

Acute carpal tunnel syndrome caused by tenosynovial effusion due to calcium pyrophosphate deposition

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ABSTRACT

Acute carpal tunnel syndrome mostly occurs secondary to trauma. While storage diseases may cause symptoms of progressive nerve compression on a chronic basis, in some cases, they may present with acute onset symptoms. 77 years old female patient without known history of any rheumatic and chronic diseases was admitted to our clinic with pain and numbness. After physical examination and further interventions, surgery was performed with a pre-diagnosis of acute carpal tunnel syndrome. The patient was referred to the rheumatology department when the pathological examination of the samples taken during surgery was consistent with pseudogout.

Key words: CPPD, acute carpal tunnel syndrome, median nerve palsy

Introduction

Median nerve compression is one of the most common entrapment neuropathies encountered in the daily orthopedic clinic [1]. Often it develops on a chronic basis.

Less commonly it may occur acutely mostly due to the trauma and requires urgent intervention. Also some deposition disease may cause acute carpal tunnel syndrome (ACTS) [2].

As a rare reason, calcium pyrophosphate dihydrate crystal deposition disease (CPPD) is reported in the literature before [3]. Chondrocalcinosis is a condition whose frequency increases with age and was seen in 44% of joint radiographs taken for those older than 84 years [4].

In this article we aimed to present a unique case of acute carpal tunnel syndrome (ACTS) due to the calcium pyrophosphate deposition.

Case Presentation

77 year-old female patient was admitted to our clinic with acute severe pain and swelling around volar aspect of her left wrist and numbness 1st, 2nd, 3rd, and lateral half of the 4th. Fingers, which has started since last night. She has come to our clinic two day ago with the complaint of mild pain in the volar of her wrist. Patient was right-handed. She was 155 cm tall and 85 kg in weight. Her BMI was 35. Considering tenosynovitis in the foreground, immobilization was provided with a short arm splint, and non-steroidal anti-inflammatory treatment was initiated. Despite of taking non-steroidal

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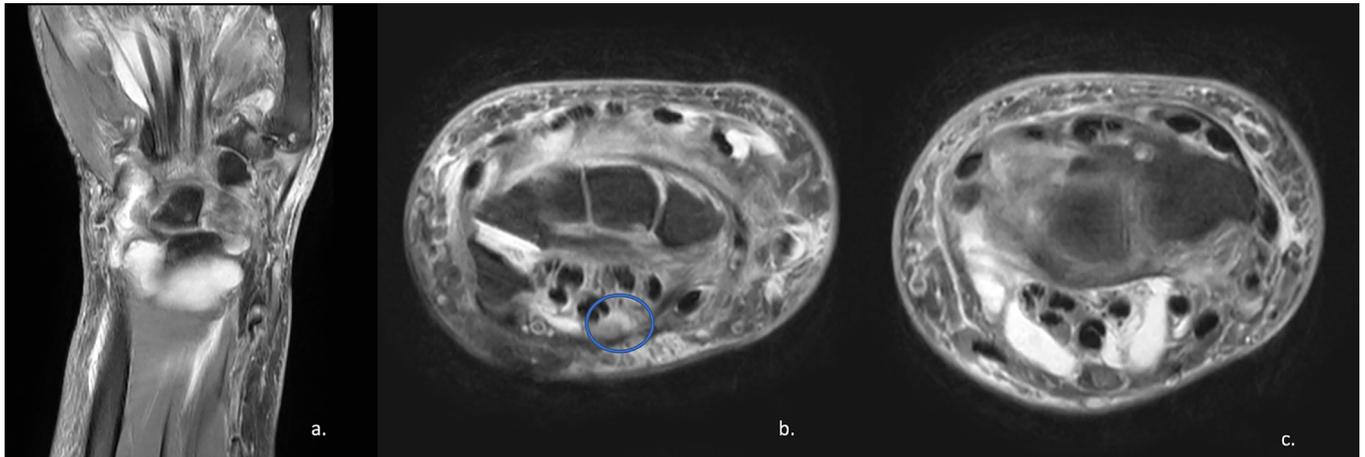


Figure 1. a. Coronal T2 MRI sequence of volar aspect of hand and wrist. b. Axial T2 MRI at level of carpal bones. Compressed median nerve is blue marked c. Axial T2 MRI sequence. Diffuse involvement around the flexor tendon.



