

Isolated Coronoid Process Fracture in a 7-Year-Old Child – A Case Report

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Learning Point of the Article:

The coronoid process was stabilized with a mini-anchor in a pediatric patient.

Abstract

Introduction: Coronoid process fractures in children are rare and infrequently reported in the literature; they are typically associated with posterior elbow dislocations.

Case Report: We report a case of an isolated coronoid process fracture in a 7-year-old male child, treated surgically with open reduction and internal fixation of a Regan and Morrey Type II fracture, using a mini-anchor and high-resistance suture cerclage. The patient was followed for 21 months postoperatively.

Conclusion: This therapeutic approach proved to be effective for coronoid process fractures in pediatric patients who have not yet achieved complete ossification.

Keywords: Coronoid process fracture, mini-anchor fixation, pediatric elbow.

Introduction

The coronoid process of the ulna plays a critical role in elbow stability and serves as the insertion point of the brachialis muscle. In pediatric patients, it is primarily composed of cartilage. Coronoid fractures in children are rare and are typically seen in association with posterior elbow dislocations or as avulsion injuries of the brachialis muscle during elbow hyperextension events [1,2,3,4]. According to Henrikson, coronoid process fractures occur in approximately 3% of elbow dislocations in the pediatric population [5]; the overall incidence of elbow dislocations in this age group is also considered low, estimated at about 6 cases/100,000 children/year [6]. This study presents a case of an isolated fracture of the elbow's coronoid process.

Understanding the treatment approach requires knowledge of the Regan and Morrey classification, which defines coronoid fractures into three types. Type I: Small fragments not involving the articular surface; Type II: Larger fragments involving up to 50% of the process; Type III: fragments involving more than 50%. Type I fractures are generally managed conservatively, while Type II and III fractures usually require internal fixation to preserve elbow flexion [7].

Case Report

A 7-year-old male patient sustained a fall from standing height, presenting with pain, swelling, and functional impairment of the

Author's Photo Gallery



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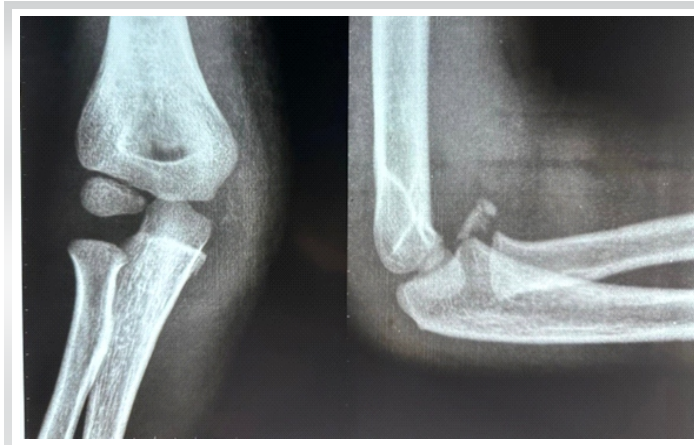


Figure 1: Pre-operative radiograph with anteroposterior and lateral views.

right elbow. Initial elbow radiography revealed a coronoid process fracture without dislocation (Fig. 1). A subsequent tomography scan confirmed the fracture (Fig. 2).

Surgical treatment was indicated due to the risk of flexion block (Regan and Morrey Type II) [1]. The procedure was performed under general anesthesia and right brachial plexus block. An anterior approach to the elbow was employed, using a “boat-race” incision between the brachial artery and median nerve to access the fracture. Intraoperatively, the fragment appeared larger than on radiographs, due to its predominantly cartilaginous composition.

Minimal fixation was chosen, using a mini-anchor inserted into the ulna and high-resistance suture cerclage to secure the fragment (Fig. 3). Layered closure was performed following meticulous hemostasis. The elbow was immobilized with a brachio-palmar splint.

At 1 week postoperatively, wound dressing and control radiograph were performed. The patient was asymptomatic, and imaging demonstrated adequate reduction and fixation (Fig. 4). No signs of infection were observed. Sutures were removed at 2 weeks, and the splint was maintained for 4 weeks

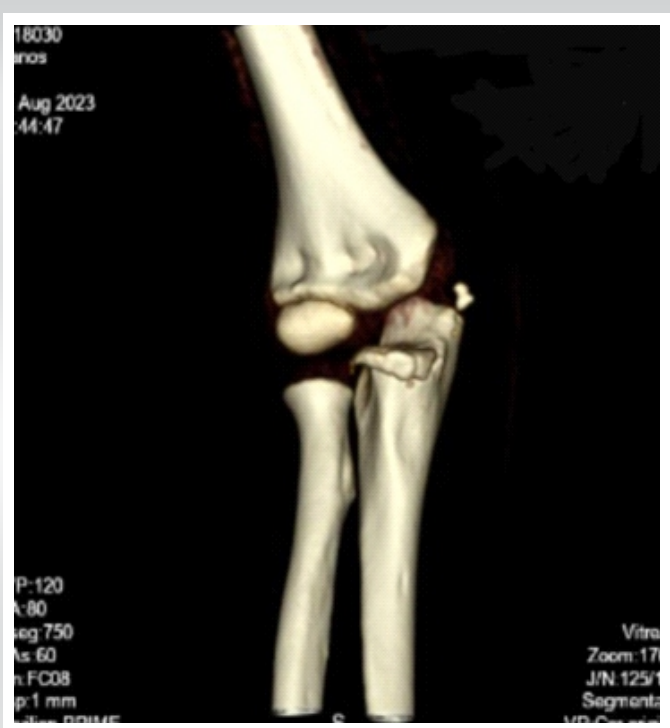


Figure 2: Pre-operative 3D reconstruction computed tomography scan confirming a fracture of the coronoid process.

