

Scapular Winging in a Child

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A six-year-old male was brought to the neurology clinic with scapular winging following a biopsy of cervical lymph node (LN) a year prior to his presentation. The cranial nerve examination and motor examination were normal apart from the findings shown in Figure 1. His sternocleidomastoid (SCM) muscle strength was normal.

Nerve conduction study (NCS) along with a needle exam was performed for the patient. NCS for upper trapezius showed no major differences between the two sides. The needle examination of the left upper trapezius showed no spontaneous activity. Motor units were large in amplitude and showed polymorphism in > 50% of the units.

Question

1. What is the most likely diagnosis for this patient?
 - a. Right-sided scapular winging secondary to long thoracic nerve injury.
 - b. Left-sided scapular winging secondary to spinal accessory nerve injury.
 - c. Left-sided scapular winging secondary to dorsal scapular nerve injury.
 - d. Right-sided scapular winging secondary to C5 radiculopathy.

Answer

- b. Left-sided scapular winging secondary to spinal accessory nerve injury.



Figure 1: (a) Back examination of the patient. (b) Examination of the scapula from the front showing left upper trapezius atrophy (arrow). (c) Examination of the trapezius muscle with arm abduction. (d) Rhomboid muscle examination. (e) Serratus anterior muscle examination. (f) Left spinal accessory nerve complete transection (the cut ends indicated by asterisks) with neuroma (arrow). (g) Sural nerve graft. (h) Left spinal accessory nerve after bridging with reverse graft from sural nerve.

DISCUSSION

Scapular winging has been identified as a cause of shoulder pain and dysfunction since 1837 when the first case of isolated serratus anterior palsy leading to winging was described by Velpeau.¹

A prominent scapula can be due to various etiologies, which could be secondary to injury to long thoracic and spinal accessory nerves affecting the serratus anterior and trapezius muscles. Rarely, it could be secondary to a lesion in the dorsal scapular nerve resulting in weakness of the rhomboid muscle and thereafter winging scapula.²

Patients with trapezius palsy are usually found to have lateral scapular winging.³ Scapular winging in our patient was minimally seen at rest. However, it can be easily elicited with arm abduction and with resisted external shoulder rotation [Figure 1c]. The winging was present and more pronounced on the left side during serratus anterior examination [Figure 1e]. However, during rhomboid muscle examination, there was no clear asymmetry [Figure 1a and d]. The history of cervical lymph node resection, along with examination findings of upper trapezius atrophy [Figure 1b] on the left side and prominent lateral scapula with left arm abduction [Figure 1c], trapezius muscle weakness when testing shoulder shrugging on the left, and needle examination findings confirm the diagnosis of left-sided spinal accessory nerve iatrogenic injury post-lymph node biopsy.

Iatrogenic spinal accessory nerve injuries mostly from cervical lymph node biopsy, mass excision, or radical neck dissection as the nerve passes through the posterior neck triangle are among the most common causes of trapezius palsy. Other causes may include road accident trauma, deep massage trauma, and blunt or penetrating trauma.^{2,4} Our patient had sparing of the SCM muscle. That was probably because the injury was distal to the nerve supply to the SCM. Clinically, trapezius palsy may present with shoulder drop, pain, and difficulty elevating the arm or moving objects. Diagnosis is mainly clinical and includes looking for Tinell's sign. Investigations may include shoulder and scapula radiographs to look for the possibility of pathological fractures, the presence of accessory ribs, or osteochondroma. Magnetic resonance imaging was used to look for trapezius muscle atrophy or scarring around spinal accessory nerve. NCS can be obtained for lesion localization.^{1,5}

Other diagnoses may include herniated nucleus pulposus, shoulder impingement or instability, serratus, rhomboid paralysis, scoliosis, neuromuscular disease, fracture malunion, scapula osteochondroma, stroke, and herpes zoster infection.^{2,6}

Management of scapular winging includes conservative and surgical treatments. Conservative management includes physical therapy, transcutaneous nerve stimulation, external support, and non-steroidal anti-inflammatory drugs if pain is present. If there is no recovery within one year of the injury, surgical repair might be indicated.²

Our patient was referred for plastic surgery 13 months after the injury. He was operated on and found a complete transection of the spinal accessory nerve with a neuroma [Figure 1f] and a negative response of the trapezius muscle using intraoperative nerve stimulation. The neuroma was excised, and the gap was bridged with a reverse sural nerve graft [Figure 1g and h]. He was three weeks post-surgical exploration at the time of publication and continues physiotherapy. Trapezius muscle palsy should be suspected in any patient with scapular winging post-cervical LN biopsy. A high index of suspicion is especially important in pediatric populations, as the common symptoms of shoulder and arm pain are difficult to elicit in this population. These patients should be referred to NCS for diagnosis confirmation, along with a physiotherapy facility to help the patient regain function. A plastic surgery referral should be initiated early on if there is no clinical or electrophysiological evidence of nerve recovery.

Disclosure

The authors declared no conflicts of interest. Informed consent was obtained from the patient's guardian for publication.

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