Figure 2. a. perioperative image shows synovial fluid around the tendons b. perioperative image shows calcium pyrophosphate crystals around flexor tendons. c. Calcium pyrophosphate crystal within the fibrotic synovium(HE stain ×100 magnification).

anti-inflammatory drug, cold therapy and immobilization for two days, her pain didn't decrease and she was unable to move her wrist because of pain. Although she had intermittent pain in the first ray due to carpometacarpal arthrosis, she has never had such pain around the wrist and palm region in the past. She has no medical history of rheumatologic disease or trauma. Her only known chronic disease is her controlled hypertension diagnosed 5 years ago. She didn't describe daily activity changes that can cause this symptoms. Also there was

no other joint involvement.

Pain with palpation, swelling was remarkable on physical examination. Tinel and Phalen test were positive; no thenar atrophy was seen. Plain radiographs were unable to explain this acute pathology, therefore for further investigation magnetic resonance imaging (MRI) was performed. Tenosynovitis in flexor tendon sheaths, prominent in the flexor retinaculum and flexor tendons, effusion around intercarpal ligaments was reported on MRI. (Figure 1)

Acute carpal tunnel was considered in the light of the examinations and clinical evaluation. Immediate release surgery planned. Surgery was performed on the same day the patient applied to our clinic.

Volar incision has been done through the palmar crease. Large amount of synovial fluid was aspirated. Transverse carpal ligament was loosened through the proximally and distally. Around median nerve and flexor tendons, a large amount of calcified tissue was seen. External neurolysis for median nerve and synovectomy for flexor digitorum superficialis, flexor digitorum profundus and flexor pollicis longus was performed. (Figure 2a) Excised tissue was sent to the pathology lab for further investigations. After 5 days of splint treatment and ice therapy the patient was able to move her wrist and fingers without pain. The numbness in the region innervated by the median nerve disappeared at the end of the first week. Sutures were taken at 14th day. At her 6th month follow-up, she had no complaints about her wrist and other joints.

The pathology report was as follows : (1)diffuse villous proliferation in the synovium, (2)deposits compatible with calcium pyrophosphate. (Figure-2b)

Discussion

Median nerve and 9 tendons are located within the carpal tunnel (under transvers carpal ligament). When the pressure in the cavity exceeds a certain critical level, the microcirculation of the median nerve may be disrupted [5].

ACTS usually occurs secondary to distal radius and carpal bone fractures. In addition to these, less commonly many atraumatic causes have been reported in the literature [2]. In the literature it has been reported that CPP deposition may also cause acute symptoms of compressive neuropathy [6]. When CPP deposition involves the wrist joint, calcifications of the TFCC and distal radio-ulnar joint (DRUJ) are typical. Deposits can occur as heavy punctate or linear calcifications in the fibrocartilage, but they may also occur in articular hyaline cartilage and joint capsule [7].

CPPD, commonly called pseudogout is a deposition disease presents with sudden onset of monoarticular and oligoarticular arthritis. Although it mostly involves the knee joint, other joints like wrist, shoulder, ankle and hand may be affected [8]. Our patient had a sudden severe pain and swelling around her wrist which has started two day ago and numbness on the median nerve dermatome.

Unlike carpal tunnel syndrome that occurs on chronic ground, for ACTS transvers carpal ligament should be released in the early period. It is still controversial in which time interval the surgery should be performed. However, in the literature it has been emphasized that delayed intervention may result permanent damages [9]. We observed that the pain and numbness disappeared after the surgery, which we performed within 48 hours from the onset of the symptoms.

For treatment of acute release[10], synovial fluid aspiration [6] steroid injection and splitting [11] are among options. Itagaki [6] presented a case of 92 years old man who was admitted to emergency department with wrist pain and swelling. After fine needle aspiration, pain relief was achieved. However they didn't report the long term follow-ups. Lewis et al [10] performed carpal tunnel release and synovectomy for a 65 year old male-carpenter whose complaints has started two days ago. Single dose steroid injection has also been described in the literature. A single corticosteroid injection provides temporary relief in approximately 76% after 6 weeks, but only 22% are symptom-free after 1 year [11]. In our case, large amounts of CPP crystals were seen around the tendons and median nerve. To prevent recurrence and decrease the pressure we performed both carpal tunnel release and synovectomy. It also provides us enough material for pathological examination.

It must be kept in mind that other reasons other than trauma may cause acute carpal tunnel syndrome. Especially deposition disease are easy to be overlooked. In this article, we aimed to show that calcium pyrophosphate

osphate crystals accumulated in the carpal tunnel over time can cause acute onset pain.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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