

# Severe Median Nerve Injured After Local Corticosteroid Injection in A Carpal Tunnel Syndrome Patient —A Case Report

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## Case report

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# Abstract

## Background

The corticosteroid injection is known to be an effective and safe treatment for carpal tunnel syndrome, no serious complications was reported in previous literature. We report a severe median nerve injured case after corticosteroid injection. Case presentation: A 55-year-old female patient was admitted to our hospital because of numbness in her right finger for 10 years. Total six corticosteroid injections were performed in the past 2 years, and the symptoms did not relief significantly. She underwent ligament resection and median nerve release. The median nerve epineurium thickened and the scar was obvious during the surgery. The patient made a perfect recovery after surgery. Conclusions: The accurate preoperative assessment and personalized treatment are very important for peripheral nerve entrapment disease.

## Background

Carpal tunnel syndrome (CTS) is the most common peripheral

nerve entrapment syndrome of the upper extremities(1). Most risk factors for CTS: tumor, gouty tophus, traumatic bone or nerve injury, immune system disease, pregnancy and diabetes(2, 3). A corticosteroid injection is known to be an effective, safe and widely used treatment for CTS(4). There were no serious complications and no acute exacerbation of CTS after corticosteroid injection in previous literature reports. We report a case of severe complication after corticosteroid injection.

## Case Presentation

A 55-year-old female patient was admitted to our hospital because of numbness in her right hand for 10 years, and the pain get worse for two years. The initial symptoms were paresthesia and nocturnal numbness of the right middle finger without pain. Later, the numbness developed in in the median nerve distribution. Over the past 10 years, the symptoms recurred and the numbness gradually increased. Two years ago, the patient developed pain in the right hand, which was radiation-like pain. The pain radiates down the elbow joint extremity to the fingers. There was no shoulder and neck pain, dizziness, headache, and no range of motion disorder. The patient has no history of trauma. In the past two years, total six corticosteroid injections were performed in her wrist, and the symptoms did not relief significantly and become worse. The Boston Carpal Tunnel Syndrome Questionnaire (BCTQ) score was 55.

Electromyography revealed: the median nerve injured, conformed severe carpal tunnel syndrome.

Ultrasound of wrist revealed: The right median nerve was significantly thicker than the left side, the echo was low, no interruption was seen, and the transverse carpal ligament was thickened(Figure1). A cervical spine MRI examination revealed: C3/4, C4/5, C5/6 intervertebral discs herniated, C6/7 discs bulge with mild protrusions, degeneration, and cervical degeneration. A right wrist MRI examination revealed: The median nerve is thickened, and slightly higher signal in T2WI□Figure2□. Ultrasound-guided pulsed

radiofrequency of the cervical spinal nerve root + posterior branch block + epidural steroid injection (ESI) were performed. The symptoms did not improve significantly. There was no significant atrophy of the thenar. She had a positive Tinel's sign and Phalen's test on her right wrist.

The patient underwent general anesthesia for the surgery. We made the double mini-incisions. A distal incision was made for the transverse carpal ligament resection and another proximal incision for the median nerve release. It was found that the transverse carpal ligament was thickened. The distal median nerve epineurium thickened, and the scar of proximal median nerve epineurium was obvious. The nerve epineurium was excised and the fascicular membrane was released. The median nerve was completely released(Figure3). Sodium hyaluronate was injected into the neural trunk. Postoperative the patient's numbness and pain relieved

significantly, and The BCTQ score was 24 three weeks after surgery. Postoperative MRI examination revealed: The thickened median nerve became normal thickness(Figure4). Oral methylcobalamin tablets (0.5 mg every 8 h; Eisai Co, Ltd Japan) were taken for six months. There was no difference in the daily life of the patients during the one-year follow-up.

