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Isolated Trapezius Strain in a Patient with Multiple Sclerosis and Spasticity

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Trapezius muscle injuries often occur in conjunction with high-grade acromioclavicular joint injuries [1], but to our knowledge, isolated trapezius injuries have not been described in the literature. We present a case of isolated trapezius strain in a spastic patient with multiple sclerosis documented with magnetic resonance imaging (MRI).

Case Report

A 45-year-old man with primary progressive multiple sclerosis and history of left upper and lower extremity spasticity presented with severe left shoulder pain that developed over a one month period. The pain required him to hold his shoulder in extreme abduction to prevent muscular spasm and pain. Because of the extreme discomfort, he was unable to lift any weight with his left upper extremity, and the limb was essentially unusable.

His course of multiple sclerosis included a longstanding history of spasticity, particularly of the left lower extremity, for which spasticity clinic prescribed him an ankle-foot orthosis. He had tried baclofen previously, but reported little benefit from it; he was not on any medications or any other treatment for spasticity at the time of presentation other than occasional use of the orthosis. The patient also refused treatment for multiple sclerosis in general, and recently the patient noted a general decrease in gait.

On physical exam, there was significantly decreased active range of motion of the left upper extremity, with intact passive range of motion. The clinician also palpated a "mass" in the region. MRI was then ordered to evaluate the shoulder.

T1 weighted sequence without contrast demonstrated high signal in the trapezius insertion site consistent with the presence of blood products (Fig. 1A). There was no fracture and no mass effect at the site of high signal. T2 FSE (fast spin echo) fat saturation sequences demonstrated high signal abnormality at the trapezius insertion on the scapular spine corresponding to edema and likely muscle-tendon injury (Fig. 1B). The trapezius muscle belly was bunched up, and the tendon was surrounded by high signal and medially retracted (Fig. 1C). With contrast administration, there was mild enhancement around the retracted tendon, indicating subacute to chronic injury with inflammatory reaction or active fibrosis (Fig. 1D). There was no mass-like enhancement.

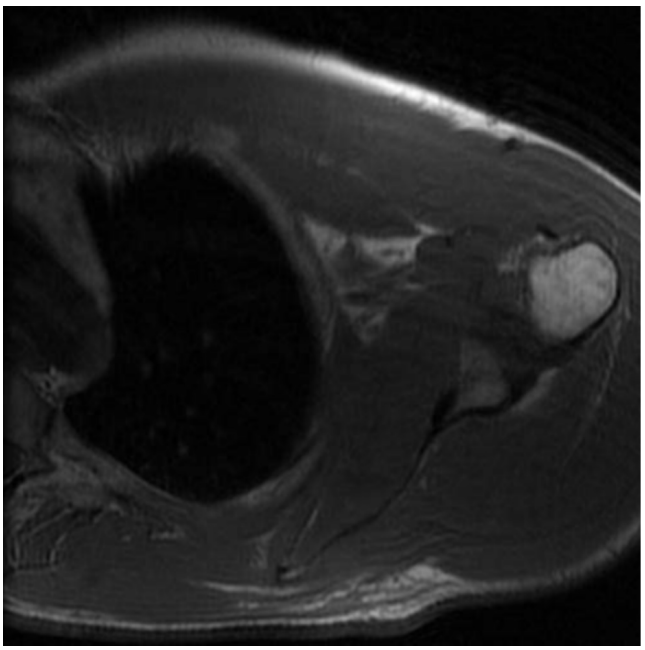

Figure 1A. 45-year-old man with multiple sclerosis and spastic shoulder. T1 weighted sequence demonstrating fibrosis/scar at the trapezius insertion, but normal musculature without mass.

