

Trigger Wrist Associated with Carpal Tunnel Syndrome Caused by Flexor Digitorum Superficialis Muscle Belly Hypertrophy: A Case Report and Literature Review

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Abstract

Background: Trigger wrist is a rare disease with few reported cases in the literature. This condition presents with painful sensation and a clicking sound during finger or wrist movements.

Case Report: In this report, we present a 32-year-old man suffering from trigger wrist along with carpal tunnel syndrome caused by muscle belly hypertrophy and extension to the carpal tunnel. The diagnostic approach and surgical techniques are explained.

Conclusion: In cases of trigger wrist associated with carpal tunnel syndrome (CTS), there may be an underlying cause covering both the trigger wrist and CTS at the volar side of the wrist. Therefore, a precise clinical examination is recommended to avoid unnecessary surgery, releasing of A1 pulley, or steroid injection.

Keywords: Trigger; Wrist; Carpal Tunnel Syndrome; Flexor Digitorum Superficialis

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Background

Trigger wrist, which is the entrapment of flexor tendon at the site of the wrist, occurs rarely compared to the trigger finger. It is a painful sensation along with a click at the wrist while flex and extending fingers (1). Several studies have reported cases of trigger wrist and described possible causes such as soft tissue tumors [e.g., giant cell tumor (GCT), intramuscular lipoma] (2), flexor tenosynovitis and tendon adhesions (3), wrist ganglion cyst (4), anomalies of flexor tendons (5), localized amyloidosis, (3) gouty tophus deposit (6), and some other related causes.

Suematsu et al. classified the cause of trigger wrist into three categories. Class A trigger wrist is due to a tumor or nodule occurring on the flexor tendon sheath, which enters and exits from the carpal tunnel. Class B trigger wrist is due to anomalous muscle belly (including an abnormal lumbrical muscle or abnormal muscle belly of the FDS. Class C trigger wrist is a combination of class A and B. Of the three classes, class A is the most prevalent one (7).

Here we are reporting a rare case of trigger wrist along with carpal tunnel syndrome (CTS) mainly caused by muscle belly hypertrophy and extension to the carpal tunnel. The main aim of this report is to present muscle belly extension to the wrist as a possible cause of trigger wrist, discuss the approaches and surgical techniques in releases adhesion, and categorize and discuss probable causes to be prevented in the future.

Case Report

A 32-year-old man referred to the hand clinic with complaints of a long time right wrist pain and numbness of median nerve territory especially after hard handwork which was accompanied by click and pain sensation at the volar side of the wrist while flex and extending the 2nd finger of the right hand.

He had no medical or family history of wrist pain or click or other chronic diseases.

In the physical examination, the range of motion (ROM) of wrist and finger joints and forces were normal, there was paresthetic sensation at the tip of the 2nd to 4th fingers at right hand and median nerve territory along with positive Tinel, Phalen, and Durkan tests, and the click while flex and extending the 2nd finger was felt and also seen on the volar side of the wrist.

Plain radiography showed no bony structure deformity or fracture. The following workup showed mild CTS in electromyography (EMG) and nerve conduction velocity (NCV) of the right hand with median nerve sensory latency of 4 milliseconds and motor distal latency of 3 milliseconds on the right side.

Magnetic resonance imaging (MRI) of the right hand revealed tendon partial tearing and the flexor tendon sheath of the second finger had mild effusion at the carpometacarpal level of the wrist as shown in figure 1.

We diagnosed CTS, trigger wrist secondary to tenosynovitis within the carpal tunnel, and performed surgery under general anesthesia.



Figure 1. Magnetic resonance imaging (MRI) of the right wrist showing mild effusion in the wrist

After prepping and draping the patient in the supine position, and using a tourniquet with 250-mmHg pressure, the extended approach was used in order to release the carpal tunnel. After releasing the proximal, transverse carpal ligament (TCL), and distal parts of the carpal tunnel, the belly of the 2nd and 3rd finger FDS muscles was found to be extended distally through the tunnel and also to the distal of TCL while extending fingers.

The belly of the FDS muscle was thoroughly excised to the proximal part while keeping the tendon intact and in the end, finger movements were rechecked. A Penrose drain was performed then the skin was sutured with nylon suture 3-0. A volar splint proximal to the distal hand crease in a 20-degree extension was put on the hand. The drain was removed after 48 hours and the splint after 10 days and wrist movements started thereafter. Sutures were removed after 3 weeks, and during the follow-up period, all the paresthesia, pain, and click were relieved (Figure 2).



