

# Winging of Scapula - Case Report

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**Abstract:** Background: Scapular dyskinesia was defined by McClure et al. 17 as "the presence of either winging or dysrhythmia" after they provided a reliable evaluation of visual classification. A winged scapula is characterized by the medial or lateral aspect of the scapula appearing to protrude from the back. This abnormal position of the scapula can lead to a variety of physical functional disabilities, including pain, decreased strength, and disruptions of range of motion, with abduction and flexion of the affected upper extremity being the most common ranges of motion that are abnormal. The dorsal scapular nerve and the long thoracic nerve are the two clinical findings of shoulder nerve injuries that can cause scapular winging. Method: In this prospective case report, a 12 year old male patient with pain and weakness over neck and shoulder region was presented. Conservative management of the patient was done with the inclusion of stimulations to the serratus anterior muscle along with the scapula-thoracic muscle training including scapular PNF. Conclusion: With scapular muscles training along with stimulation over serratus anterior muscle show notable changes have been observed pre and post treatment in pain, range of motion, strength and winging of scapula.

**Keywords:** scapular dyskinesia, scapular stabilizing muscles, scapulothoracic muscle training

## 1. Introduction

Kibler (19) first described scapular dyskinesia after seeing altered and consistent changes in scapular posture adjustments and changed scapular kinematics in overhead athletes with shoulder impingement. Kilber is credited with creating the most well-known clinical test, the lateral scapula slide test, which assesses the scapular muscles' capacity to govern the medial border of the scapula in three different limb positions: adduction, hands on hips, and 90 degrees abduction.<sup>1</sup> A winged scapula most commonly results from injury or compromised innervations in the serratus anterior muscle. The long thoracic nerve is the nerve that innervates this muscle. Occasionally, injury or impingement of this nerve can cause the serratus anterior muscle to fail, giving the medial border of the scapula a winged look. Less frequently, the shoulder blade may stick out to the side as a result of injury to the trapezius or rhomboid muscles, which are controlled by the spinal accessory nerves and dorsal scapular nerve, respectively causing the shoulder blade to shift sideways because of the unbalanced muscle strength caused by trapezium or rhomboid weakness; this happens because the trapezius muscle is responsible for lifting, pulling back, and rotating the shoulder blade.<sup>2</sup>

An inadequately strong serratus anterior muscle can lead to scapular winging and disturbance in the coordinated movement of the glenohumeral joint. The long thoracic nerve palsy is often the cause of scapular winging, which can be identified by asking the patient to flex to 90° or perform a wall push up. The function of the trapezius muscle is assessed by performing a shoulder shrug, and if there is weakness or atrophy in this muscle, it could be caused by a spinal accessory nerve palsy.<sup>3</sup>

## 2. Case Report

A 12 year old, right handed, school going, male patient came to physiotherapy OPD at V.S.P.M's College of Physiotherapy, Nagpur with complains of pain, stiffness and weakness in neck and right shoulder. Earlier, he used to play cricket and experienced neck pain twice, but on 4<sup>th</sup> January 2024, he experienced severe symptoms while he was

continued playing cricket. The patient then visited AIIMS Hospital where analgesics along with Winger's brace were prescribed. MRI was performed on 5/1/24 for Right Shoulder which suggested subtle altered signal noted in the acromion near the acromioclavicular joint which appears hyperintense on PDFS sequences –s/o non-specific marrow edema. Thin fluid noted along the subscapularis tendon-s/o tendinitis. Another MRI scan was performed on 10/1/24 for the Cervical spine and the Brachial plexus which reveals C3-C4 & C4-C5 postero-central small disc protrusion with annular tear intending anterior thecal sac. He came to the OPD for physiotherapy on 20<sup>th</sup> January 2024. Goals of the patient included pain reduction, increase in mobility and ability to perform all the daily activity specifically improving overhead activities without any limitation.

### Diagnostic Testing

Nerve Conduction Velocity (NCV)

18/1/24-

Right serratus anterior NCV shows reduced CMAP with normal latency as compared to left side.

Right trapezius CMAP shows abnormal shape.

Impression- axonal lesion to right long thoracic nerve of Bell

18/3/24

Motor NCS:

Showed reduced CMAP amplitude from right spinal accessory (trapezius) nerve.

20/3/24

Right serratus anterior NCV shows reduced CMAP amplitude and area with abnormal shape and normal latency

Right trapezius shows reduced CMAP amplitude and area with abnormal shape and prolonged latency

Impression- Axonal lesion to right long thoracic nerve of Bell and axonal/ muscular lesion in right trapezius.

### Clinical Examination

Wall push test for serratus anterior palsy <sup>4</sup>

**Outcome Measures**

- NPRS
- Range of motion

**Intervention**

The intervention included

- Shoulder isometrics in multiple angles in flexion and abduction in supine position
- Shoulder shrugs in supine position
- Hughston's exercises
- Scapular retractions in multiple angles
- PNF for scapular muscles
- Faradic stimulation over serratus anterior muscle (30 repetitions and 3 sets) – before and after exercises

**3. Results**

1) Pain

Pre treatment-  
On NPRS-

On activity-6/10

At rest-2/10

Before Treatment



After Treatment

**4. Discussion**

Damage to the long thoracic nerve frequently leads to scapular winging. If the serratus anterior muscle is not working properly, patients may experience difficulty in lifting their arm above their head on the affected side. The function of the serratus anterior muscle was repaired by relieving pressure, freeing nerves, and using strong electrical stimulation on the long thoracic nerve.<sup>5</sup>As exquisite as this case was, even we performed multidisciplinary treatment including PNF for scapular muscles and faradic stimulation over the serratus anterior muscle along with scapulothoracic muscle training. PNF has been described as a comprehensive rehabilitation concept, promoting range of motion, strength, motor learning and motor control training. The activation of specific scapular muscles is significantly higher when performing PNF arm patterns compared to maximum voluntary contraction. Also, PNF positions improve movement efficiency of the joint by inducing changes in the muscle activation sequence.<sup>6</sup>

**5. Conclusion**

Stimulation of serratus anterior muscle and scapular PNF along with conventional exercises assists in pain reduction, improving range of motion and reduced scapular winging.

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