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Abbreviations: MR, magnetic resonance, FSE, fast spin echo, AC, acromioclavicular, STIR, short TI inversion recovery

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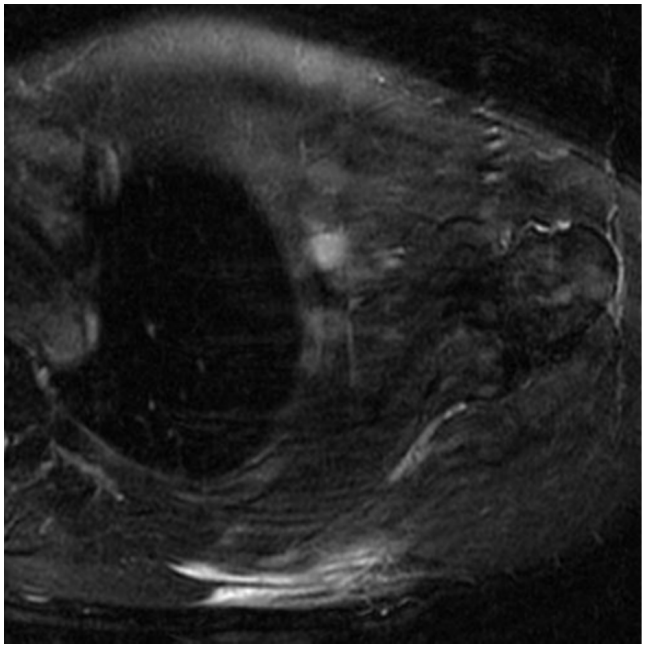

Figure 1B. 45-year-old man with multiple sclerosis and spastic shoulder. Axial T2 FSE with fat-suppression shows high signal at the lateral trapezius.

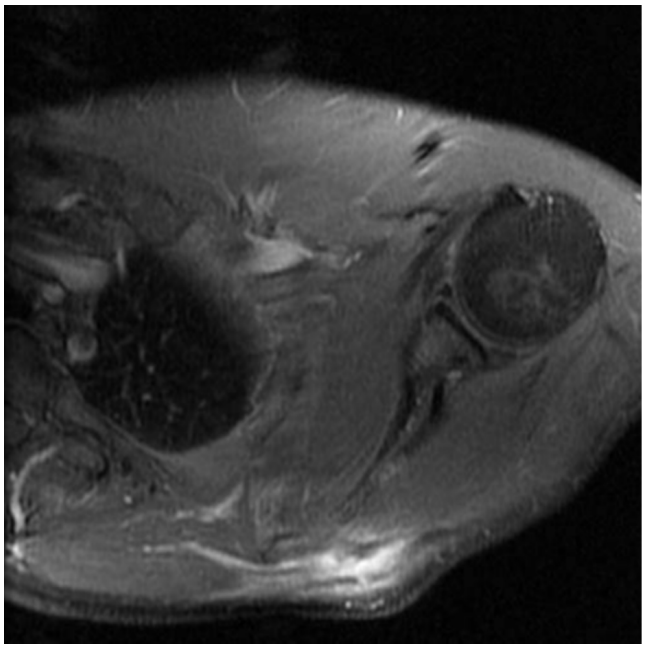

Figure 1D. 45-year-old man with multiple sclerosis and spastic shoulder. Axial T1 fat-suppressed post-contrast images demonstrating mild enhancement of the trapezius insertion on the scapular spine, indicating inflammatory reaction or active fibrosis.

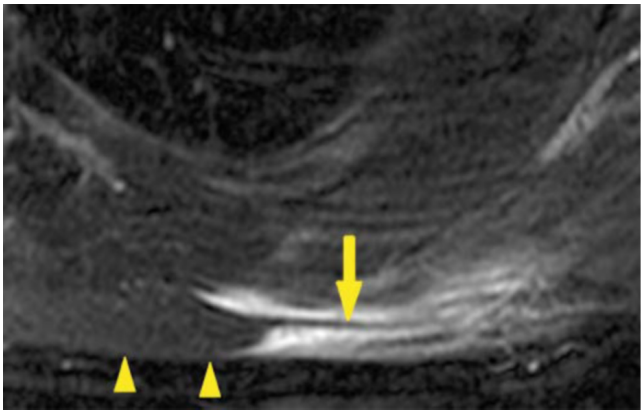

Figure 1C. 45-year-old man with multiple sclerosis and spastic shoulder. Photographic detail shows bunched up trapezius muscle belly (arrowheads) and medially retracted tendon (long arrow).

