Case Report

BIOMEDICAL Journal of Scientific & Technical Research

ISSN: 2574 -1241

DOI: 10.26717/BJSTR.2022.47.007450

Case Report: Teenage Patient with Chronic Thoracic Pain and Associated Stomach Symptoms

Laura Gagnon*

Board Certified Orthopaedic Specialist, Doctor of Physical Therapy Program, Assistant Professor, Lincoln Memorial University, USA

***Corresponding author:** Laura Gagnon, Board Certified Orthopaedic Specialist, Doctor of Physical Therapy Program, Assistant Professor, Lincoln Memorial University, USA

ARTICLE INFO

Received: November 04, 2022

Published: November 11, 2022

Citation: Laura Gagnon. Case Report: Teenage Patient with Chronic Thoracic Pain and Associated Stomach Symptoms. Biomed J Sci & Tech Res 47(1)-2022. BJSTR. MS.ID.007450.

Abbreviations: AROM: Active Range of Motion; MMT: Manual Muscle Testing; DTRs: Deep Tendon Reflexes; AROM: Active Range of Motion; MMT: Manual Muscle Testing; IMT: Integrated Manual Therapy; TP: Tender Point; HEP: Home Exercise Program; PVM: Paravertebral Musculature

ABSTRACT

Background and Purpose: Incidence of thoracic spine pain in adolescents is like that of adults and if persistent is a risk factor for chronic pain in adulthood. Physical therapy is a common intervention for what is perceived to be from a primarily musculoskeletal etiology. This case study describes an adolescent with treatment of skeletal and visceral strain counterstain techniques.

Case Description: The patient was a 15-year-old female with chronic thoracic spine pain. Upon further questioning during treatment, it was revealed that the patient had stomach pain and decreased hunger for 1 ½ years. A physical therapy evaluation was performed including alignment, AROM, segmental testing, palpation, manual muscle testing, functional testing, and visual analogue scale. A treatment plan was implemented with the primary tools of therapeutic exercise and manual therapy of mobilization and strain counterstain.

Outcomes: Physical therapy resulted in return of full function, 0/10 pain and an associated abolishment of stomach pain and return to an ability to be hungry.

Discussion: This case report details the effects of musculoskeletal treatment on visceral symptoms. The mechanism and association of physical therapy manual treatments on visceral signs and symptoms is an area of needed research as demonstrated in this case study.

Keywords: Thoracic Spine Pain; Physical Therapy; Strain Counterstain; Manual Therapy

Background and Purpose

Clinical Problem: Epidemiology and Diagnosis of Thoracic Pain in Adolescents

Reports range from approximately 80-90% and 50% to 80% of the western population [1,2] experiencing at least one episode of back pain during their lifetime, affecting all ages from adolescents to the elderly [2]. Briggs, et al. reviewed 33 studies and reported the occurrence of thoracic spinal pain at 4.0-72.0% (point) and 15.6-19.5% (lifetime) [3]. The epidemiology of adolescent thoracic pain is not as clear as that of adults. Jeffries, et al. performed a systematic literature review (56 primary epidemiological studies concerning adolescent back pain) and concluded that thoracic pain prevalence varied from 9.5% to 72% in adolescents [4]. The lack of standardization of data collection and reporting, and definitions compromised results for these researchers. However, they include that there is some evidence that adolescent back pain is a risk factor for spinal pain in adulthood and the incidence of back pain reached adult levels by the age of 18 [4]. The longitudinal study

 DOI: 10.26717/BJSTR.2022.47.007450

by Widhe [5] showed back pain in the 15–16-year-old age span to be at an incidence of one third of the 90 children in the study. Kamper, et al. [6] summarized self-reported musculoskeletal pain by adolescences similar to adult levels, higher in females and noted that spine pain is a major cause of disability in adolescents with up to 25% of these impacting school or physical activities. Also noted is the impact of social and psychological factors on spine pain in this age category [6,7]. Dolphins, et al. [7] noted that those with psychosomatic complaints had significantly higher odds of back pain. One might expect to find adolescents presenting for physical therapy treatment to address back pain in a typical outpatient orthopedic treatment setting with the possibility of multiple factors impacting the treatment plan and outcomes.

