Magnetic resonance imaging (mri) for parsonage turner syndrome

Ressonância magnética (ressonância magnética) para a síndrome do virador do presbitério

DOI:10.34117/bjdv8n1-254

Recebimento dos originais: 07/12/2021
Aceitação para publicação: 14/01/2022

Alexia Rangel de Castro
Brazil- medical student at Universidade Federal do Ceará
Avenida Professor Euclides César, 420
E-mail: alexiacastro@alu.ufc.br

Claudia Ciarlini Martins
Brazil - Radiologist
Rua Dr. Mário Fernandes, 500
E-mail: claudiaciarlini@gmail.com

Luiz Gonzaga Nogueira Junior
Brazil- Neurology Specialist
Associação Médica Brasileira (AMB) - Ministério da Educação (MEC)
Avenida da Universidade, 2853 - Benfica - Universidade Federal do Ceará
E-mail: lgnjr2002@yahoo.com.br

José Daniel Vieira de Castro
Brazil- Radiologist/ Neuroradiologist - Titular Professor
Radiology in the Departamento de Medicina Clínica at Universidade Federal do Ceará
Avenida Professor Euclides César, 420
E-mail: danielcastro@ufc.br

ABSTRACT
Parsonage Turner Syndrome (PTS) is an acute neuritis involving the brachial plexus and peripheral nerves of the shoulder, that presents with sudden onset of shoulder pain, and progresses to paresis and atrophy of the muscles innervated by the involved segments. The diagnosis relies on clinical history and physical examination combined with Magnetic Resonance Imaging (MRI) and electroneuromyography. The MRI is a very important asset in the evaluation of these patients, as it allows the confirmation of PTS diagnosis and excludes other differential diagnosis of shoulder pain. Its findings include acute and chronic denervation, and possible alteration of the brachial plexus or involved peripheral nerves signal. PTS has a good prognosis requiring only support treatment in most cases. The early and correct diagnosis is essential to the proper patient’s conduct, as it allows proper treatment, and it avoids additional tests and unnecessary surgical procedures. This article contains a PTS case report with clinical presentation, physical examination images, diagnosis, MRI images, evolution, and prognosis, as well as a literature review.

Keywords: Parsonage Turner Syndrome, Magnetic Resonance Imaging, Case report.
RESUMO
A Síndrome de Turner (PTS) é uma neurite aguda envolvendo o plexo braquial e os nervos periféricos do ombro, que se apresenta com início súbito de dor no ombro e progride para paresia e atrofia dos músculos inervados pelos segmentos envolvidos. O diagnóstico baseia-se na história clínica e no exame físico combinado com Ressonância Magnética (RM) e eletroneuromiografia. A RM é um recurso muito importante na avaliação desses pacientes, pois permite a confirmação do diagnóstico de PTS e exclui outros diagnósticos diferenciais de dor no ombro. Seus achados incluem denervação aguda e crônica, e possível alteração do plexo braquial ou do sinal de nervos periféricos envolvidos. A PTS tem um bom prognóstico que requer apenas tratamento de suporte na maioria dos casos. O diagnóstico precoce e correto é essencial para a conduta adequada do paciente, pois permite um tratamento adequado e evita testes adicionais e procedimentos cirúrgicos desnecessários. Este artigo contém um relato de caso da PTS com apresentação clínica, imagens de exame físico, diagnóstico, imagens de ressonância magnética, evolução e prognóstico, bem como uma revisão da literatura.

Palavras-chave: Síndrome de Parsonage Turner, Imagens de Ressonância Magnética, Relato de caso.