## Discussion And Conclusion

The optional treatment for CTS including nonoperative measures (oral nonsteroidal anti-inflammatory or steroids drug, manual splints, local corticosteroids injection and physical therapy, etc) and surgical intervention. The routine corticosteroid injection is performed using needle applied 1 cm proximal to the wrist flexion crease. The angle of the needle was about 45 degrees. The corticosteroid (triamcinolone or diprospan) mixed with lidocaine were injected between the flexor carpi radialis tendons and the palmaris longus. If patient feels paresthesia, the needle must be retracted and reinserted. The main mechanism of corticosteroid application was reducing inflammation, swelling and pressure of median nerve in carpal tunnel(5, 6). Generally believed that this is suitable for short-term CTS treatment, and no more than three injections should be given to one hand(7). Why our patient's symptoms got worsened after receiving the injection, we analysis the following reasons: The patient had a longer course of disease, more serious condition and a thickened transverse carpal ligament, corticosteroid injection is not preferred, surgery maybe the better treatment option. Therefore, the evaluation of the severity of CTS is very important. For peripheral nerve entrapment, we recommend a comprehensive evaluation with MRI and electrodiagnostic evidence before the surgery(8, 9). Because the effect of injection was not obvious, multiple puncture and corticosteroid injection caused the scar proliferation of the nerve epineurium, aggravating the symptoms(10). Direct puncture damage to the median nerve was not ruled out without ultrasound guidance(11).

In this case, we not only resected the transverse carpal ligament, but also released scars from nerve epineurium and fascicular membrane. Corticosteroid injection was not suitable. It illustrates the importance of accurate preoperative assessment and personalized treatment for peripheral nerve entrapment disease.

## Abbreviations

Magnetic resonance imaging MRI; T<sub>2</sub>-weighted image T2WI; epidural steroid injection (ESI); Carpal tunnel syndrome CTS; epidural steroid injection ESI; The Boston Carpal Tunnel Syndrome Questionnaire, BCTQ

## Declarations

## Ethics approval and consent to participate

The study protocols were approved by the Medical Ethics Committee of the First Affiliated Hospital of the College of Medicine, Zhejiang University

### Consent for publication

Written informed consent was obtained from the patient for publication of clinical details and clinical images. Upon request, a copy of the consent form is available for review by the Editor of this journal

## Competing interests

The author declares that they have no competing interests.

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## Author contributions

HL designed the study, performed data collection, analyzed the results, and HY Z drafted the manuscript. All the authors have read and approved the final manuscript.

