TOS—An Introduction to the Evaluation and Treatment of Complex Neuromusculoskeletal Dysfunction with Manual and Craniosacral Therapy : Part II

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An Introduction to Treatment of Thoracic Outlet Syndrome with Manual and Craniosacral Therapy

In the case involving Thoracic Outlet Syndrome, treatment to address the neuromusculoskeletal dysfunction of the pelvis and trunk is required. Treatment which focuses solely on the tissues and structures in the thoracic outlet region will often not have lasting results. Manual therapy to normalize joint mobility, muscle tone, and connective tissue flexibility of the pelvis, lumbar, thoracic, cervical, and rib cage regions is often necessary to completely resolve the signs and symptoms of TOS. For example, utilization of muscle energy techniques to correct dysfunction of the pelvis and trunk can often restore postural symmetry; elimination of pelvic obliquity and shoulder girdle obliquity is a goal. The tissue tension secondary to changes in functional anatomy, which is the result of postural asymmetry in the shoulder girdle region such as a protracted shoulder girdle, can compromise the brachial plexus.

In areas of postural asymmetry, articular balance is compromised and joint mobility and physiologic ranges of motion are limited. Compromise of normal mobility of proximal body areas will result in decreased ranges of motion of the cervical spine, rib cage and shoulder girdle, which contribute to the tissue tension patterns of TOS.

These authors have discovered that even chronic and severe TOS can often be resolved with comprehensive manual therapy, which is dysfunction specific. This introduction will present integration of four manual therapy approaches which, when combined, address the increased tissue tension and hypomobility which typically compromises the brachial plexus. They are: *strain and counterstrain technique, myofascial release technique, craniosacral therapy, and visceral manipulation.*

Strain and counterstrain technique, developed by Lawrence Jones, D.O., is an approach to normalize abnormal neuromuscular physiology. Through the arrest and reduction of inappropriate proprioceptor activity, muscle fiber relaxation and elongation is achieved with this technique resulting in improved articular balance and increased ranges of motion. If the scaleni muscles are hypertonic and therefore the muscle fibers at rest are functionally shortened, as described in Part I of this article, counterstrain techniques would result in relaxation and elongation of these fibers, thus; 1) decreasing their compression of the brachial plexus, 2) increasing mobility of the cervical intervertebral joints to decrease compression of the cervical nerve roots, and 3) releasing the superior pull on the first rib to increase the costoclavicular joint space.

Myofascial release techniques, well documented in osteopathic literature, address dysfunction in the continuous, contiguous system of the connective tissue. This approach results in increased flexibility of the soft tissues. The infiltration and increase of connective tissue in the scaleni as found in traumatic TOS can be addressed with myofascial release.

Craniosacral therapy, developed by John Upledger, D.O., affects the tension of the dura mater, including the compromise of the dural sheath surrounding the nerve roots. Utilization of craniosacral therapy can decrease the tension of the cervical and upper thoracic nerve roots, compromised at the intervertebral foramina, a common clinical finding in TOS.

Visceral manipulation, developed by Jean Pierre Barral, D.O., can address areas of dysfunction and fascial restrictions within the chest cavity. Utilization of visceral manipulation can restore mobility to the pleura and pleural dome, which may be affecting the thoracic inlet and the costoclavicular joint space.

Recommendations: dysfunction specific treatment plans for Thoracic Outlet Syndrome

A. Treatment to decrease compromise of cervical and upper thoracic nerve roots.

1. Craniosacral therapy: The Upledger 10-step protocol. The techniques include: transverse fascial releases to decrease diaphragm tissue tension; lumbosacral junction decompression; suboccipital decompression; frontal list; parietal lift; sphenobasilar compression and decompression; temporal mobilization; temporomandibular joint compression and decompression; and dural stretch; CV4. These techniques are described in *Craniosacral Therapy* by John Upledger, D.O. and Jon Vredevoode.

B. Treatment to decrease compression of the brachial plexus between the middle and anterior scalene muscles may include:

1. Strain/counterstrain technique for the lower anterior cervical tender points. (Pgs. 51-53, *Strain and Counterstrain,* Lawrence Jones, D.O.)

