

CASE REVIEW: A CLINICIAN'S PERSPECTIVE**Benefits of Thoracic Extension Procedures with a Stubborn Cervical Derangement***Kimberly Greene, PT, Dip. MDT*

With lots of research supporting manual therapy applied to the thoracic spine for neck pain and radiculopathy^{1,2,3}, the MDT thoracic procedures can be beneficial when cervical procedures have provided minimal or no improvement. This case report supports implementation of thoracic procedures with a patient that displays signs and symptoms consistent with left C5/6 radiculopathy. At initial assessment, sitting erect with a lumbar roll caused a worsening of forearm symptoms. Any attempt at implementing cervical extension peripheralised symptoms to his left forearm. The patient's mechanics and symptoms improved using left lateral flexion with patient overpressure as long as the patient was sitting in a slightly protruded position. The patient was sent home with left lateral flexion techniques on Day 1.

The next two visits were attempts to integrate extension procedures, but symptoms peripheralised and patient continued with left lateral flexion procedures. On the third visit, the patient was able to sit erect without peripheral symptoms. Repeated left rotation was assessed, but resulted in symptoms peripheralising to the forearm. Repeated right rotation had no effect on symptoms. With no improvement from any other cervical procedures, the patient continued with left lateral flexion + OP with force progressions.

On the fourth visit, the patient was still unable to tolerate cervical extension, left rotation or flexion. The patient reported only minimal improvement (10%) and left lateral flexion was the only cervical procedure that provided any reductive ability. On the fourth visit, thoracic extension procedures were assessed, which resulted in improvement of his symptoms and cervical motion. The patient performed force progressions using a chair for overpressure followed by thoracic extension with clinician overpressure. While the thoracic procedures did not fully reduce the cervical obstruction, it did improve motion and symptoms to warrant the use of thoracic procedures.

For the next two weeks, the follow-up visits consisted of thoracic extension in sitting with clinician overpressure of the upper thoracic spine. During those two weeks, the patient was unable to tolerate thoracic mobilizations or cervical extension/rotation procedures without peripheralising symptoms. On week five, however, the patient was able to tolerate thoracic extension mobilization in sitting without peripheralising symptoms demonstrating further reduction of the obstruction. To emphasize upper thoracic extension, the hand placement for clinician overpressure and mobilization is more proximal (T2/T3) than what is mentioned in McKenzie's cervical and thoracic text¹. After implementing thoracic procedures for three weeks, the patient reported an overall 70% improvement.

At week six, the patient was able to rotate his head to the left with only neck pain and no peripheral symptoms. Since the patient still displayed a slight loss of left rotation and plateaued with thoracic extension techniques, cervical techniques were reassessed. The patient was still unable to tolerate repeated cervical extension without the worsening of left arm pain indicating a need to assess lateral cervical procedures. Left cervical rotation provided more symptomatic improvement than left lateral flexion. Hence, the patient was sent home with left cervical rotation with overpressure. The patient continued for two weeks using repeated left cervical rotation with overpressure and force progressions. Finally, at week eight, the patient was able to incorporate cervical extension without arm or forearm symptoms to fully reduce the cervical derangement.

In summary, this patient's clinical presentation could have easily been misclassified in the "OTHER" category as a mechanically unresponsive radiculopathy since cervical extension consistently worsened and peripheralised symptoms. However, thoracic procedures must be assessed if baselines worsen or plateau with cervical techniques. Often, thoracic procedures can be effective in the initial reduction of cervical radiculopathy. Importantly, however, with derangements of the cervical spine, cervical extension procedures will ultimately be required to fully reduce the derangement. The thoracic procedures are a possible treatment option as long as there is improved symptomatic and mechanical change associated with the procedures. Manual techniques are required if symptoms do not remain better with patient generated forces and occasionally have to be implemented for several weeks.

