

Fracture Of The Proximal Ulna In Association With An Ipsilateral Complex Distal Radius Fracture: A Case Report

Z Gamie, R Sehjal, K Lowery, D L Shaw

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Abstract

Introduction

Simultaneous ipsilateral proximal and distal fractures of the forearm are rare.

Case presentation

A 10-year-old Caucasian boy presented with a unique combination of ipsilateral distal radius and proximal ulna fractures in the forearm. The fractures were managed with closed reduction under general anaesthetic. A good outcome was achieved using closed reduction.

Conclusion

To the best of the authors' knowledge there have been limited reports of similar cases in the literature with the same presenting combination of fractures. It is important to be aware of this type of injury to avoid missing the concomitant fracture, which may be overlooked due to the distracting injury and to enable management in a timely manner.

INTRODUCTION

Simultaneous ipsilateral distal and proximal fractures of the forearm are rare [1-3]. There have been case reports describing an olecranon fracture associated with an ipsilateral distal radius epiphyseal injury[1], a Monteggia lesion with an associated ipsilateral distal radius epiphyseal injury[4] or associated with ipsilateral distal radius and ulna metaphyseal fractures[5, 6]. Furthermore, there are limited numbers of cases describing concomitant lateral humeral epicondyle fractures in association with a Monteggia fracture[7, 8]. We describe the case of a child sustaining a displaced complex Salter Harris type II transepiphyseal fracture of the left distal radius in association with an ipsilateral simple proximal ulnar shaft fracture and undisplaced fractures of the ulna styloid and lateral epicondyle of the humerus. The management was to treat the distal radius and proximal ulnar shaft fracture with closed reduction and plaster application as two separate fractures, which resulted in a good outcome.

CASE REPORT

A 10-year-old Caucasian boy was admitted to our

department after falling from 12 feet onto his left non-dominant arm. On examination he had injuries to the elbow and wrist both of which were closed and neurovascularly uncompromised. Radiographs revealed a displaced complex transepiphyseal Salter Harris type II fracture of the left distal radius in association with an ipsilateral simple proximal ulnar shaft fracture and undisplaced fractures of the ulna styloid and lateral epicondyle of the humerus (Figures 1, 2 and 3). He was immobilised in an above elbow backslab and was taken to the operating theatre the next day to undergo manipulative reduction and aboveelbow cast application under a general anaesthetic. Immediate postoperative radiographs demonstrated an acceptable reduction. Figure 4 shows the position at three weeks, demonstrating a metaphyseal fragment separated from the more distal radius growth plate; however, the growth plate was well aligned. Five weeks post-injury, his range of movement at the elbow was from 20-110 degrees and he could pronate the forearm about 15 degrees from the mid-prone position. He had weakness of the interossei laterally and of palmar abduction; however, no weakness was found in finger or wrist extension. He had sensory loss in the median and ulnar nerve

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distribution, with the median nerve more affected. No sensory loss was detected in the forearm; however, a positive Tinel's sign was found at the elbow. Electrophysiological studies demonstrated a severe left median nerve neuropathy mainly affecting the sensory components of the nerve; however, due to absent sensory potentials, it was difficult to localise the site of damage. The ulnar sensory potential was relatively attenuated suggesting he may have had a mild neuropraxia affecting the left ulnar nerve. Radiographs demonstrated evidence of union at the fracture sites (Figures 5 and 6).

In a further review at 10 weeks post-injury, movement at the elbow and sensation was improved. At 14 weeks, he had full pronation-supination but lacked the last 5-10 degrees of extension at the elbow. The only residual symptom was a small area of altered sensation in the tip of his middle finger. He was advised to continue with physiotherapy and it was anticipated that there would be further recovery in his median nerve symptoms and there was no need for surgical intervention.

Figure 1

Anteroposterior radiograph of the left wrist demonstrating a complex Salter Harris type II fracture of the left distal radius.



Figure 2

Lateral radiograph of the left wrist demonstrating a complex Salter Harris type II fracture of the left distal radius.



Figure 3

Left forearm radiograph demonstrating an ipsilateral proximal ulna fracture.



