

Overcompensated Cervical Syndrome (O.C.S.): Two Case Reports Supporting the Thompson Technique Protocol

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ABSTRACT: *Introduction:* This paper describes the identification and management of Overcompensated Cervical Syndrome (OCS) in 2 patients presenting to a chiropractic teaching facility. OCS was first described by Thompson, developer of the Thompson Technique, and is characterized by neck pain and hypomobility, taut and tender trapezius, tender 1st rib, and spinous rotation of C2-C7. *Clinical Features: Case #1:* A 22-year-old woman presented with neck pain and stiffness, headaches and disturbed sleep following a motor vehicle accident. Examination revealed the presence of the indicators of OCS. Five adjustments were delivered over 9 weeks, and the patient reported complete resolution of initial symptoms. *Case #2:* A 36-year-old woman presented with neck and mid-back pain and headaches. Examination also revealed the presence of the indicators of OCS. After 11 adjustments over 12 weeks, her mid-back pain persisted, however OCS signs and symptoms resolved completely. *Discussion:* This case series illustrates the management of 2 patients presenting with neck pain and other signs and symptoms of what Thompson described as OCS. Despite being first outlined nearly 30 years ago, no account of it exists in the peer-reviewed literature. Practical experience has shown that OCS often follows an injury to the neck, such as an MVA (Motor Vehicle Accident), and may be diagnosed as cervical dystonia or torticollis. Since Thompson theorized that adjusting the 1st rib would alleviate the signs and symptoms of OCS, it is speculated that this adjustment normalizes neuromechanical dysfunction of cervical musculature, particularly the trapezius. *Summary:* This retrospective case series describes the management of 2 cases of OCS using Thompson Technique chiropractic adjustments. Caution is urged when drawing definitive conclusions from these results or when generalizing to other patients.

Index Terms: CHIROPRACTIC; CERVICAL DYSTONIA; TORTICOLLIS; PAIN, NECK; ALTERNATIVE THERAPIES; COMPLEMENTARY MEDICINE; MANIPULATION, CHIROPRACTIC.

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Introduction

Overcompensated Cervical Syndrome (OCS) is a condition first described by J. Clay Thompson, developer of the Thompson Technique, a chiropractic system of adjusting that utilises drop-piece tables.¹ Thompson noted that when

patients presented with non-resolving or recurring neck pain, there was often multiple spinous process (SP) deviation toward the painful side with an associated ipsilateral taut and tender trapezius muscle.¹ On the cervical anteroposterior (AP) radiographs of these patients, Thompson noticed a marked deviation of the C2-7 SPs, with progressively diminishing deviation from C3 to C7.^{1,2} Thompson described OCS as a global fixation usually induced by some kind of a trauma, such as a cervical acceleration-deceleration injury from a MVA.^{1,2} Hyman proposed that a T1 rib subluxation contralateral to the spinous process laterality caused a contracture in the upper trapezius muscle.² He also proposed “The overcompensation of the cervical spine has occurred as a result of disturbance in the neurological control (ipsilateral and contralateral fibers), from the brain cell to the tissue cell (trapezius muscle).”²

In cases of OCS, Thompson¹ suggests the correction involves checking for a contralateral first rib subluxation, and after correction, a reduction of trapezius tension and tenderness is often noted immediately. See Figure 1 for a summary of OCS signs and symptoms.

Neck pain is extremely common following a MVA, with over 60% of MVA victims reporting neck pain within days of the accident,³⁻⁶ and approximately half reporting continued discomfort after 1-2 years.^{6,7} It is clear that left untreated,

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neck pain after MVA can have a substantial impact on future recurring neck pain and associated disability. In addition, muscle and fascial pain is common following whiplash.⁸ It has been found that although muscle injury may not be directly responsible for pain following whiplash, it may play an indirect part in post-whiplash pain.⁸ Therefore, it is speculated that following a traumatic neck injury, neck musculature becomes hypertonic, causing global fixations of the zygapophyseal joints and subluxating the contralateral first rib.

Despite the current evidence being weak, there is some substantiation for chiropractic manipulation improving neck pain and cervical range of motion.⁹⁻¹³ The aim of this paper is to describe two cases of patients presenting with OCS symptomatology, patient management and the outcomes of the intervention. The reporting of this case series may urge practitioners to consider a finding of this proposed syndrome (OCS) when these signs and symptoms are present. In addition, this paper may encourage researchers to further investigate the theoretical condition of OCS and to compare the effectiveness of Thompson Technique with other manipulative techniques.

