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Parsonage-Turner syndrome and SARS-CoV-2 infection: a case report

Syndrome de Parsonage-Turner et infection au SRAS COVID-19 : à propos d'un cas

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SAADE François **:** aucun

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Abstract

Parsonage-Turner syndrome (PTS) is a rare condition whose etiology is not known. While the diagnosis is clinical, MRI assessment and electromyography (EMG) can support the diagnosis. Certain situations are at risk: post-operative, post-infection and post-vaccination. A 22-year-old man with no previous history presented with sudden neck and right upper extremity pain 3 weeks after a confirmed COVID-19 viral infection. EMG testing identified denervation in the trapezius and serratus anterior muscles. PTS is a rare condition that can occur after COVID-19 infection. The combination of long thoracic nerve and accessory spinal nerve involvement is almost exclusively seen in PTS. This diagnosis should not be overlooked so the patient can be treated as effectively as possible.

Résumé

Le syndrome de Parsonage-Turner (SPT) est une affection rare et méconnue. Le diagnostic est clinique mais des bilans d'imagerie (IRM) et d'électromyographie peuvent étayer le diagnostic. Certaines situations sont à risque : postopératoire, post-infectieuse et post-vaccinale. Nous rapportons le cas d'un jeune homme de 22 ans, sans antécédent, qui a présenté, trois semaines après une infection virale par le SARS COVID-19, des douleurs cervicales et du membre supérieur droit. L'évaluation électromyographique montre de la

dénervation dans les muscles trapezius et serratus anterior. L'association d'une atteinte du nerf thoracique long et d'une atteinte du nerf spinal accessoire n'est observée quasiment qu'au cours du SPT. C'est un diagnostic qu'il ne faut pas négliger de manière à traiter plus efficacement le patient atteint.

Keywords: Parsonage Turner syndrome; COVID-19; Viral infection; Upper extremity

Mots-clés : Parsonage-Turner ; Covid-19 ; Infection virale ; Membre supérieur

Level of evidence : IV

Niveau de preuve : IV

Dear Editor-in-Chief,

Parsonage-Turner syndrome (PTS), also known as idiopathic brachial plexopathy or brachial neuritis, is a rare condition (1.64 cases per 100,000 people) that affects young adults, although some cases have been reported in adults over 60 years of age [1]. It is mainly characterized by severe acute, unilateral shoulder pain that can extend to the rest of the arm [1]. The latter is not position dependent and subsides after 1–2 weeks. Weakness, muscle atrophy and paresthesia appear and then gradually recede [1,2]. While the diagnosis is mainly based on clinical findings, electromyography (EMG) and magnetic resonance imaging (MRI) examinations are essential to confirming the PTS diagnosis [3]. Treatment is based on class I (or higher) analgesics and corticosteroid therapy [4,5]. The etiology and pathophysiological are not well understood, although some precipitating situations have been identified, such as the post-operative, post-infection (viral in 25% to 55% of cases) and post-vaccination period [1,3].

PTS has been reported recently following COVID-19 infections [2,6–9]. Here, we report one case of PTS involving the long thoracic and spinal accessory nerves. This was a 22-year-old male with no relevant history except for an episode of anterior dislocation of his right shoulder. Upon sudden development of torticollis, he took at PCR test for COVID-19 that came back positive. Three weeks later, he presented at the emergency room because of pain in his cervical spine and right upper limb, with no signs of trauma. No paresthesia was present

During the clinical examination, the patient had limited shoulder motion in abduction (45°) due to pain with visible atrophy of the trapezius muscle relative to the other side. He was unable to push against resistance in forward flexion. When examining his scapulothoracic region, there was an obvious winged scapula that mainly affected its medial edge and the ropey tendon of the inferior (ascending) portion of the trapezius was absent [4,10].

Given this presentation, EMG testing and MRI were requested. The EMG revealed denervation of the trapezius and serratus anterior muscles, while the MRI showed hyperintensity (edema) associated with denervation of these two muscles, confirming the diagnosis (Fig. 1). A 7-day course of oral corticosteroids was prescribed in combination with rehabilitation.

