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\textsuperscript{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 text\textsuperscript{1}. 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:

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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
am / as the day progresses / pm
other walking, standing and biking
Bottor bending, sitting
am / as the day progresses / pm
other cervical traction, steroids
Disturbed Sleep Yes / No
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: 

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### EXAMINATION

**POSTURE**
- Sitting: Good / Fair / Poor
- Standing: Good / Fair / Poor
- Protruded Head: Yes / No
- Wry Neck: Right / Left
- Correlation of Posture: Better / Worse / No effect
- Relevant: Yes / No
- Other Observations:

**NEUROLOGICAL**
- Motor Deficit: NAD
- Sensory Deficit: C5/6 paraesthesia
- Reflexes: NAD
- Dural Signs: + left Elvys

### MOVEMENT LOSS

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<thead>
<tr>
<th>Movement</th>
<th>Maj</th>
<th>Mod</th>
<th>Min</th>
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<tr>
<td>Extension</td>
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<td>left forearm</td>
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**Lateral Flexion**
- Lateral flexion R: X
- Lateral flexion L: X
- Rotation R: X
- Rotation L: X

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

<table>
<thead>
<tr>
<th>Pretest Symptoms Sitting</th>
<th>Symptoms During Testing</th>
<th>Symptoms After Testing</th>
<th>Mechanical Response</th>
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<tr>
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<td>Ret PRO</td>
<td>x 1 increase left arm</td>
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<td>Ret RET</td>
<td>x 6 peripheralised left forearm</td>
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<td>Ret EXT</td>
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<td>Rep Ret EXT</td>
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**Pretest Symptoms Lying**
- Lateral flexion
- Rotation

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**If required pretest pain sitting:**
- Lateral flexion
- Rotation
- Flexion

**STATIC TESTS**
- Protrusion
- Retraction
- Extension: sitting / prone / supine

**OTHER TESTS**

### PROVISIONAL CLASSIFICATION
- Derangement: Pain Location
- Derangement: asymmetrical below elbow

### PRINCIPLE OF MANAGEMENT
- Education:
- Mechanical Therapy: Yes / No
- Extension 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 paraesthesia

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