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## Case Report

# Ulnar nerve palsy after treatment of olecranon fracture with tension band wiring

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## ABSTRACT

A case of olecranon fracture treated with tension band wiring presented to us with symptoms of ulnar nerve injury. The ulnar nerve was explored and injury was identified between two heads of flexor carpi ulnaris (FCU) distal to the level of cubital tunnel. The injured nerve was repaired using sural nerve grafts and the patient improved as witnessed on regular follow-up.

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## 1. Introduction

Olecranon fracture is one of the common fractures in the upper limb.<sup>1,2</sup> Generally, simple displaced fractures are fixed with tension band wiring (TBW).<sup>3</sup> Although complications of this procedure are not common but they can occur in rare cases, specially nerve damage.<sup>4</sup>

## 2. Case Report

A 25 years old man presented to us complaining of weakness of hand for 1 month. He had undergone surgery for olecranon fracture 3 months back at other center by open reduction and internal fixation with TBW. After removal of the Plaster of paris (POP) slab 1 month after surgery he noticed that his hand power is weak with gradual clawing of the ulnar sided fingers and diminished sensation over the medial aspect of the hand (Figure 4). He also gave history of a discharging sinus over the surgical site which improved gradually with treatment. On clinical examination we found loss of sensation over the ulnar nerve dermatome with 0/5

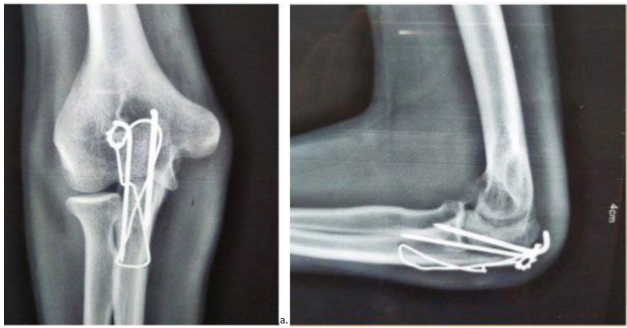
power of Flexor Carpi Ulnaris (FCU), Flexor Digitorum Profundus (FDP) of IV<sup>th</sup> and V<sup>th</sup> digit (Figure 5) and froment's sign of left hand (Figure 6). An ulnar nerve injury was suspected and confirmed with EMG study (Figure 7). The patient underwent removal of the implant and exploration of the ulnar nerve. Intraoperatively we found an injury to the ulnar nerve distal to the level of the tunnel where the ulnar nerve enters between the two heads of FCU. Neuroma-in-continuity was present with no neural tissue. We divided the neuroma and resected the nerve till healthy nerve ends were noted, a gap of 5 cm was present. We harvested a sural nerve graft and repaired the nerve with cable grafts (Figure 3).

## 3. Discussion

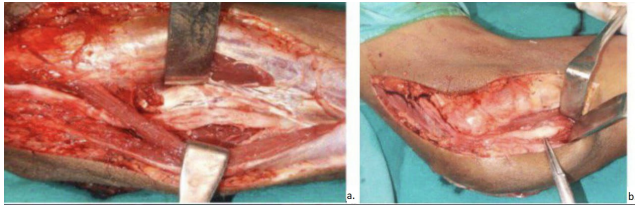
Olecranon fracture accounts for 10% of all upper extremity fractures.<sup>5</sup> Anatomic reduction should be achieved due to the intra-articular extension of the fracture.<sup>6</sup> Tension-band wiring is usually done for internal fixation in displaced olecranon fracture. Ulnar nerve palsy from the operative treatment by tension-band wiring have been reported in 10%

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**Fig. 1:** Plain radiograph showing **a:** AP and **b:** Lateral view



**Fig. 2:** **a:** Intra-operative pictures showing no injury to the ulnar nerve upon exploration upto the point where the nerve enters between the two heads of flexor carpi ulnaris; **b:** Intra-operative pictures showing the injury to the ulnar nerve at the level where the bone was drilled i.e. after the nerve enters between the two heads of flexor carpi ulnaris



**Fig. 3:** Picture showing the ulnar nerve repair done with sural nerve

patients.<sup>7</sup> Loss of reduction, osteophyte formation, backing out of the K wire can cause ulnar nerve palsy in olecranon fracture.<sup>8</sup>

The cause of ulnar nerve palsy is unique in our case, which has not been described previously in literature. In all cases it was due to change in cubital tunnel anatomy. In this case, the cause was iatrogenic injury, while drilling the bone to make tunnel to pass the wire. Nerve injury was seen at the level of drilling as shown in the Figure 2. This finding is different from other causes of the ulnar nerve injury after TBW in olecranon fracture.

While exploring the nerve there was no lesion at the level of cubital tunnel here, although upon further exploration a

Full Name: [Redacted]  
 Patient ID: [Redacted] Age: [Redacted] Gender: [Redacted]  
 Visit Date: [Redacted]

**Motor NCS**

Nerve / Sites	Muscle	Latency ms	Amplitude mv	Segments	Distance cm	Velocity m/s
L Median - APB	APB	3.40	9.7	Wrist - APB		
Elbow	APB	7.40	9.5	Elbow - Wrist	27	68
L Ulnar - ADM	ADM	NR	NR	Wrist - ADM		
Elbow	ADM	NR	NR	B.Elbow - Wrist		

**Sensory NCS**

Nerve / Sites	Rec. Site	Onset Lat ms	Amp. µV	Segments	Distance cm	Velocity m/s
L Median - Dig II	Index	2.81	52.1	Wrist - Index	16	57
L Ulnar - Dig V	Wrist	NR	NR	Dig V - Wrist	14	NR

**F Wave**

Nerve	Min M Lat ms	Max M Lat ms	Mean M Lat ms	Min F Lat ms	Max F Lat ms	Mean F Lat ms
L Median - APB	3.2	3.4	3.4	25.8	33.2	27.7
L Ulnar - ADM	NR	NR	NR	NR	NR	NR

**Conclusion**

**Motor NCS ; NR left ulnar nerve.**

**Sensory NCS ; NR left ulnar nerve.**

**F Wave ; NR left ulnar nerve.**

Please Correlate Clinically

**Fig. 4:** EMG report



**Fig. 5:** Weakness of 4<sup>th</sup> and 5<sup>th</sup> digit of left hand while making a fist

lesion was found in between the 2 heads of flexor carpi ulnaris. Therefore, after exploration at the cubital tunnel level the operating surgeon should explore distal to the cubital tunnel where the nerve enters between two heads of FCU, so that any nerve injury doesn't go unnoticed.

As the ulnar nerve lies close to the medial cortex of the olecranon, it has the highest risk of injury. Although it is an uncommon complication, this may result in nerve palsy, which is disabling to the patient. To reduce the injury of the ulnar nerve during surgery, surgeons have to be careful



**Fig. 6:** Froment's sign



**Fig. 7:** Ulnar claw hand

while drilling the bone to insert the wire. We found that it is safe to drill from medial to lateral side.

#### 4. Source of Funding

None.

#### 5. Conflict of Interest

None.


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