Isolated Dorsal Scapular Neuropathy Associated with Repetitive Minor Trauma: A Case Report

Tekrarlayan Minör Travmalarla İlişkili İzole Dorsal Skapuler Nöropati: Olgu Sunumu

Yüksel KAPLAN, Semiha KURT*, Hatice KARAER*

Inonu University, Turgut Ozal Medical Center, Department of Neurology, Malatya

*Gaziosmanpasa University Faculty of Medicine, Department of Neurology, Tokat, Turkey

ABSTRACT

Introduction: The dorsal scapular nerve innervates the levator scapula and rhomboid major and minor muscles. Isolated neuropathy of the dorsal scapular nerve is quite rare. A few case presentations in the literature have suggested that acute or chronic repetitive trauma to the neck and shoulder area can play a role in the aetiology.

Case: We present the case of an 18-year-old female patient with a 1-year history of pain over her scapula while using her right hand and the inability to use her right arm actively due to increasing pain which was especially present on extension of the right arm. On neurological examination, she had mild winging of the right scapula. Abduction of the right arm was found to be normal. Weakness with adduction and inner rotation of the right scapula was noted. The right rhomboid muscle was found to be atrophic. Nerve conduction studies were normal. Denervation potentials were noted in the right rhomboid major and levator scapula muscles by needle electromyography. She had no history of acute trauma. When potential chronic repetitive traumas were investigated, it was found that the patient had taken 3-hour exams every week for 30 months and had studied at least 4-5 hours a day. She also noted that she had the habit of resting her weight on her right elbow while studying.

Conclusions: We suggest that the isolated dorsal scapular neuropathy lesion seen in this case was caused by repetitive chronic trauma related to a poor body position while studying. *(Archives of Neuropsychiatry 2008; 45: 107-9)*

Key words: Dorsal scapular nerve, winged scapula, repetitive trauma

ÖZET

Giriş: Dorsal skapuler sinir, levator skapula, rambdoid major ve minör kaslarını innerve eder. Bu sinirin izole lezyonu son derece nadirdir. Literatürde çok az sayıdaki olgu sunumunda boyun-omuz bölgesine akut veya tekrarlayan kronik travmaların etyolojide rol oynayabileceği bildirilmektedir.

Olgu: Onsekiz yaşında kadın hasta, 1 yıl önce başlayan skapula üzerinde özellikle kolun öne doğru hareketi ile artan ağrı, sağ kolunu aktif kullanamama şikayeti ile başvurdu. Nörolojik muayenede sağda hafif kanat skapula görünümü mevcuttu. Sağ kolun abduksiyon hareketi normaldi. Skapulanın adduksyon ve içe rotasyon hareketinde kısıtlılık mevcuttu. Rombdoid kasın atrofik olduğu gözlendi. Sinir ileti çalışmaları normaldi. İğne elektromiyografide (EMG) sağ rombdoid major ve levator skapula kaslarında denervasyon potansiyelleri mevcuttu. Akut travma öyküsü yoktu. Hasta etyolojide rol oynayabilecek kronik tekrarlayan travmalar yönünden sorgulandığında üniversite sınavlarına hazırlık amacıyla yaklaşık 30 haftadan beri her hafta 3 saat süren deneme sınavlarına girdiği, bunun dışında günde en az 4-5 saat ders çalıştığı, gerek sınavda gerek ders çalışma sırasında sağ dirseğine dayanarak, ağırlığını sağ tarafına vererek ders çalışma alışkanlığı olduğu öğrenildi.

Sonuç: Bu olguda izole dorsal skapuler sinir lezyonunun ders çalışma ve sınavlar sırasında yanlış duruş pozisyonuna bağlı tekrarlayan, kronik minör travmalara bağlı gelişmiş olabileceği düşünüldü. *(Nöropsikiyatri Arşivi 2008; 45: 107-9)*

Anahtar kelimeler: Dorsal skapuler sinir, kanat skapula, repetitif travma

Introduction

The dorsal scapular nerve (DSN) is a motor nerve that arises mainly from the C5 spinal nerve root and travels within the scalenus medius muscle. The DSN courses downward behind the brachial plexus deep to the levator scapula muscle, which the DSN innervates, and terminates by piercing the deep surfaces of the major and minor rhomboids (1). The rhomboids normally elevate and adduct the medial border of the scapula (they are antagonists of the serratus anterior) and, along with the levator scapula, rotate the scapula so that the inferior angle moves medially (2).

