard treatment, preferably delayed until ossification matures (6–12 months post-injury) to reduce recurrence.

Giannicola et al. (J Shoulder Elbow Surg, 2019) reported that surgical excision of proximal PRUS yields favorable outcomes when performed with meticulous technique and careful protection of neurovascular structures. Interposition of soft tissue (fascia, fat, or anconeus muscle) may further prevent recurrence. Early postoperative rehabilitation is essential to maintain range of motion.

Recurrence remains a concern, particularly when resection is incomplete or performed prematurely. The use of nonsteroidal anti-inflammatory drugs and radiation therapy as prophylaxis remains controversial.

Figure 1 Preoperative radiograph showing proximal radioulnar synostosis

Figure 2 CT scan confirming osseous bridge between radius and ulna

Figure 3 Intraoperative view showing exposure of the synostosis.

Figure 4 Postoperative radiograph demonstrating complete excision of the synostosis

Figure 5 Full range of motion after surgery

4. Conclusion

Post-traumatic radioulnar synostosis is a rare but disabling condition. Complete excision of the synostosis, combined with early rehabilitation, can provide excellent functional outcomes. Long-term follow-up is necessary to detect potential recurrence.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest

Statement of ethical approval

Ethical approval was obtained.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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