



*Clinical Note*)

# PARSONAGE-TURNER SYNDROME: about a case of atraumatic shoulder pain.

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**Abstract:** Parsonage-Turner Syndrome (PTS), also known as amyotrophic neuralgia, is characterized by acute onset pain located in the proximal area of the upper limb, which evolves to present muscle paresis, atrophies and sensory disturbances. For the diagnosis of the pathology, it is essential to carry out a thorough anamnesis and examination, and complementary tests such as magnetic resonance imaging and electromyography can be very useful, which allow us to arrive at this disease as a diagnosis of exclusion. It is important to carry out a multidisciplinary approach to this entity both from the diagnostic and therapeutic point of view. Both the diagnosis and the pharmacological and rehabilitation treatment must be early to improve the prognosis.

**Keywords:** Parsonage-Turner syndrome, atraumatic shoulder pain, muscle paresis.

## 1. Introduction

Amyotrophic neuralgia, also known as Parsonage-Turner syndrome or brachial neuritis, is a disease with an approximate incidence of 1.6 cases/100,000 inhabitants<sup>1</sup> with predominance in males<sup>2</sup>, which manifests as an acute neuropathy of the brachial plexus<sup>3</sup>. It is a multifocal, immune-mediated inflammatory process that involves the peripheral nerves, and whose etiology and pathophysiology are currently unknown<sup>4,5</sup>. Precipitating factors such as infections, trauma, intense physical exercise, surgeries, traumatic births or systemic diseases have been described<sup>6</sup>.

Clinically it is characterized by presenting several phases. The initial phase, which lasts approximately 3 weeks, is characterized by the sudden onset of pain in the upper extremities, throbbing and predominantly nocturnal, followed by an atrophic phase with the presence of weakness, loss of muscle mass, accompanied by deficits. progressive neurological and, sometimes, sensory deficits<sup>7,8</sup>. Up to 80% of patients have a unilateral onset, and in 60% of cases the dominant side is affected<sup>9</sup>.

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During the atrophic phase there is compensation by compensatory strategies by the stabilizer muscles of the shoulder, which usually lead to scapular dyskinesia 10

The involvement of the plexus most commonly involves the upper and middle trunks, with the motor nerves being the most frequently affected, among which the long thoracic, suprascapular, axillary, musculocutaneous, anterior and posterior interosseous nerves stand out 5

As for the diagnosis, it is based on carrying out a detailed history and physical examination that demonstrate the aforementioned symptoms. In addition, it is advisable to perform an MRI of the affected shoulder and cervical spine, which despite showing a non-specific image, 11, 12 allows us to rule out other diseases such as rotator cuff tears, traumatic plexopathy, labral damage, syndrome of entrapment and calcium tendinitis 7, 9. Electromyography is also considered useful, which will show considerable motor involvement 13

There is no specific treatment for amyotrophic neuralgia, but it is possible to achieve a complete recovery in more than half of the patients in a period of two to three years, depending on the severity of the initial symptoms 14 .

Most patients with PTS are treated with a multidisciplinary approach that includes both pharmacological treatment and physical therapies 15. However, there are cases in which it is not possible to recover muscle function, evidencing the persistence of a neurological deficit.

