Hand Disorders in Pregnancy: De Quervain's Tenosynovitis and Carpal Tunnel Syndrome

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Abstract

The most frequently encountered hand disorders în pregnancy are DeQuervain's tenosynovitis and carpal tunnel syndrome. Both affection's ethiology is directly related with hormonal changes occurred during pregnancy. Their commun points are therapeutic limitations (nonsteroidal anti-inflammatory drugs NSAIDs and corticosteroid infiltrations), but also a benign evolution în most cases, despite of those therapeutic limitations.
Keywords: *hand disorders, pregnancy, hormonal changes, benign evolution*

Pregnancy induce major changes in a woman's body, both physiological and pathological one. Hand disorders are part of the second one.

The most frequently encountered hand disorders in pregnancy are DeQuervain's tenosynovitis and carpal tunnel syndrome.

De Quervain's tenosynovitis - (tendinitis, tendovaginitis) is stenosing tenosynovitis of the abductor pollicis longus and extensor pollicis brevis tendons at the radial styloid process. These two tendons, within their common sheath, comprise the first compartment of the dorsal carpal ligament at the wrist (figure 1).

Epidemiology

De Quervain's disease is diagnosed much more commonly in women than in men, with a 8/1 female/male ratio[(1)]. A higher frequency , of the disease, was noticed in pregnant women, during their second and third trimester of pregnancy.

Etiology

Most common involved factors are:

- Mechanical factors:
  - ✓ repetitive microtrauma;
  - ✓ local acute trauma;
  - ✓ prolonged vicious attitude (working at PC tastature).
- Chronic inflammator factors:
  - ✓ rheumatoid arthritis.

In case of a pregnant woman, De Quervain's tenosynovitis can occur , in absence of these factors. In this case, a hormonal association, may be taken in consideration, based on the major hormonal changes occurred during pregnancy.

Majority of the authors[(1)], consider that the hormone most likely to be implicated would be prolactin. Not only is this hormone elevated in nursing women, but it begins to rise in the eighth week of pregnancy, peaking at 10 times the nonpregnant level at term (Mc Farland)[(2)]. Afterwards, when breast-feeding is stopped, clinical signs of the disease spontaneously decrease. An interesting suggestion would be to draw prolactin levels in non breast-feeding patients with deQuervain desease.

Another argument fot hormonal etiology is the fact that the dominant hand was affected no more often than the nondominant.

Clinical signs

The main clinical signs are pain and limited range of motion of the wrist, their intensity increasing with the level of inflammation.

Examination reveals that the first dorsal compartment over the radial styloid becomes thickened and feels bone hard; the area becomes tender, painful for palpation . Usually, the compartment's thickening so distorts the sparsely padded skin in this area that a visible fusiform mass is created (figure 2).

The best ways to make the diagnosis, is to perform the Finkelstein test (figure 3). The Finkelstein test consisting of flexion of the thumb across the palm and then ulnar deviation of the wrist, draws the tendons of the first dorsal compartment distally and causes sharp, local pain when tendon entrapment has occurred and inflammation is present[(3)]. Finkelstein test needs to be perform bilateral. A false positive test is due to a metacarpo-phalangeal pathology of the first ray.

Paraclinical tests

There are no specific laboratory tests for De Quervain's disease. In order to establish a positive diagnosis, is no need for x ray, clinical examination being more than enough. Never the less, imagistic examination, such as MRI, can be performed during the last two semesters of pregnancy, revealing with a high specificity and sensibility, soft tissue injuries, of the first dorsal compartment.

Another imagistic investigation that can performed in a pregnant woman, is represented by high-resolution ultrasonography. Plain radiography is used in order to perform a differential diagnosis with carpal scaphoid fracture, or radial stiloid fracture, but x rays are forbidden for pregnant woman.

Differential diagnosis:

- carpal tunnel syndrome
- carpal-metacarpal osteoarthritis of the first ray
- Kienbock semilunar osteonecrosis
- scaphoid fracture, or radial stiloid fracture

Treatment

a) Nonsurgical treatment:

- Criotherapy - local ice applications
- Orthopaedic treatment - wrist immobilization with a splint, type policis spica
- Nonsteroidal anti-inflammatory drugs (NSAIDs) are forbidden for pregnant women. For local treatment, corticosteroid intracompartmental injections have been used, but there are no data about their safety[5].

b) Surgical treatment: reserved only for advanced cases if conservative measures fails. Simple decompression of both tendons and partial resection of the extensor ligament with a maximum of 3 mm can be recommended in operative treatment with excellent long-term results [4].

Prognosis

Most patients are well responsive to nonsurgical treatment. For pregnant woman we encountered a slight diminution of clinical signs after birth, but a real remission occurs after breast - feeding period[5], possible due to a decrease in prolactin level, and in the same time, ending of child manipulation period.

Carpal tunnel syndrome (CTS) is a compressive neuropathy of the median nerve at the wrist. The carpal tunnel is located at the base of the palm and is bounded on 3 sides by carpal bones and anteriorly by the transverse carpal ligament, resulting an inextensible compartment (figure 4). Inside run the median nerve, flexor tendons, and their synovial sheaths.