Figure 1

SIGNS AND SYMPTOMS OF OVERCOMPENSATED CERVICAL SYNDROME (OCS)	
<i>History</i>	Non-resolving or recurring neck pain Difficulty turning to one or both sides (often present)
<i>Physical Examination</i>	Multiple cervical SP rotation to the painful side Taut and tender ipsilateral trapezius muscle Tender and/or subluxated contralateral 1 st rib
<i>Radiographic Examination</i>	Marked deviation of the axis SP toward painful side Remaining cervical SPs deviating ipsilaterally Progressively diminishing SP deviation from C3 to C7

CASE REPORTS

Outlined below are the case histories, physical and radiological exam findings, treatment plans and outcomes for 2 cases of OCS. The local Institutional Review Board approved this study and written informed consent was obtained from both patients.

Case # 1

A 22-year-old woman presented for chiropractic care for neck and shoulder pain following a MVA 3 days before. Since the accident she experienced constant neck pain radiating to the left shoulder exacerbated by movement of the cervical spine. On presentation, the patient completed a quadruple visual analogue scale (QVAS) and the Neck Disability Index (NDI). The QVAS is a self-report ranking of (1) Present pain, (2) Typical or Average pain, (3) Pain at its best, and (4) Pain at its worst, where respondents rank their pain from 0 (“No pain”) to 10 (“worst pain possible”). Despite little research supporting the temporal facets of the QVAS (2-4),

visual analogue scales in general have been found to be valid instruments of pain intensity,¹⁴ and sensitive to treatment effects.¹⁵ In addition, memory of pain intensities have been found to be accurate, especially in patients with neck pain,¹⁶ therefore, the QVAS appears to be a valuable tool for pain assessment. The NDI is a 10-question questionnaire aimed at understanding how a patient’s neck pain has impacted his everyday life (*e.g.* personal care, lifting, concentration, *etc.*).¹⁷ Respondents rate their disability on an ordinal scale from 0 (low) to 5 (high), with a maximum score of 50, and usually reported as a percent (%).^{17, 18} Although it has been shown that the NDI does not capture the full spectrum of disability following a whiplash-type injury,¹⁹ it does demonstrate good test-retest reliability,^{17,18,20} high internal consistency^{17,18,20,21} and good concurrent validity.^{17,20}

On the QVAS at intake, this patient reported that her typical pain was 5, current pain was 4, and the pain at its best was 1 and worst, 7. On the initial NDI, the patient scored a 9/50 (or 18%), and reported initially that at presentation she had moderate neck pain, moderate infrequent headaches, and her sleep had been slightly disturbed since the accident. In addition to the QVAS, the patient completed a Numeric Pain Rating Scale (NPRS) at the beginning of each visit. NPRS scores each visit are outlined in Table 1.

During the physical exam, the following significant results were found: maximal foraminal encroachment (left) and shoulder depression test (right) both elicited pain. In addition, the patient exhibited normal, but painful, cervical active ranges of motion, with pain in flexion, extension and bilateral lateral flexion. During the postural exam, a high left shoulder and forward head posture were found. In addition, palpation revealed tenderness in the neck bilaterally and along the left trapezius, and hypertonic musculature bilaterally at the cervicothoracic junction. All other orthopedic and neurological testing was normal, including: upper extremity motor testing revealed scores of 5/5 bilaterally for shoulder abductors, elbow flexors, wrist extensors and flexors, finger extensors and flexors, and hand intrinsic; deep tendon reflexes were +2 bilaterally for the biceps, brachioradialis and triceps reflexes; C5 to T1 dermatomal testing was unremarkable; Jackson’s Compression, and Cervical Distraction Tests revealed no significant findings. In addition, vital signs were recorded and found to be within normal limits: height 1.64 meters, 58.5 kg, Body Mass Index (BMI) 21.8, heart rate 66 beats/minute, respiratory rate 18/minute, normotensive, and body temperature 98.2°F.

A radiographic examination of the cervical spine was performed, with anteroposterior (AP), AP open-mouth (APOM), neutral lateral, and posterior oblique views were taken. On the APOM and AP radiograph, marked left deviations of the SPs of C2 and C3 to C7 (respectively) were noted (Figure 2). In addition, the patient brought a CT scan of the cervical spine with her on presentation, which ruled out facet dislocation and other bone and joint pathologies.