Figure 4

Anteroposterior radiograph of the left wrist 3 weeks post-injury demonstrating a clear view of the fracture pattern, with a metaphyseal fragment separated from the more distal radius growth plate, but the growth plate appears well aligned.



Figure 5

Left forearm radiograph demonstrating union of the proximal ulna and distal radial epiphyseal fractures.



Figure 6

Lateral radiograph of the left wrist demonstrating union of the complex Salter Harris type II fracture of the left distal radius.



DISCUSSION

Simultaneous ipsilateral distal and proximal fractures of the forearm are rare[3]. The fracture described in this case does not fall into the category of previously reported forearm fractures in a child or Monteggia type fractures, of which there are four types[9] or a Monteggia equivalent fracture[2, 10]. Closed reduction is often the treatment of choice for forearm and Monteggia fractures due to the capacity to remodel[4, 11], but occasionally open reduction and internal fixation is required if proper alignment has been difficult to obtain[2, 12]. The exact mechanism of injury that could have caused this pattern of injury in this child is unclear. The mechanisms of injury that could cause two level fractures in

the ipsilateral forearm have not been well understood; however, it is thought to occur when a child falls on an outstretched hand while the forearm is in pronation[13]. This type of injury can result in a distal radial physis injury and with continued rotation of the trunk and longitudinal compression this can lead to the Monteggia lesion. The combination of fractures in our case is very uncommon and would probably have resulted from two separate injuries, hyperextension of the wrist and traumatic flexion of the forearm, occurring in quick succession. In a recent retrospective analysis[3], ipsilateral proximal and distal forearm fractures have been categorised into two groups to help enable management in a timely manner: (1) Group A, valgus stress with hyperpronation injury, resulting in proximal Monteggia or Monteggia-equivalent fracture with distal metaphyseal or epiphyseal injury and (2) Group B, direct highenergy trauma, resulting in a proximal diaphyseal fracture pattern with distal metaphyseal or epiphyseal injury. It is important to identify group B fractures due to the increased need for operative treatment, particularly in cases with an associated distal epiphyseal fracture for which closed reduction cannot be achieved or the fracture is unstable[3]. Injuries to arteries and nerves are relatively infrequent following closed forearm fractures in children[14]. Median, ulnar and radial nerve neurapraxia symptoms have been reported previously following Monteggia fractures in children [2, 14], sometimes requiring carpal tunnel decompression[2]. It has recently been reported that neurological injury occurs most frequently with distal epiphyseal fractures, in up to 37% of cases, with the median nerve most commonly injured [15]. The majority are neuropraxias recovering days to weeks postmanipulation[15]. It is important to have a high index of suspicion of neurological injury at the initial assessment; as such findings would necessitate prompt reduction. Neurological injuries that develop after the initial normal assessment may raise suspicions of compartment syndrome; furthermore, there is a possibility of nerves becoming trapped at the time of reduction[15].

CONCLUSION

We have reported on a rare combination of injuries, involving a Salter-Harris type II separation of the distal radius and proximal ulnar shaft fracture with associated median and ulnar nerve neurapraxias. It is important to be aware of this type of injury to avoid missing the second fracture, which may be overlooked due to the distracting injury. The distal forearm and wrist must be included in the

initial radiographic examination of proximal forearm fractures and despite its rarity; recognition and early management can lead to a good outcome. The management in this case was to treat them as two separate fractures with closed reduction, which resulted in a successful outcome.

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Author Information

Zakareya Gamie, BSc, MRCS

Department of Trauma and Orthopaedic Surgery, Bradford Royal Infirmary
United Kingdom
ugm1zg@doctors.org.uk

Ranjit Sehjal, MRCS

Department of Trauma and Orthopaedic Surgery, Bradford Royal Infirmary
United Kingdom
ranjitsehjal@doctors.org.uk

Kathryn Lowery, MRCS

Department of Trauma and Orthopaedic Surgery, Bradford Royal Infirmary
United Kingdom
katlowery300@yahoo.com

David L. Shaw, MSc FRCS(ed) FRCS(orth) CSci

Department of Trauma and Orthopaedic Surgery, Bradford Royal Infirmary
United Kingdom
David.Shaw@bradfordhospitals.nhs.uk