Chronic thoracic region pain can be difficult to diagnose. The range of possibilities for the origin of thoracic spine pain can include musculoskeletal, neural, and visceral origins [1,8]. Musculoskeletal thoracic pain may stem from postural/alignment issues, cervical and thoracic zygoapophyseal joints [9] and discs, myofascial tissue, paravertebral, scapular, and intercostal musculature, fractures or dislocations of the vertebrae, facet joints, ribs [10], sternum, and clavicle, and joint dysfunction at the costovertebral or costochondral joints [1, 8, 10]. Visceral causes of thoracic pain range from renal origin (acute pylenephritis and kidney disease), pulmonary (lung infection, emphysema, chronic bronchitis, pleurisy, pneumothorax, pneumonia), cardiovascular (angina, myocardial infarction, aortic aneurysm), cancer (mediastinal, pancreatic, breast), gastrointestinal (esophagitis, esophageal spasm, peptic ulcer, acute cholecystitis, biliary colic, pancreatic disease), to 'others' (infection, osteoporosis, fibromyalgia, psychogenic, acromegly, Cushing's syndrome) [1]. One cause of back pain unique to adolescents is due to carrying heavy backpacks [3,11]. Sheir-Neiss [11] found that in 1122 backpack users (12 to 18 years old) 74.4% had back pain. Adolescents with back pain carried significantly heavier back packs and those back packs represented a greater percentage of their body weight [11]. Back pain is a very common clinical problem presenting for physical therapy intervention for both adults and adolescents. This case report involves an adolescent with thoracic spine pain that both presents and is treated in an unusual fashion.

Evaluation and Treatment Procedures: A Review

The patient was evaluated at an outpatient physical therapy clinic. Evaluation included patient history, active range of motion (AROM), manual muscle testing (MMT), deep tendon reflexes (DTRs) and sensation testing. The spine was palpated and special orthopedic tests of mobility and pain provocation (posterior/ anterior - P/A tests) were performed. Joint mobility testing (position and motion), alignment and tender point assessments were obtained. These techniques are from the Strain Counterstrain (SCS) and Integrated Manual Therapy (IMT) Advanced Strain Counterstrain techniques as taught by Laurence Jones and Sharon Weiselfish-Giammatteo. SCS, originally known as positional release technique, is a passive technique to decrease the tender point (TP) and tone of the musculature being treated [12,13]. The TP, which is a small hypersensitive point found in the subcutaneous, fascial, or muscular tissue, is palpated and a position of the body is found in which at least 70% of the tenderness of that point has dissipated [12,14]. This position of comfort is usually one in which the musculature containing the TP is shortened. The position is then held for 90 seconds in the traditional SCS and from 1 minute to if the tissue continues to demonstrate a reduction in tone (called a defacilitated release) in the IMT Advanced SCS [12]. The TP continues to be lightly palpated throughout the procedure to monitor overall tone and tenderness. The patient must be gently repositioned after treatment of a TP as a quick, strong active contraction of the treated musculature tends to refacilitate the hypertonicity. Some of the SCS treatments can be taught to patients to be performed as a home exercise program (HEP).

A review of the literature shows some experimental studies using SCS to treat musculoskeletal dysfunction [15-20]. These studies showed positive results with the use of SCS to reduce pain [20] and increase strength [21] for patients with back pain. Pedowitz [22] presents a case study using SCS for treatment of iliotibial band friction syndrome and Lewis and Flynn [20] present four case studies of patients treated with SCS. Three of the four patients presented in the case studies had total resolution of symptoms and the fourth a 75% reduction in symptoms. IMT is based on Jones SCS principles but applied to visceral structures [12].