This case was then reviewed, diagnoses made and a treatment plan recommended. The International Classification of Diseases (ICD-9) diagnostic codes for this case are outlined in Table 2. The mechanism of the injury and the clinical presentation made this patient a good candidate for

Table 1

ICD-9 DIAGNOSTIC CADES OUTLINED BY CASE

CASE # 11	CASE # 2	ICD-9 CODES	DESCRIPTION
√		728.85	Spasm of muscle
√	√	729.1	Myalgia and myositis, unspecified
√	√	739.1	Nonallopathic lesion, cervical region
√	√	739.2	Nonallopathic lesion, thoracic region
√	√	739.8	Nonallopathic lesions, rib cage
√		847.0	Sprain of neck

ICD, International Classification of Diseases

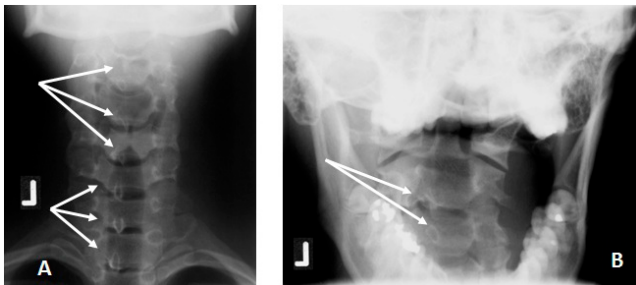


Figure 2 – Case #1 Plain Film Radiographs. A. AP Cervical. Marked spinous process (SP) deviation to the left. B. APOM. Marked deviation of C2 spinous process to the left. (Arrows indicate SP deviation.)



Figure 3 – Thompson Technique protocol, setup for the 1st rib adjustment

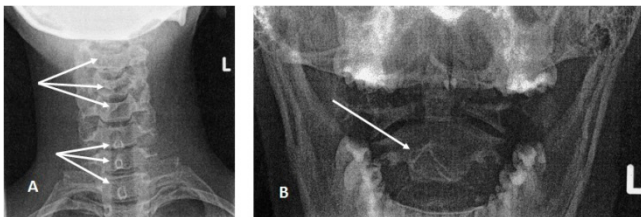


Figure 4 – Case #2 Plain Film Radiographs. A. AP Cervical. Marked spinous process deviation to the right. B. APOM. Marked deviation of C2 spinous process to the right. (Arrows indicate SP deviation.)

Table 2

NPRS FOR EACH CASE BY WEEK		
NPRS Score (Neck Pain)		
WEEK #	CASE 1	CASE 2
1	4	2
2	*	1
3	2	2
4	1	2
5	*	3
6	0	*
7	0	3
8	0	3
9	‡	2
10	-	2
11	-	2
12	-	0

Patients were asked to rate their neck pain on a scale of 0 to 10, with 10 being the highest.

NPRS, Numeric Pain Rating Scale; *No patient visit this week; ‡Patient was discharged after week 8

chiropractic care. It was the marked deviation of SPs seen on the radiographs, the painful cervical range of motion, the tender left trapezius which led the investigators to the identification of OCS, and to consider the Thompson treatment protocol. It was at this time that a right first rib subluxation was also identified by palpation. Treatment consisted only of Thompson Technique chiropractic adjustments primarily of the right first rib, but also of spinal segments as indicated on the day. For OCS cases, the Thompson adjustment for the 1st rib (right in this case) is performed by turning the prone patient's head to the side of spinous deviation (left in this case), thus pushing the spinous processes in the direction of correction (restoring proper biomechanics).² The 1st rib is adjusted using a spring-loaded drop mechanism, with the contact made on the superiolateral aspect of the first rib and with a line of drive superior-to-inferior and slight posterior to anterior. See Figure 3 for pictorial views of the adjustment setup. It is believed that this action will traction the contralateral trapezius and by default pull the spinous processes in the proper direction.

Treatment frequency was 6 adjustments over an 8-week period. The patient reported significant immediate relief after the first adjustment, and continued to improve until discharge following the 6th adjustment.

Case # 2

In the second case, a 36-year-old woman presented for chiropractic care for neck/mid-back pain and migraine headaches. The neck/mid-back pain was intermittent and of 4 years' duration. For this complaint, she reported having had previous chiropractic care, osteopathic care, acupuncture and massage, all giving her a degree of temporary relief. The patient also reported having had migraine headaches with photo- and phonophobia for the previous 15 years. Nothing gave her lasting relief, although Aleve® (Naproxen, Bayer Healthcare LLC, Morristown, NJ), a nonsteroidal anti-inflammatory drug (NSAID), gave her temporary relief. In addition, she reported having had three MVAs, all head on collisions, over the previous 15 years, with the last one being 5 years before presentation.

This patient also completed a QVAS for the neck pain, mid-back pain and migraine headaches, an NDI, and a Revised Oswestry Back Pain Disability Questionnaire (ROBPDQ) for the mid-back pain. On the NDI, the patient scored a 9/50 (or 18%), and initially reported that she had moderate neck pain, moderate infrequent headaches, and her sleep has been slightly disturbed since the accident.

