Conservative Treatment of PASTA (Articular Partial Supraspinatus Tendon Avulsion) in a Patient with High Functional Demand: Case Report With a 6-year Follow-up

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ABSTRACT

Partial Articular Surface Tendon Avulsion (PASTA) lesions are among the most common types of partial rotator cuff injuries. This case report examines a 30-year-old patient with high functional demands who was diagnosed with a PASTA lesion. The patient presented with pain and dysfunction, as assessed by functional scales. A conservative treatment plan was implemented, including medication and a physiotherapy regimen adapted to the patient's progress. Clinical follow-up and serial imaging with magnetic resonance imaging (MRI) were performed over a six-year period. The evolution of the lesion showed no progression, and significant functional improvement was documented. A review of the literature and this case's outcomes underscore the potential for conservative management in treating PASTA lesions. This case highlights the need for further research comparing the effectiveness of conservative and surgical interventions.

Keywords: Rotator cuff tear; conservative treatment; PASTA lesion; case report.

Level of Evidence: IV

Tratamiento conservador de una lesión PASTA (*partial articular supraspinatus tendon avulsion*) en una paciente con alta demanda funcional. Presentación de un caso con un seguimiento de 6 años

RESUMEN

Las lesiones PASTA son una de las lesiones parciales del manguito rotador más comunes. Se presenta a una paciente de 30 años con alta demanda funcional, que tenía dolor y disfunción según las escalas funcionales, a quien se le diagnosticó una lesión PASTA. Se optó por un tratamiento conservador, que incluyó medicación y fisioterapia adaptada a la evolución, con controles clínicos y por imágenes durante 6 años. La evolución del tratamiento conservador, monitoreado por resonancia magnética seriada, mostró que la lesión no progresó y la función mejoró significativamente. Este caso resalta la necesidad de realizar más investigaciones que comparen las intervenciones conservadoras y las quirúrgicas.

Palabras clave: Lesión del manguito rotador; tratamiento conservador; lesión PASTA.

Nivel de Evidencia: IV

INTRODUCTION

Partial rotator cuff injuries have an incidence ranging from 17% to 37% in the general population, with a higher prevalence of up to 80% in individuals in their eighth decade of life.[1,2] These injuries are a common cause of shoulder pain and functional limitations in daily activities.[3]

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Partial lesions can be classified using the Ellman system,[4] which categorizes them based on their location (articular, bursal, or intratendinous) and the degree of tendon involvement (Grade I: <3 mm, Grade II: 3–6 mm, Grade III: >6 mm). Snyder proposed a similar grading system, incorporating lesion location (A = articular surface, B = bursal surface, C = complete) and arthroscopic visualization (Grades 0–4).[5]

Among these, PASTA (partial articular supraspinatus tendon avulsion) injuries are particularly noteworthy, comprising up to 91% of all partial rotator cuff injuries.[6] This type of lesion results from a combination of intrinsic, extrinsic, and traumatic factors. Intrinsic factors include changes in the vascularity of the rotator cuff and metabolic alterations associated with aging, which have been extensively studied.[7] Extrinsic factors encompass shear stresses on the supraspinatus tendon caused by narrowing of the coracoacromial arch, repetitive microtrauma (especially linked to overhead activities), and internal impingement.[6] These injuries are commonly observed in athletes who engage in throwing sports, such as volleyball players and baseball pitchers.[8]

The natural progression of PASTA lesions remains unclear, but spontaneous resolution of partial rotator cuff injuries is considered unlikely,[6] 53% of PASTA lesions tend to progress in size over time, often necessitating surgical intervention. [3,9]

In this context, we present a rare case of complete healing of a PASTA lesion managed conservatively, with a 6-year follow-up (2018–2024). Clinical evaluations and periodic assessments with serial MRIs, performed every three years, demonstrated improved functional scale scores and satisfactory healing on imaging. To our knowledge, no previously published case has documented such long-term follow-up with periodic MRIs every three years under conservative management.

CLINICAL CASE

A 25-year-old right-handed woman with a body mass index of 21, a regular volleyball player (three times per week), presented with pain and functional limitation in her right shoulder, preventing her from performing overhead movements. On the initial physical examination (2018), the patient demonstrated active and passive range of motion in the right shoulder, with 180° elevation, 100° external rotation, and internal rotation reaching T12. Mild signs of ligamentous hyperlaxity were noted, confirmed by a positive sulcus test. Neer and Hawkins impingement tests, as well as the supraspinatus strength test (Jobe), were positive. MRI of the right shoulder (Figures 1 and 2) revealed a partial articular tear of the supraspinatus tendon.