Case Description

Patient History/Review of Systems

A 15-year-old female was referred to physical therapy by her pediatrician due to pain in her thoracic region. She reported no significant medical history for any systems other than musculoskeletal. In 2003, she fractured the growth plate in her thumb and in 2004, she suffered several ankle sprains. Her thoracic pain extended from roughly T2 to T12 bilaterally and was rated at 1-3 out of 10 subjectively on the Visual Analog Scale. She reported the onset of this pain to be insidious and of 1 ½ years in duration. The symptoms were described as an ache and tenseness in the back and shoulders. She stated that heat and massage made the pain better. She reported that prolonged sitting and the progression of the day made the symptoms worse. Upon more detailed questioning, the patient included that the pain seemed worse mostly at school after lunch and in the evenings. She did include that she 'did not feel it too much' after swimming in the afternoon. The patient's mother reported that she had recently hit a growth spurt. The patient was noted to be tall and thin.

 DOI: 10.26717/BJSTR.2022.47.007450

Examination

Objective evaluation of posture revealed the right scapula/ shoulder girdle to be slightly higher with no significant deviations or scoliotic curves of the spine. Her thoracic spine AROM was 80% of normal limits (NLs) flexion with pain, right lateral flexion with pain on the left and left lateral flexion with pain bilaterally (left > right). The lateral curve was limited a moderate amount (50% NLs) with decreased smooth quality of curve bilaterally. Thoracic rotation appeared to be grossly NLs without pain. Segmental testing of the thoracic spine using the technique of posterior/anterior spring testing was negative for all except T7. With further assessment, T7 was noted to be rotated to the left. Palpation revealed increased tone throughout the left paravertebral musculature (PVM) of the thoracic spine. No strength deficits were noted, and sensation was NLs. The clinical impression at this point was one of thoracic pain secondary to malposition of T7 and increased PVM tone. The patient seemed appropriate for skilled intervention including a progression of manual therapy including Strain Counterstrain and joint mobilization 1-2 times a week.

Intervention

Initial treatment of this adolescent patient included manual therapy, specifically joint mobilization of posterior to anterior (P/A) grade 3 (Maitland [23]) to T7, SCS to L PVM and seated joint mobilization to T7 with active forward flexion (sustained natural apophyseal glide - SNAGs of the Mulligan technique [24]). The patient was provided with thoracic spine mobility exercises including foam roll thoracic spine extension and side lying rotation. These were to facilitate normal motion of the T7 facets above and below in all planes. The patient was educated concerning the best way to handle her backpack, proper posture for sitting at home and school and how to stretch the spinal musculature to relieve symptoms with prolonged sitting. The patient left without pain and with full active range of motion in the thoracic spine.

The patient returned for treatment 17 days later and reported she was better for 1 week and then the symptoms returned. The symptoms were no longer daily but only 3 times a week. She continued to report that the pain would begin around lunch and then get worse in the evening. She reported the swimming season was now over. Objective measures showed the thoracic spine motion in forward flexion was now at 50% of NLs with pain, lateral flexion moderately limited again (50% NLs) with pain and T7 was once again rotated left. Treatment included the joint mobilization at T7 which was effective in correcting the malposition of T7. However, the clinician began to investigate the SCS points for the anterior and posterior thoracic spine [13] Tender points were found in the thoracic and lumbar PVM, bilateral upper trapezius, (specific Jones points named AT4, AT7 and AT8 [13]) which are in the anterior chest above, local to and below the xiphoid process (Appendix C). In fact, the patient had a ‘ticklish’ response to the points close to the xiphoid process noted to be related to the IMT advanced SCS stomach point [12]. The previous exercises were reviewed and a new one (the prone swimmer for spinal extensors) was added. The patient again had full range of motion and no pain. The therapist then addressed the patient’s mother and stated that one of the TPs was reported to be related to stomach signs/ symptoms [12,13]. Both the mother and daughter then began to reveal the story of her long-standing stomach pains. The stomach pain would begin at lunch, and she would no longer want to eat. The mother was concerned for the girl was thin and stated she really wanted to eat but just couldn’t after lunch. The clinician then instructed the patient in the home SCS position for the stomach/ AT7/8 [12,13] points to perform any time the pain returned. The instructions provided to the patient for the home SCS were

1. palpate the TP,
2. flex the thoracic spine forward in a seated position until the TP was no longer tender and then hold at least 2 minutes.

