**Trigger finger at wrist caused by degenerative changes of the flexor tendon sheath and carpal tunnel syndrome: a case report**

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**ABSTRACT**

Trigger finger at wrist is a rare condition. Symptoms include finger triggering, snapping or catching at the wrist level. Carpal tunnel syndrome and median nerve compression neuropathy are almost always associated. We reported one case which was caused by degenerative changes of the flexor tendon sheath and carpal tunnel syndrome.

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**Introduction**

Trigger finger at wrist is a relatively rare condition. Only a few cases were reported worldwide for the past decades. The most common causes for this condition found in literature are mass lesions or anomalous muscle belly in the carpal region. Commonly, carpal tunnel release with excision of the lesion will achieve full relieve of the triggering symptoms. In this case report, we are presenting a patient with trigger finger at wrist. However, in different previous reports, the aetiology for this case is degenerative changes of the flexor tendon sheath, rather than occupying lesion. A review of the medical literature on this condition is also performed.

**Case report**

We report a case of a 50-year-old Chinese female, right-hand dominant, manual labourer, who presented with multiple digit triggering. In September 2006, she had undergone steroid injection to left middle, ring fingers, right index and middle fingers with initial symptom relief. Subsequently, she had left middle, ring finger, right index, middle and ring finger trigger releases done during the period from May 2007 to October 2008 in four separate operations. She was discharged from further follow-up as all triggering resolved after surgery.

She came back to our clinic seven years later in November 2015 with recurrent triggering of right middle and ring fingers. This was associated with numbness of the radial three and half digits of right hand. On examination, there was median nerve neuropathy with decreased radial three and half digits sensation. Tinel’s and Phalen’s signs were both negative. There was tendon triggering with palpable clicking over the mid-palm during finger flexion. There was no evident triggering at the level of A1 pulley in all digits of right hand. Previous trigger release scars over the right middle and ring fingers were well healed with no underlying adhesions. There was no wrist tenderness and active range of motion in the wrist was full with no clicking.

Wrist ultrasound showed that the median nerve was swollen at the level of distal radius and was compressed at the level of the distal carpal tunnel. Cross-sectional area (CSA) at pisiform level was 11.6 mm\(^2\) (upper limit 11 mm\(^2\)). Flattening ratio (FR) and volar bulging (VB) of the flexor retinaculum were within normal ranges. The maximal thickness of flexor retinaculum was 1.7 mm. There was no evidence of anomalous masses or migration of the lumbricals into the carpal tunnel during finger flexion. At about the level of the mid-palm, there were linear calcifications related to the middle and ring finger tendon sheath (Figure 1(a),(b)). The affected flexor tendons appear to become distorted as they glide past the areas

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of calcification. Tendons were round and smooth at A1 pulley level (Figure 1(c)). These calcifications were not evident on plain X-ray (Figure 2), which was normal with no significant degenerative changes seen in carpal joints. The nerve conduction study showed severe right carpal tunnel syndrome with significant impaired conduction velocity (26.9 m/s). Laboratory tests including C-reactive protein, uric acid and rheumatoid factor were all normal.

She subsequently underwent surgery of right carpal tunnel release. Intraoperative findings showed thickened transverse carpal ligament and tight carpal tunnel. No extra lumbicals or mass lesions were seen on visible tendons throughout their excursions within the carpal tunnel (Figure 3(a),(b)). There were some calcific plaques seen on the tendon sheath. Tendons were otherwise healthy. (Figure 4). The previous palpated triggering at mid-palm immediately resolved and tendon excursion was normal after release of the carpal tunnel and no further exploration of the tendon sheaths was performed. On follow-up visit in our clinic, there was no more finger triggering or numbness.