Based on clinical and imaging findings, a diagnosis of a PASTA lesion of the right rotator cuff was made. In collaboration with the patient, conservative management was chosen. Initially, with the aim of reducing inflammatory and painful symptoms, non-steroidal anti-inflammatory drugs and physiotherapy focusing on posterior capsule stretching were prescribed. The patient was also instructed to perform daily home exercises. After four weeks, once the inflammatory stage had subsided, physiotherapy transitioned to a strengthening phase targeting the pectoralis, latissimus dorsi, trapezius, and particularly the serratus anterior muscles.

Figure 1. MRI of the right shoulder, coronal section, in T2 sequence.

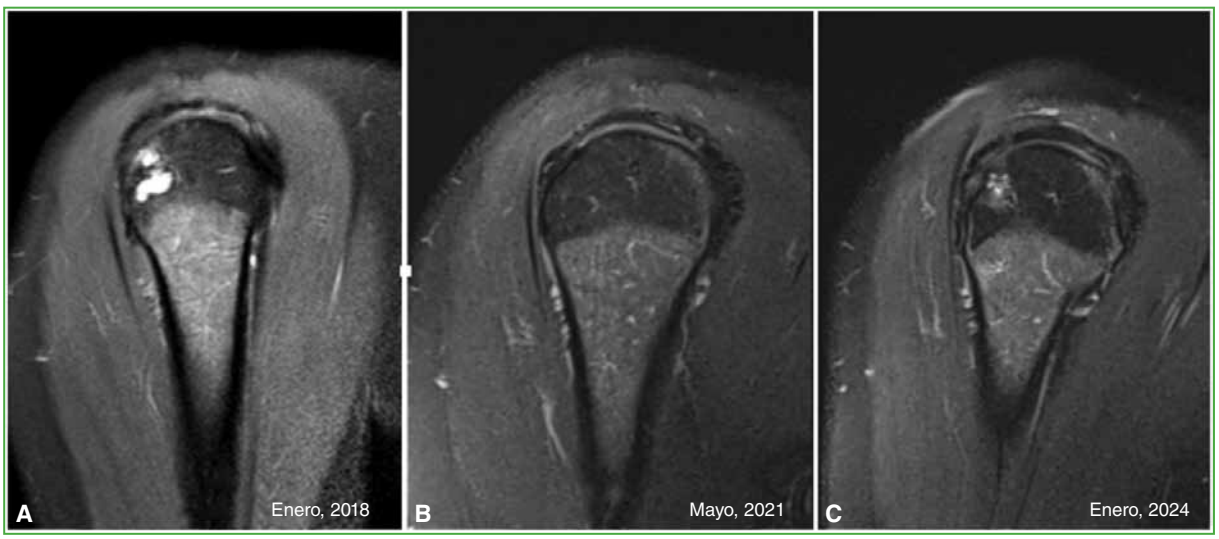

Figure 2. Magnetic resonance imaging of the right shoulder, sagittal view, T2 sequence.

During the entire treatment period, the patient was monitored in outpatient settings using two functional scales: ASES (*American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form*)[10] (Figure 3) and SANE - (*Single Alpha Numeric Evaluation*)[11] (Figure 4).