During the physical exam, right and left cervical lateral flexions were marginally reduced (38° right and 40° left), however all other cervical ranges of motion were within normal limits. During the postural exam, a high left shoulder and forward head posture were also found. Also, palpation revealed hypomobility and tenderness on the right from C2 to T3, tautness of both trapezius muscles (worse on the right) and pain on palpation of the left 1st rib. In addition, testing of the upper extremity dermatomes revealed loss of pain sensation in the T1 dermatome on the right, while all other dermatomal testing were unremarkable. All other physical exam findings were within normal limits, including: upper extremity motor testing revealed scores of 5/5 bilaterally for

shoulder abductors, elbow flexors, wrist extensors and flexors, finger extensors and flexors, and hand intrinsic; deep tendon reflexes were +2 bilaterally for the biceps, brachioradialis and triceps reflexes; Maximal Foraminal Compression, Jackson's Compression, Shoulder Depression and Cervical Distraction Tests revealed no significant findings. In addition, vital signs were recorded and found to be within normal limits: height 1.55 meters, 49.0 kg, BMI 20.4, heart rate 60 beats/minute, respiratory rate 16/minute, normotensive, and body temperature 98.0°F.

A radiographic examination of the cervical spine which included these views: anteroposterior (AP), AP open-mouth (APOM), and neutral lateral. On the AP radiograph, marked axis SP deviation to the right was noted, with the remaining cervical SPs also displaying moderate deviation to the right. In addition, mild arthritic changes were found on C4-C7 endplates and C5-C7 facet and uncinatate joints. The cervical AP and APOM radiographs for this patient are shown in Figure 4. The presentation of right-sided neck pain, the taut and tender right trapezius muscle, the tender 1st ribs bilaterally and the cervical SPs deviation to the right pointed to the finding of OCS.

This case was also reviewed, diagnoses made and a treatment plan recommended. The ICD-9 diagnostic codes for this case are also outlined in Table 2. Treatment consisted of Thompson Technique chiropractic adjustments to left 1st rib (see Figure 3) and cervicothoracic junction, and manual myofascial triggerpoint therapy to both trapezius muscles. Treatment frequency was 11 weekly adjustments over a 12-week period at a chiropractic teaching facility. The patient responded well to care, reporting immediate reduction of neck pain and improved mobility after the first adjustment. Her neck pain NPRS scores for each visit are outlined in Table 2.

DISCUSSION

This case series illustrates two patients presenting with the specific signs and symptoms which have collectively been described as OCS by Dr. Thompson. Despite its first description occurring nearly 30 years ago,¹ no other account of OCS has yet been reported in any peer-reviewed literature. Perhaps this case series will stimulate interest in future research.

Practical experience has shown that OCS often follows a traumatic injury to the neck, such as an MVA. Whether the subluxation of the 1st rib is the result of the injury or a risk factor for developing OCS remains to be seen. In either case, the resultant neck pain and dysfunction is oftentimes diagnosed as torticollis²² or cervical dystonia (CD),²³ considered by some to be the same condition.²⁴ Popular invasive treatments for CD include surgery,^{25,26} injection with botulism toxin,^{27,28} antiparkinsonian drugs such as Trihexyphenidyl²⁹ and other oral medications.³⁰ While there have been a number of case series published describing non-invasive interventions (such as chiropractic) for CD,^{31,32} to date none have been verified to be effective using scientific methods.³⁰

It is our speculation that trauma can cause an increased hypertonicity of the trapezius and scalene muscles, which in turn may result in cervical nerve dysfunction, and ultimately subluxations of the 1st rib and cervical or upper thoracic

vertebra. It is further speculated that a Thompson Technique adjustment of the 1st rib relieves the hypertonic musculature and nerve dysfunction, giving the patient relief of the symptoms of CD and OCS.

The limitations of this study are those for any retrospective case series, such as, the management of these patients occurred within an uncontrolled environment.³³ Caution is urged when drawing definitive conclusions from these results or when generalising to other patients.³³ This study would have been strengthened by the more rigorous follow-up assessments of these patients.

Future research should include the correlation of OCS signs and symptoms in CD or torticollis patients, which may show the under-identification of OCS. Also, clinical trials testing the efficacy Thompson Technique protocol for CD / torticollis are warranted.

SUMMARY

This case series describes the management of 2 cases of OCS, which was first described by Dr. J. Clay Thompson, developer of the Thompson Technique. The signs and symptoms of OCS may also be present in persons with CD or torticollis, or following a traumatic injury to the head or neck. Future research testing the efficacy of Thompson Technique for OCS, CD and torticollis is warranted.

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