Isolated DSN neuropathy is very rare. However, a few case studies have concluded that acute and repetitive traumas in the neck and shoulder area can precipitate isolated DSN neuropathy (3-5). Here we report a case of isolated DSN neuropathy as a possible manifestation of repetitive chronic minor trauma.

Address for Correspondence/Yazışma Adresi: Dr. Yüksel Kaplan, Inonu University, Turgut Ozal Medical Center, Department of Neurology, Malatya, Turkey
E-posta: yukselkablan@yahoo.com **Received:** 16.01.2008 **Accepted:** 24.05.2008

Case

An 18-year-old female patient with a 1-year history of pain on her right scapula while using her right hand and the inability to use her right arm actively due to increasing pain was evaluated at our outpatient clinic.

On neurological examination, mild winging of the right scapula was noted. Abduction of the right arm was found to be normal. There was weakness of adduction and internally rotation of the right scapula. The right rhomboid muscle was atrophic. When the patient's right arm was positioned in flexion at elbow and backward, the winged scapular appearance became clear (Figure 1), however when she pushed against a wall, the winged scapular disappeared (Figure 2). Electroneuromyography (ENMG) was performed on the right median, ulnar, and radial nerves for motor and sensory conduction. Right medial-lateral antebrachial cutaneous sensorial nerve conductions were normal. The right biceps, triceps, and deltoid muscle motor latencies evaluated by stimulation of Erb's point and right and left long thoracic nerve motor conductions were normal (6). Denervation potentials were found in the right rhomboid major and levator scapula muscles by needle electromyography (EMG). The needle EMG findings were normal in the other muscles studied.

Her medical history was insignificant, and routine evaluations including systemic physical examinations, other neurological examinations, hematological and biochemical standardized laboratory tests, chest X-ray, electrocardiograms, and cervical magnetic resonance imaging were all within normal limits. The patient was directed to department of the Physical Medicine and Rehabilitation for rehabilitation and correction of her posture while studying.

Discussion

Because the DSN derives from the proximal brachial plexus, involvement of this nerve in an upper brachial plexopathy suggests a proximal lesion. The nerve may also be entrapped within the scalenus medius muscle.

Isolated DSN lesions are very rare because the nerve is protected by the deep neck muscles along its course. Furthermore, the functions of the DSN are partially compensated by the accessory nerve and long thoracic nerve. When the DSN lesion is isolated, the scapula slides out slightly and moves away from the thorax. This abnormality, contrary to long thoracic nerve neuropathy, becomes more obvious when the arm is moved backwards, flexion at the elbow, and is less obvious when the elbow is positioned straight ahead. An ENMG should be performed to exclude other potential causes. If the ENMG is normal, orthopedic problems such as Sprengel's deformity or muscle ruptures should be considered (5).

The examination findings of this case suggested that the winged scapula indicated an isolated DSN lesion. The identification of ENMG abnormalities in the DSN and its innervated muscles supported our diagnosis. Furthermore, other potential causes of a winged scapula such as long thoracic nerve neuropathy, accessory nerve lesion, neuralgic amyotrophy, C7 radiculopathy, and progressive muscular dystrophy were excluded by ENMG.

A few cases of isolated DSN lesions due to acute trauma in the neck and shoulder have been presented (3), and chronic repetitive traumas as occur in volleyball and basketball players have been suggested to play a role in the etiology (4, 7). In our case, there was no history of acute trauma. When potential chronic repetitive traumas were investigated, we found that the patient had taken 3-hour exams every week for 30 months and had studied at least 4-5 hours a day; she also noted that she had the habit of resting her weight on her right elbow while studying.