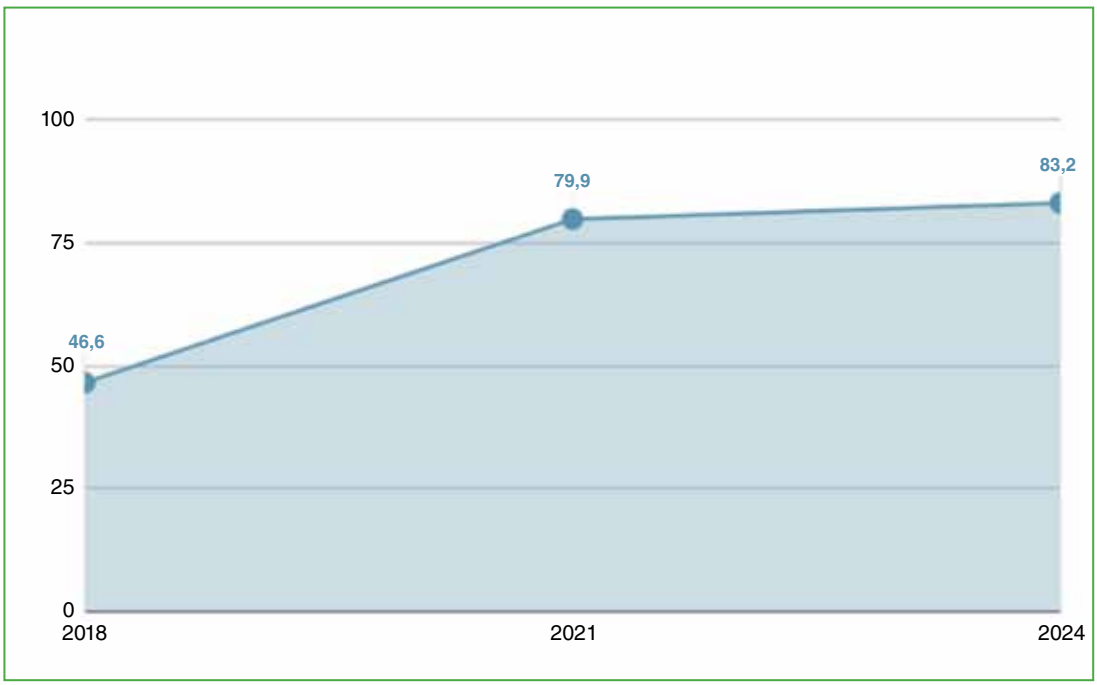

Figure 3. Evolution of the ASES score over the 6 years of follow-up.
ASES = *American Shoulder and Elbow Surgeons Standardized Shoulder Assessment Form.*

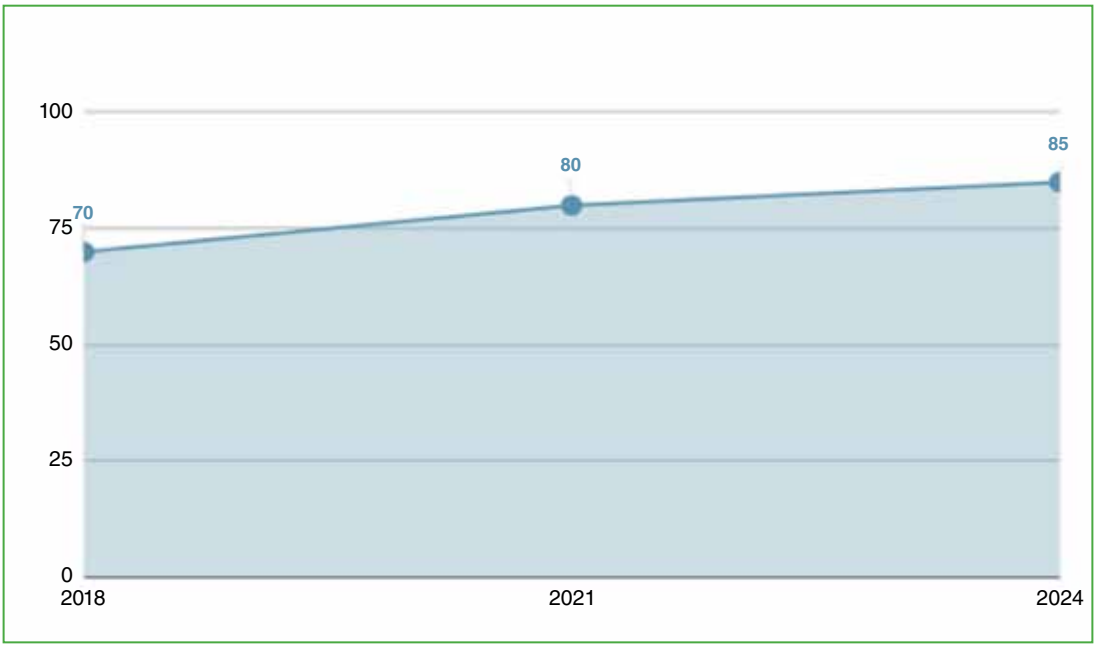

Figure 4. Evolution of the SANE score over the 6 years of follow-up.
SANE = *Single Alpha Numeric Evaluation.*

In addition to clinical evaluations, serial MRIs were performed at three-year intervals (January 2018, May 2021, and January 2024) (Figures 1 and 2), showing progressive clinical and radiological improvement.