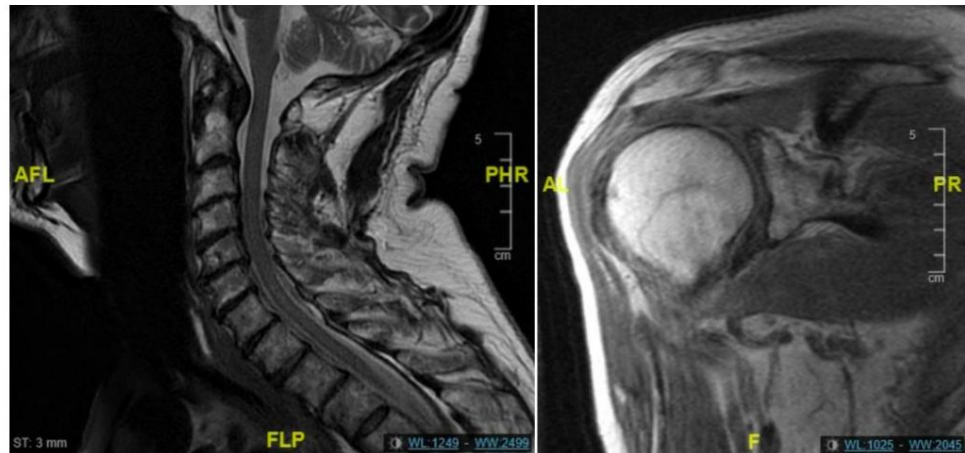
## 2. Clinical case

An 81-year-old male patient, with a history of Chronic Obstructive Pulmonary Disease (COPD), dyslipidemia, and arterial hypertension who attended the emergency department due to sudden onset left shoulder pain of 3 weeks of evolution, with no history of trauma. He presents pain of neuropathic characteristics with irradiation to the first finger of the left hand and with a value of 8/10 on the Visual Analogue Scale (VAS), which worsens with passive mobilizations of the shoulder.

Physical examination revealed neck pain radiating to the left shoulder with a muscle balance (LB) of the left upper limb (MSI) of 5/5 except for the brachial biceps where strength was 1/5 and marked hypoesthesia in the C5-C6 territory. -C7. MSI and shoulder girdle weakness, mainly with weakness for elbow flexion.

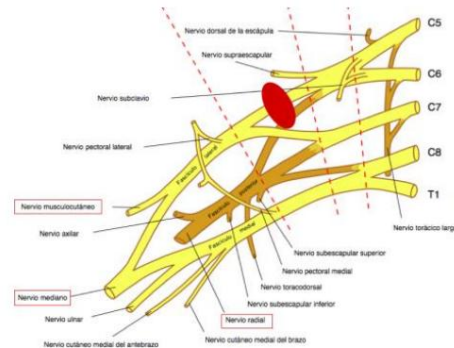
Suspecting PTS, the patient was referred to outpatient clinics, where a differential diagnosis was made with neoplastic, infectious, or autoimmune diseases, and cervical and shoulder magnetic resonance imaging (MRI) and electromyography (EMG) were requested.

The MRI revealed a stenosis of the cervical canal without myelopathy, impingement of the subacromial fatty space, and complete rupture of the supraspinatus tendon (**Figure 1**).