postoperatively. After that, the patient was referred to elbow physiotherapy for range-of-motion recovery.

Two months after surgery, the patient had completed eight physiotherapy sessions and remained pain-free. Goniometric assessment showed full extension (0°) and flexion limited to 130° (20° deficit). Imaging confirmed fracture consolidation.

At 8 months, the patient returned with full elbow range of motion and normal function, with imaging confirming consolidation and an anatomically reduced joint. At 21 months, follow-up imaging again confirmed complete healing and reduction (Fig. 5), and goniometric evaluation showed a preserved range of motion (-10° extension to 150° flexion) (Fig. 6).



Figure 3: Intraoperative.

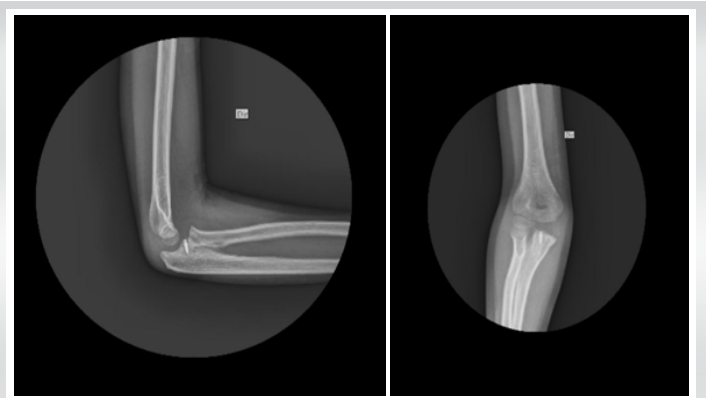


Figure 4: Radiograph at 1 week postoperatively.

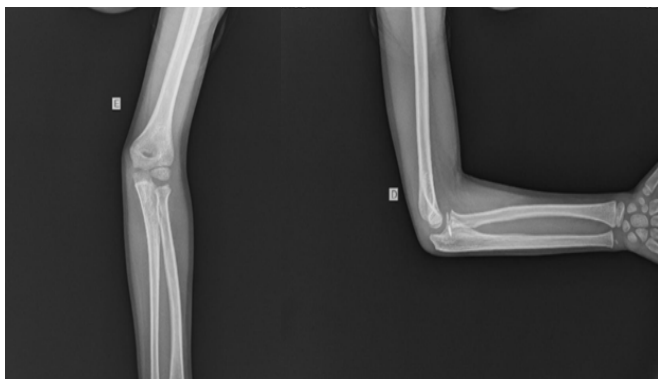


Figure 5: Radiograph at 21 months postoperatively.

Discussion

Coronoid process fractures in children are rarely encountered due to their cartilaginous structure, often resulting in misdiagnosis or missed diagnosis [7, 8]. Intraoperatively, the fracture fragment was noted to be much larger than radiographically evident, owing to the cartilaginous nature of the epiphyseal coronoid process [2].

In our case, the patient presented with an isolated coronoid process fracture following a fall onto an outstretched hand. Surgical treatment with minimal fixation was performed, and the patient was followed for 18 months, demonstrating complete healing, full range of motion (ROM), and preserved elbow function.

In the case reported by Khodnapur et al., a 9-year-old male sustained a Regan and Morrey Type III fracture after a similar mechanism of injury. The patient underwent open reduction and internal fixation with Herbert screws, and 1-year follow-up showed full ROM and stable elbow joint [7].

Gadgil et al., described a case of a 40-month-old female with a

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given the consent for his/ her images and other clinical information to be reported in the journal. The patient understands that his/ her names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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Figure 6: Full range of motion at 21 months postoperatively.

Type II coronoid fracture, in which the anterior band of the medial collateral ligament avulsed the coronoid fragment. The patient underwent surgical repair using non-absorbable periosteal sutures and fully recovered elbow motion and stability [9, 10].

Conclusion

Based on our case outcome and a review of the literature, open reduction and internal fixation appear to be an effective approach for pediatric Type II coronoid process fractures, supporting the conclusions of Regan and Morrey, Selesnick et al., and Hanks and Kottmeier. No post-operative joint instability or neurovascular complications were observed.

Clinical Message

Early diagnosis, appropriate physical examination, open fixation treatment, and long-term post-operative follow-up are critical for the successful management of pediatric Type II coronoid process fractures.

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