The patient was instructed to perform this any time she had thoracic pain or stomach symptoms.

Outcomes

The patient was scheduled to return for treatment and reassessment in 1 ½ weeks (sooner if she could not reproduce SCS at home). The patient called and reported the home SCS consistently took away her symptoms. She was told to continue at home, and she would have a verbal recheck over the phone in one week. One week later she had not had any symptoms and excitedly explained that she was hungry again! Since the patient was symptom free, she did not return for a final objective assessment. However, at the last treatment in the clinic the patient’s AROM, MMT and alignment assessments showed normal parameters. Because this case was so unusual, the clinician spoke with the mother roughly 18 months after the last phone consultation and the young lady was still symptom free. The patient noted that she no longer had to perform the home SCS.

Discussion

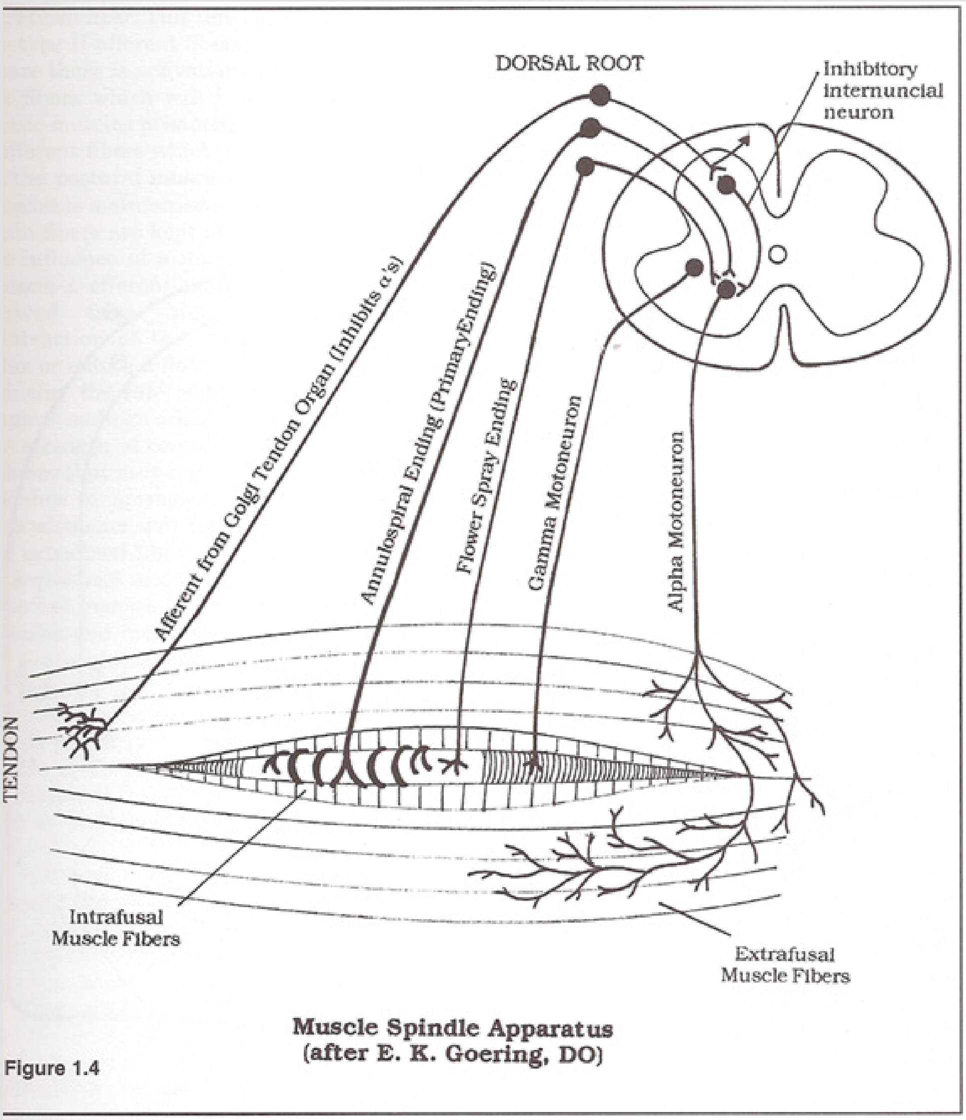
This case was one of the initial patients treated with Jones SCS [13] and IMT [12] in this physical therapy practice. This case was significant due to the following factors:

