

An Atypical Presentation of Pacinian Corpuscles on Bilateral Guyon's Tunnel

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Summary: Guyon's syndrome results from a lesion of the ulnar nerve at the wrist caused by several conditions. The most common causes are ganglion, lipomas, fractures of the radius or pisiform bone, occupational trauma, neuritis, musculotendinous arch, and diseases of the ulnar artery. The clinical presentation varies with the site of lesion, as described by Sean and McClain in 1969, and can involve combined sensory and motor deficits, motor deficit alone, or sensory deficit alone. We present a case of bilateral Guyon's canal syndrome caused by a lipoma with Pacinian corpuscles on both wrists. Patient presented with sensory deficit as it is described by Shea and McClain with a negative electroneuromyography for ulnar compression. Articles correlating clinical presentation, etiology, and electrophysiological findings relating to ulnar nerve compression on the wrist are still uncommon in the literature. (*Plast Reconstr Surg Glob Open* 2018;6:e1946; doi: 10.1097/GOX.0000000000001946; Published online 19 November 2018.)

Cubital tunnel syndrome is the second most common peripheral compression neuropathy of the upper extremity¹ after median nerve entrapment and the first cause of the ulnar nerve entrapment, which can be entrapped at 6 sites along its pathway¹¹:

- 1) At the Struthers' arcade
- 2) Just proximal to medial epicondyle
- 3) In the groove between olecranon process and medial epicondyle, described as the cubital tunnel
- 4) In the tunnel between the humeral and the ulnar heads of the flexor carpi ulnaris muscle
- 5) At its exit from the flexor carpi ulnaris in the forearm
- 6) Through Guyon's canal, described as the ulnar syndrome

This syndrome is a symptom complex with sensory and motor deficiencies or dyesthesia.

Ulnar tunnel syndrome results from a lesion of the ulnar nerve at the level of the Guyon's canal (also known as pisohamate tunnel). The most common causes that involve the ulnar nerve at the wrist are compression from a ganglion¹⁰, lipomas, fractures of the radius, or pisiform bone, occupational trauma,² neuritis, musculotendinous arch, and diseases of the ulnar artery.

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From a clinical point of view, the Guyon's canal syndrome presents with wrist pain, sensory abnormalities, and muscle weakness that affects the fingers. On type I, lesion is characterized by sensory loss combined with weakness of all ulnar intrinsic hand muscles. Type II lesion affects all ulnar intrinsic hand muscles but produces no sensory loss, and type III lesion affects interosseous and lumbrical muscles but spares the hypothenar muscles.⁹

PACINIAN CORPUSCLES

Also known as Vater corpuscles are situated on anterior cruciate ligament, lateral meniscus (cornus), articular external fibrous capsule and adipose tissue, periosteum adjacent to capsular insertion⁸ and specially on reticular dermis, where their function is to respond at pressure and vibrations⁴ through mechanical transitory movements and vibrations.

We present the description of a case of bilateral ulnar tunnel syndrome caused by a lipoma with Pacinian corpuscles reported on the histopathology report. Our intention by reporting this case is to bring a better knowledge of Guyon's syndrome by dividing the etiology into compressive and noncompressive causes.

CASE REPORT

A 45-year-old Hispanic woman, with medical history of asthma under control since 2016, past surgical history of hiatus hernia treated with Nissen fundoplication in 2009, allergic to sulfas and fenotiazinas.

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The patient came for the first time to doctor's office in 2016 due to the sudden appearance of prickling diffuse pain at hypothenar eminence with distal irradiation on volar section of the fourth and fifth right digits, exacerbated by humidity and improvement intensity with wrist splinting. By the time, symptoms increased in severity with weakness becoming incapacitating secondary to pain. Contralateral symptoms were presented few months later.

She was previously evaluated by neurosurgery's department, ruling an immunologic disease test with a negative immunologic profile and an a bilateral negative electro-neuromyography for cubital neuropathy.

Upon physical examination, she presented weakness on the first to the fourth finger, and centrifugal positive cubital Tinel sign on both hands at wrist level, and positive Phalen test at 15 seconds on the right hand and at 25 seconds on the left hand.

