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## Ulnar nerve injury following fracture of distal radius: A case report

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### Abstract

Ulnar nerve injury subsequent to a fracture of distal radius is extremely rare compared to median nerve injury. Treatment of ulnar nerve injury after closed distal radius fracture is controversial. The present manuscript describes the case of a compression of ulnar nerve following Frykman type 2 distal radius fracture by ulnar styloid fragment at the wrist along with literature review.

**Keywords:** Compression, literature, frykman

### Introduction

The occurrence of ulnar nerve lesion after distal radius fractures is rare (0.05%). While median nerve injury occur as a complication of 5-7% of distal radius fractures [1]. These nerve injuries are associated with higher energy trauma. These palsies are thought to be secondary to nerve contusion, fracture induces traction or compression from local edema [2].

We report a unique case of a Distal radius fracture presenting with ulnar neuropraxia secondary to compression of ulnar nerve by ulnar styloid fracture fragment.

### Case report

We present a case of 53 year old male patient with injury to right hip and right wrist followed by a minor road traffic accident. Patient was brought to the Out Patient Department of GITAM Institute of Medical Sciences and Research on august 2023. After thorough examination and radiological investigative work up the patient was diagnosed to have intracapsular fracture neck of femur right and Frykman type 2 distal radius fracture right. Distal radius fracture was treated conservatively by below elbow pop cast and patient was admitted for surgery for fracture neck of femur. Patient was operated by Bipolar Hemiarthroplasty, patient was made to walk on 2<sup>nd</sup> post-operative day and was discharged on 3<sup>rd</sup> post-operative day and suture removal was done on 12<sup>th</sup> post-operative day. On 2 months follow up the POP cast was removed and since then patient was complaining of pain and paraesthesias over the ulnar aspect of right hand patient was treated conservatively and was asked to come for follow up after 1 month. At 3 months follow up patient had no relief of symptoms and there was wasting of the hypothenar aspect of right hand (Fig :1) so we had taken a plain radiograph of right wrist which showed consolidation of distal radius fracture and non-union of ulnar styloid fracture (Fig:2). On suspicion of ulnar nerve compression by ulnar styloid fragment a high resolution ultrasonography was done which showed ulnar nerve compression at the level of ulnar styloid (Fig:3). The thickness of ulnar nerve was 13mm proximal to ulnar styloid, 10mm at the level of ulnar styloid and 12mm distal to ulnar styloid.

### Discussion

Although rare, nerve injuries are possible complications of wrist fractures which should be considered during clinical management. Combined median and ulnar nerve palsy has been reported, but this represents an exceedingly rare complication of distal radius fractures. Accordingly to Bacon and Kurtzke [1] an ulnar nerve injury was found in only 1 out of 2000 patients (0.05%) with a fracture of distal radius.

An ulnar nerve injury is caused primarily by direct contusion, traction and nerve compression due to fibrosis of the adjacent tissues, swelling, intaneural fibrosis and rarely by laceration in a distal radius fracture. Zoega<sup>[3]</sup> reported from their intra-operative findings and a cadavar study that an ulnar nerve injury can occur as a result of contusion caused by a posterior and radial displacement of distal fragment. Vance *et al.*<sup>[2]</sup> observed that the ulnar and median nerve have the same relationships with the bones in the wrist and are protected by the pronator quadratus and flexor digitorum muscles. As with the median nerve, the ulnar nerve can be bowstrung by the proximal fractured radius in the case of dorsal displacement of distal fragment. In order to explain the relative immunity of the ulnar nerve to such injury Vance hypothesised that the ulnar nerve is less well tethered in Guyon's canal than the median nerve in carpal tunnel. Clark and Spencer<sup>[4]</sup> reported that compression by thick fibrous tissues around the ulnar nerve resulted in progressive ulnar nerve palsy and demonstrated that a permanent ulnar nerve injury could be avoided even when it was displaced or extended in a fracture of distal radius because it has higher mobility and extensibility than the median nerve.

In our case the patient presented to us with the complaint of persistent ulnar neuropathy even after cast removal. Initially we hypothesised that the compression of ulnar nerve was due to tight plaster applied and the symptoms would resolve after removal of plaster but they were not resolved. Patient was managed conservatively and plain radiograph at 2 months follow up showed healed distal radius fracture with ulnar styloid non union. Ultrasonography confirmed the compression of ulnar nerve was due ulnar styloid fragment proximal to Guyons canal.

Andrea Poggetti<sup>[5]</sup> *et al.* in 2019 reported a case of ulnar neuropathy following distal radius fracture they found that the ulnar nerve was encased in dense scar tissue and kinked at about 1cm proximal to the wrist crease and the nerve was stuck between the fracture fragments. They hypothesized that at the moment of trauma the ulnar nerve which is tethered in the Guyon's canal was first pulled dorsally and then pinched by sharp proximal radial fragment. Chul-Hyon Cho *et al.*<sup>[6]</sup> in their observation of two cases ulnar nerve palsy following distal radius fractures stated that their intra-operative findings of ulnar nerve exploration revealed swelling of ulnar nerve and adhesions of the adjacent fibrous tissues. James E.Feng *et al.*<sup>[7]</sup> in their case report stated that on surgical exploration they found that the ulnar nerve was found to be travelling dorsoulnarly around the ulnar head under moderate tension. Reduction of ulnar nerve relieved the symptoms post-operatively.