a) the length of treatment was shorter than average for treatment of back pain (only 2 visits and all goals were met);

b) both the musculoskeletal signs and symptoms and the visceral signs and symptoms were abolished during treatment and are still gone 18 months later; and

c) the above occurred in a chronic situation of 1½ year history of pain. Both the esophagus and stomach/duodenum have pain referral patterns to the thoracic spine posteriorly (T6-T10) [1].

The stomach/duodenal pain pattern includes the xiphoid process region1 - which is the location for the TP for Jones SCS and the IMT Advanced SCS point that is reported to affect the stomach [12,13]. The symptoms tend to include an aching, burning, gnawing, cramp-like pain that can be mild or severe. Associated signs and symptoms include early satiety. This patient reported signs and symptoms that matched with the stomach etiology of early satiety, an ache and tenseness that onset around a mealtime that had a pain distribution (T7 and xiphoid region) matching that of stomach dysfunction (Appendix B). The stomach is innervated by the vagus nerve (CN X) which supplies it with parasympathetic stimuli [25]. Parasympathetic stimulation facilitates gastrointestinal secretion and motor activity [26]. One main premise of the Jones SCS[9] and Weiselfish-Giammatteo's IMT12 Advanced SCS is that the autonomic nervous system is rebalanced during treatment, with an increase in parasympathetic activity and decrease in sympathetic activity, The mechanism for this is through modulation of the muscle spindles (resetting or decreasing the gain in the alpha-gamma loop, see Appendix A) to the spinal cord level, thus defacilitating a few spinal levels above and below the level of the muscle involved in the SCS position [12,13].



Appendix A[13].

 DOI: 10.26717/BJSTR.2022.47.007450

OVERVIEW GASTROINTESTINAL PAIN PATTERNS—cont'd

STOMACH AND DUODENAL PAIN (Fig. 8-12)