1 INTRODUÇÃO

Parsonage Turner Syndrome (PTS) is an acute neuritis involving the brachial plexus and peripheral nerves of the shoulder, with unknown cause. It presents clinically with sudden onset of shoulder pain, lasting from hours to weeks, with progression to paresis and atrophy of the muscles innervated by the involved segments. (1)

Magnetic resonance imaging (MRI) is an important asset in the evaluation of patients presenting with shoulder pain, as it allows analysis of many differential diagnoses. PTS is one of the many conditions which diagnosis is facilitated after the realization of this exam, and the most typical findings are diffuse high signal intensity on T2-weighted images, involving one or more muscles innervated by the brachial plexus. (2)

The disease has a good prognosis, as it is usually self-limited, requiring only support therapies, in contrast to many other differential diagnoses of shoulder pain, that may require surgery. (1)

This is a case report of Parsonage Turner Syndrome, for which consent was obtained, with typical physical examination and MRI findings, demonstrating the positive effect of MRI to the proper diagnosis and conduct of the patient.

1.1 CASE REPORT

A 21-year-old male patient, farmer, previously healthy, presented with high intensity burning pain on his right shoulder, which irradiated to ipsilateral upper limb, associated to paresis and loss of function, especially of external rotation movement. The pain was constant
and not responsive to commonly used analgesics. It was limiting the patient's labor activities; however, it was worse at night, awakening the patient multiple times. One month after the initiation of symptoms, the patient referred to waking up with incapacitating weakness of the right arm, mostly of proximal muscles, associated with pain and tactile hypoesthesia of lateral region of arm and forearm. There were no other important manifestations and no relevant previous conditions.

In the physical inspection, hypotrophy of the right scapular waist musculature and postural asymmetry with higher elevation of the right shoulder in comparison to the left shoulder were noticeable, which suggested more intense tension of trapezius and levator scapulae muscles to compensate for the scapular instability. (figures 1 and 2)

In passive up and forward movement of the right shoulder, the right scapula was prominent, which suggested paresis of anterior serratus muscle. (figure 3). There was also monoplegia of the right upper limb.

The bicipital, stylorradial and tricipital osteotendinous reflexes were hypoactive. There were hypoesthesia plates in territory of the fifth and sixth vertebrae on the right.

The main diagnosis hypothesis was PTS, so it was solicited realization of electroneuromyography and MRI of the shoulder girdle right region.

The electroneuromyography showed preganglionic lesions in the areas of fifth to seventh cervical nerve roots, with acute denervation and chronic reinnervation.

The magnetic resonance images of the shoulder revealed signs of atrophy and denervation in muscles of rotator cuff, characterized by, hypersignal in proton density weighted with fat saturation (PDFS) and short tau inversion recovery (STIR) sequences (figures 1 to 3).

The magnetic resonance images of the brachial plexus revealed hypersignal in STIR and diffusion weighted sequences (figures 4 and 5).

- Figure 1: Coronal DP FAT SAT shows hypersignal and atrophy of supra spinal muscle.
- Figure 2: Coronal DP FAT SAT shows hypersignal and atrophy of infra spinal and deltoid muscles.
- Figure 3: Coronal STIR sequence shows hypersignal and atrophy of supra spinal muscle.

- Figure 4: Coronal STIR sequence shows hypersignal of roots, truncus, divisions of right brachial plexus.
- Figure 5: Coronal STIR sequence shows hypersignal of fascicles of right brachial plexus (arrows).

The clinical, electromyoneurographic and MRI findings were all consistent with PTS diagnosis. Therefore, the patient started treatment with analgesia and physical therapy and continues follow-up on the service.

2 DISCUSSION

Parsonage Turner syndrome (PTS), also known as neuralgic amyotrophy or brachial plexopathy, is a rare condition characterized by sudden onset of intense and constant shoulder pain and other subsequent neurological symptoms, such as progressive weakness, motor commitment and sensory deficits. It usually presents after an episode of infection, trauma, or surgery, however, it can occur without any notable precedents, as in the case above. (3) In 1948, Parsonage and Turner described a series of 136 patients, giving the condition its name, however, it was initially reported in 1943 by Spillane. (4,5).

