

Low-tech rehabilitation and management of a 64 year old male patient with acute idiopathic onset of costochondritis

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Objective: *This study was conducted to discuss the treatment and management of a patient presenting with acute idiopathic costochondritis.*

Case: *64 year old male patient presenting with acute anterior chest pain of one week duration.*

Treatment: *High-velocity low-amplitude thrust manipulation was used to the zygapophyseal joints of the thoracic spine, costotransverse, and costochondral joints involved. Acupuncture, ischemic compression, cross fibre friction massage techniques, and cryotherapy were utilized on the local area of pain. Specific exercise prescription (low tech rehabilitation) was also utilized. Improvement of pain reported on the Visual Analog Scale was noted with a complete resolution of the condition at the conclusion of treatment. No recurrences were reported on an eleven month follow up of the patient.*

Conclusion: *Conservative management, including manipulation and exercise prescription, may be beneficial in the treatment of benign costochondritis. (JCCA 2008; 52(4):224-228)*

key words: rehabilitation, costochondritis

Introduction

Acute chest pain of unknown origin warrants further investigation and often brokers referral to the Emergency Department. In fact, 20-30% of all emergency hospital admissions are accounted for by acute chest pain.^{1,2} While acute chest pain can be of cardiac origin, a large

Objectif : *Cette étude a été effectuée pour débattre du traitement et de la gestion d'un patient présentant de costochondrite.*

Cas : *Un homme de 64 ans présentant des douleurs thoraciques antérieures aiguës, qui durait depuis une semaine.*

Traitement : *Une manipulation, de faible amplitude et de haute vélocité, consistant en poussées, a été appliquée aux joints de la colonne thoracique, des ligaments costo-transversaires et costo-costaux. On a eu recours en application locale à l'acupuncture, à la compression ischémique, aux techniques de massage friction des fibres croisées et à la cryothérapie. On a également programmé des exercices spécifiques (un rétablissement de technique traditionnelle). Une réduction de la douleur a été relevée sur l'Échelle visuelle analogue et un rétablissement complet du patient a été constaté à la fin du traitement. Aucune réapparition de la douleur n'a été rapportée après un suivi de 11 mois.*

Conclusion : *Une gestion prudente, y compris une prescription de manipulations et d'exercices, peut être bénéfique dans le traitement de costochondrite. (JACC 2008; 52(4):224-228)*

mots clés : rétablissement, costochondrite

portion of the cardiology outpatient workload is made up of non-cardiac chest pain.¹ Once cardiac and pulmonary causes of chest pain are ruled out, structures of the chest wall should also be considered when identifying the primary source of pain.

Costochondritis is a common cause of chest pain^{1,2} but

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is not a condition that is well understood.^{2,3} There are numerous causes of costochondritis including acute or repetitive trauma, infection, and seronegative spondyloarthropathies.^{1,2} Costochondritis may also be associated with more serious conditions such as *Escherichia coli* infection in the cartilage, intravenous drug abuse, primary tumours, and other rheumatologic disorders.^{4,5} Alternatively, many cases of costochondritis are idiopathic.^{5,6,7} A diagnosis of costochondritis differs from the diagnosis of Tietze's syndrome in that costochondritis may affect numerous costochondral joints with no swelling, while Tietze's syndrome typically affects one joint and is associated with swelling.^{1,2,8,9,10} Costochondritis typically affects the second through the fifth costal cartilages,^{2,8} whereas Tietze's syndrome most commonly affects the second or third costal cartilage.^{2,8,9}

Once a diagnosis of benign costochondritis has been made, conservative management can be useful in managing pain and attempting to resolve the condition.^{2,4,6} Treatment of costochondritis can include reassurance, heat, ice, manual therapy, acupuncture, exercise prescription, injections of anesthetic-corticosteroid, topical or oral analgesics, and prescription of other drugs including sulfasalazine^{1,2,4,6} or capsosungin combined with fluconazole.¹¹

The more benign forms of costochondritis are usually self limiting, resolve within a year,⁴ and may occur at any age. While some sources report that there is no gender preference,⁷ most sources report that women account for more cases of costochondritis than men.^{1,2,4,8} It was found that the majority of case studies were conducted on female patients.^{4,5,6} The purpose of this article is to report a case of acute idiopathic costochondritis, and its management, in a male patient.

Case Presentation

A 64 year old Caucasian male presented with acute onset of pain localized to the sternum and described as spreading to the chest bilaterally, beginning one week prior to presentation at the chiropractor's office. Recognizing the risks associated with chest pain in his age group, the patient had initially presented to his medical doctor upon the onset of symptoms. After a thorough investigation of his heart and lungs, including an electrocardiogram, he was told his heart and lungs were "clear," and advised to use heat and to take Tylenol #2 to attempt to relieve the

pain. The patient reported that the pain seemed to move to either side of his anterior chest wall approximately in line horizontally with the nipples. He reported that this pain referred to the armpits bilaterally and into the lower thoracic spine. The patient reported that the pain was an 8/10 on the Visual Analog Scale at the time of the initial assessment. He reported that although this pain was variable, there was always some pain present, and that the pain worsened with getting in and out of his car, coughing, sneezing, use of his arms, or checking his blind-spot bilaterally while driving. He further reported difficulty on occasion with full inspiration, and a burning sensation that he localized to the left pectoralis musculature. He reported that holding his sternum with either hand tended to decrease his pain. The patient denied pain and/or paresthesias in the arms and legs bilaterally. Past medical history of the patient includes hypothyroidism, moderate acid reflux disease, Samter's Triad (asthma, nasal polyps, and intolerance to Aspirin/NSAIDs). He reported that he was taking prescription medication including Thyroxin, Prevacid and Nalcrom that were monitored by his family physician. He also reported that he was treated for Lymphoma in 1958 with several courses of radiation and that he has been cancer free since that time.

