

Pronator Teres Syndrome – Case Report with Imaging Tests Diagnosis

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Abstract: Pronator teres syndrome is characterized by compression of the median nerve, leading to dysfunction of the affected limb. Median nerve entrapment causes paresthesia, changes in sensitivity, and loss of strength in the fingers, in addition to causing loss of hand dexterity. The diagnosis of pronator teres syndrome is complicated, due to its similarity with other neuropathies of the median nerve. So, it is important to emphasize the need for a physical examination together with imaging tests, especially ultrasound, for its correct diagnosis. We report the case of a 28-year-old woman who complained of tingling for ten years in the proximal third of the left forearm at rest that worsens on exertion and weakness if not moving. On physical examination, she has no limitation of movement but refers to a feeling of weakness and numbness in his forearm. Ultrasonography demonstrates compression of the median nerve between the ulnar and humeral heads of the pronator teres muscle, a finding confirmed by magnetic resonance imaging and electroneuromyography. The patient was treated with physiotherapy presenting improvement of symptoms after 45 days.

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Introduction

Anatomically, the median nerve originates from the brachial plexus, crossing several structures (Soubeyrand et al., 2020), such as the ligament of Strutters, the two bellies of the pronator teres muscle, the lacertus fibrosus, the arcade of the superficial flexor digitorum, the origin of the anterior interosseous nerve and the vascular arches (Dubois de Mont-Marin et al., 2021). Thus, the median nerve is susceptible to compression under any alteration of some of these structures (Binder et al., 2021).

Pronator teres syndrome is a rare condition (Moura and Agarwal, 2020) and its etiology is the hypertrophy of the pronator teres muscle or schwannoma in the pronator tunnel (Binder et al., 2021), caused by repetitive movements of supination and pronation, overload or trauma with associated hematoma or deformity (Babaei-Ghazani et al., 2018; Chang et al., 2022). This entrapment commonly occurs between the humeral heads and ulnar of the pronator teres muscle (Binder et al., 2021). However, this entrapment can occur due to other proximal anatomical structures in the upper forearm (Moura and Agarwal, 2020).

For the diagnosis, it is necessary to investigate the signs and symptoms – sensory alteration, pain, paresthesia, and alteration in finger movement – together with ultrasound, due to the symptomatologic similarity with carpal tunnel syndrome (Babaei-Ghazani et al., 2018).

Herein, we report the case of a 28-year-old male patient reporting tingling in the proximal third of the left forearm at rest that worsens on exertion and weakness in the hand.

Case report

A 28-year-old man complaining of tingling for ten years in the proximal third of the left forearm at rest that worsens on exertion and weakness if not moving. He denies previous surgeries and traumas. Denies diseases under treatment. On physical examination, he has no limitation of movement but refers to a feeling of weakness and numbness in his forearm. The rest of the physical exam is normal.

Ultrasonography demonstrates compression of the median nerve between the ulnar and humeral heads of the pronator teres muscle (Figure 1), a finding confirmed by magnetic resonance imaging (Figure 2). The electromyography showed prolonged sensory latency in the distribution of the median nerve corresponding to the pronator teres region.

The patient started physiotherapy, without medications, with improvement of symptoms after 45 days, not showing numbness at rest, referring it only to great efforts. Thus, the patient refused surgical treatment.