## Acknowledgements

Not Applicable

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## Figures

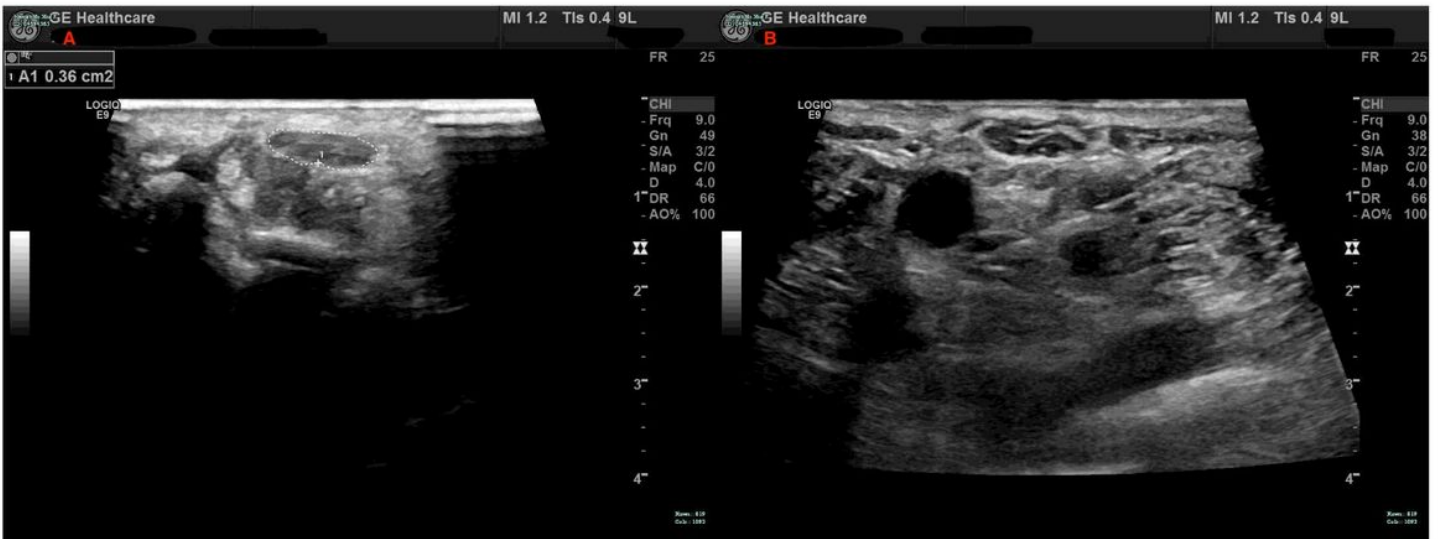
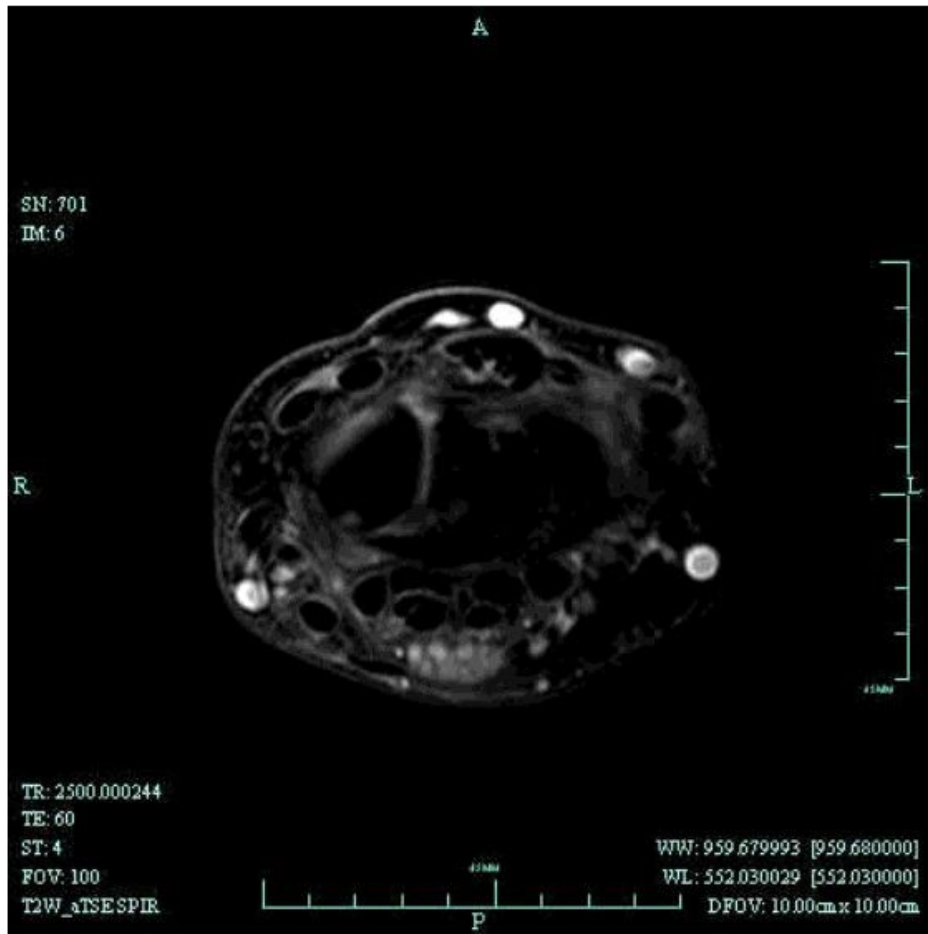


