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A Gilliat-Sumner hand with a mega transverse apophysis: A case report

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Abstract
Thoracic outlet is a syndrome resulting from compression of neurovascular structures that pass through the outlet. Neurogenic thoracic outlet syndrome is the most frequent category, 90% of cases characterized by weakness and paresthesia of the upper limb. In the presence of this clinical case with thenar and hypothenar atrophy, it is called Gilliat-Sumner Hand. In this case, we describe a clinical case of Gilliat-Sumner hand as a result of a hypertrophic transverse apophysis of C7, which was surgically treated and followed up for more than one year.

Keywords: Thoracic outlet syndrome, Gilliat-Sumner hand, hypertrophic transverse apophysis

Introduction
Thoracic outlet, first it is described in 1956 by Peet *et al*., it is describing a set of symptoms caused by compression of neurovascular structures that pass through the outlet [1, 2]. Anatomically, it is defined from the supraclavicular fossa to the axilla, passing through the clavicle and the first rib [2]. It contains three noble structures subject to compression, which are the subclavian artery and vein and the brachial plexus. These structures can be compressed in the interscalene triangle, in the costoclavicular space and in the retropectoralis minor space [2]. The cause of compression of the neurovascular bundle can be a set of several causes, with soft tissue being the most frequent at 70% and bone at 30% [1-3]. Depending on the etiology, it can be due to three subtypes, neurogenic categories, representing more than 90% of existing cases, venous from 3 to 5% and arterial from less than 1% [1-3]. On average, the incidence of this patient is from three to 80 cases per 1000 people, with a typical age between 20 and 40 years, being more common in women in a proportion of 3.5:1 [1, 3].
Neurogenic Thoracic Outlet Syndrome (NTOS) is characterized by the presence of local pain in the plexus, paresthesias and weakness of the entire upper limb, which it is not justified by other causes. It can be subcategorized as true when the clinical presence is justified with imaging and electrical alterations, or disputed when there is a discrepancy between them [1, 2, 4, 5]. In 1970 Gilliant *et al*. was the first to describe the clinical characteristic of true NTOS [4], due to thenar, hypothenar and interosseous atrophy and hyperesthesia of the medial cutaneous nerve of the forearm. The constellation of these characteristics associated with electrical alterations is currently designated by the Gilliat-Sumner Hand (GSH) and it is indicative of NTOS and it is a surgical indication [4-6]. We describe a case of GSH that was treated surgically and with camp for more than 1 year.

Case Report
A 47-year-old female patient, with no personal history. She is referred for consultation due to pain in the right cervical area radiating to the ipsilateral limb, aggravated by any movement of the limb, associated with nonspecific paresthesia's in all fingers and weakness in the entire upper right limb. Physical examination showed atrophy of the thenar and hypothenar eminence as well as in the interdigital commissures, associated with a deficit in strength mainly in the grip and pinch of the hand, figure 1(A; B). The patient underwent electromyographic tests (EMG) which revealed a decrease in the motor amplitude of the median and decreased

amplitude of latency of the medial cutaneous nerve of the forearm (MAC), being consistent with disorders of the lower trunk of the brachial plexus. In the Magnetic Resonance Imaging (MRI), figure 2 (A; B), detected a mega transverse process of C7 with costiform appendix with a distance of 10 mm from the plexus with local increase of the fat signal indicating an inflammatory process. Based on this evidence, the patient was diagnosed with NTOS with GSH and was admitted for surgical treatment. A right supraclavicular approach was performed, with partial myotomy of the hypertrophic fibers of the anterior, middle and posterior scalene, plexus neurolysis and it was performed a 1cm osteotomy of the C7 transverse mega apophysis.

The surgery was performed and she was discharged 2 days after the operation. It was observed in the first month at three, six- and 12-months post-operation (post-op) and annually thereafter. At 4 weeks post-op, starting at that time the physiatric treatment, the patient showed a clear improvement in pain, but she still had paresthesia's and muscle weakness in her hand. After half a year she no longer had paresthesia's and after 1 year she had improved hand grip, but still had some pinch deficit compared to the contralateral limb.