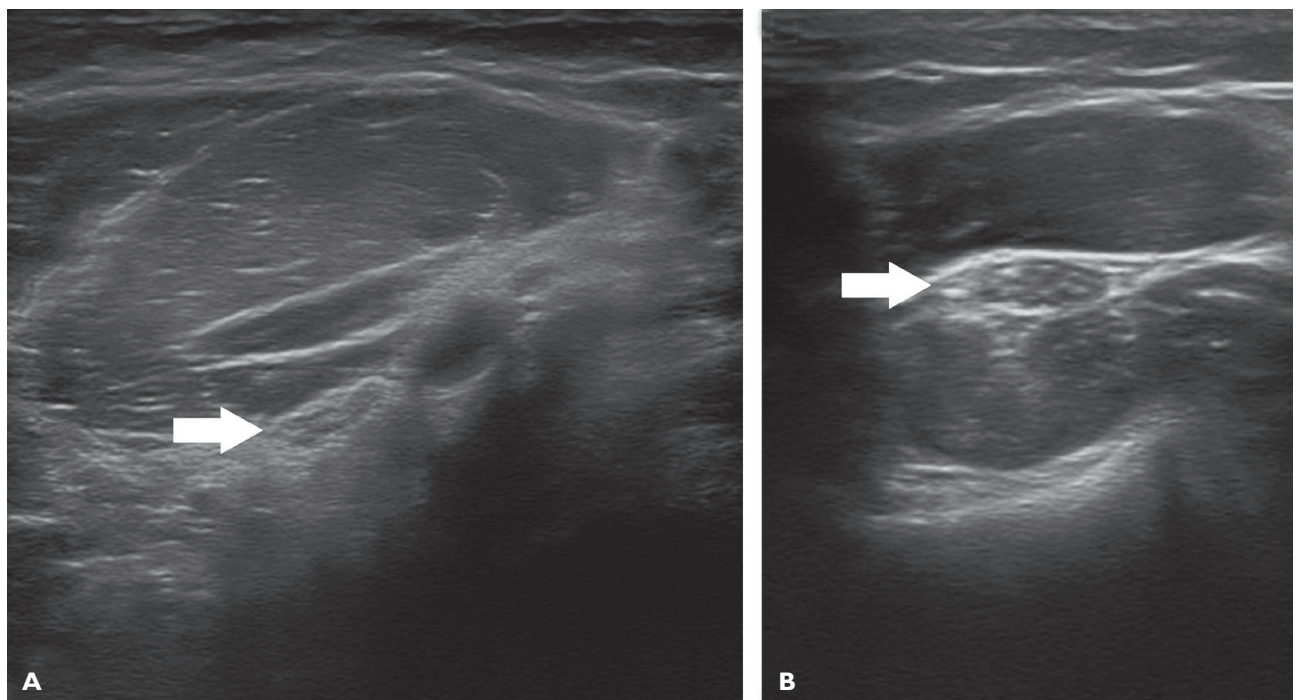


Figure 1: A) Ultrasonography of the left forearm demonstrating flattening of the median nerve between the muscle bellies of the humeral and ulnar heads of the pronator teres (white arrow). B) Ultrasonography of the left forearm at the level of the radial head, demonstrating a normal-looking median nerve (white arrow).