Epidemiology - higher frequency in second age women. Particularly, pregnant women develop carpal tunnel syndrome, a painful problem that 28 percent of them have to endure[6].

Pathophysiology

Any space occupying process, developed inside the carpal tunnel can induce median nerve compression, at that level. Some researchers believe that pregnant women are more prone to developing carpal tunnel syndrome because they retain more fluid during the later stages of their pregnancies[7]. The more fluid you retain, the more swelling occurs, tenosynovial edema, squeezing the nerves that run through the hands and fingers. Median nerve neuropathy is due to an ischemic process, a direct compression representing a secondary mechanism.

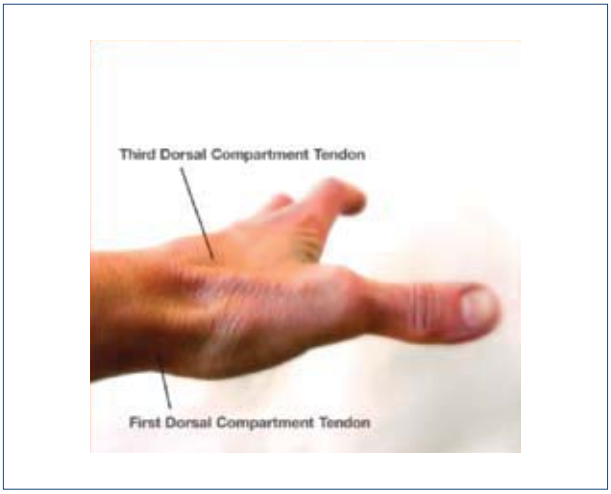

Figure 1. First dorsal compartment

Figure 2. First dorsal compartment thickening

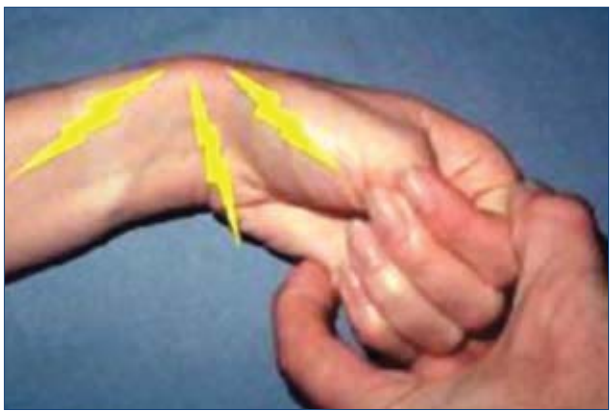

Figure 3. The Finkelstein test

Clinical signs

Main symptoms are pain and parenthesis in the median nerve distribution of the hand. Pain is generally worse at night than during the day. Patients may awaken with a burning pain or tingling that may be relieved with shaking their hands. Classic carpal tunnel syndrome (CTS) is

