



Atrophy of the Infraspinatus Muscle as A Result of Atraumatic Isolated Suprascapular Neuropathy: A Case Report and Review of the Literature

İnfraspinatus Kasında Atrofiye Neden Olan Atravmatik İzole Supraskapular Sinir Hasarı: Olgu Sunumu ve Literatürün Gözden Geçirilmesi

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Summary

Suprascapular neuropathy may occur as a result of traction, direct trauma, repetitive overhead activities, extrinsic compression and iatrogenic causes. The cases have been reported in the literature usually seen after trauma in athletes and young people. However, in chronic cases or in elderly people, a history of trauma may not always be necessary. Here, we present a 59-year-old sedentary male with a 3-month history of atraumatic posterior shoulder pain and weakness. Initially, he was misdiagnosed at several other clinics as periarthritis of the shoulder. A detailed physical examination showed atrophy of the infraspinatus muscle. Electrophysiologic studies of the right upper extremity revealed normal peripheral nerve conduction parameters except for prolonged Erb latency recorded from the infraspinatus muscle. Electromyography showed spontaneous activity and reduced recruitment in the infraspinatus muscle, while supraspinatus muscle was normal. Magnetic resonance imaging demonstrated posterior labral tear and a paralabral synovial cyst extending to the infraspinatus muscle as well as edema in the infraspinatus muscle consistent with denervation. The patient, who did not benefit from conservative therapy, was referred for surgery. Suprascapular neuropathy resulting in isolated weakness and atrophy of the infraspinatus muscle could be challenging at its onset and electrophysiologic evaluation is essential for the differential diagnosis. *Türk J Phys Med Rehab 2013;59:154-6.*

Key Words: Suprascapular neuropathy, rehabilitation, electrophysiology, shoulder pain

Özet

Supraskapular sinir sıkışması traksiyon, direkt travma, tekrarlayan mikrotravmalar, kitle lezyonu ve iyatrojenik sebepler sonrası görülebilir. Literatürde genellikle sporcularda ve gençlerde travma sonrası görülen olgular bildirilmiştir. Ancak kronik durumlarda ve yaşlılarda travma öyküsü her zaman bulunmayabilir. Burada 59 yaşında, travma olmaksızın ortaya çıkan ve 3 aydır artan şiddette sağ omuz ağrısı ve kuvvet kaybı şikayeti ile kliniğimize başvuran bir erkek hasta sunulmaktadır. Farklı merkezlerde omuz periartriti olarak değerlendirilen ve konservatif tedavilerden fayda görmeyen hastanın detaylı fizik muayene sonucunda sağ infraspinatus kasında atrofi saptanması üzerine yapılan üst ekstremité elektronöromiyografisinde, sağ infraspinatus kasından kayıtlı uzamış sağ supraskapular sinir Erb latansı ve infraspinatus kasında denervasyon bulguları saptandı; supraspinatus kası korunmuştu. Çekilen manyetik rezonans görüntüleme sonucunda posterior labrumda yırtık, infraspinatus kasına uzanan paralabral sinovyal kistik lezyon ve infraspinatus kasında denervasyon ile uyumlu ödem saptandı. Konservatif tedavilerden fayda görmeyen hasta cerrahi tedavi için yönlendirildi. İzole infraspinatus kasında atrofi ve kuvvet kaybına yol açan supraskapular sinir hasarı tanısını erken evrede koymak güç olabilir. Ayırıcı tanı için elektrofizyolojik değerlendirme esastır. *Türk Fiz Tıp Rehab Derg 2013;59:154-6.*

Anahtar Kelimeler: Supraskapular nöropati, rehabilitasyon, elektrofizyoloji, omuz ağrısı

Introduction

Since its first description by Thompson et al. (1) in 1959, suprascapular neuropathy (SSN) has been assumed to be a rare cause of shoulder pain and dysfunction, and was often considered a diagnosis of exclusion. However, with the advent of magnetic resonance imaging (MRI), its use in evaluating shoulder pathology and increased use of electrophysiologic tests, this condition has become a topic of an increased number of research. Suprascapular neuropathy may occur as a result of traction, direct trauma, repetitive overhead activities, manifestation of neurologic amyotrophy, and extrinsic compression. The incidence and the prevalence of SSN is still unknown. Most of the existing data about the occurrence of SSN are results from case studies which mainly involve athletes. The prevalence of SSN among professional volleyball players has been estimated as high as 20% to 33% (2,3). Occupational repetitive trauma has also been reported in baseball pitchers, weightlifters, dancers, and newsreel cameramen (4-7). Antoniou et al. (8) have reported the largest case series which included only 53 patients and a meta-analysis reported by Zehetgruber et al. (9) has revealed only 88 published reports on suprascapular neuropathy from 1959 through 2001. However, the number of articles relevant to SSN has increased over the past decade, and currently, isolated SSN is a well documented clinical entity. It has been suggested that SSN accounts for 1% to 2% of all cases of shoulder pain (10). An association between retracted rotator cuff tears and SSN has been reported in the literature (11,12). It has been suggested that individuals with a massive rotator cuff tear associated with fatty infiltration and/or atrophy of muscle and individuals with a labral tear and resultant paralabral cyst formation are vulnerable to SSN (13). Isolated SSN limited to the infraspinatus muscle is relatively rare and, most reported cases show a correlation between young age and trauma (14). However, in chronic cases or in elderly people, a history of trauma may not always be necessary.