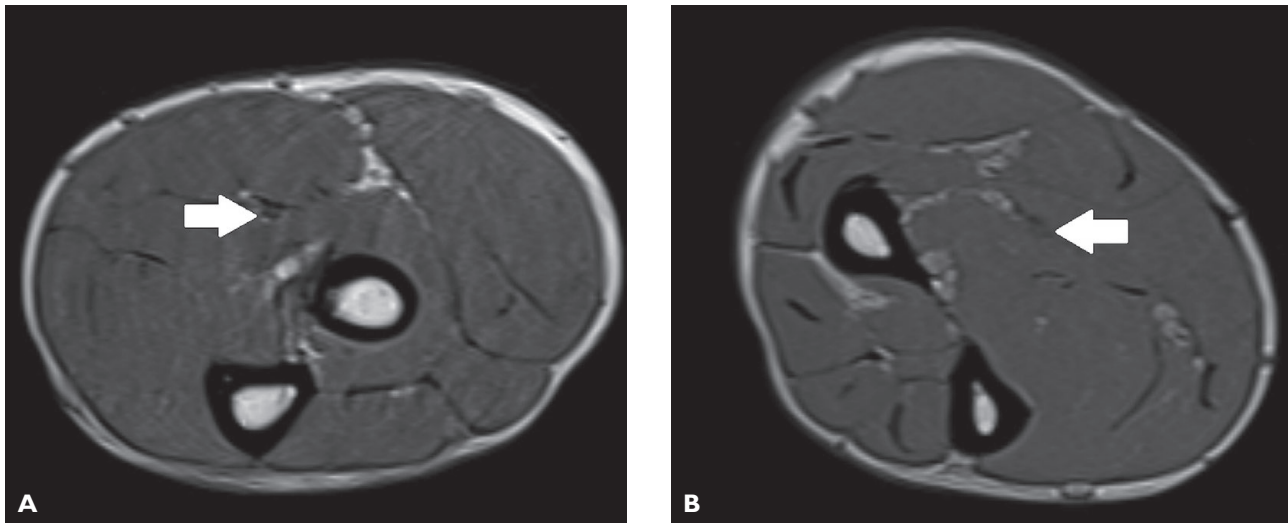


Figure 2: A) Magnetic resonance imaging of the right forearm demonstrating the usual-looking median nerve (white arrow). B) Magnetic resonance imaging of the left forearm demonstrating flattening of the median nerve between the muscle bellies of the humeral and ulnar heads of the pronator teres (white arrow).

Discussion

The peripheral nerves are easily translocated in the intramuscular compartments (Chang et al., 2022). However, in pronator teres syndrome the median nerve is compressed by adjacent structures, either by the pronator teres muscle, Strutters ligament, bicipital aponeurosis, or the fibrous border of the flexor digitorum muscle (Babaei-Ghazani et al., 2018). So, symptoms are generally caused by the involvement of the flexor pollicis longus muscles and the radial half of the flexor digitorum profundus muscles (Chang et al., 2022).

Clinically, it is described as a median neuropathy of the proximal forearm (Soubeyrand et al., 2020), with symptoms of pain in this region, sensory alteration of the first to third radial digits, paresthesia, weakness of the intrinsic muscles of the hand, loss of strength in pinching, loss of agility with the hand (Babaei-Ghazani et al., 2018), dysesthesia or paralysis in the innervation zone of the median nerve (Binder et al., 2021), as demonstrated in the case report by Moura and Agarwal (2020).

The isolated pronator teres syndrome is a rare disease, which has a complicated differential diagnosis from other neuropathies of the median nerve, such as the usual carpal tunnel syndrome, double crush syndrome, and anterior interosseous nerve syndrome (Moura and Agarwal, 2020). The occurrence of often from the association between carpal tunnel syndrome and pronator teres syndrome (Binder et al., 2021).

In addition to the symptoms, tests can be performed in the physical examination, such as resisted forearm

pronation test, middle finger test, and resisted flexion-supination test (Binder et al., 2021) and imaging exams, with emphasis on ultrasound or magnetic resonance (Créteur et al., 2017). Electromyography is also useful for establishing the diagnosis (Créteur et al., 2017), but abnormal electrodiagnostic findings are observed in only 10% of pronator teres syndrome cases (Afshar, 2015).

It is important to emphasize that ultrasound is essential for the diagnosis of peripheral nerve compression, above all, showing a change in the cross-sectional area of the nerve. In technical terms, the reference value of the median nerve is 4.9–12.9 mm, and the difference in the area of the median nerve between the upper limbs of up to 3.0 mm² at the level of the pronator teres muscle (Chang et al., 2022). Créteur et al. (2017) suggest the evaluation of the upper limbs with four cross-sectional images complemented by dynamic tests. Ultrasonography allows standard and dynamic evaluations of the median nerve, in addition to post-traumatic lesions of the pronator teres muscle and local tumours.

Finally, the treatment is based on physiotherapy and surgery, so that the surgical procedure may be elective depending on the state of the syndrome in the patient (Binder et al., 2021).

Conclusion

Pronator teres syndrome is a rare disease that is difficult to diagnose, and generally hinders the dexterity of hand movements. For its investigation,

it is necessary to correlate the physical and imaging exams and present the surgical procedure as the main treatment. But, as demonstrated in the case reported, physiotherapy can improve the symptoms, without the need for surgery.

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