The McKenzie Institute International has created a library of procedural videos designed to assist clinicians at various levels of MDT training. The videos are presented progressively respective to a clinician's level of training. Thoracic procedures are introduced in the Part B and Part D curriculums. These videos are extremely beneficial when trying to master a skill after the course and are essential when studying for the Credentialing or Diploma Exams. **To gain access to the procedure videos, please consult with your home branch, or MII head office for countries without an Institute branch.**

The following two videos highlight thoracic extension in sitting with clinician overpressure and thoracic extension in sitting mobilizations. The suggestions are beneficial when implementing these thoracic procedures:

Video: Thoracic Extension in Sitting with Clinician OP

1. Patient position: Patient sits erect and maintains lumbar lordosis. Patient's shoulders are in flexion with hands supporting cervical spine. The patient lifts the elbows up as far as possible.
2. Therapist position: One hand is on the spinous process of mid-thoracic spine and the opposite arm is cradling patient's arms near elbows to facilitate upward motion of elbows.
3. Force Application: Heel of hand applies posterior-anterior through thoracic spine while the opposite hand applies upward pressure through elbows. Equal force through thoracic spine and distal arm near elbows. Force is applied slowly and equally at end-range while fully releasing through range of motion for each repetition.

Video: Thoracic Extension Mobilizations in Sitting

1. Patient position: Patient sits erect and maintains lumbar lordosis. Patient's shoulders are in flexion with hands supporting cervical spine. The patient lifts the elbows up as far as possible.
2. Therapist position: One hand is on spinous process of mid-thoracic spine and the opposite arm lifts the patient's distal arms near elbows passively until mid-thoracic spine at end-range.
3. Force application: Heel of mobilizing hand applies posterior-anterior pressure through thoracic spine while the opposite hand applies constant upward lift through elbows. The heel of mobilizing hand applies slow gradual increase of force through thoracic spine at end-range while releasing with each repetition working further into range of motion.

After viewing the two videos recommended above, consider the following mistakes which are commonly noted with Thoracic Techniques in Sitting:

1. Patient in a position of slouched sitting preventing thoracic spine from attaining end-range.
2. Depending on height of patient, therapist may need to bend knees and crouch down to allow for appropriate force application.
3. Patient's shoulders positioned in more horizontal abduction rather than flexion allowing for more motion at shoulders than thoracic spine
4. Stay close to patient so that the forearm and heel of hand can apply force posterior-anteriorly. If too far away from patient, the line of drive will be asymmetrical allowing more frontal plane movement.

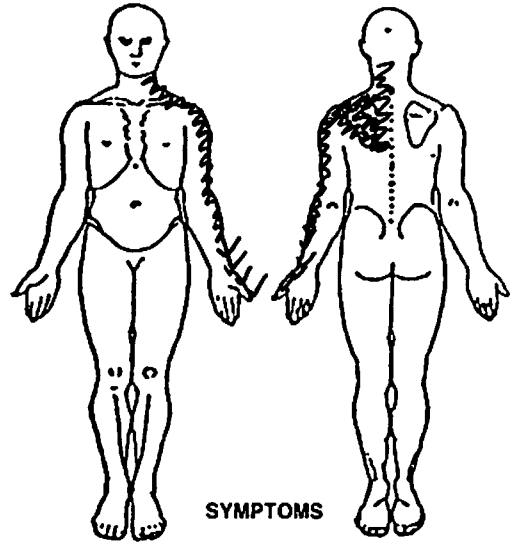
References:

1. Cleland JA, Childs JD, McRae M, Palmer JA, Stowell T. (2005). Immediate effects of thoracic manipulation in patients with neck pain: a randomized clinical trial. *Manual Therapy*;10(2):127-135
2. Cleland JA, Glynn P, Whitman JM, Eberhart SL, MacDonald C, Childs JD. (2007). Short-term effects of thrust versus nonthrust mobilization/manipulation directed at the thoracic spine in patients with neck pain: a randomized clinical trial. *Physical Therapy*;87(4):431-440
3. Ragonese J. (2009). A randomized trial comparing manual physical therapy to therapeutic exercises, to a combination of therapies, for the treatment of cervical radiculopathy. *Orthopaedic Physical Therapy Practice* 2009;21(3):71-76
4. McKenzie RA, May S. (2006). The Cervical & Thoracic Spine Mechanical Diagnosis and Therapy. 2nd ed. Waikanae, NZ: *Spinal Publications*



THE MCKENZIE INSTITUTE CERVICAL SPINE ASSESSMENT

Date _____
 Name Mr. Thoracic Sex Male
 Address _____
 Telephone _____
 Date of Birth _____ Age 51
 Referral: GP / Orth / Self / Other neurosurgeon
 Work: Mechanical stresses Sitting 8-10 hours/day
 Leisure: Mechanical Stresses Biking 3-4 times/week
 Functional Disability from present episode Walking, standing and biking
 Functional Disability score _____
 VAS Score (0-10) 4/10-8/10