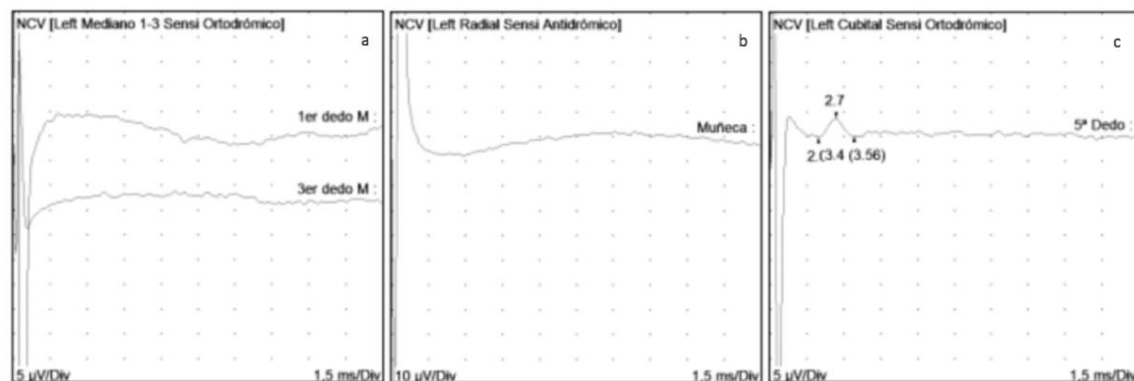


**Figure 1:** Cervical MRI and left shoulder MRI images.

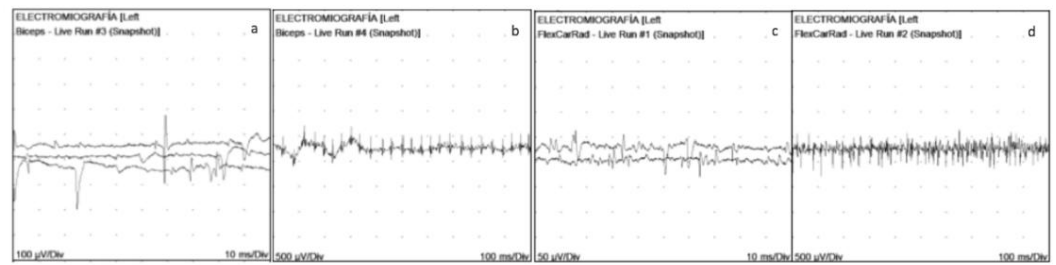
On the other hand, the EMG shows a severe left brachial plexopathy with greater involvement in the anterior division of the upper trunk (musculocutaneous nerve) and involvement of the anterior and posterior portions of the middle trunk (median nerve and radial nerve). moderate grade (**Figure 2**) showing absence of sensory response potentials (PRS) in C6 and C7 dermatomes (**Figure 3**). In the anterior division of the upper trunk (median nerve) it presents a massive loss of inactive motor units and with signs of subacute reinnervation (**Figure 4**).



**Figure 2:** Anatomy of the brachial plexus and location of the lesion.



**Figure 3:** Image absence of sensory conduction of the median and radial nerves (a, b), normal ulnar nerve conduction (c).



**Figure 4:** Involvement of the anterior division of the upper trunk (biceps and carpis radialis) showing active denervation with biphasic waves and positive waves (a, c) and a simple tracing (b, d).

After making the diagnosis of exclusion, it was decided to start treatment with high-dose corticosteroids, analgesia, and rehabilitation treatment that consisted of gaining joint range through active-assisted mobilization of the upper limb, strengthening of the elbow flexor muscles, electrotherapy (interferential currents), and exercises of proprioception.

During treatment, the patient progressively gained strength in the MSI until reaching a MB of 5/5, improved scapular synkinesis, and partially recovered sensation, with mild hypoesthesia persisting in the C7 territory.

Once the treatment was finished, a control EMG was requested, where a left brachial plexopathy of the anterior division of the upper and middle trunks was evidenced, predominantly sensory, with a current mild affectation of the motor fibers, observing an increase in density in maximum effort tracing and the presence of unstable polyphasic motor units demonstrating progress in reinnervation.

### 3. Discussion

Shoulder pain without previous trauma is one of the main reasons for consultation in Traumatology, Rehabilitation, Neurology and Rheumatology. For this reason, it is advisable to carry out a thorough history taking and physical examination in order to establish an adequate differential diagnosis 9

When faced with a patient with shoulder pain associated with changes in sensitivity and/or muscle paresis, it is important to take Parsonage-Turner Syndrome into account, since it is an underdiagnosed pathology that presents with non-specific symptoms and is therefore associated with a delay in diagnosis 6.9

It is necessary to request additional tests such as EMG and MRI to help in the diagnosis in an appropriate clinical context. Although TPS is considered a diagnosis of exclusion, EMG findings will show acute denervation from axonal neuropathy 13

Despite not being specific, MRI allows us to observe muscle edema in the initial phases and later the muscle atrophy corresponding to denervation, giving us information about the evolutionary state and helping its differential diagnosis 11 , 12.

The early diagnosis of PTS is decisive in the complete recovery of the patient, so we must include it in the differential diagnosis of painful shoulder without a history of trauma to avoid delaying the start of treatment.

We do not have a specific treatment for this neuropathy, which is sometimes resistant to drug treatment, so it is important to start rehabilitation treatment early with the aim of maintaining joint movement of the shoulder and recovering muscle strength 15

The time until complete recovery is variable, being able to present residual symptoms such as pain, muscle fatigue in the shoulder and neck, and scapular dyskinesia despite the recovery of the peripheral nerve, since the cerebral mechanisms that suggest this affection are still not evident 14, 15

#### 4. Conclusions

It is necessary to emphasize the need to keep this pathology in mind in the differential diagnosis of shoulder pain without a previous history of trauma. Bearing in mind that Parsonage Turner Syndrome or Amyotrophic Neuralgia is a painful clinical entity that is difficult to diagnose by means of complementary tests, so the differential diagnosis of other shoulder pathologies must be considered in order to establish a diagnosis of exclusion of this one.

In turn, the earlier in the start of treatment we will achieve a better prognosis, as well as a considerable reduction in the number of complications.

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