Winging scapula with a lesion in the spinal accessory nerve

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Introduction

Winging scapula results in when muscles responsible to stabilize the scapula are weak or paralyzed. When muscles are unable to hold the scapula to the back of the chest wall, the lateral and medial borders of the scapula get an "undue prominence" causing the scapula to protrudes from the back giving rise to the appearance of "wings." Winging scapula is commonly caused by paralysis of the serratus anterior muscle resulting from damage to the long thoracic nerve. Winging scapula can also be caused by the paralysis of the trapezius or rhomboid muscles due to lesions in the spinal accessory nerve and nerve to rhomboids respectively (1). The condition results in limitations of upper limb function by different mechanisms. The serratus anterior is inserted to the entire length of the medial border of scapula; rhomboid minor and major are attached to the same border at the level of the scapular spine and inferior to the spine respectively while trapezius is attached to the superior margin of the scapular spine and the medial edge of acromion process (2). All four muscles contribute to hold the scapula to the axial skeleton. In clinical settings, it is important to identify impaired muscle by carefully observing the direction of scapular displacement.

We report a case of winging scapula due to a lesion in the spinal accessory nerve as a complication of posterior triangle lymph node excision and ways to avoid it.

Case presentation

A 23-year-old man presented with difficult in raising right arm and paresthesia along the medial border of the arm up to the wrist. He also complained of weakness in fine movements of the right hand such as in writing and playing carom. He was seen by a surgeon five months before, with pain in right side of the neck when rotating the neck to the opposite side. A lump in the posterior triangle was detected and removed surgically on a previous occasion. Subsequently, it was identified as a lymph node with normal histology.

On examination, a surgical scar was noted on the right side of the neck (Figure 1) with depression of the shoulder. There was wasting of the trapezius muscle (middle fibers). Prominent medial border and inferior angle of the scapula with lateral and backward displacement; "winging scapula" was noted when the patient is pushing against the wall. (Figure 2). The distance between the line drawn on spinous processes of the thoracic vertebra and the line drawn on the medial border of the scapula was measured to compare the displacement (3). The displacement of the scapula was 0.5 cm and 2 cm on left and right respectively (Figure 3).

Muscle strength of different muscles was examined. The shoulder flexors, extensors, medial rotators and lateral rotators were in grade 4 (manual muscle testing procedure) except for abductors of the shoulder on right side above the horizontal plane. He had grade 2 weakness in this movement and he complained of pain and paresthesia while doing this movement. All he scapular movements

including shrugging, protraction and retraction were reduced on the right side (grade 4) when compared with those on the left side (grade 5).

Figure 1: Surgical scar on right side of the neck (yellow arrow)

Figure 2: Posterior view of the patient with detachment of scapula and shoulder depression

The Electromyography (EMG) examination showed occasional fibrillation potentials in the right trapezius muscle with no active motor units on attempted contraction. Needle EMG of serratus anterior, rhomboid supraspinatus and deltoid were normal.

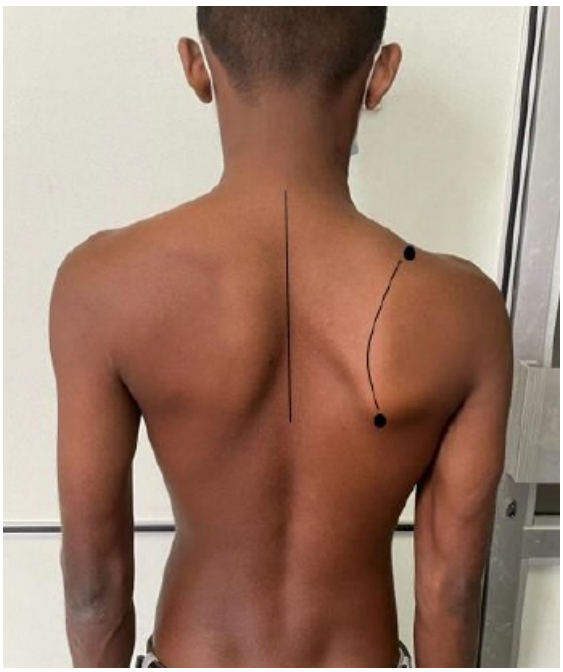

Figure 3: Measurements taken to evaluate the scapular displacement

Discussion

The spinal accessory nerve runs a fairly superficial course in the posterior triangle of the neck. The commonest cause of damage to the spinal accessory nerve is iatrogenic during procedures of the posterior triangle of the neck (4). Previous cases reported lymph node biopsies (68%) followed by sebaceous cyst excisions (7%), radical neck dissections (5%), and other processes including central venous cannulation (15%) (5). The lesion in the spinal accessory nerve can cause paralysis of the trapezius muscle resulting in loss of the normal contour shoulder making it appear as depressed and winging of the scapula (6).

Winging scapula is a common sign of serratus anterior muscle paralysis due to lesions in the long thoracic nerve (1). Additionally, paralysis of the trapezius and rhomboid muscles can cause

winging scapula. The differentiation can be observed by the direction of displacement of the scapula. In serratus anterior muscle paralysis, the scapula is displaced medially and superiorly. In trapezius muscle paralysis, the superior angle of scapula is displaced laterally while in rhomboids the inferior angle is more laterally displaced (1). However, EMG confirms the diagnosis.

The upper, middle and lower fibers of trapezius muscle are inserted to the lateral third of the clavicle, the acromion and the crest of the spine of the scapula (2). Paralysis of trapezius muscle will impair the movements of the upper limb including shoulder elevation, scapula retraction and lateral rotation resulting winging scapula. In our patient, shoulder depression, lateral displacement of scapula and weakness in shoulder elevation and lateral rotation of scapula is indicative of winging due to weakness of trapezius.

The clinical presentation in this patient is mainly due to effects of paralysis of trapezius muscle. The other symptoms the patient such as pain, paresthesia and weakness in fine movements of the hand when the arm is elevated are most likely to be due to downward displacement of the shoulder girdle causing pressure on the brachial plexus.

The accessory nerve exits the skull through the jugular foramen. Soon after emerging, it separates into a spinal part and a cranial part. The spinal part supplies the sternocleidomastoid muscle and then descends downwards in the posterior triangle of the neck to supply the trapezius muscle. As the nerve passes superficially in the posterior triangle of the neck, just below the skin and fat tissue layer, it can get damaged easily. If the nerve gets damaged during surgery, the patient complains of shoulder pain, pain and paresthesia in the axillary area or occipital area and weakness in shoulder movements (6). The previous literature suggests identifying the vein (that drains into the pharyngeal plexus of veins) that runs anterior to the spinal accessory nerve in the posterior triangle as a landmark to prevent iatrogenic injury (7).

Conclusions

Winging scapula can occur due to a lesion in spinal accessory nerve as a complication of exploration of posterior triangle such as in a case of lymph node excision. This can be diagnosed with careful examination of the scapula and upper limb movements. Further confirmation of the involved muscles can be achieved by an appropriate EMG examination.

Informed consent has been obtained from this patient to publish this case report with photographs.

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