2. Strain/counterstrain technique for the lateral cervical tender points. (Pg. 53 *Strain and Counterstrain,* Lawrence Jones, D.O.)

3. Strain/counterstrain technique for an elevated first rib. (Pg. 63, *Strain and Counterstrain,* Lawrence Jones, D.O.)

4. Myofascial release to the middle cervical fascia. (Continuing education courses which teach different approaches to myofascial release are sponsored by: Ursa Foundation, Upledger Institute: Barnes MFR Seminars, Travell, Diologues in Contemporary Rehabilitation, etc.)

C. Treatment to decrease compression of the brachial plexus within the costoclavicular joint can include:

1. Strain/counterstrain technique for the anterior first thoracic tender point located on the sternal notch. (Pg. 57, *Strain and Counterstrain*, Lawrence Jones, D.O.)

2. Strain/counterstrain technique for the anterior C7 and C8 tender points located on the proximal clavicle. (Pg. 53, *Strain and Counterstrain*, Lawrence Jones, D.O.)

3. Strain/counterstrain technique for the anterior and posterior acromioclavicular joint tender points. (Pgs. 78-79. Pg. 83. *Strain and Counterstrain*, Lawrence Jones, D.O.)

4. Strain/counterstrain technique for an elevated first rib tender point. (Pg. 63, *Strain and Counterstrain*, Lawrence Jones, D.O.)

5. When compression of the neurovascular bundle is further compromised by restrictions of the pleura and pleural dome, then the following should be added: Visceral manipulation of the anterior cervical fascial fibers which attach at the pleural dome, and visceral manipulation to the pleural dome. (Chapter 2, *Visceral Manipulation*, Jean-Pierre Barral, D.O.)

6. Visceral manipulation for the first costoclavicular ligament, the ligaments inserting on the coracoid process (cunoid, trapezoid, acromiocoracoid), the suspensory ligaments and the subclavius muscle. (Chapter 2, *Visceral Manipulation*, Jean-Pierre Barral, D.O.)

(*Note:* Myofascial release or specific mobilizations can be substituted for #6.)

D. Treatment of the brachial plexus compression beneath the pectoralis minor can include:

1. Strain/counterstrain technique for depressed first and second rib tender points. (Pg. 64, *Strain and Counterstrain*, Lawrence Jones, D.O.)

2. Strain/counterstrain technique for depressed third rib tender point. (Pg. 64, *Strain and Counterstrain*, Lawrence Jones, D.O.)

3. Myofascial release to the clavipectoral fascia. (Myofascial release can be learned in continuing education courses.)

If implementation of this treatment plan is successful, the specific neuromusculoskeletal dysfunction (which was evidenced by positive results of above described tests) will be corrected. There should be a significant decrease in the elicitation and reproduction of signs and symptoms upon repetition of those same tests. There should be a general improvement in postural symmetry of the shoulder girdle, e.g., a decrease in the severity of the protraction of the shoulder girdle. There should be improved articular balance and joint mobility, increased muscle fiber relaxation and elongation, and increased soft tissue flexibility throughout the thoracic outlet and shoulder girdle region. Often a residual component of the neuromusculoskeletal dysfunction in the thoracic outlet region is an anteriorly displaced humeral head, with a tight anterior glenohumeral joint capsule and hypomobility of posterior glide of the humeral head in the glenoid fossa. Treatment for normalization of glenohumeral joint mobility on this plane and improved articular balance can include:

1. Strain/counterstrain technique for the subscapularis tender point. (Pg. 81. *Strain and Counterstrain*, Lawrence Jones, D.O.)

2. Strain/counterstrain technique for the latissimus dorsi tender point. (Pg. 80. *Strain and Counterstrain*, Lawrence Jones, D.O.)

3. Articular myofascial release and mobilization for the glenohumeral joint. (Myofascial release and mobilization techniques are taught at continuing education courses by sponsors mentioned above.)

4. Articular myofascial release and mobilization for the scapulothoracic joint.

The above recommended treatment plans may require a few repetitions with cumulative improvement after each treatment session. This comprehensive and integrated approach utilizing manual and craniosacral therapy has facilitated an effective and efficient recovery process for many Thoracic Outlet Syndrome patients.

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