Figure 1

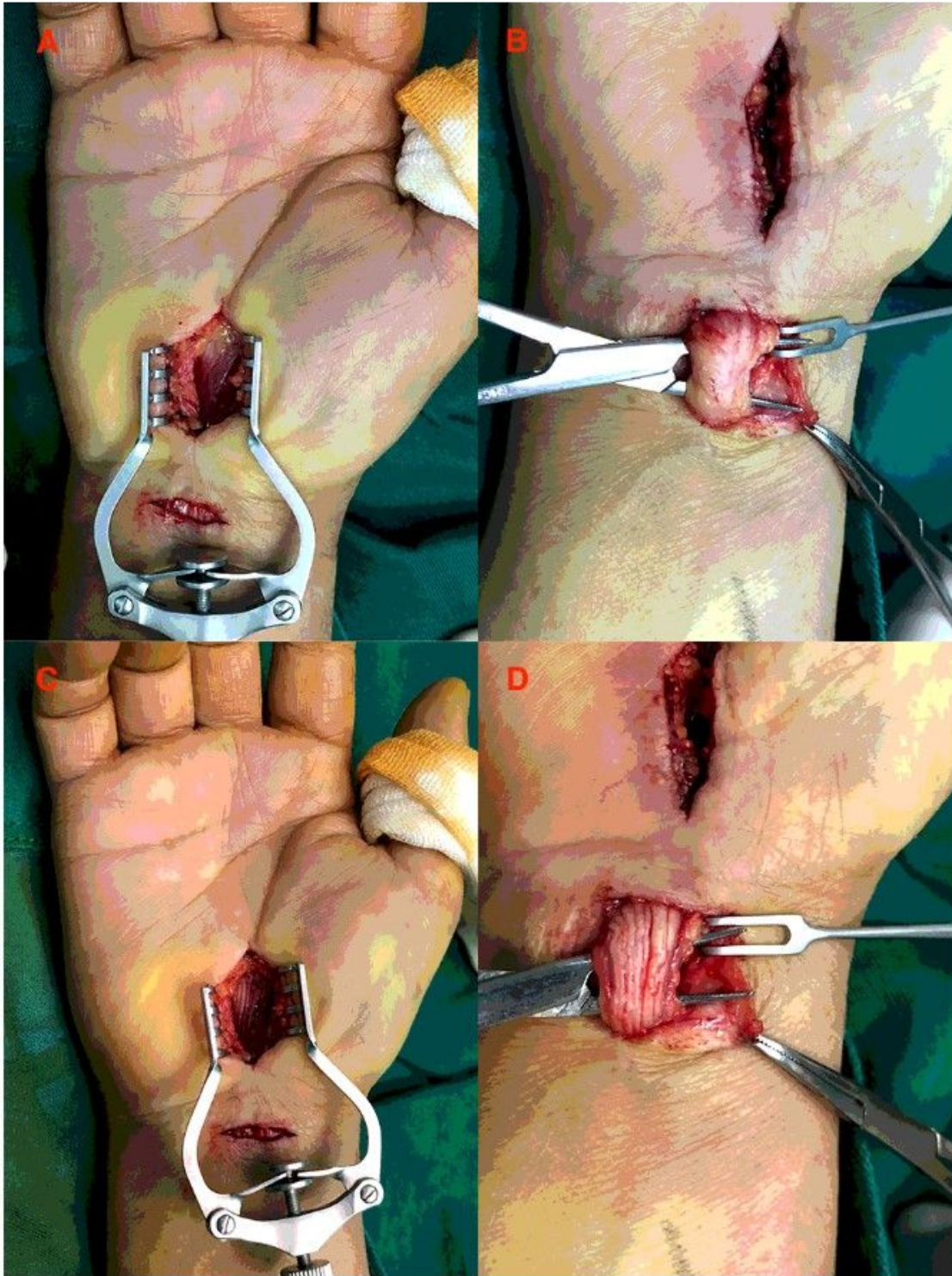
The median nerve on the right side(A) was significantly thicker than the normal side(B)



