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# Counterstrain technique for anterior and middle scalene tender point

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**Abstract:** When a patient presents with head, neck, or respiratory concerns, the scalene muscles are not commonly considered. However, somatic dysfunctions of the anterior/middle scalenes (AMS) can be contributing to or causing these medical concerns. Although tender points within the scalene muscles have been documented within the muscle belly, they have not been documented at the insertion site. This article details how to diagnose and treat an AMS tender point with an efficient technique that requires minimal exertion and maximal comfort for both the physician and patient at a new tender point location. This article also discusses the importance of this tender point and provides a list of additional somatic dysfunctions that may be used to problem-solve a scalene tender point that fails to correct.

**Keywords:** counterstrain; neck pain; respiratory/circulatory model; scalenes; tender point

The scalene muscles are not commonly considered when a patient presents with head, neck, or respiratory concerns. Because the scalene muscles originate on the transverse processes of C4–6 and insert on the superior aspect of the first rib [1], scalene dysfunctions can be described as neck pain, shoulder pain, headache, thoracic outlet syndrome (scalenus anticus syndrome), difficulty with deep breathing, pain on palpation of the first rib (such as when diagnosing the sidebending component of the thoracic inlet), and radiating neck pain [2]. By addressing the anterior and

middle scalene (AMS) muscles with counterstrain, which is regarded as a gentle and conservative treatment with research currently emerging in the literature [3, 4], we can improve motion of the cervical spine and first rib to reduce muscle tightness, enhance restricted breathing, and decrease pain that may be contributing to the presenting complaint.

Current literature for the treatment of the AMS tender point includes a supine counterstrain technique in which the tender point is found by pushing anterior to posterior on the muscle belly with the force directed medially, and the treatment position is maintained with both hands holding the head off the table [5]. However, before this article, there has been no literature to discuss the treatment of a tender point found at the insertion of the musculature. Utilizing this new tender point location and treatment approach, we can address this dysfunction in an efficient way that may be more comfortable for both the physician and patient. Additionally, the modified AMS tender point approach can be an adjunctive tool to treat thoracic inlet somatic dysfunctions.

## Clinical summary

In his book *Strain and Counterstrain*, Jones et al. [6] describes the basic principles of treating counterstrain. These involve identifying areas of tenderness related to specific muscles (tender points) and then monitoring that area of tenderness with a finger. Many beneficial changes can be seen with this technique, including reduced pain perception and reduced inflammation, greater local muscular strength, reduced fascial stiffness, and improved proprioceptive input [7]. Suggested mechanisms behind counterstrain include neurologic changes mediated via mechanoreceptors, Golgi tendons, and Ruffini corpuscles, proprioceptive relationships between antagonist muscles, and altering fibroblast activity to reduce localized inflammation [7]. The muscle of interest is then taken into its position of ease, which is accomplished by approximating the origin to the insertion. The physician should appreciate a softening of the monitored area, while the

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patient reports a 75–100 % reduction in tenderness. This position is held for a minimum of 90 seconds (s). Throughout the 90 s, the physician is monitoring the tender point for warmth or pulsation. Once 90 s have passed, the patient is brought back to a neutral position passively and the tender point is reassessed for decreased tenderness.

## Diagnosis

The AMS tender point is located on the superior aspect of the first rib at the AMS insertion site with the physician pushing caudally. This location is demonstrated in Figures 1 and 2 on a patient and on a skeleton, respectively. This tender point can be found with the patient lying supine, the physician seated at the head of the table, and with the physician placing the thumbs in line with the external auditory meatus until contact is made with the superior aspect of the first rib, anterior to the T1 transverse processes. This location is different from the originally documented tender point that was found with a force directed into the belly of the muscle and is a newly suggested location proposed by these authors found at the muscular insertion site (the superior aspect of the first rib). This tender point can often be identified when the physician is attempting to diagnose the sidebending component of the thoracic inlet, where the patient reports tenderness at the palpation site.