The patient elected for conservative treatment for his shoulder pain, consisting of tizanidine and physical therapy. One month after the MR examination, he reported slightly decreased pain and increased range of motion and weight bearing, although both were still significantly limited. He also reported a decrease in his shoulder spasticity, although he did not attribute this to tizanidine, and in fact he had already discontinued the drug. Physical exam at this time noted a muscular defect adjacent to the scapular spine at the trapezius insertion, with mild scapular winging. The patient was satisfied with the results and was continuing to be followed in clinic.

Discussion

In the setting of nonpenetrating trauma, trapezius muscle injuries most commonly occur in the context of high grade (at least Rockwood type III) acute AC (acromioclavicular) joint injuries, typically involving rupture of the AC and coracoclavicular ligaments with concomitant detachment of the deltoid and trapezius muscle insertions [1].

Evaluation of the acutely injured shoulder typically begins with plain radiographs for osseous alignment and fractures, and often this is the only imaging necessary. When severe soft tissue injury is certain or highly suspect, such as the case for shoulder dislocation or high-grade AC joint injury, elective MR is often performed to characterize the extent of soft tissue injury, particularly if surgery is being contemplated. However, a recent study suggested shoulder ultrasound might be useful as an alternative modality in evaluating soft tissue injury to the shoulder in the setting of acute AC joint injury; authors reported 80% sensitivity and 100% specificity for diagnosing trapezius detachment when performed by a skilled operator [2].

In the case reported here, radiography was not performed because of the lack of acute trauma to the shoulder, instead directly proceeding to MR. Furthermore, because the clinician was concerned for neoplasm causing the pain, post-contrast sequences were obtained. The combina-

tion of T1 and T2 or STIR (short TI inversion recovery) sequences is commonly used to evaluate skeletal muscle; the T1 sequence evaluates general anatomy such as masses, fatty infiltration, or atrophy, and the T2 and STIR sequences evaluate for edema. Post-contrast T1 sequences may be added if tumor is suspected as in this case, or if there has been surgery as both tumors and post-operative scar/fibrosis often enhance following gadolinium administration. In addition to muscle-tendon injury, intramuscular high signal on T2-weighted images may also indicate prolonged spasm, atrophy, denervation, post-exercise, or atrophy [3]. Denervation may occur in multiple sclerosis, and may result in intramuscular high signal on T2-weighted images [4,5]. No electromyelogram of the trapezius was performed to confirm or exclude the possibility of denervation in the case reported here. However, we believe that the finding of the retracted trapezius tendon is specific for a muscle-tendon injury.

Spasticity is a common sequela of neuromuscular disorders such as cerebral palsy as well as spinal cord injury which often results in significant deformity, pain, fractures, spasticity, tendon rupture and a myriad of other complications [6,7]. In many of these cases there is gross deformity, and plain radiograph should be the initial imaging modality in order to characterize osseous internal derangement or fracture. However, given the lack of recent acute trauma and absence of gross deformity, MR was not an unreasonable first step despite the history of spasticity in our patient. Treatment of spasticity is widely varied and highly dependent upon the capabilities and desires of the patient, ranging from physical therapy to medical therapy to surgery. Botulinum toxin has been recently utilized as a treatment for spasticity with much success in small muscle groups such as the arm and hand, however efficacy is much reduced in the larger muscle groups such as the shoulder and leg [8,9]. Our patient with focal spasticity had been offered Botulinum toxin injection therapy, but had refused it along with most other treatments.

In summary, isolated trapezius avulsion is a rare event, usually this injury occurs concomitantly with acute traumatic high-grade AC disruption. However, in the context of spasticity in patients with traumatic brain or spinal cord injury or neuromuscular disorders, isolated soft tissue injuries should be suspected, and MR provides a highly sensitive and specific modality for evaluation of such injuries.

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