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CASE REPORT OLGU SUNUMU

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A Rare Cause of Winged Scapula in Two Male Adolescents: Dorsal Scapular Nerve Neuropathy

İki Adölesan Erkekte Kanat Skapulanın Nadir Bir Nedeni: Dorsal Skapular Sinir Hasarı

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The first of the cases was presented as a poster at the 4th FTR Course Days Congress, March 16-19, 2023, Antalya, Türkiye.

ABSTRACT Scapular winging secondary to dorsal scapular nerve (DSN) damage is very rare. It is usually seen in women and in the 3rd and 4th decades of life. To our knowledge, no case of isolated DSN neuropathy in childhood has been reported in the literature. Here, we report 2 cases of wing scapula due to isolated DSS neuropathy. Both cases were adolescent males who were interested in bodybuilding sports. It is crucial to consider that winged scapula, which can contribute to shoulder and back pain in children, may develop due to isolated DSN neuropathy, with chronic minor traumas potentially playing a role in its etiology.

ÖZET Dorsal skapular sinir (DSS) hasarına sekonder skapular kanatlanma çok nadirdir. Genellikle kadınlarda 3 ve 4. dekatlarda görülür ve bilgimize göre literatürde çocukluk çağında izole DSS nöropatisi vakası yoktur. Burada, izole DSS nöropatisine bağlı olarak kanat skapula gelişen 2 olguyu sunuyoruz. Olguların 2'si de ergenlik çağında olan ve vücut geliştirme sporları ile ilgilenen erkek hastalardır. Çocuklarda omuz ve sırt ağrısı nedenlerinden biri olan kanat skapulanın, izole DSS nöropatisine bağlı gelişebileceği ve etiyolojisinde kronik minör travmaların etkili olabileceği akılda tutulmalıdır.

Keywords: Case report; dorsal scapular nerve; scapular winging; shoulder pain

Anahtar Kelimeler: Olgu sunumu; dorsal skapular sinir; kanat skapula; omuz ağrısı

Winged scapula is an often overlooked cause of shoulder pain resulting from dysfunction in the shoulder stabilizer muscles.[1,2] The prevalence of scapular winging has been reported to range between 0.21 and 0.003%.[3] More recent studies suggest a potentially higher prevalence due to misdiagnosis or underreporting.[1] Scapular winging can arise from various causes, including osseous pathologies, genetic disorders, myopathies, and neuropathies. While nerve-induced scapular winging is most commonly attributed to long thoracic nerve injury, it can also occur due to damage to the accessory nerve and, more rarely, the dorsal scapular nerve (DSN).[2]

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The DSN innervates the rhomboid muscles, which retract the medial border and the inferior angle of the scapula in a medio-superior direction toward the vertebral column, facilitating scapular rotation during shoulder adduction.[2-6] Isolated DSN neuropathy leading to winged scapula is very rare. In a few reported cases, it has been observed that the majority of the affected individuals are women aged 30-40 years.[2-6]

In the literature, according to our knowledge, there is no case report of isolated DSN neuropathy in childhood. Here, we present two adolescent male cases who developed a wing scapula due to isolated DSN neuropathy.

CASE REPORTS

CASE 1

A 17-year-old male patient applied to our clinic with complaints of left shoulder pain and weakness that had begun two weeks earlier. He had no known medical conditions or medications. There was no family history or recent sports injuries, viral infections, immunizations, or shoulder/thorax surgeries. The patient engaged in regular bodybuilding activities five days a week, played basketball, and carried a heavy backpack for an hour daily.

On physical examination, winging of the left scapula was observed (Figure 1). No sensory or motor deficits were detected in the neurological examination.

Rotator cuff pathologies were ruled out with a shoulder magnetic resonance imaging (MRI). The electroneuromyographic (ENMG) study included bilateral upper extremity sensory and motor conduction studies, as well as long thoracic nerve motor conduction studies, all of which yielded normal results. In the needle ENMG study, the left serratus anterior and trapezius muscles were found to be normal, while abnormal spontaneous activity (+2) was observed in the left rhomboid muscle. Motor unit potential (MUP) analysis was normal and the interference pattern was mildly (-1) decreased. The needle electromyographic (EMG) examination of the left deltoid and infraspinatus muscles also appeared normal, excluding upper trunk lesions of the brachial plexus and C5 radiculopathy. Electrophysiological findings indicated “acute mild partial axonal degeneration of the left DSN”.

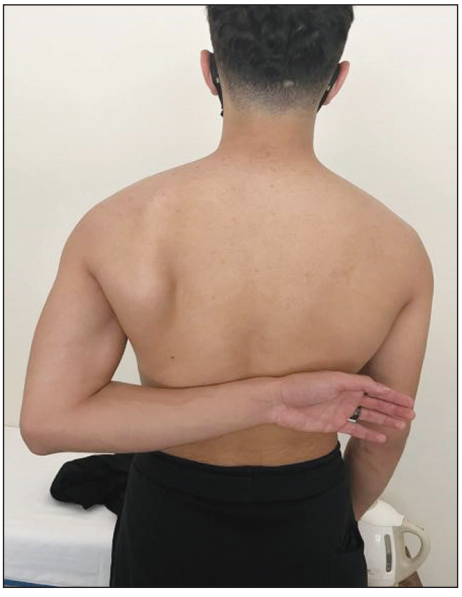

FIGURE 1: Clinical presentation of the patient with left wing scapula on admission to the hospital.

The patient was advised to refrain from sports activities and heavy backpack usage. Acemetacin, at 60 milligrams bid, was prescribed. At the two-week follow-up, the patient reported no pain, and the scapular winging had significantly improved.