Figure 4.
Carpal tunnel anatomy.
P - pisiform,
S - scaphoid

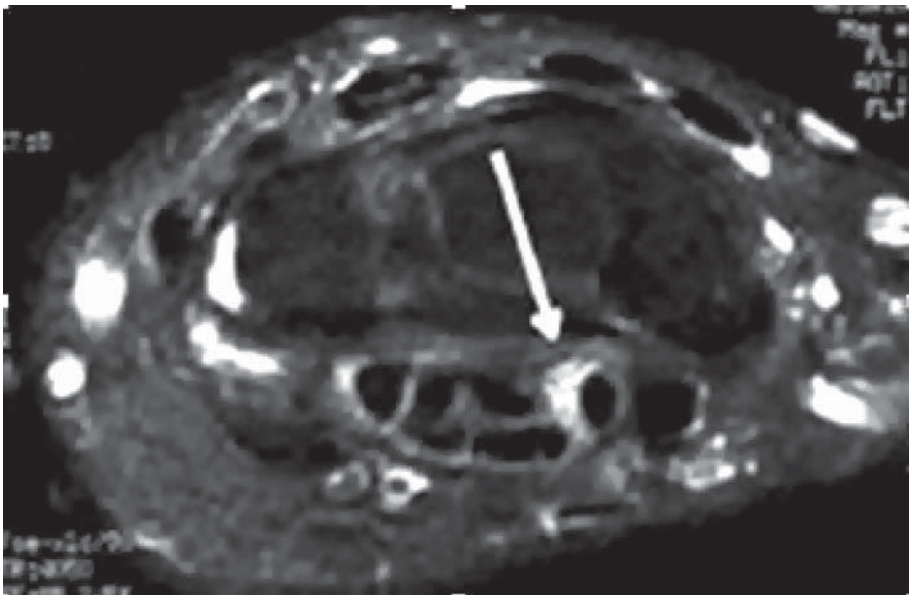

Figure 5.
Carpal tunnel MRI.
Arrow - Median nerve

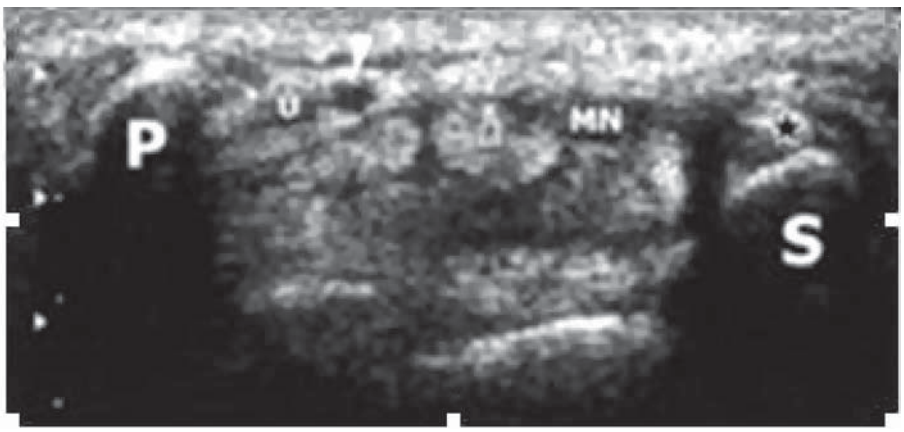

Figure 6.
Carpal tunnel ultrasound scan.
P - pisiform,
S - scaphoid,
MN - median nerve

associated with symptoms that affect at least 2 of the first through third digits; symptoms affecting the fourth and fifth digits, wrist pain, and radiation of pain proximal to the wrist may also occur, but classic CTS is not associated with symptoms on the palm or dorsum of the hand. In the same time other symptoms may occur:

- morning stiffness or cramping of hand;
- frequently dropping objects, partial functional impotence;
- vasomotor disorders, sweat decrease.

In order to establish a positive diagnosis, provocative tests are necessary:

- **Tinel test** - tapping the volar wrist over the median nerve may produce paresthesia in the median distribution of the hand. Pooled data show the sensitivity and specificity of the Tinel sign to be 50% and 77%, respectively.
- **Phalen test** - hyperflexion of the wrist for 60 seconds may elicit paresthesia in the median nerve distribution. A literature review showed the average sensitivity and specificity of the Phalen sign to be 68% and 73%, respectively.
- **Compression test** - applying firm pressure to the palm over the nerve entrance in carpal tunnel, for up to 30 seconds to elicit symptoms, that will disappear when compression is stopped.

Differential diagnosis

- compressive neuropathies of the nerve roots and brachial plexus;
- proximal median neuropathy;
- polyneurophaty.

Paraclinical tests - X ray investigations (plain radiography, CT) are useful for fracture or bone tumors diagnosis, but this type of investigations are forbidden for pregnant woman in the first and second trimester and not recommended in the third one.

Other imagistic methods that can be used are:

MRI - represents an accurate method in diagnosing CTS, assessing both lesions of the content of carpal tunnel (tendons, synovial sheaths), and lesions of the walls of the tunnel (figure 5). In the same time dynamic MRI imaging may be used in identifying dynamic CTS[7] (CTS symptoms brought on only by repetitive wrist motion).

High-resolution ultrasonography - a noninvasive method of investigation, has received increased attention in the evaluation of CTS, revealing soft tissue injuries inside the carpal tunnel (figure 6).

Electromyographic (EMG) and nerve conduction studies - very useful to confirm the diagnosis of CTS, being most helpful in the determination of the site and severity of nerve compression. This type of investigations has been found to have an 85% sensitivity and specificity greater than 95% for diagnosing CTS[8].

Treatment

a) Nonsurgical treatment: frequently used, for most patients, but with some limitations in case of pregnant woman. In their case, nonsteroidal anti-inflammatory drugs (NSAIDs) in systemic use, are forbidden. Local corticosteroid infiltrations is rarely used. As in deQuervain tenosynovitis, there are no data about their safety. Risk free method of nonsurgical treatment are:

Orthopaedic treatment - wrist immobilization with volar splint, placed in neutral position, because flexion and extension of the wrist increases carpal intracanal pressure.

Local physiotherapy - laser therapy, ultrasounds.

b) Surgical treatment - as in deQuervain tenosynovitis, this type of treatment is reserved only for advanced cases if conservative measures fails and consists of surgical release of the transverse carpal ligament. The surgical approach may be open or endoscopic, both approaches showing similar efficacy[9].

Evolution and prognosis

Many of international studies have concluded that CTS during pregnancy seems to be less severe than idiopathic CTS. Over 50% of cases clinical symptoms decrease rapidly after nonsurgical treatment or in some cases spontaneously, with no form of treatment. In the rest of cases symptoms persists up to a year postpartum, but nevertheless, presenting constant decrease of symptoms during that period of time[11,12].

Concluding, hand disorders, deQuervain tenosynovitis and carpal tunnel syndrome, are frequently encountered pathological entities, in pregnancy. Both affection's ethiology is directly related with hormonal changes occurred during pregnancy. These affections presents a benign evolution in most cases, despite of those therapeutic limitations (nonsteroidal anti-inflammatory drugs NSAIDs and corticosteroid infiltrations) clinical symptoms decreasing or even disappearing until a year postpartum. ■

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