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Case Report

Median nerve entrapment in surgical scar: a rare complication in volar plating of fractures of distal end radius

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ABSTRACT

A 25-year-old male presented to our OPD with pain and swelling of right wrist following trauma by RTA. X ray showed comminuted intraarticular fracture distal end radius (R) and confirmed with 3D CT. Patient was operated 15 days later with plate osteosynthesis using a 3-hole Elli's T plate. The patient presented with complaints of numbness and tingling sensations over lateral 3 and half fingers about 2 months after surgery. Previous scar tissue excision was done which exposed the median nerve adhesions in its distal course with the scar tissue followed by median nerve neurolysis with carpal tunnel release was done.

Keywords: Median nerve entrapment, Carpal tunnel release, Surgical scar, Distal end radius fractures

INTRODUCTION

Median nerve entrapment is a complication seen in volar plating done for distal radius fracture. In literature, the incidence of carpal tunnel syndrome with volar plating for distal radius fracture was reported as 3%.[2] However, the incidence of median nerve entrapment under surgical scar tissue is a topic to be studied further.

CASE REPORT

A 25-year-old male presented to our OPD with pain and swelling of right wrist following trauma by RTA. X-ray showed comminuted intraarticular fracture distal end radius (Frykmann type 3). Right side and intra articular fragments visualised on CT wrist with 3D reconstruction. Patient was operated 15 days later with plate osteosynthesis using a 3-hole Elli's T plate.

The patient presented with complaints of numbness and tingling sensations over lateral 3 and half fingers about 2 months after surgery.

Figure 1: Pre-op 3D CT of hand and post op X-ray.

Figure 2: Sensory loss over lateral 3 ½ finger.

We were suspecting CRPS (Complex regional pain syndrome) or as it is a well-known complication in such cases, all our examination and investigations got inclined towards CRPS.

But a significant finding on examination was a positive Tinel sign, which made us think of getting an NCV study to rule out compartment syndrome.

On nerve conduction sensory study: right median nerve was not recordable; rest of the findings were within normal limits.

We further went on for MRI keeping a provisional diagnosis of carpal tunnel syndrome, MRI was also suggestive of carpal tunnel syndrome and oedema of pronator quadratus muscle, accordingly we started the management for the same with anti-inflammatory drugs, physical therapy and supportive treatment.

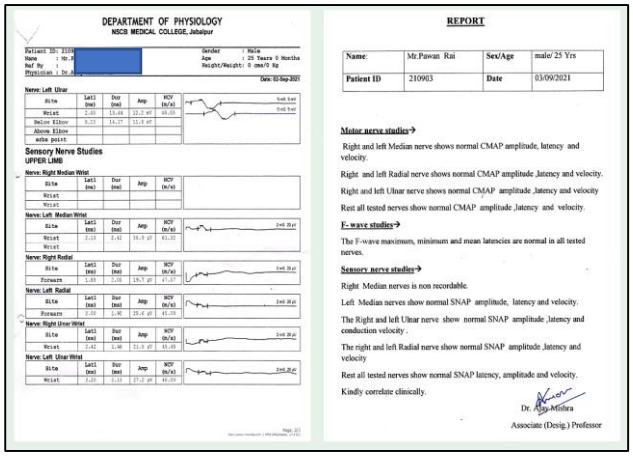

Figure 3: Nerve conduction velocity study.

Even after 15 days there was no relief, a fellow colleague suggested for an ultrasonography and USG showed median nerve entrapped below the scar tissue.