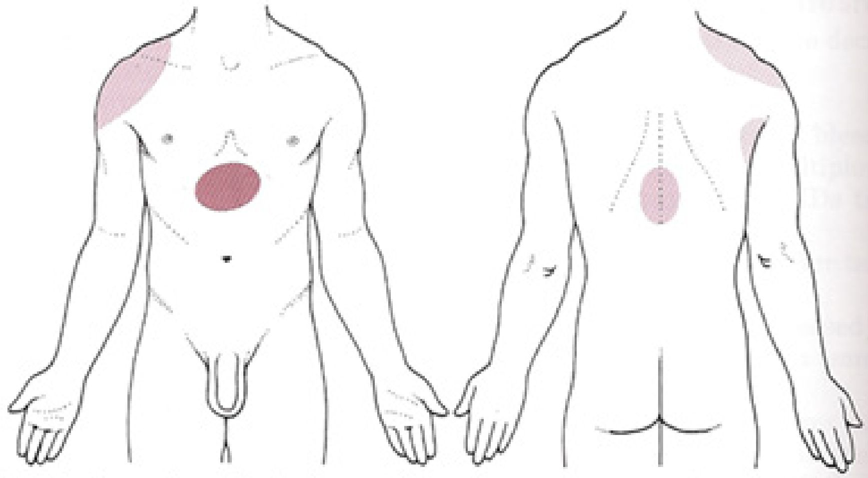
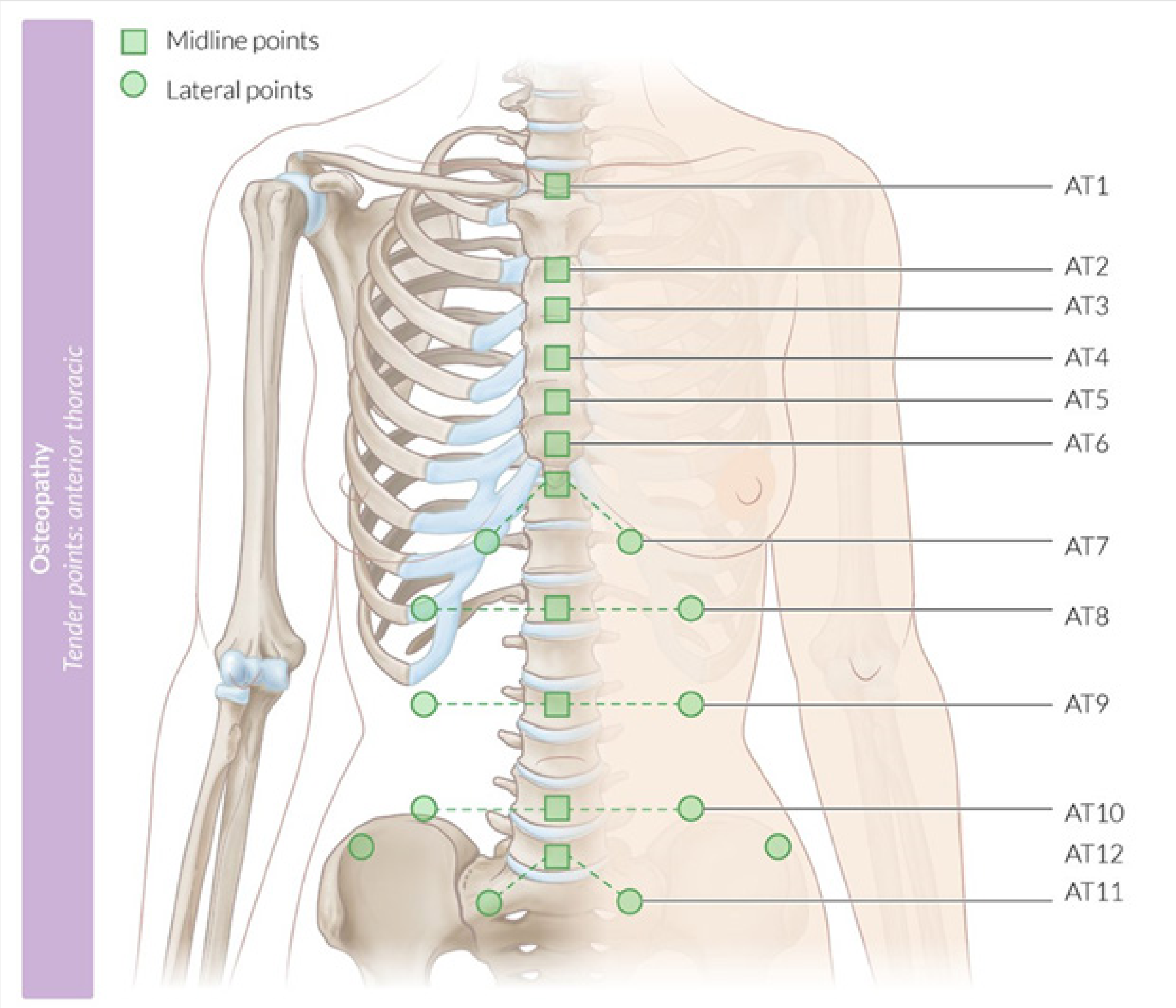


Fig. 8-12 • Stomach or duodenal pain *(dark red)* may occur anteriorly in the midline of the epigastrium or upper abdomen just below the xiphoid process. There is a tendency for the stomach and duodenum to refer pain posteriorly. Referred pain *(light red)* to the back occurs at the anatomic level of the abdominal lesion (T6 to T10). Other patterns of referred pain (*light red*) may include the right shoulder and upper trapezius or the lateral border of the right scapula.