Gross and Gelbermans's<sup>[8]</sup> in their cadaveric study delineated the relationship between the symptoms and three anatomical zones of ulnar nerve compression at the wrist. Zone I is proximal to the bifurcation of the ulnar nerve; compression of which would lead to motor and sensory symptoms. Zone II includes the motor branch after its bifurcation, which would lead to purely motor symptoms. Zone III encompasses the superficial branch of the ulnar nerve, which would lead to only sensory symptoms. Ultrasonographic scanning can confirm the diagnosis as well as localize the area of compression.

Classification of ulnar nerve injuries is similar to that used for median neuropathies: Type 1, primary injuries, apparent immediately at the time of the injury; type 2, secondary injuries, following unstable or partial reduction and malunion; type 3, late on delayed injuries, occurring months or years

after fracture healing and type 4, injuries following forced manipulation and immobilization<sup>[9]</sup>.

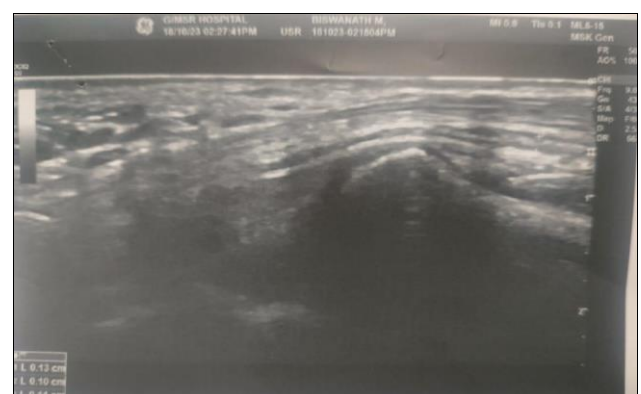
There were no similar studies as in our case where the compression of ulnar nerve was from ulnar styloid.



**Fig 1:** Wasting at hypothenar aspect of right hand



**Fig 2:** Plain radiograph of the wrist showing healed distal radius fracture with ulnar styloid non-union



**Fig 3:** High resolution ultrasonography showing compression of ulnar nerve by ulnar styloid fragment

## Conclusion

Ulnar nerve neuropathy following distal radius fracture pose a diagnostic and therapeutic challenge. High resolution ultrasonography can be helpful to delineate the course of the nerve and to rule out any compression over the ulnar nerve. This case report offers a unique case of ulnar nerve impingement by ulnar styloid fragment. Current literature suggests persistent ulnar nerve palsy independent of acuity

can be an indication for surgical exploration following distal radius fracture.

**Conflict of Interest**

Not available

**Financial Support**

Not available

**Reference**

1. Bacorn RW, Kurtzke JF. Colles' fracture: a study of two thousand cases from the New York State Workmen's Compensation Board. *J Bone Joint Surg Am.* 1953;35(A):643-658.
2. Vance RM, Gelberman RH. Acute ulnar neuropathy with fractures at the wrist. *J Bone Joint Surg Am.* 1978;60(7):962-965. DOI:10.2106/00004623-19786007000015.
3. Zoega H. Fracture of the lower end of the radius with ulnar nerve palsy. *J Bone Joint Surg Br.* 1996;48(3):514-516.
4. Clarke AC, Spencer RF. Ulnar nerve palsy following fractures of the distal radius: clinical and anatomical studies. *J Hand Surg Br.* 1991;16(4):438-440.
5. Poggetti A, Nucci AM, Baluganti A, *et al.* Ulnar nerve injuries in distal radius fractures. *JPRAS Open.* 2020;24:20-24. DOI:10.1016/j.jpra.2020.02.005.
6. Cho HS, Lee JH, Lee S, *et al.* Ulnar nerve palsy following closed fracture of the distal radius. *Clin Orthop Surg.* 2010;2(1):55-59. DOI:10.4055/cios.2010.2.1.55.
7. Feng JE, Espiritu MGS, Tooley TR, Altman PR. Ulnar nerve translocation following a routine distal radius fracture. *Iowa Orthop J.* 2023;43(1):185-189.
8. Gross MS, Gelberman RH. The anatomy of the distal ulnar tunnel. *Clin Orthop Relat Res.* 1985;198:238-247. DOI:10.1007/bf00435451.
9. Kozin SH, Wood MB. Early soft-tissue complications after fractures of the distal part of the radius. *J Bone Joint Surg Am.* 1993;75:144-153. DOI:10.2106/00004623-199301000-00018.

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