

Bilateral Suprascapular Nerve Entrapment

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Bilateral suprascapular nerve entrapment syndrome is very rare. It presents with shoulder pain, weakness and atrophy of the supraspinatus and infraspinatus muscles.

We present a twenty-year old man having a history of bilateral shoulder pain associated with weakness. Electromyographic studies revealed signs of a lesion that caused a neuropathic state of the left suprascapular nerve, moderate axonal loss of the right suprascapular nerve and denervation of the right suprascapular muscle. The patient was treated with physical and medical therapy. Due to worsening of the symptoms, a surgical operation was performed by the excision of the transverse scapular ligaments bilaterally. His pain, weakness and atrophy had diminished on examination six weeks later. Suprascapular nerve entrapment should be considered in patients with shoulder pain, particularly those with weakness and atrophy of the supraspinatus and infraspinatus muscles.

Key Words: Bilateral suprascapular nerve, nerve entrapment, shoulder pain

INTRODUCTION

The suprascapular nerve originates from the fourth, fifth and sixth cervical nerve roots. It is a mixed sensory and motor nerve, and has a long, complex anatomical course, providing the potential for trauma and entrapment. It passes through the suprascapular notch and beneath the transverse scapular ligament, to innervate the supraspinatus and infraspinatus muscles. Its entrapment occurs frequently at the scapular notch. Repeated adduction of the arm causing traction injury to the suprascapular nerve compromises the nerve against

the rigid edge of the suprascapular notch.^{1,2}

Suprascapular nerve entrapment usually presents with shoulder pain and weakness. It should be included in the differential diagnosis of chronic shoulder pain as well as cervical disc disease, tendonitis, degenerative joint disease, bursitis, rotator cuff disease and adhesive capsulitis.

Bilateral suprascapular nerve entrapment syndrome has rarely been described³⁻⁵ We report a twenty-year old man with bilateral suprascapular nerve entrapment syndrome, complaining of bilateral shoulder pain and weakness.

CASE REPORT

A twenty-year old Caucasian presented with a history of bilateral shoulder pain, which was especially localized in the scapular region, for three years. He recalled no trauma to the shoulder. The symptoms were aggravated by lifting heavy things and with forced activities, which decreased on rest. The pain was felt at the right shoulder first, then the left. The pain was not associated with cold or warmth, and the symptoms were progressive. When lying on his right arm, he had nocturnal pain. There was a history of bodybuilding exercises for one year. He was working at a factory and lifting heavy boxes.

Physical examination revealed a depression of the shoulders, more prominent scapulae and increased dorsal kyphosis. There was moderate atrophy of the supraspinatus and infraspinatus muscles bilaterally (Fig. 1). No cervical paravertebral muscle spasm was detected, and pressure to this region was painless. Neck motion was also painless and full. In the upper extremities, there was no sensory loss detectable and there were no

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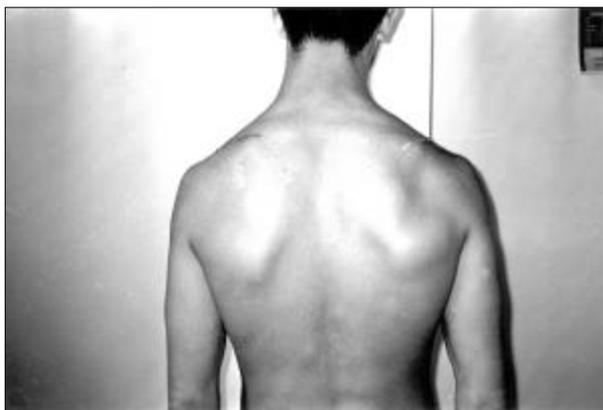


Fig. 1. Atrophy of the bilateral supraspinatus and infraspinatus muscles, especially prominent on the right.

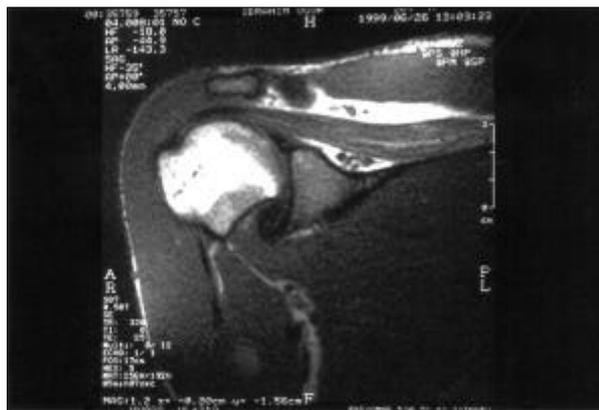


Fig. 2. Magnetic resonance imaging shows right supraspinatus muscle atrophy.