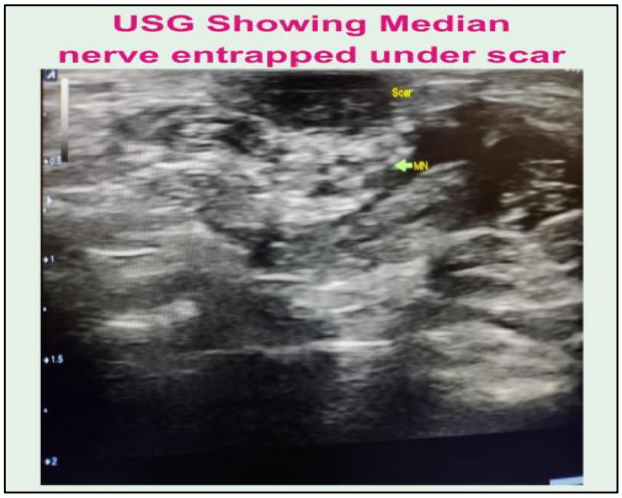

Figure 4: USG showing median nerve entrapped under scar with sensory loss over lateral 3½ finger.

Figure 5: Operative procedure done for release of carpal tunnel.

Figure 6: Confirmation of release by median nerve stimulation.

Operative details

Previous scar tissue excision was done which exposed the median nerve adhesions in its distal course with the scar tissue followed by median nerve neurolysis with carpal tunnel release was done.

Two check dress were done on day 3 and day 5. Sutures were removed on day 14. Patient was discharged on pregabalin for 15 days.

Follow-ups were taken on 4th, 8th and 12th week.

On follow-up patient got symptomatically better with reduced tingling and numbness in post operative period with progressive Tinel's sign. At 12 weeks, patient was asymptomatic.

DISCUSSION

The carpal tunnel is formed by the transverse carpal ligament (flexor retinaculum) superiorly and the carpal bones inferiorly.[3] The median nerve, accompanied by the nine flexor tendons of the forearm musculature, must pass through this anatomical tunnel.[3] Median nerve entrapment in carpal tunnel is common complication.

The compression of the median nerve can cause ischemia and mechanical nerve interruption.[8]

In the present report, the patient was relatively young at 25 years of age. Dyer et al reported that patients with ipsilateral upper extremity trauma, women less than 48 years of age, and patients with greater than 35% fracture translation were at increased risk for median nerve entrapment in acute carpal tunnel syndrome.[7] Cavalcante et al in their case report studied a 40-year-old male patient who reported with pain and paresthesia in his right hand in the last 2 months, associated with weakness in the apprehension of objects and difficulty to work.[6]

The incidence of median nerve entrapment in carpal tunnel syndrome after volar locking plate fixation for DRF is reportedly 2.8%.[9] Isobe et al identified 9 cases (10%) with abnormal nerve conduction accompanying median nerve symptoms in their series. While Protopsaltis et al reported that the average incidence of median nerve entrapment in carpal tunnel syndrome after volar plating was 10.1%, which ranged from 0-23%.[4,10]

In the present case, the median nerve was entrapped in the surgical scar tissue which is not reported in literature much yet. The incidence of all post-operative hand numbness in locking plate group was significantly higher than that of the non-locking plate-10.2-3.03%.[3] The incidence of late carpal tunnel syndrome after volar plating with locking plate was 4.17%.[3]

As the use of volar locked plating (VLP) systems has become commonplace, extensor and flexor tendon-associated complications have been increasingly recognized, both in the form of tenosynovitis and ruptures.[5]

CONCLUSION

We concluded that prevention of the possible complications that can occur following treatment of a distal radius fracture must be the surgeon's foremost concern. Complications that do arise should be treated sooner to prevent any further long-term consequences. This method allows restoration of the anatomy, stable internal fixation, a decreased period of immobilisation and early return of wrist function. Also, this method is effective in the anatomic realignment, allows early joint motion, owing to its fixation strength. Volar approach provides both, access with minimal surgical trauma on distal radius and fixation with a better adaptation to surrounding tissues. Tendon irritation and rupture, carpal tunnel syndrome, malunion, complex regional pain syndrome, loss of reduction, and post traumatic arthritis must all be considered when treating distal radius fractures. An orthopaedic surgeon should not only focus on the perfect reduction and perfect fixation but also focus on the things present around the bone i.e., soft tissues and on perfect closure. Before jumping onto advanced investigations, one should rely on clinical examination and basic investigations like ultrasonography.

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