After 12 months, pain and range of motion had significantly improved, allowing a gradual return to sports. Weight training for muscle strengthening was continued.

At the third year of follow-up (2021), the SANE score reached 80, and the ASES score was 79.9, indicating substantial functional improvement. MRI (Figures 1 and 2) showed almost complete tissue repair compared to the initial study.

The patient returned in March 2024 for re-evaluation and reported being pain-free, participating in recreational volleyball twice a week without functional limitations. Clinical examination revealed full active and passive range of motion, with negative Neer, Hawkins, and Jobe tests. The SANE score increased to 85. MRI (Figures 1 and 2) confirmed stabilization of the lesion and satisfactory healing.

DISCUSSION

Partial rotator cuff injuries are a common cause of shoulder pain, limitations in daily activities, and absences from work.[8] Despite progress in understanding the pathophysiology of PASTA rotator cuff injuries, their exact mechanisms remain elusive. These injuries commonly occur at the junction of the tendon fibers of the supraspinatus and infraspinatus muscles.[1,12]

Scientific studies have demonstrated a greater prevalence and size of blood vessels in the bursal region of the rotator cuff compared to the articular surface, which is described as a relatively hypovascularized area.[13,14] Histological analyses also indicate that collagen fibers in the articular surface are thinner and less organized than those in the bursal region.[14] These findings support the hypothesis that the articular surface is only about half as robust as the bursal surface.[15] This evidence explains the higher prevalence of PASTA lesions (91%) among partial rotator cuff injuries.[6]

According to Sher et al., diagnosing PASTA lesions clinically can be challenging due to the possibility of asymptomatic cases.[12] Pain is typically elicited during resisted abduction with the shoulder positioned at 90° of abduction, aligned with the scapular plane, and in internal or external rotation. For identifying supraspinatus tendon injuries, Itoi et al. recommend using the Jobe maneuver.[16] Positive results may also be observed with impingement tests, such as those described by Neer and Hawkins.[17]

Various imaging modalities are used to evaluate these injuries. Ultrasonography is a cost-effective and accurate diagnostic tool, but magnetic resonance imaging (MRI) remains the most sensitive imaging method for diagnosing partial rotator cuff injuries.[4,12]

Ellman and Snyder et al. proposed the two most widely used classifications for PASTA lesions; however, both focus exclusively on quantifying ruptures in the coronal plane on MRI.[4,5] Tennent and Green argue that the lack of a comprehensive classification system for these lesions contributes to ongoing uncertainty regarding their optimal management.[18]

The therapeutic approach to PASTA lesions is still controversial. Most surgeons agree that treatment should be tailored to the lesion's severity and stage, with initial management typically being conservative. Surgical repair is generally indicated for symptomatic patients when more than 50% of the supraspinatus tendon thickness is involved (Grade III according to Ellman or Snyder).[9,18]

To date, no studies have been published describing the natural course of PASTA lesions or techniques to identify which lesions are most likely to progress with conservative treatment.[18] Ji et al. reported that 53% of partial lesions tend to enlarge over time, eventually requiring surgical intervention.[3] Similarly, Yamanaka et al. found that 80% of partial lesions treated conservatively progressed to full-thickness tears in a follow-up study with arteriography.[19] These findings highlight the rarity of the case presented in this report: complete healing of a PASTA lesion achieved through conservative treatment, confirmed clinically and radiologically. The conservative treatment in this case consisted of an initial phase focusing on rest, cessation of pain-inducing movements, non-steroidal anti-inflammatory drugs, and joint mobilization physiotherapy to reduce pain, protect the muscle, and restore range of motion. Subsequently, the treatment progressed to physiotherapy aimed at strengthening the stabilizing muscles of the scapula and rotator cuff.

Reports of conservative treatment for PASTA lesions are scarce in the literature. To our knowledge, no previous case has documented such a prolonged follow-up with serial MRI evaluations every three years. This report, along with a brief literature review, may serve as a basis for future comparative clinical trials to evaluate surgical and conservative management strategies.

CONCLUSIONS

This article aimed to provide a concise literature review and document the evolution of a conservatively managed PASTA lesion. A 6-year follow-up with serial MRI demonstrated that the lesion did not progress, and the functional outcomes were satisfactory. Although conservative treatment is not extensively discussed in the literature, this case underscores the need for prospective research to compare the advantages and disadvantages of conservative and surgical approaches.

Conflict of interest: The authors declare no conflict of interest.

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