Table 1. The Nerve Conduction Velocity Study Results for the Present Patient, Both before and after Treatment

	Before the treatment		After the treatment	
	Distal latency (ms)	Amplitude (mV)	Distal latency (ms)	Amplitude (mV)
R supraspinatus	14.6	1.4	5.8	1.8
L supraspinatus	7.1	4.3	4.2	1.2

Table 2. The Needle EMG Study Results for the Present Patient, both before and after Treatment

	Before the treatment			Six weeks later			After the treatment		
	Fibrillation	Positive sharp wave	Polyphasia	Fibrillation	Positive sharp wave	Polyphasia	Fibrillation	Positive sharp wave	Polyphasia
R infraspinatus	4+	4+	Polyphasic	4+	4+	Polyphasic	2+	2+	Polyphasic
R supraspinatus	4+	4+	Polyphasic	4+	4+	Polyphasic	Absent	Absent	Polyphasic
L infraspinatus	Absent	Absent	Normal, Polyphasic	1+	1+	Polyphasic	Absent	Absent	Normal, Polyphasic
L supraspinatus	Absent	Absent	Normal, Polyphasic	Absent	Absent	Normal, Polyphasic	Absent	Absent	Normal, Polyphasic

reflex changes. The passive range of motion of the shoulders was normal. Abduction and external rotation of the arms were weak. The manual test of upper extremity strength resulted in the following: For the right shoulder, the supraspinatus muscle 3/5, deltoid muscle 5/5, infraspinatus muscle 3/5 and the rhomboid muscle 5/5; for the left shoulder, the supraspinatus muscle 3+/5, deltoid muscle 5/5, infraspinatus muscle 3/5 and the rhomboid muscle 5/5.

Laboratory investigations, including a complete

blood count, serum chemistries and urine analysis, were normal. X-rays of the cervical and shoulder region were also normal. Electromyographic (EMG) studies (Table 1 and 2) revealed signs of a lesion that caused a neuropathic state of the left suprascapular nerve, moderate axonal loss of the right suprascapular nerve and denervation of the right suprascapular muscle.

An MRI of the right shoulder revealed atrophy of the supraspinatus and infraspinatus muscles (Fig. 2). At the left shoulder, adipose tissue

between the supraspinatus muscle and acromion was reduced. The cervical MRI was normal. A physical therapy programme comprised hot pack, transcutaneous electrical nerve stimulation (TENS), electrical muscle stimulation and exercises was performed for 20 sessions. Etodolac, 800 mg/day, and vitamins B1 and B6 were administered. The EMG studies repeated six weeks later revealed worsened results (Table 2). The patient was surgically treated. Resection of the superior transverse scapular ligaments and neurolysis of the suprascapular nerves were performed bilaterally during the same operation, with a posterior approach being preferred. An exercise program was planned, and an improvement in the working conditions recommended. In the examination performed six weeks after surgery, the motor functions of the supraspinatus and infraspinatus muscles were normal. An EMG study confirmed the improvement (Table 2). On the follow-up MRI of the shoulders, the muscle atrophies were also noted to have improved.

DISCUSSION

The suprascapular nerve extends deep into the trapezius and omohyoid muscles, following the course of the suprascapular artery to the suprascapular notch. It passes under the superior transverse scapular ligament. After passing inside the supraspinatus fossa, it extends deep into the supraspinatus muscle, extending motor branches to the muscle. It then extends around the lateral border of the spine of the scapula, passes under the inferior transverse scapular ligament, enters the infraspinatus fossa and innervates the infraspinatus muscle.^{1,2,5,6}

Suprascapular nerve entrapment is an infrequently diagnosed syndrome. The most common presenting symptom of suprascapular nerve entrapment is the sudden onset of shoulder pain related to trauma or following an episode of heavy lifting.⁷ It is exacerbated by movement of the shoulder girdle, particularly with cross-body adduction of the extended arm.^{8,9} The discomfort may become so severe that it disturbs sleep, with the patient unable to lie upon the involved shoulder.¹⁰ In our patient there was a history of heavy

lifting and his shoulder pain was aggravated by forced upper extremity activities. His sleep was also disturbed with pain when lying on his right arm.

There was wasting and atrophy of the supraspinatus and infraspinatus musculature, causing weakness associated with abduction and external rotation.¹¹ Our patient also showed symptoms of weakness, which had gradually increased over a three years period, with atrophy of suprascapular and infraspinatus musculature.

In addition to the patient's medical history and physical examination, several diagnostic tests, including plain films of the cervical spine and shoulder, myelography, CT, MRI, and/or arthrography of the shoulder, may be necessary.⁷ Diagnosis is established from the EMG findings.¹² An EMG study in our patient also revealed findings of denervations. A suprascapular nerve block, with lidocaine, may relieve the shoulder discomfort and also serve as a useful diagnostic maneuver.¹³

The treatment of entrapment of the scapular nerve depends on the duration of symptoms, and the location and etiology of the entrapment.¹⁰ Our initial conservative treatment was composed of medical and physical therapy. Due to persistent symptoms, a surgical decompression of the nerve was performed.

This case report of bilateral suprascapular nerve entrapment represents a rare condition. It may be an occupational disorder, which may lead to disability in the shoulder region. Our institution is a social insurance hospital, providing healthcare especially to workers. Early diagnosis may prevent the atrophy of the related muscles, shoulder pain, weakness, and disability in this population. With our patient the diagnosis was made possible after referral to our hospital. He returned to his occupation 6 months after the initiation of the treatment.

Bilateral suprascapular nerve entrapment is a rarely reported condition. It should be considered in patients with shoulder pain, particularly those with supraspinatus and infraspinatus muscle weakness and atrophy, (especially in patients with an occupational history of heavy manual labor involving heavy lifting). An EMG and a nerve block will differentiate this condition from the

other causes of muscle and joint dysfunction. If conservative therapy fails, surgical release of the entrapped nerve offers an excellent chance of complete relief from the pain and resolution of the weakness.

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