Location:	Pain in the midline of the epigastrium Upper abdomen just below the xiphoid process One to two inches above and to the right of the umbilicus
Referral:	Common referral pattern to the back at the level of the lesion (T6 to T10) Right shoulder/upper trapezius Lateral border of the right scapula
Description:	Aching, burning ("heartburn"), gnawing, cramp-like pain (true visceral pain)
Intensity:	Can be mild or severe
Duration:	Comes in waves
Associated signs and symptoms:	Early satiety Melena Symptoms may be associated with meals
Possible etiology:	Peptic ulcers: gastric, pyloric, duodenal (history of NSAIDs) Stomach carcinoma Kaposi's sarcoma (most common malignancy associated with acquired immunodeficiency syndrome [AIDS]).

Appendix B[1].



Appendix C[13].

This report details the effects of a musculoskeletal treatment on visceral symptoms, possibly due to modulation of the autonomic nervous system with SCS techniques. One such case study is reported by Degenhardt [27]. Though clinical research is limited on the connection between SCS and visceral effects, additional questioning by this therapist proved useful in the treatment of the patient's stomach problems. The patient is now free of back pain and able to eat normally. Further research is needed on the efficacy of Strain Counterstain techniques in general, and to study to possible effect on viscera with these techniques. Is treatment with SCS a quicker route to facilitate hypertonicity and return normal motion than traditional treatments? With little clinical research to undergird the possible connection of SCS to visceral effects is it prudent to ask a patient what this clinician did: are there any stomach issues - and then relate the home SCS program to the onset of stomach symptoms? If this clinician had not asked this very important treatment question, then effective resolution of the patient's problems with home management may have been missed and this young patient might still be trying to manage lack of hunger and back pain as a growing adolescent (as she had for the preceding year and half). These are questions that need to be addressed with future research.

References

1. Goodman CC ST, John Heick,Rolando T Lazaro (2007) Differential Diagnosis for Physical Therapists. St. Louis, Missouri: Saunders Elsevier.

