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Nikita Tripathi
JSS AHER

Dr Adarsh Thammaiah
JSS AHER

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A Case of Atypical Presentation of Radial Nerve Injury

Nikita Tripathi [7th Term MBBS], Dr Adarsh Thammaiah, Department Of Orthopaedics, JSS Medical College, JSSAHER, Mysuru

CASE REPORT:

CLINICAL HISTORY:

A 12 year old male patient was admitted at JSS Hospital with complaints of inability to extend his right wrist and fingers . The patient gives a history of self fall from a cycle 1 week back , following which he complained of severe pain and deformity of his right arm. Pain was sudden in onset and aggravated on movement of the arm and relieved on immobilisation.

There was severe tenderness in the lower arm. Deformity and crepitus was felt on movement. Patients could perform active movements of the elbow, wrist and fingers.

X ray of the right arm was taken and was diagnosed with fracture of the right humerus.

Fracture was transverse type at the junction of the middle and lower 1/3rd shaft which was displaced.

Closed reduction was done and the above elbow POP slab was applied and planned to treat it conservatively. No neurovascular deficit was seen.

Later after 4-5 days, the patient reviewed back to opd with complaints of not being able to extend his wrist and fingers with loss of sensation over the 1st web space.

Slab was removed and examination of the right upper limb was done.

EXAMINATION AND INVESTIGATIONS:

Attitude

The arm was rested on the bed with 90 degrees flexion at the elbow. There appeared to be a wrist drop deformity with complete flexion at the wrist and mild flexion at the MCP and IP joints.

Inspection

Skin over the arm appeared to be normal

There was mild diffuse swelling over the middle and distal part of the arm.

Palpation

No local rise in temperature

Sensation over the 1st web space on the dorsal side of the hand was reduced.

Motor power of

Triceps 5/5

ECRL and ECRB 0/5

Brachioradialis 0/5

Extensor digitorum 0/5

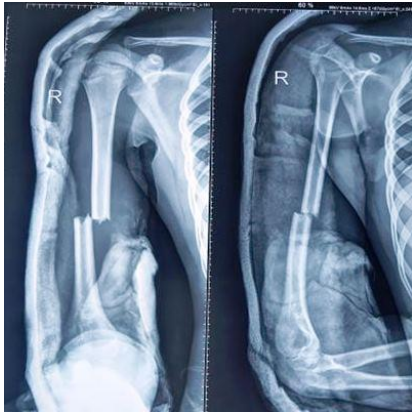
Extensor carpi ulnaris 0/5

Extensor indices 0/5

Extensor digiti minimi 0/5

Distal pulses palpable

PRE-OP X-ray



AP and Lateral X-ray of right humerus showing transverse fracture of mid and lower 1/3rd of right humerus along with displacement.



Picture showing wrist drop

FINAL DIAGNOSIS:

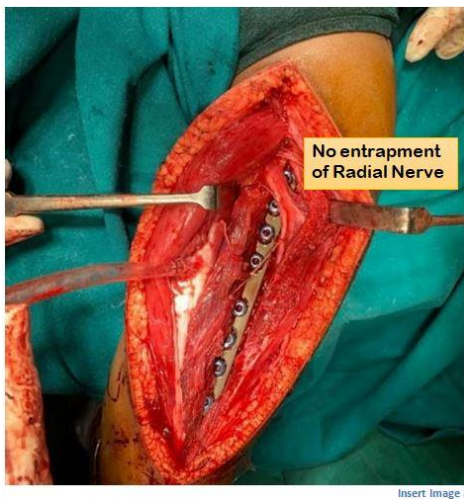
Fracture of the shaft of humerus with wrist drop secondary to lower radial nerve injury probably due to neuropraxia.

DISCUSSION:

TREATMENT:

Exploration of the radial nerve was done. There was no nerve entrapment or contusion seen. Open reduction of the fracture and fixation with plate and screws was done.

Dynamic cockup splint was applied to the wrist and fingers to maintain the length and tone of the muscle and prevent any muscular contraction.



Picture showing fracture reduction with plate and screws and radial nerve crossing over the lower part of the plate from medial to lateral



POST OP Xray showing humerus fracture reduced and fixed with plate and screws



Insert image 5

Picture showing dynamic cockup splint

RADIAL NERVE INJURY

Root Value: C5-T1; Branch of posterior cord of brachial plexus

RADIAL NERVE IN THE ARM

1. Muscular branches
 - long and medial head of triceps [before entering spiral groove]
 - lateral and medial head of triceps [in the spiral groove]

- brachialis , brachioradialis , ECRL [below the spiral groove]
2. Cutaneous branches
- posterior cutaneous nerve of the arm [above the radial groove]
 - lower lateral cutaneous nerve of the forearm [in the radial nerve]

RADIAL NERVE IN THE FOREARM

- branches into superficial and deep terminal branches in the cubital fossa
- superficial branch is cutaneous and distributed to the lateral half of the dorsum of the hand and to the proximal parts of the dorsal surface of the thumb, index, middle and lateral half of the ring finger
- deep posterior interosseous branch supplies ECRB and part of supinator and after leaving supinator tunnel supplies EDC, EDM, EI, ECU, abductor pollicis longus, extensor pollicis longus and brevis. [1]

MODES OF INJURY

1. In the axilla
 - aneurysm of the axillary vessels
 - crutch palsy
2. In the shoulder
 - proximal humeral fractures
 - shoulder dislocation
3. In the spiral groove
 - shaft fracture
 - saturday night palsy

- syringe palsy
- surgical positions (Tredelenburg)
- 4. Between spiral groove and lateral epicondyle
 - fracture shaft humerus
 - supracondylar fracture humerus
 - lateral epicondyle fracture of the humerus
 - penetrating and gunshot injuries
 - cubitus valgus deformity
- 5. At the elbow
 - posterior dislocation of the elbow
 - fracture head of humerus
 - Monteggia fractures. [2]

LEVEL OF LESION

1. High (above spiral groove)
 - total palsy
1. Low type I (between the spiral groove and the lateral epicondyle)
 - wrist drop
 - thumb drop
 - finger drop
 - loss of sensation in dorsum of first web space
1. Low type II (below the elbow)
 - thumb drop

- finger drop
- loss of sensation over the first web space. [2]

EXAMINATION

- Testing for triceps
- Lesion in mid humeral level or above



Insert image 6

- Test for Brachioradialis
- Lesion prox to the supinator



Insert image 7

- Test for supinator
(Elbow in extension to eliminate the supination action of biceps)

Lesion proximal to the supinator tunnel



Insert image 8

- Test for extensors of the wrist & fingers (MP joints & IP joints)



Insert image 9

HOLSTEIN LEWIS FRACTURE- It is a long spiral fracture of the lower one third of humerus leading to entrapment of radial nerve



Insert image 10

But in this case,

1. Patient presented with Radial nerve injury after 5 days of application of the U slab
2. Fracture is lower to the radial groove
3. Fracture is transverse type and not the spiral
4. Intraoperatively no entrapment of the radial nerve was observed.

So this was an unusual presentation of radial nerve injury with fracture of the humerus, where the cause is still unknown.

CONCLUSION:

ACKNOWLEDGEMENTS: None

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