It is noteworthy that the patient referred more symptomatic the left hand, without paresthesias and dysesthesias, and we didn't find any motor neither sensitive abnormality.

The patient underwent for surgical decompression of the Guyon's canal on September 02, 2016. The patient was inducted with general anesthesia. It was placed the pneumatic ischemia on the right braquial region, marking the incision taking as reference the flexor carpi ulnaris radial edge, the pisiform and the hamate hook. Isquemia was activated at 220 mm Hg and was performed a 3 cm incision with a surgical scalpel blade No. 15 in the volar-cubital region

starting at the wrist crease toward the pisiform and hamate hook haul, ending on the medial palmar crease. Dissecting tissues with scissors, sectioning the transverse cutaneous palmar muscle, till the ulnar nerve, ulnar artery and the volar annular ligament were exposed, finding the cubital nerve proximal to the wrist. From this point, it was made the distal dissecting of the nerve, sectioning the carpal ligament, the piso-hamate ligament and the muscle fibrous condensations finding the cubital bifurcation at zone I, dissecting until the bifurcation of the sensitivity nerve branches were found. It was observed that the compression was caused by a lipoma of around 1×1 (Fig. 1) mm surrounding the nerve at the first sensitivity-motor bifurcation, same that was resected in 360 grades and sent for histopathological examination. The nerve was followed and explored the motor branch (Fig. 2) until its entrance at the fibrous hypothenar archus, liberating and exposing the nerve and its branches, verifying their integrity. Finally, the nerve was irrigated with Ropivacaine and after reviewing the hemostasis, the wound was closed in 3 layers using Poliglecaprone 25 thread 4/0 and 5/0 approaching subcutaneous tissue giving coverage to the nerve. Isquemia was ended at 51 minutes from starting the surgical procedure. The patient's hospital discharge was 24 hours after the surgery with an antebraquial splinting.

A second surgical intervention was performed on January 27, 2017, for the Guyon's left hand tunnel release under the same surgical technique. The patient evolved with symptomatic relief in a 90% on both hands after dis-

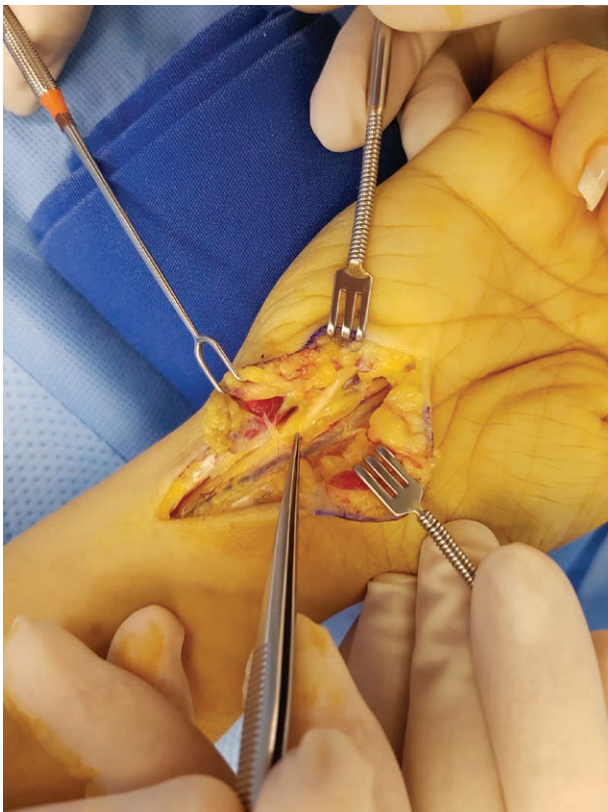


Fig. 1. Surgical and anatomical view of the right hand showing the site of lipoma.