Figure 2. Surgical procedure, from incision (1) to postop visit (4)

Discussion

Trigger wrist is a condition that has been rarely seen and reported worldwide. As previously described, it is contributed to soft tissue tumors such as GCT or intramuscular lipoma (2, 3) flexor tenosynovitis and tendon adhesions (3, 7), wrist ganglion cyst (4), anomalies of flexor tendons (5), localized amyloidosis (3), and gouty tophus deposit (6) as the leading causes of trigger wrist so far mostly accompanied by CTS.

In the study of Wakasugi et al., a 37-year-old case with CTS and trigger wrist was reported. The complication was caused by localized amyloidosis revealed by Congo red staining showing diffuse hyalinized material and green-yellow birefringence in polarized microscopy on histologic examination. They concluded that tenosynovial amyloid deposition around the Flexor Digitorum Profundus (FDP) tendon formed a mass and resulted in triggering of the finger at the volar wrist. Their report indicated that localized amyloidosis in the carpal tunnel could be a cause of trigger wrist and synovectomy around the flexor tendons could be an effective treatment (3).

Al-Qattan et al. presented a rare case of trigger finger and CTS caused by flexor tendon related ganglion in a 16-year-old boy suffering from 2 months of triggering of the right wrist. Their exploration revealed a ganglion on the flexor superficialis tendon which resulted in complete resolution of triggering symptoms after its removal (8).

Park et al. (1) presented a case series of a total of 5 trigger wrist cases, three of which caused by anomalous muscle belly of FDS which was also reported by Kerasnoudis (9) and Bou-Merhi et al. (10) and two cases of fibroma around flexor tendon sheath within the carpal tunnel. Their cases' symptoms were all resolved after surgical release and excision at the retinaculum site. They also concluded that accurate examination and proper diagnosis are mandatory to avoid improper and time-wasting treatment for patients with trigger wrist, since it is difficult to differentiate trigger wrist from trigger finger or CTS when characteristic snapping or triggering around the wrist is absent (1).

Rand et al. reported a case of a 38-year-old man suffering from trigger wrist and acute CTS with a history of gout. He had a palpable mass at the volar side of the wrist, which was first suggested for schwannoma by MRI of the wrist and then ended in tophaceous mass affecting the tendon of FDS of the middle finger, causing a trigger lesion at the proximal margin of the flexor retinaculum. His

symptoms diminished after releasing the flexor retinaculum and excision of the tophaceous mass (6).

Additionally, a rare case of trigger wrist caused by GCT of the flexor sheath was described by Chalmers et al. by the British Association of Plastic, Reconstructive and Aesthetic Surgeons (BAPRAS). They found unusual acute CTS and trigger wrist and mild palmar swelling of the wrist, which was caused by GTC after histologic study of the mass arising from the deep flexor tendon of the right middle finger (11).

Another case of hypertrophied lumbrical muscle and tenosynovitis causing CTS and triggering at the wrist was described by Shimizu et al. They found a rare condition in which while flexing the middle and index fingers, lumbrical muscles were drawn into the carpal tunnel, causing triggering at the wrist. They released the retinaculum and all symptoms were relieved immediately leaving no sign of triggering or CTS (12).

In the present study, we reported a rare case of trigger wrist accompanied by CTS due to 2nd and 3rd FDS muscle belly hypertrophy and proximal extension which has been previously reported by Park et al. (1), Kerasnoudis (9), and Bou-Merhi et al. (10).

As described by Suematsu et al., our case lays in class B of trigger wrist (due to anomalous muscle belly of the FDS (7). Accurate diagnosis and CTR with excision of triggering mass in these cases of the FDS muscle belly extension is necessary to treat trigger wrist. Moreover, it is recommended that, in cases of trigger finger associated with CTS, there may be an underlying cause covering both the trigger finger and CTS at the volar side of the wrist, thus the precise examination or ultrasound would reveal the possible cause. It is necessary to perform precise clinical examination in order to find the possible cause of trigger wrist associated with CTS and to avoid unnecessary surgery, releasing of A1 pulley or steroid injection.

Conclusion

In conclusion, we presented a rare case of trigger wrist accompanying CTS caused by FDS muscle belly extension and hypertrophy. Accordingly, physicians should be aware of triggering wrist and perform a full examination to avoid unnecessary workup or surgeries.

Conflict of Interest

The authors declare no conflict of interest in this study.

Acknowledgments

None.

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