Case Report

A 59-year-old sedentary male was presented to our outpatient clinic with a 3-month history of posterior shoulder pain and weakness. He had difficulty in performing movements involving external rotation of the right shoulder. Initially, he was misdiagnosed at several other clinics as peri-arthritis of the shoulder and treated with nonsteroidal anti-inflammatory drugs and physical therapy which failed to improve his symptoms. There was no history of recent trauma involving the right shoulder. On physical examination, right shoulder external rotation was painful and minimally restricted. There was no neurologic deficit, however, detailed physical examination revealed atrophy of the infraspinatus muscle. Right shoulder plain radiographs were unremarkable. Electrophysiologic studies were performed to confirm a clinical diagnosis of SSN. Bilateral upper extremity electrophysiologic studies revealed normal peripheral nerve conduction parameters except for prolonged Erb latency recorded from the right infraspinatus muscle while latency recorded from suprascapular muscle was within normal range. Electromyography showed spontaneous activity and reduced recruitment in the infraspinatus muscle,

while the supraspinatus, rhomboids, deltoid and biceps muscles were normal. Coronal and sagittal fat suppressed T2-weighted MRI demonstrated inferior labral tear and a paralabral synovial cyst extending to the infraspinatus muscle and an edema pattern in the infraspinatus muscle consistent with denervation (Figure 1). After failure of further trial of conservative treatment, the patient was referred for surgical treatment, however, he did not accept surgery.

Discussion

Originating from the upper trunk of the brachial plexus, the suprascapular nerve passes through the suprascapular notch, beneath the transverse scapular ligament and sends motor branches to the supraspinatus muscle. The nerve then passes deep to this muscle in the suprascapular fossa continuing into the spinoglenoid notch and terminates in the infraspinatus muscle. Cases of suprascapular entrapment neuropathy lead to two different clinical pictures (15). Nerve injury at the suprascapular notch affects the innervation of both the supraspinatus and infraspinatus muscles, whereas injury at the spinglenoid notch, which is relatively infrequent, only affects the infraspinatus muscle. Patients with SSN typically have an aching pain localized to the superior or posterolateral aspect of the shoulder. As in our patient, complaints of shoulder weakness and fatigue with overhead activities are common. Suprascapular neuropathy resulting in isolated weakness and atrophy of the infraspinatus muscle could be challenging at its onset and must be differentiated from servical radiculopathy, or bone and joint diseases of the shoulder. Furthermore, SSN can occur with or without concomitant shoulder pathology. For these reasons, it is difficult to diagnose a suprascapular lesion on the basis of patient's history alone. Similarly, posterior shoulder pain in our patient could be attributed both to suprascapular neuropathy and labral tear. This may explain why our patient was misdiagnosed as peri-arthritis in other clinics. A careful

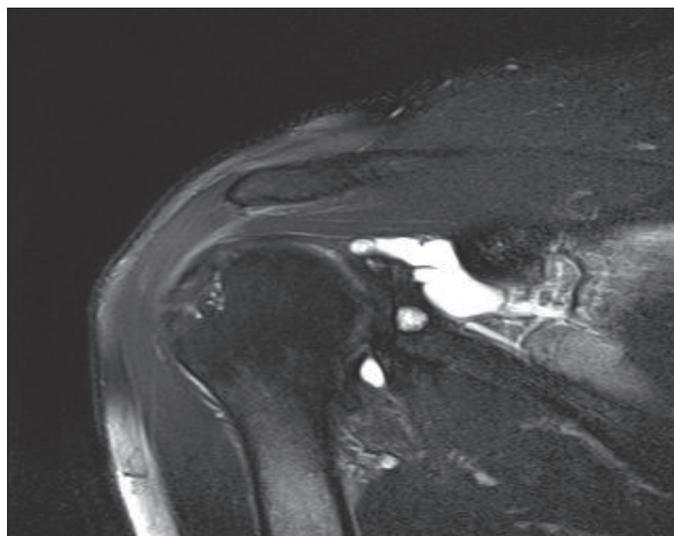


Figure 1. T2-weighted magnetic resonance image demonstrating inferior labral tear and a paralabral synovial cyst extending to the infraspinatus muscle and edema pattern in the infraspinatus muscle.

and detailed clinical evaluation and electrophysiological study is essential in addition to radiodiagnostic tests. Although MRI may demonstrate the apparent cause for SSN, electrodiagnostic tests including electromyography and nerve conduction studies remain the standard for the diagnosis and confirmation for SSN (13). In a recent study, it has been reported that an electrodiagnostically confirmed diagnosis of SSN was seen in 4.3% of all new patients and in 43% of patients with clinical or radiographic suspicion of SSN (16). The treatment for SSN remains controversial. Initial treatment is usually conservative, consisting of activity modification, physical therapy and nonsteroidal anti-inflammatory drugs. Surgical intervention is considered for patients with coexisting shoulder injuries requiring surgical treatment, presence of space occupying lesions or for patients who fail to benefit from conservative therapies. Extrinsic nerve compression at the spinoglenoid notch, especially by ganglion cysts, has been shown to have poor results with non-operative management (17). These ganglia are believed to develop when capsulolabral injuries create a valve-like effect and force synovial fluid into the surrounding tissues (18). This mechanism probably applies to our patient as well. Since there was no neurological deficit in our patient, an intense physical therapy program including electrotherapy, ultrasound and strengthening exercises of the shoulder girdle muscles were carried out along with nonsteroidal anti-inflammatory drugs. Although the patient's complaints of weakness in the right arm decreased, posterior shoulder pain persisted. For these reasons, the patient was referred for surgery. Operative treatment may include open or arthroscopic decompression of the suprascapular nerve with or without repair of associated shoulder abnormalities (19, 20). However, the optimal surgical approach still remains to be determined. Suprascapular neuropathy can be overlooked as a source of posterior shoulder pain. Furthermore, clinical evaluation of these patients may be difficult because other shoulder pathologies may have overlapping symptoms. Electrophysiologic evaluation is essential in patients with clinical or radiographic signs of SSN.

Conflict of Interest

Authors reported no conflicts of interest.

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