2. Rubin DI (2007) Epidemiology and risk factors for spine pain. Neurol Clin 25(2): 353-371.
3. Briggs AM, Smith AJ, Straker LM, Bragge P (2009) Thoracic spine pain in the general population: prevalence, incidence and associated factors in children, adolescents and adults. A systematic review BMC Musculoskelet Disord 10: 77.
4. Jeffries LJ, Milanese SF, Grimmer-Somers KA (2007) Epidemiology of adolescent spinal pain: a systematic overview of the research literature. Spine (Phila Pa 1976) 32(23): 2630-2637.
5. Widhe T (2001) Spine: posture, mobility and pain. A longitudinal study from childhood to adolescence. Eur Spine J 10(2): 118-123.
6. Kamper SJ, Henschke N, Hestbaek L, Dunn KM, Williams CM (2016) Musculoskeletal pain in children and adolescents. Braz J Phys Ther 20(3): 275-284.
7. Dolphens M, Vansteelandt S, Cagnie B, Vleeming A, Nijs J, et al. (2016) Multivariable modeling of factors associated with spinal pain in young adolescence. Eur Spine J 25(9): 2809-2821.
8. Freedman MK, Overton EA, Saulino MF, Holding MY, Kornbluth ID (2008) Interventions in chronic pain management. 2. Diagnosis of cervical and thoracic pain syndromes. Arch Phys Med Rehabil 89(3 Suppl 1): S41-46.
9. Dreyfuss P, Tibiletti C, Dreyer SJ (1994) Thoracic zygapophyseal joint pain patterns. A study in normal volunteers. Spine (Phila Pa 1976) 19(7): 807-811.
10. Meuwly JY, Wicky S, Schnyder P, Lepori D (2002) Slipping rib syndrome: a place for sonography in the diagnosis of a frequently overlooked cause of abdominal or low thoracic pain. J Ultrasound Med 21(3): 339-343.
11. Sheir-Neiss GI, Kruse RW, Rahman T, Jacobson LP, Pelli JA (2003) The association of backpack use and back pain in adolescents. Spine (Phila Pa 1976) 28(9): 922-930.
12. Giammatteo TW-GS (1997) Integrative Manual Therapy for the Autonomic Nervous System and Related Disorders. Berkeley, California: North Atlantic Books.
13. Jones LH KR, Goering E (1995) Jones Strain-Counterstrain. Boise ID: Jones Strain-Counterstrain, Inc.
14. Bazzi MO, Sergent SR (2022) Osteopathic Manipulative Treatment: Counterstrain Procedure - Cervical Vertebrae. StatPearls Treasure Island (FL).
15. Collins CK, Masaracchio M, Cleland JA (2014) The effectiveness of strain counterstrain in the treatment of patients with chronic ankle instability: A randomized clinical trial. J Man Manip Ther 22(3): 119-128.
16. Dayanir IO, Birinci T, Kaya Mutlu E, Akcetin MA, Akdemir AO (2020) Comparison of Three Manual Therapy Techniques as Trigger Point Therapy for Chronic Nonspecific Low Back Pain: A Randomized Controlled Pilot Trial. J Altern Complement Med 26(4): 291-299.
17. El-Khateeb YS, Mahmoud AG, Mohamed MH, Abd El-Azeim AS (2022) Influence of adding strain-counterstrain to standard therapy on axioscapular muscles amplitude and fatigue in mechanical neck pain: a single-blind, randomized trial. Eur J Phys Rehabil Med 58(4): 621-629.
18. Lizis P, Kobza W, Jaszczur-Nowicki J, Wisniewski D (2021) Osteopathic Manual Treatment Compared to Kaltenborn-Evjenth Orthopedic Manual Therapy for Chronic Low Back Pain: A Randomized Study. Altern Ther Health Med.
19. Wong CK SAC (2013) Effect of Strain Counterstrain on Pain and Strength in Hip Musculature. Journal of Manual & Manipulative Therapy 12(4): 215-223.
20. Lewis C FT (2013) The Use of Strain-Counterstrain in the Treatment of Patients with Low Back Pain. Journal of Manual & Manipulative Therapy 9(2): 92-98.
21. Cote P, Wong JJ, Sutton D, Shearer HM, Mior S, et al. (2016) Management of neck pain and associated disorders: A clinical practice guideline from the Ontario Protocol for Traffic Injury Management (OPTIMa) Collaboration. Eur Spine J 25(7): 2000-2022.
22. Pedowitz RN (2005) Use of osteopathic manipulative treatment for iliotibial band friction syndrome. J Am Osteopath Assoc 105(12): 563-567.
23. RS M (1995) Saunders Manual of Physical Therapy Practice. Philadelphia, PA: W.B. Saunders Company.
24. BR M (1999) Manual Therapy "NAGS", "SNAGS", "MWMS" etc. (4th Edn.)., Wellington, New Zealand: Plane Vew Services Ltd.
25. FH N (2018) Atlas of Human Anatomy: Elsevier.
26. Browning KN, Travagli RA (2014) Central nervous system control of gastrointestinal motility and secretion and modulation of gastrointestinal functions. Compr Physiol 4(4): 1339-1368.
27. BF D (2000) Osteopathic Manipulative Medicine: Optimizing Patient-focused Health Care. The Advisor 21.

ISSN: 2574-1241

DOI: 10.26717/BJSTR.2022.47.007450

Laura Gagnon. Biomed J Sci & Tech Res