CASE 2

A 16-year-old male patient was admitted to our clinic with complaints of pain and winging in the right shoulder. It was learned that his complaints had continued for one month and he had been engaged in bodybuilding activities regularly for about two months.

During rest, the right scapula was more laterally positioned, with a more prominent lower medial border and angle compared to the left scapula. This was evident during active shoulder flexion and abduction (Figure 2). The passive range of motion for the right shoulder was normal and no motor deficits were detected.

Shoulder MRI results were normal, and the ENMG study revealed normal results for bilateral upper extremity sensory and motor conduction stud-

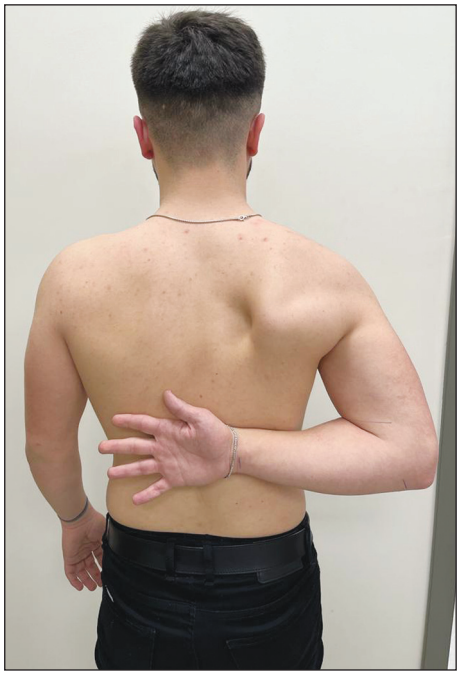

FIGURE 2a: The right scapula was more laterally located. The lower medial border and inferior angle of the right scapula are more prominent compared with the left.

FIGURE 2b: Winging of the scapula was more remarkable during shoulder flexion.

ies and long thoracic nerve motor conduction studies. The needle ENMG study found no pathology in the right serratus anterior and trapezius muscles but revealed abnormal spontaneous activity (+1) in the right rhomboid muscle. MUP analysis was normal, and the interference pattern was slightly decreased (-1). The needle EMG examination of the right deltoid and infraspinatus muscles were also normal, thus ruling out an upper trunk lesion of the brachial plexus. Electrophysiological findings were reported as compatible with "acute mild partial axonal degeneration of the right DSN".

The patient was advised to avoid strenuous sports activities for a period. Acemetacin 60 milligrams bid was prescribed. At the one-month follow-up, the patient reported significant reductions in pain and scapular winging.

We obtained consent from the families to publish these reports and to include their photographs.

DISCUSSION

In pediatric patients, scapular winging can be attributed to various causes, including bone pathologies such as osteochondroma and exocytosis, as well as genetic congenital muscle pathologies such as muscular dystrophy, congenital myopathy, and limb girdle muscular dystrophy. Rarely, the wing scapula may also be seen due to neuropathies.[1]

A comprehensive medical history, physical examination, and imaging are essential for accurately diagnosing winged scapula. Scapular winging resulting from osseous pathology is present at rest and is neither provoked nor relieved by positional changes.[1] In both cases, shoulder pathologies were ruled out through detailed physical examinations and various diagnostic tests. Biochemical values, including muscle enzymes, hemogram, erythrocyte sedimentation rate, thyroid function tests, cervical radiography, cervical MRI, and shoulder MRI, were all within normal ranges. Additionally, detailed ENMG studies indicated the absence of myopathy, brachial plexopathy, and radiculopathies.

DSN is a motor nerve originating mainly from the 5th cervical spinal nerve roots, coursing within the scalenus medius muscle, traveling along the levator

scapula and innervating the rhomboid muscles.[7,8] Isolated DSN lesions are very rare, as they are shielded by deep neck muscles throughout their course.[7,8] In addition, the presence of some anatomical variations may facilitate DSN damage.[4]

In addition to a few cases of isolated DSN neuropathy due to hypertrophy of the middle scalene muscle or acute trauma to the neck and shoulder, isolated DSN neuropathy has been reported in a few cases such as volleyball and baseball players, judo competitors, and boxers.[1,6,9] Neither of our cases had a history of acute trauma; however, the first case had a history of repetitive minor traumas, including heavy backpack usage in addition to bodybuilding and basketball, while the second case was involved in bodybuilding sports.

As a result, scapular winging can often mimic more common shoulder pathologies, including glenohumeral instability, acromioclavicular joint disorders, rotator cuff disorders, and other neurogenic conditions such as brachial plexus injuries and radiculopathies. Scapular winging, although rare, can be caused by DSN neuropathy due to chronic minor trauma and should be kept in mind in the differential diagnosis. ENMG study plays a very important role in the differential diagnosis.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Author contribution

The authors confirm contribution to the paper as follows: ***Study Conception and Design:*** *Zeynep Kıraç Ünal, Methiye Kübra Sezer, Zeynep Şener Doğruel, Ece Ünlü Akyüz;* ***Data Collection:*** *Zeynep Kıraç Ünal, Methiye Kübra Sezer, Zeynep Şener Doğruel, Ece Ünlü Akyüz;* ***Analysis and Interpretation of Results:*** *Zeynep Kıraç Ünal, Methiye Kübra Sezer, Zeynep Şener Doğruel, Ece Ünlü Akyüz;* ***Draft Manuscript Preparation:*** *Zeynep Kıraç Ünal, Methiye Kübra Sezer, Ece Ünlü Akyüz. All authors reviewed the results and approved the final version of the manuscript.*

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