**Discussion**

Trigger finger at wrist is a rare condition which was first reported by Eibel in 1961 [1]. It is a triggering phenomenon of the fingers with the triggering point of the flexor tendons at the transverse carpal ligament. In literature, it is also known as ‘trigger wrist’ [2–8]. However, this may be confused with clicking, snapping or crepitus of the wrist during wrist motion. We prefer the term ‘trigger finger at wrist’ for more accurate description of this condition.

Suematsu classified the aetiology of trigger finger at wrist in 1985 [3]. Type A is due to tumour or nodular lesion occurring on the flexor tendon sheath which causes tendon triggering at the carpal tunnel. Type B is due to anomalous muscle belly, including an abnormal lumbrical muscle or abnormal muscle belly of the flexor digitorum superficialis, within the carpal tunnel. Type C is a combination of Type A and Type B. No malignant tumour was ever reported associated with trigger finger at wrist. By reviewing the existing reports, most cases fall into this classification. Due to the low incidence of this diagnosis, Suematsu’s classification may not be exclusive. Ogino et al. reported two cases of trigger finger at wrist secondary to partial laceration of the flexor digitorum superficialis tendon in 1986 and 1994 [9,10]. Iwasaki et al. [11] reported another case caused by tendon adhesion between the flexor pollicis longus and flexor digitorum superficialis tendons after palmaris longus tendon harvest for elbow ligament reconstruction surgery. In our case, the triggering was contributed by both degenerative changes of the tendon and the thickened transverse carpal ligament, which has not previously been described as a cause of trigger finger at wrist. Calcific deposits tend to arise in tendons secondary to chronic inflammation [12]. And chronic inflammation is also the cause of carpal tunnel syndrome. Though the plaques are small, with combination of tight carpal
tunnel, triggering of the flexor tendons might still occur. However, we are not able to explain why this phenomenon is so rare since carpal tunnel syndrome with tendon sheath degeneration should not be uncommon. One explanation might be that a lot of patients with carpal tunnel syndrome and trigger finger were treated concurrently which might have masked the true aetiology. On the other hand, pre-operative ultrasound and intraoperative examination of the flexor tendon sheath are not common practice in clinical settings. This might also contribute to our under-knowledge.

The symptoms are similar to trigger finger at the A1 pulley, including finger triggering, snapping or catching. Carpal tunnel syndrome is almost inevitably associated with this condition in most of the reported cases [2–8,11,13]. During physical examination, flexor tendon triggering at the carpal tunnel should be looked for. Triggering at the A1 pulley might be palpable due to either coexistence of triggering at A1
pulley level or snapping conducted through the ten-
don from the carpal tunnel. A missed diagnosis of trig-
erging at the wrist will result in a patient having
unresolved symptoms after treatment or surgery for
trigger release.

Imaging studies are helpful if trigger finger at wrist
is suspected. Ultrasound is able to provide dynamic
pictures for the tendon triggering [8,13,14]. As seen in
our case, it demonstrated the thickened carpal tunnel,
the calcification of the tendon sheath and tendon dis-
tortion during finger motion due to those calcified pla-
qukes. As a matter of fact, the ultrasound findings
helped us to have a better understanding of the con-
dition and eventually led us to proceed with surgical
approach for the patient. MRI and CT scans are also
useful in cases with large tumours, for both evaluation
and operation planning [4–8].

Once the diagnosis is made, surgical intervention is
required for further management. Carpal tunnel
release was done in all reported cases for associated
carpal tunnel syndrome [2–8,11,13]. Excision of the
tumour or the anomalous muscle belly is required if
present. Good results of trigger resolving have been
shown in all the reports after surgical treatment
[1–11,13]. For our case, the tendon triggering resolved
immediately after the transverse carpal ligament was
released.

Conclusion

Trigger finger at wrist is rare, especially for aetiology
described above. However, with combination of a tight
carpal tunnel, lesions like calcification plaques can also
cause triggering phenomenon. With help of imaging
study, better understanding and outcome of the con-
dition will be achieved.

Disclosure statement

No potential conflict of interest was reported by the authors.

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