Dorsal Scapular Nerve: Is it a target for scapular pain?

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Learning Objectives

1. Attendees will be able to understand the anatomy of the dorsal scapular nerve.
2. Attendees will be able to recognize periscapular pain secondary to dorsal scapular nerve involvement.
3. Attendees will be able to evaluate the role of a dorsal scapular nerve procedure to treat a dorsal nerve neuropathy.

Abstract

Background: This study investigates the role of the dorsal scapular nerve (DSN) block in treating periscapular pain associated with scapular dyskinesia. Scapular dyskinesia is a prevalent condition causing shoulder dysfunction and pain, yet its management remains a clinical challenge.

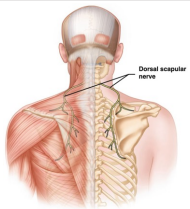
Methods: Our approach included a comprehensive narrative review of existing literature and a detailed case study. The review encompassed randomized controlled trials, observational studies, and case reports, focusing on the efficacy of DSN block in treating periscapular pain associated with scapular dyskinesia.

Results: A total of 10 articles published on DSN for periscapular pain relief from 1993 to 2023. 3/10 articles reported ultrasound guidance in performing DSN block. 3/3 articles reported >50% pain relief.

Conclusions: The findings suggest that the DSN block is a promising treatment for scapular dyskinesia, offering significant therapeutic benefits. This study advocates for the incorporation of DSN block into clinical practice for managing scapular dyskinesia and calls for further research to explore its full potential and long-term effects.

Introduction

- The **annual prevalence of thoracic spine** pain in adults ranges from 15.0% (aged 35 to 45 years) to 34.8% (aged 16 to 65 years).
- **The incidence of DSN neuropathy is not well-established**, partly due to under recognition and misdiagnosis in clinical practice.
- **Etiology:**
  - Trauma: heavy lifting, concomitant injuries to the long thoracic or suprascapular nerve, whiplash, and anterior shoulder dislocation.
  - Entrapment factors: hypertrophy of the middle scalene muscle and an abnormally long transverse process of C7.
  - Occupational history: volleyball, basketball, and extended overhead work typical for teachers, painters, and electricians.
- **Symptoms of dorsal scapular neuropathy:**
  - interscapular pain,
  - shoulder and arm pain,
  - sharp or burning medial scapular pain
  - sense of "traction" within the shoulder.



Treacst, Springer 2016

Morantes De Los Reyes et al 2022.

Table 32.5 Diagnostic tests of dorsal scapular nerve

	Potential distinguishing features
Physical exam	Tenderness over the middle scalene and medial scapula; winged scapula (lateral displacement) and no trapezius weakness
Provocative maneuvers	Slowly lowering arm from forward arm elevation
Diagnostic injection	At scalene or interscapular site
X-rays	Elongated C7 transverse process
MRI	Atrophy and possible abnormal signal of the rhomboid muscle
Ultrasound	Flattening of the nerve at the middle scalene
Arteriography	Not useful
Electrodiagnostic studies	Needle stimulation of the rhomboid at Erb's point shows prolonged distal latency. No abnormality of the supraspinatus, infraspinatus, or deltoid. Needle EMG rhomboid may show long duration, polyphasic MUP with spontaneous activity

Treacst, Springer 2016

Table 32.4 Differential diagnosis of dorsal scapular nerve

	Potential distinguishing features
Shoulder impingement	Shoulder X-ray with arm abducted
Adhesive capsulitis	Shoulder arthrogram
AC joint pathology	X-ray showing AC degeneration, AC joint injection
Rotator cuff disease	MRI showing rotator pathology
Glenohumeral instability	X-rays showing glenohumeral instability
Cervical radiculopathy	Dermatomal pain pattern, weakness/ sensory changes, reflex changes
Brachial plexopathy	EMG
Rhomboid myofascial pain	Taut bands or myofascial nodules
Thoracic facet pathology	Tenderness more medially over the paravertebral region, spondylosis
Thoracic disk	Paresthesias in a dermatomal pattern, increased with coughing

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Anatomy

Table 32.2 Dorsal scapular nerve anatomy

Origin	The C5 ventral ramus (frequently also with contributions from C4)
General route	Often shares a trunk with the long thoracic nerve. Pierces the middle scalene or its posterior surface, passes posterior to the levator to the inferior part of the levator and the serratus posterior superior, then parallel to the medial margin of the scapula on the inner surface of the rhomboid muscles. Joins the dorsal scapular artery (from the transverse cervical artery)
Sensory distribution	Skin sensation along the medial border of the scapula
Motor innervation	The rhomboid (major and minor) and occasionally the levator scapulae muscles
Anatomic variability	Variable contributions from C4 to T1, may share a trunk with the long thoracic nerve and may innervate the levator scapulae
Other relevant structures	The dorsal scapular artery, serratus posterior superior muscle

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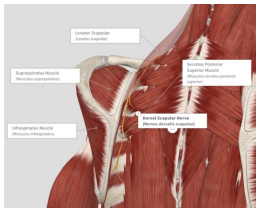
C. Anatomy '24 ipad application screenshot