The pathophysiology of PTS has not yet been fully elucidated, but many processes have been implicated, such as infectious, genetical, mechanical and autoimmune mechanisms. 30% to 70% of patients refer similar previous conditions, leading to the assumption that they may play an important role in the development of the disease. These previous conditions described are infection, surgery, anesthesia, trauma, immunizations, and many others, which are
considered possible risk factors. Due to the high rate of previous infectious and immunizations antecedents, the theory of an immune mediated pathological mechanism seems to be the most supported one. (6) However, these previous conditions are not always present, as in the case reported.

PTS occurs mostly between the third and seventh decades of life, but there were reported cases from 3-month-old to 82-year-old patients. It affects men almost twice as much as women. (7)

The diagnosis relies on clinical history, however, PTS is not commonly in the differential diagnosis of many physicians, therefore, on many occasions, the patient is initially diagnosed with other conditions with similar presentation, such as glenohumeral bursitis, muscle strain and acute cervical radiculopathies, which delays proper conduct and treatment. (8)

Electrodiagnosis and imaging studies can be very important for confirmation of the clinical diagnosis. An electroneuromyography test can define the precise location of the lesion, however it is not a sensitive method, so its use is only indicated after about 4 to 6 weeks of the onset of symptoms. The electroneuromyography performed from 3 to 4 weeks after onset of symptoms can present acute denervation signs and its realization after 3 to 6 months can show old denervation and early reinnervation. (9) In the case reported, this test was performed after 2 months of the onset of symptoms, and it revealed both acute denervation and chronic reinnervation.

The MRI is the most important imaging technique in patients with shoulder pain and weakness, as it provides detailed soft tissue contrast and multiplanar images. (7). It is a very important step in the conduct of these patients, as it can show common features of PTS, and exclude other differential diagnoses of shoulder pain, such as compressive neuropathies, rotator cuff injuries and impact syndrome, as well as myopathies, tumors, and myositis, ruling out diagnoses that require surgical treatment, in contrast to the pharmacological and physiotherapy treatment of PTS. (10)

The most striking features of PTS on the MRI are muscle denervation alterations with a distribution pattern of one or more of the peripheral nerves originated from the brachial plexus. In very early stages, the muscle appearance is normal, and after about 2 weeks, there are signs of edema, caused by the acute denervation, with higher capillary blood flow and extravasation of fluids to the extracellular space, which appears as an increase of intramuscular signal in the T2-weighted image. (7,10)
Gradually, muscle atrophy develops, in a chronic denervation pattern, with reduction of muscle volume and fatty infiltration, leading to an increase of signal in the T1-weighted images in comparison to normal muscle in adjacent regions. The fatty infiltration can also be recognized in T2-weighted images, with decrease of signal in inversion recovery images and fat suppression sequences. (7)

The MRI features are not specific, and they must be correlated to the clinical history to establish PTS diagnosis, as many other conditions can increase the signal in an MRI image, such as trauma, compressive neuropathy, disc herniation, and chronic excessive overload of muscles due to extreme physical activity. (10)

Upadhyaya et al, in their paper, elucidated the importance of Magnetic resonance neurography (MRN), and the recognition of its alteration in PTS cases, as it allows visualization of the entire brachial plexus. In the analyses of 15 cases, the MRN findings in T2-weighted fat saturated images and STIR images showed hyperintense signal with or without mild thickening, as well as more common involvement of roots rather than terminal branches, findings similar to those described in the case above. (11)

PTS is typically self-limited, requiring only support treatment. At the initial painful phase, rest and analgesia are indicated. After the pain subsides, the physiotherapy treatment is important, to achieve complete functional recovery. (12) In general, patients with more severe initial symptoms are the ones with the most prolonged course of disease. Absence of motor recovery or recurrence are rare. Generally, the patients have a favorable recovery. (3)

The recognition of PTS is very important for the radiologist, despite its low incidence, to raise the suspicion of this rare diagnosis after the observation of typical manifestations on MRI, such as alteration of plexus brachial signal, acute or chronic denervation signs of shoulders muscles, especially if these features are correlated to suggestive clinical information. In many cases, the radiologist is the first physician to suggest the correct diagnosis, preventing the use of inadequate pharmacological and surgical treatments.
REFERENCES