HISTORY

Present Symptoms Left neck and arm
 Present since 8 weeks Improving / Unchanging / Worsening
 Commenced as a result of biking Or no apparent reason
 Symptoms at onset neck / arm / forearm / headache
 Constant symptoms neck / arm / forearm / headache Intermittent symptoms: neck / arm / forearm / headache
 Worse bending sitting turning L forearm lying / rising
 a/m / as the day progresses / p/m when still / on the move
 other walking, standing and biking
 Better bending sitting turning lying
 a/m / as the day progresses / p/m when still / on the move
 other cervical traction, steroids
 Disturbed Sleep Yes No Pillows _____
 Sleeping postures Prone / sup / side R / L Surface Firm / soft / sag
 Previous Episodes 0 1-5 6-10 11+ Year of first episode _____
 Previous History x5 episodes with neck only; fully resolved with cervical traction

Previous Treatments None

SPECIFIC QUESTIONS

Dizziness / tinnitus / nausea / swallowing / +ve -ve Gait / Upper Limbs: normal / abnormal
 Medications: Nil / NSAIDS / Analg / Steroids / Anticoag / Other steroids (x2 days)
 General Health: Good / Fair / Poor
 Imaging: Yes / No MRI C5/6 HNP
 Recent or major surgery: Yes / No Night Pain: Yes / No
 Accidents: Yes / No Unexplained weight loss: Yes / No
 Other: _____

EXAMINATION

POSTURE

Sitting: Good / Fair / **(Poor)** Standing: Good / Fair / **(Poor)** Protruded Head: **(Yes)** / No Wry Neck: Right / Left **(Nil)**
 Correction of Posture: Better / **(Worse)** / No effect **Prod L Forearm** Relevant: Yes **(No)**
 Other Observations: _____

NEUROLOGICAL

Motor Deficit NAD Reflexes NAD
 Sensory Deficit C5/6 paraesthesia Dural Signs + left Elvys

MOVEMENT LOSS	Maj	Mod	Min	Nil	Pain
Protrusion			X		nil
Flexion			X		left forearm
Retraction	X				left forearm
Extension	X				left forearm

	Maj	Mod	Min	Nil	Pain
Lateral flexion R		X			nil
Lateral flexion L	X				left forearm
Rotation R		X			nil
Rotation L	X				left forearm

TEST MOVEMENTS Describe effect on present pain – During: produces, abolishes, increases, decreases, no effect, centralising, peripheralising. After: better, worse, no better, no worse, no effect, centralised, peripheralised.

	Symptoms During Testing	Symptoms After Testing	Mechanical Response		
			↑Rom	↓Rom	No Effect
	Pretest symptoms sitting: (L) neck, arm				
	PRO				
	Rep PRO				
①	RET x 1 increase left arm				
	Rep RET x 6 peripheralised left forearm				
	RET EXT				
	Rep RET EXT				
	Pretest symptoms lying: (L) neck, arm				
②	RET x 1 increase left arm				
	Rep RET x 6 peripheralised left forearm				
	RET EXT				
	Rep RET EXT				
	If required pretest pain sitting: (L) neck, arm				
	LF - R				
	Rep LF - R				
③	LF - L x 1				
	Rep LF - L 3 x 10 decrease arm NB (L) Rep left LF + OP 3 x 10 decrease arm B				
	ROT - R				
	Rep ROT - R				
	ROT - L				
	Rep ROT - L				
	FLEX				
	Rep FLEX				

STATIC TESTS

Protrusion _____ Flexion _____
 Retraction _____ Extension: sitting / prone / supine _____

OTHER TESTS

PROVISIONAL CLASSIFICATION

Derangement _____ Dysfunction _____ Postural _____ Other _____
 Derangement: Pain Location _____ Derangement: asymmetrical below elbow _____

PRINCIPLE OF MANAGEMENT

Education: _____ Equipment Provided: _____
 Mechanical Therapy: **(Yes)** / No Lateral Principle
 Extension Principle: _____ Lateral Principle: Rep Left LF + OP q 2 hours
 Flexion Principle: _____ Other: _____
 Treatment Goals: 1. Return to biking for exercise 2. Walking and standing without left arm pain and paraesthesias