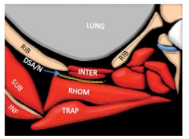


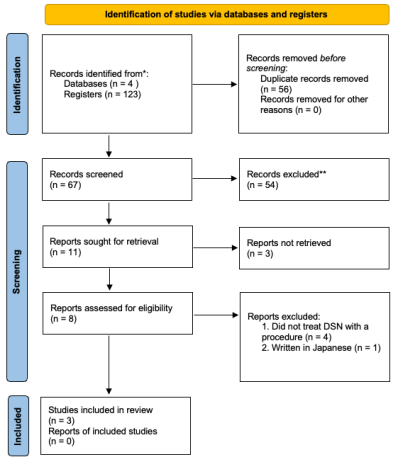
Fig.4 Schematic anatomy of the posterior chest wall showing the DSN, DSA, rhomboids (RHOM), intercostal muscles (INTER), subscapularis (SUB), infraspinatus (INF)

Sharma et al. 2021

Methods

This narrative review was conducted following a systematic approach to identify and evaluate relevant literature on dorsal scapular nerve entrapment.

Inclusion Criteria	Exclusion Criteria
Randomized Controlled Trials (RCTs), observational studies, case studies, or cohort studies. Systematic reviews and meta-analyses on the topic.	Letters to the editor, editorials, commentaries, conference abstracts, or any non-peer-reviewed publications.
Studies involving patients with scapular dyskinesia.	Studies involving patients without scapular dyskinesia or studies where scapular dyskinesia is not clearly diagnosed or defined.
Assessments or measurements of pain, range of motion, functionality, or any other relevant outcomes related to scapular dyskinesia	Studies not involving dorsal scapular nerve block or studies where this intervention is not clearly defined or detailed.
Dorsal scapular nerve block was performed	Studies that do not assess or measure relevant outcomes related to scapular dyskinesia or those lacking clear and relevant outcome measure.
Studies where the full text is available.	Paper is unavailable in English or French



Literature Search Strategy

1. **Databases Searched**: Scopus, Embase, Medline, and the Cochrane Library.

2. **Key words used**: "dorsal scapular nerve", "DSN block", "scapular dyskinesia", "periscapular pain"

3. **Search Period**: 1993 - 2023

4. **Additional Methods**: Manual search of references in identified articles.

Results

Study Reference	Patient Demographics	Treatment Administered	Methodology	Outcome Measures	Main Findings	Conclusion
Haim et al., 1993	50-year-old male with an 18-month history of semirhythmic contractions and severe thoracic discomfort	Dorsal scapular nerve block	Ultrasound-guided block with a nerve stimulator, using lidocaine and etidocaine with epinephrine	Reduction in intensity of semirhythmic contractions and pain	Successful nerve localization and block, resulting in 75-100% reduction in muscle contractions and pain	DSN block is a viable treatment for tremor/dystonia and pain, with careful consideration needed for the localization technique.
Yang et al, 2017	20 patients with interscapular pain	DSN block at the posterior tubercle of C5 (PTFCV)	Ultrasound-guided DSN block	Pain relief rate	Mean procedure duration was about 9 minutes; 40% could visualize DSN with ultrasound; 70.92% postoperative pain relief	Ultrasound-guided DSN block on PTFCV is feasible, safe, effective, and time-efficient
Sharma and Botchu, 2021	40-year-old male, painter and overhead sports player	Ultrasound-guided hydro dissection	Ultrasound evaluation and hydro dissection with lidocaine, dextrose, and triamcinolone	VAS pain score	Immediate and significant pain relief post-procedure with no scapular winging; pain-free at 16-week follow-up	Ultrasound-guided hydro dissection is an effective treatment for DSN entrapment, providing significant symptom resolution

Conclusion

- **DSN block and hydro-dissection seem to be viable options for the management of periscapular pain,** which is often refractory to conventional management.
- These techniques offer a minimally invasive alternative to surgical interventions, with a favorable risk-benefit profile.
- The successful use of ultrasound guidance in identifying anatomical landmarks, such as the PTFCV, is pivotal in enhancing the precision of these interventions.


Treacst, Springer 2016
Fig.32.11 Anterior injection of the dorsal scapular nerve at the level of the middle scalene (Image courtesy of Andrea Trescot, MD)

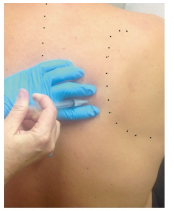

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Fig.32.12 Subscapular injection of the dorsal scapular nerve, with the shoulder rotated anteriorly ("Trescot approach") (Image courtesy of Andrea Trescot, MD)

- The variations in patient responses also raise questions about the pathophysiological underpinnings of periscapular pain—whether it is purely neuropathic, myogenic, or a complex interplay of both.
- Furthermore, the feasibility and safety profile of these interventions, as reported in the studies, suggest that they can be integrated into standard practice.
- Nonetheless, further research is warranted to establish standardized protocols, long-term outcomes, and the role of these treatments within the broader context of multidisciplinary care for periscapular pain.

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