**Figure 2**

Preoperative wrist MRI revealed: The median nerve is thickened, and slightly higher signal in T2WI

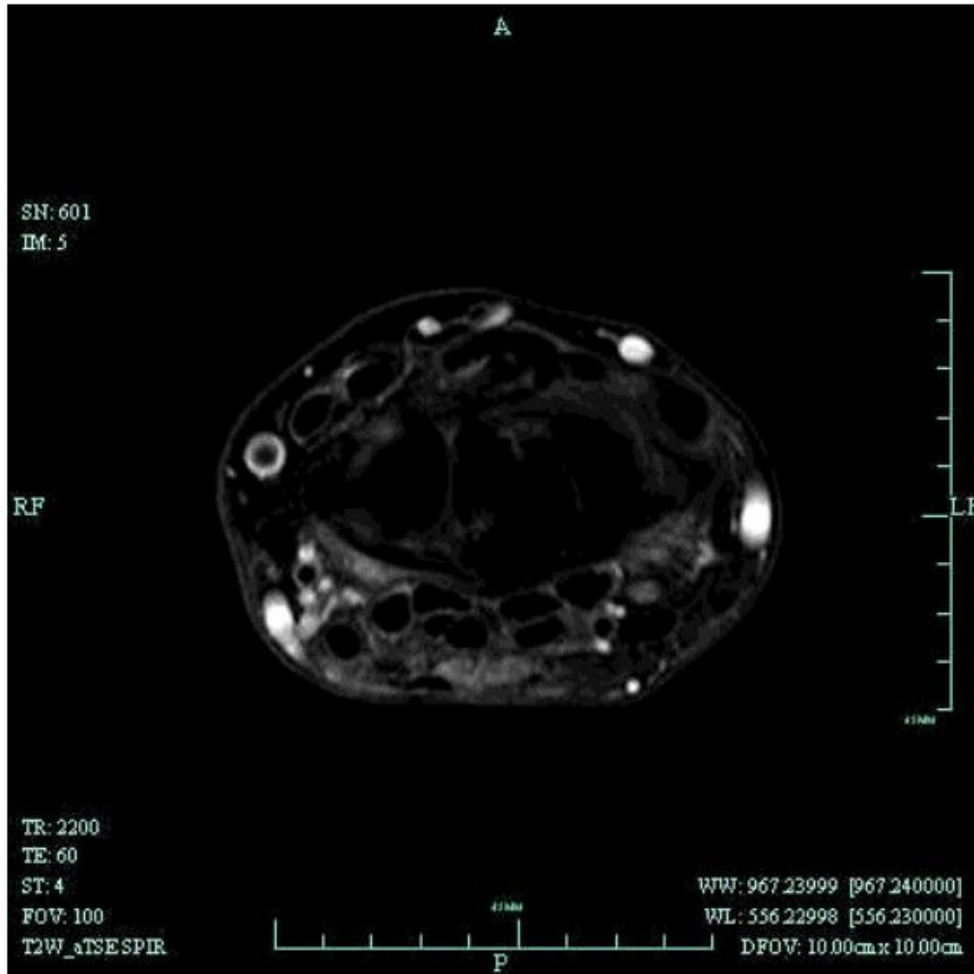




**Figure 3**

During the surgery in the distal incision, the transverse carpal ligament was thickened(A). In the proximal incision, the scar of median nerve epineurium was obvious (B). The nerve epineurium was excised and the fascicular membrane was released in the distal incision(C) and in the proximal incision(D).





**Figure 4**

Postoperative MRI examination revealed: The thickened median nerve became normal thickness