In this case, isolated DSN due to chronic repetitive traumas resulting from a poor body position while studying and taking exams was anticipated. The thin body habitus of the patient (body mass index: 16) is thought to have contributed to the lack of protection for the DSN due to the insufficient masses of the neck muscles and the nerve's increased sensitivity to trauma.

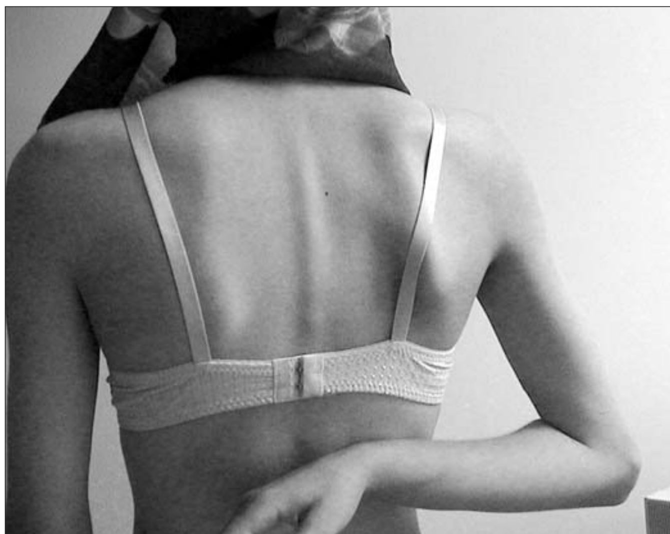

Figure 1. When the patient's right arm was positioned in flexion at elbow and backward, the winged scapular appearance became clear

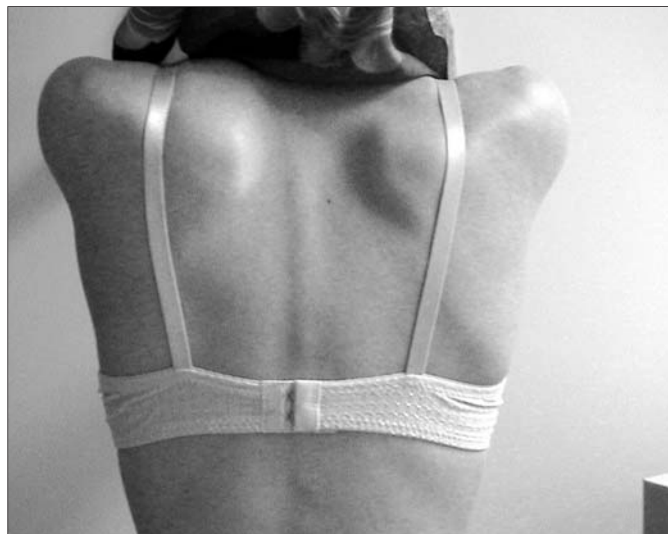

Figure 2. When the patient pushed against a wall, the winged scapular disappeared

References

1. Tubbs RS, Tyler-Kabara EC, Aikens AC et al. Surgical anatomy of the dorsal scapular nerve. J Neurosurg 2005; 102: 910-1.
2. Brazis PW, Masdeu JC, Biller J. Localization in clinical neurology. Little, Brown and Company, New York, 1996. pp 1-50.
3. Jerosch J, Castro WH, Geske B. Damage of the long thoracic and dorsal scapular nerve after traumatic shoulder dislocation: case report and review of the literature. Acta Orthop Belg 1990; 56: 625-7.
4. Ravindran M. Two cases of suprascapular neuropathy in a family. Br J Sports Med 2003; 37: 539-41.
5. Lee SG, Kim JH, Lee SY et al. Winged scapula caused by rhomboideus and trapezius muscle rupture associated with repetitive minor trauma: a case report. J Korean Med Sci 2006; 21: 581-4.
6. Lo Monaco M, Di Pasqua PG, Tonali P. Conduction studies along the accessory, long thoracic, dorsal scapular, and thoracodorsal nerves. Acta Neurol Scand 1983; 68: 171-6.
7. Haim K, Urban BJ. Dorsal scapular nerve block: description of technique and report of a case. Anesthesiology 1993;78: 361-3.