Discussion

NTOS is an uncommon entity, mainly in association with a GSA clinic and with an osseous etiology of a C7 mega apophysis [1, 3]. The presentation of this case is a typical representation of GSA [5, 6] with atrophy of the abductors pollicis, the little finger and of the intrinsic muscles of the hand. Clinical presentation could lead to other alternative diagnoses, such as carpal tunnel syndrome, cubital tunnel, cervical myelopathy and multiple sclerosis [1, 2, 6], however with EMG it showed changes characteristic of the syndrome with MAC affection and motor alteration of the median [4, 5], other typical alterations can also be found with sensory and motor alterations in the ulna nerve. These alterations are indicative of affection of the lower trunk of the brachial plexus, which are the most frequent in 68% [2, 4], with involvement of C8 and T1. One of the justifications is the transverse mega apophysis that is associated with a lateralization of the scalene and also with a medialization of the first ribs, creating irritation and entrapment of the plexus [5]. The initial approach to NTOS is conservative with physiatric treatment of at least 6 months, if there is no motor deficit and muscle atrophy [1, 2, 7, 8]. However, there is only evidence of short-term improvement and in a study compared to surgical treatment, it was only effective in 37% [2, 7]. In our case, a GSA always is requiring of the surgical treatment. There are currently 3 approaches described: Transaxillary, Supraclavicular and Posterior approach. There is no better approach, which varies depending on the specialty and the level affected. However the transaxillary approach, the most common among Orthopedics and Vascular, may not offer adequate medial decompression of the spinal nerves [2, 5]. A Supraclavicular approach was used in our case, and was the surgeon's preference. The surgery involves several complex structures, and complications are described in the literature, the most common is pneumothorax reaching 25% followed by wound infection, later poor decompression and neurovascular injury [2, 5], in our case there was none. Our patient presents a favorable progression concomitant with the literature of excellent results in 95% of cases [2, 3] and that patients with mild to moderate disease manage to fully recover their motor capacity after one year [2, 5].

GSA is an absolute indication for decompression and surgical neurolysis, which treatment it has an excellent result, however, in severe condition, certain alterations may be irreversible, and we must be attentive to an early diagnosis.

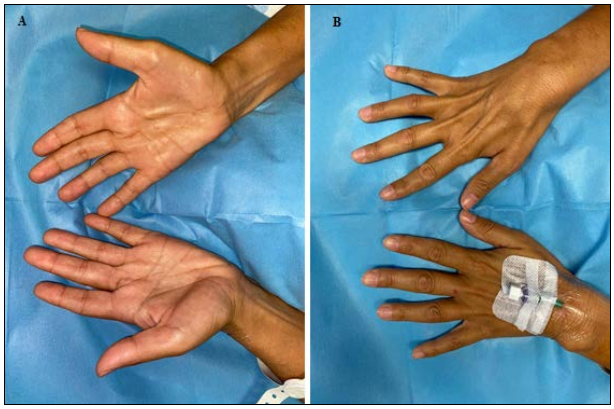

Fig 1: A. Thenar and hypothenar eminence atrophy; B. Interdigital commissures atrophy

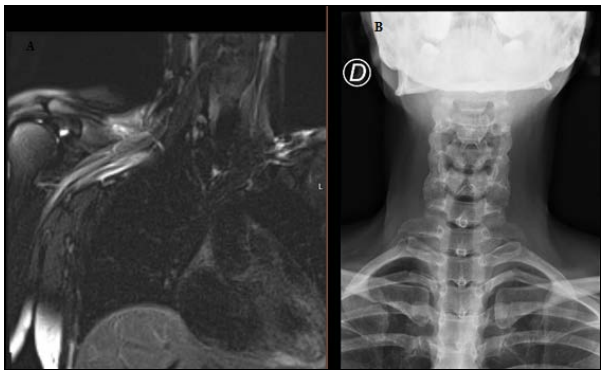

Fig 2: A. Increase signal at the Plexus on MRI; B. Mega transverse process of C7 in RX

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