At the 6-month follow-up visit (Fig. 2), the shoulder's range of motion had improved with forward flexion of 100° and strength graded as 4/5 on the British Medical Council scale. Pain had disappeared and was graded as 0/10 on a visual analog scale. Conversely, the winged scapula was still present upon clinical examination, but the trapezius muscle was no longer visibly atrophied. A second MRI at 5 months showed persistent residual atrophy of the serratus anterior, but no edema in the trapezius muscle (Fig. 3).

In this clinical case, and given the suggestive clinical profile, EMG and MRI findings, we concluded that the long thoracic and spinal accessory nerves were involved. To our knowledge, this is the first reported case in France of PTS developing following a COVID-19 infection with long thoracic nerve involvement [2,3,7–9]. Two French articles have already mentioned isolated spinal accessory nerve and phrenic nerve involvement in PTS post-COVID-19 [6,11].

Knowing the timeline of the symptoms was essential to making the diagnosis as it allowed us to identify the triggering factor. In this case, there was a clear correlation with COVID-19 infection. Although some post-vaccination cases have been reported [12–15], PTS in our patient was likely not associated with vaccination, as he had been vaccinated a few months prior. We also systematically ruled out differential diagnoses for PTS, such as adhesive capsulitis, cervical hernia, subacromial bursitis, or even calcific tendinopathy of the supraspinatus [1].

Use of oral corticosteroids during the first month combined with physiotherapy helped to accelerate recovery [1,2,4,5]. As a general rule, complete PTS recovery occurs in 36% of patients at 1 year, 75% at 2 years and 89% at 3 years [16]. In our case, the patient had not recovered a functional range of motion 6 months after PTS. This is consistent with the results

described by Diaz et al. [3]; however, different nerves were involved. While not serious in the majority of cases, one study found PTS with an isolated phrenic nerve lesion, leading to diaphragm paralysis and a stay in the intensive care unit [6]. Thus, this pathology must not be underestimated.

Author contributions

All authors attest that they meet the current International Committee of Medical Journal Editors (ICMJE) criteria for Authorship

Conflict of interest:

Laurent Obert has no specific conflict of interest related to this study but has relationships with the following organizations: FX Solutions™, Medartis™, Evolutis™, Keri Medical™, Elsevier™, CHRU of Besançon, University of Bourgogne Franche-Comté.

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Informed consent

The authors declare that the patient's informed consent was collected.

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Figure legends

Fig. 1. Intra-muscular edema in the serratus anterior and trapezius muscles is evidence of denervation.

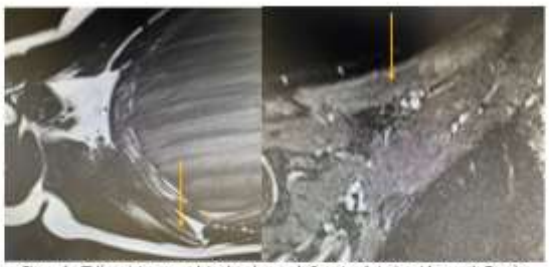

Figure 1 : Œdème intra musculaireclans le muscle Serratus Anterior et le muscle Trapèze témoignant d'une dénervation.

Fig. 2. Examination of the scapulothoracic region 6 months after the COVID-19 infection.

Figure 2 : Examen de la Scapulo-thoracique à 6 mois de l'infection a la COVID 19 (Scapula Alata)

Fig. 3. MRI done at 5 months showing persistent atrophy of the serratus anterior muscle.

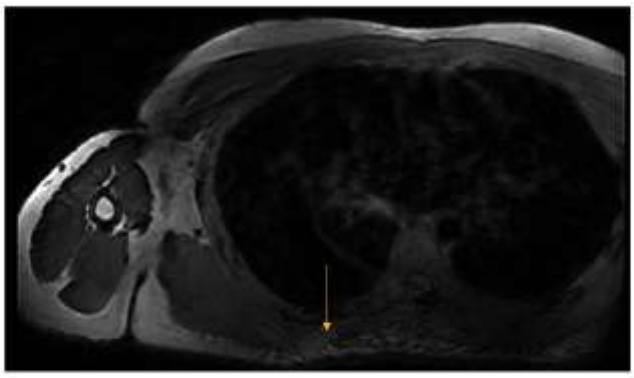

Figure 3 : IRM à 5 mois montrant l'amyotrophie du muscle serratus anterior