## Correcting the dysfunction

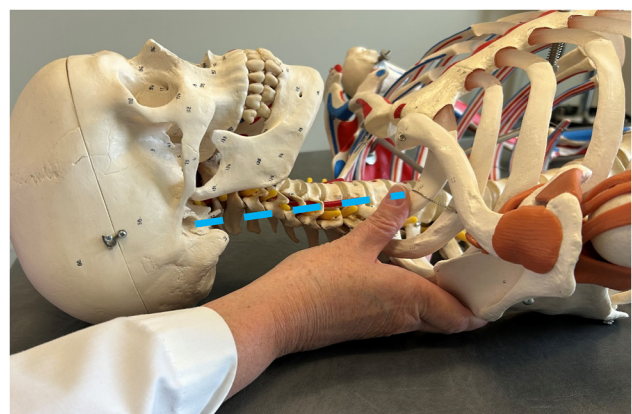
After obtaining informed consent, the patient is in a supine position with the physician seated at the head of the table. The physician's thumb is placed on the tender point location described above. If tenderness is appreciated, the patient's head is rolled onto the physician's forearm on the side of tenderness, bringing the head and neck into flexion, sidebending and rotating toward the side of dysfunction (Figure 3). The physician then reassesses for tenderness. If the tenderness is not 75–100 % improved, the physician can fine-tune for tissue softening, which may include sidebending toward and rotating away from the side of the dysfunction (Figure 4). The physician will keep the patient in this position of ease for at least 90 s, taking note of any tissue texture changes, increased tissue warmth, or tissue pulsation. The patient's head is returned passively to an anatomically neutral position.



**Figure 1:** The location of the AMS tender point, found on the superior surface of the first rib.

## Re-evaluation

The AMS tender point should have been monitored throughout the duration of treatment. Once the patient is passively returned to neutral, the tender point location



**Figure 2:** The location of the AMS tender point, found on the superior portion of the first rib, demonstrated on a skeleton. The blue dashed line demonstrates scalene insertion in relation to the external auditory meatus.



**Figure 3:** The head is passively rolled onto the physician's forearm, providing mild flexion, sidebending, and rotation toward the tender point, as indicated by the black arrows for treatment.



**Figure 4:** Fine-tuning for treatment may include rotation away from the tender point while maintaining mild flexion and sidebending toward the tender point, as indicated by the black arrows.

should be reassessed for tenderness through palpation. Improvement from baseline tenderness is expected to be 75–100 % for a successful treatment.

## Discussion

A benefit for this new AMS tender point location includes increased patient comfort during diagnosis because palpation is not required in the lateral aspect of the neck. This new location is also more efficient because it allows diagnosis to be found during routine thoracic inlet evaluation. It is notable that this tender point can be found on either side of the thoracic inlet and does not necessarily correlate to the elevated first rib (presumed to be held superiorly by a strain in the scalene musculature) associated with the inlet diagnosis. Furthermore, this treatment position is highly adaptable and can be performed in a variety of settings that may not have an osteopathic manipulative medicine (OMM) table. Although the initially documented scalene tender point treatment is also supine, per Myers et al. [5], the proposed position in this article requires less effort for the physician to maintain and allows for increased ease with patient relaxation. Finally, there is potential for improved respiration, as

well as enhanced arterial, venous, and lymphatic circulation, and diminished musculoskeletal discomfort, through its impact on the thoracic inlet and rib cage. Anecdotally, this tender point is found multiple times per day in an OMM specialty clinic setting when patients present with complaints such as neck pain, shoulder pain, and headache.

Counterstrain is a gentle technique, but not without contraindications. If patients are unable to follow directions, or experience radiculopathy or pain with the treatment position, the physician may consider utilizing other treatment modalities. There is the potential for posttreatment soreness, which can be mitigated with hydration and rest for 24–48 h after treatment [8].

There are many reasons why an AMS tender point may not resolve. Cervical dysfunctions may maintain AMS imbalances because they originate on the C4–C6 transverse processes [1]. Likewise, the scalene muscles are accessory muscles of respiration, so chronic respiratory conditions may also maintain scalene dysfunctions. A different treatment modality may be needed, such as high-velocity, low-amplitude (HVLA) to address bony dysfunctions or muscle energy to address muscle tightness. Alternatively, a different muscle may need to be addressed to correct the dysfunction (e.g., sternocleidomastoid, omohyoid, or upper trapezius).

## Conclusions

Addressing an AMS tender point impacts the body through the potential of improved respiration, as well as enhanced arterial, venous, and lymphatic circulation, and diminished musculoskeletal discomfort, through its impact on the thoracic inlet and rib cage. This technique has few contraindications, can easily be applied to supine patients, and applies minimal strain on the physician to maintain the treatment position.

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