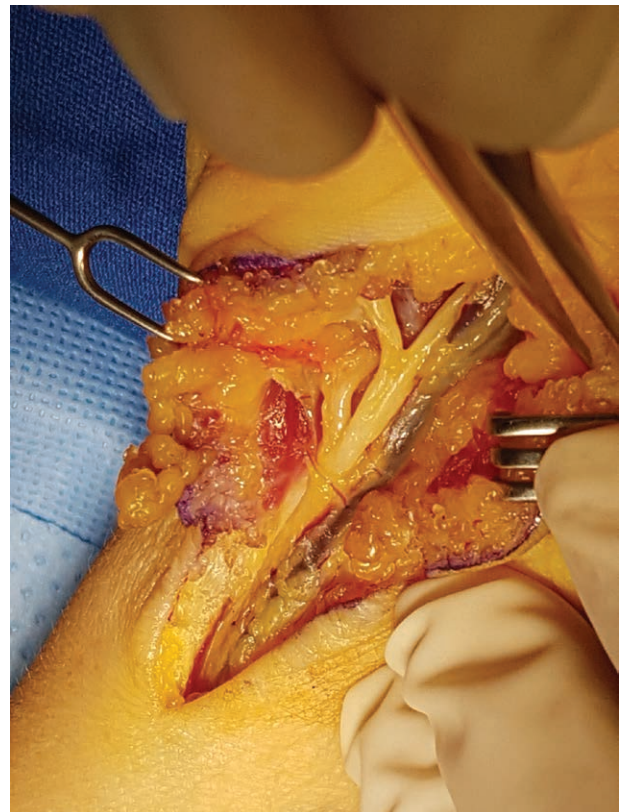


Fig. 2. Image shows deep motor branch of the ulnar nerve and the sensitive ulnar branch.



Fig. 3. One-week postsurgery wound right hand.

charge. On a 6-months follow-up after ulnar nerve decompression, the patient evolved with symptomatic relief in a 100% on both hands (Fig. 3).

DISCUSSION

Ulnar tunnel syndrome refers to compression neuropathy of the ulnar nerve at the wrist. The Guyon's canal begins at the proximal edge of the volar carpal ligaments and ends at the fibrous arch of the hypothenar muscles.

The Guyon's canal roof is the palmar carpal ligament, palmaris brevis muscle, and the origins of the hypothenar muscles. The floor's canal are the tendons of the flexor digitorum profundus, the transverse carpal ligament, the pisohamate and pisometacarpal ligaments, and the opponents digiti minimi. The medial border are the pisiform bone and the flexor carpi ulnaris tendon. The lateral wall are the extrinsic flexors' tendons, transverse carpal ligament, and the hook of the hamate.³

The ulnar nerve may be compressed anywhere along the course of the Guyon's canal causing sensorimotor, only motor, or only sensory abnormalities. Shea and McClain⁹ in 1969 classified Guyon's canal syndrome into 3 types, depending on the anatomical site at the wrist at which the ulnar nerve is compromised, and depending on that, the patient could present or not a pattern of motor and sensory loss.

However, in our case, we only observed sensory deficit as it is described by Shea and McClain⁹ on Guyon's canal

syndrome type I with weakness of the hypothenar eminence secondary to an antialgic position, due a noncompressive cause being the principal problem in the atypical presence of Pacinian corpuscles.

Even though literature reviews describe the presence of Pacinian corpuscles on arms and legs, there are no articles that described the presence of Pacinian corpuscles at the ulnar nerve causing a noncompressive syndrome at the Guyon's canal. Besides, our patient presented a lipoma on both wrist at the same place, coulding be a coincidence or a pattern.

CONCLUSIONS

We report a case of bilateral Guyon's canal syndrome due to Pacinian corpuscles that appeared on an atypical location, with an atypical symptomatology characterized by pain on finger percussion (positive tincl sign) along the path of the ulnar nerve and positive Phalen test, with an electromyographic with negative neurogenic pattern. This finding represents a new group of noncompressive causes to consider in the etiology of such syndrome, since there is not mechanical compression of the nerve at the wrist.

Guyon's canal syndrome due to Pacinian corpuscles on adipose tissue can be a new category of mixed sensorimotor causing a noncompressive syndrome by not having a mechanical compression of the nerve. Papers correlating clinical presentation, etiology and electrophysiological findings relating to ulnar nerve compression in the wrist are still uncommon in the literature.

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