Physical examination revealed anterior head carriage and an increased thoracic kyphosis on postural examination. Range of motion testing revealed full and pain free cervical flexion and extension as well as right and left rotation. Lateral flexion of the cervical spine was limited to 50% by visual estimate due to pain in the chest bilaterally. Range of motion of the lumbar spine was limited to 50% of flexion, 50% of right and left lateral bending, and 25 % of extension by visual estimate due to pain reported in the chest. All movements of the thoracic spine were guarded and when asked to perform flexion and extension of the thoracic spine the patient terminated testing due to pain. Neurologic testing of the upper and lower extremities was found to be within normal limits with respect to sensation testing, strength testing, and reflexes bilaterally. The following orthopaedic tests were performed and found to be negative (bilaterally where applicable): Cervical compression, cervical distraction, Cervical Kemp's test (active full extension and rotation), Speed's test (patient's shoulder flexed to 90 degrees and resists extension at the shoulder), Valsalva's manoeuvre, Roo's test (shoulder flexed and abducted to 90 degrees

and elbow bent to 90 degrees – hold position up to 2 minutes), Adson's test (while palpating the radial pulse the upper extremity is put into abduction and extension with external rotation-patient is instructed to rotate the head to the side of involvement, take a deep breath and hold it). Pain was elicited on palpation of the left middle trapezius muscle. Pain and a reproduction of symptoms were produced with palpation of the left pectoralis minor muscle, over the costal cartilage at rib 3, 4, and 5 on the left, and the left intercostal muscles on the anterior side of the thorax between rib 3 and 4 as well as rib 4 and 5. Palpation of the pectoralis minor muscle was performed over the pectoralis major muscle. Palpation of the same structures on the right side of the body did not elicit pain or reproduce symptoms. Palpation of the left sided intercostal muscles on the posterior side of the thorax between rib 3 and 4, as well as rib 4 and 5 produced local pain. Motion palpation and spring testing of the 4th and 5th thoracic vertebrae as well as the 4th and 5th rib on the left in a posterior to anterior direction elicited localized, but not anterior chest wall pain.

The patient was treated a total of twelve times; three times in week one, twice in weeks two and three, once each in weeks five and seven and then once a month for two months. A follow up appointment was conducted approximately eleven months after his last visit. A course of trigger point therapy including cross fibre friction massage, and ischemic compression to the intercostals musculature between rib 3 and 4 as well as rib 4 and 5 on the left side of the thorax both anteriorly and posteriorly was initiated at the first visit. In addition, high velocity, low amplitude (HVLA) chiropractic diversified adjustments were applied in a posterior to anterior direction while the patient was supine with a contact over rib 3 on the left which caused a cavitation. Mobilisation of the rib was done in a posterior to anterior direction using oscillating motions with a contact on the dorsal surface of the rib adjacent to the thoracic spinal articulation. Needle acupuncture was applied (for the first ten visits only) to "ah shi" or tender points surrounding the costocartilage of rib 4. The patient was instructed to use ice according to the following protocol: ice pack wrapped in a light towel applied over the sternum for ten minutes followed immediately by a twenty minute rest period-repeating this cycle a total of four times consecutively, daily for the first ten days of treatment. Rehabilitative exercises were

added at visit six and seven and included un-weighted supine arm pushes to activate the pectoral musculature and seated un-weighted plusses. Wall push ups were added at visit seven and progressed to full push ups and plusses at visit eight. The patient was instructed to begin with 5–10 repetitions of each exercise to his tolerance progressing to 3 sets of 10 repetitions each. The patient reported an 80% improvement in symptoms after the first visit and a rating of 2/10 on the Visual Analog Scale. At visit number three cervical range of motion was observed to be full in all directions tested bilaterally with pain reported at the end range of flexion, extension and right and left lateral flexion. The patient continued to report decreased symptoms until visit nine when he presented with exacerbated symptoms after cross country skiing, the symptoms of which were alleviated by a repeated treatment, ice, and exercise. A follow up visit was conducted eleven months after treatment in which the patient reported no subsequent pain, a rating on the Visual Analog Scale of 0/10, and was observed to have full cervical range of motion bilaterally with no reports of pain.

Discussion

The first priority when a patient presents with acute chest pain is to rule out cardiac causes. This patient had previously presented to his family doctor and had testing to rule out cardiac involvement prior to presentation to the chiropractor's office. Nevertheless, further questioning about the nature of chest pain and reproduction of pain upon palpation of the involved musculature and costochondral cartilages was important in further refinement of the diagnosis. A thorough history and physical were key factors to assist in ruling out trauma and most of the rheumatologic disorders given the patient's age at presentation, and lack of other symptoms or prior diagnoses. Lack of inflammation on inspection of the sternal region of the chest was helpful in ruling out Tietze's syndrome and infection. History and absence of skin lesions assisted in ruling out the possibility of herpes zoster but was considered due to the age of the patient and prior medical history. Helpful tests that were not performed may include measuring resting blood pressure and heart rate. If the patient failed to respond to treatment X-rays could have been ordered to further rule out rheumatologic causes and a certain percentage of cases involving infiltration by a tumour. As the patient seemed to present with a be-

nign form of costochondritis, a conservative approach to management was used.

Previous case studies have reported successful management of acute costochondritis of idiopathic or traumatic origin using manual therapy including Graston Technique,⁴ mobilisation,⁶ Kinesiotaping,⁴ specific exercise,⁶ a supine high velocity thrust to the T4/5 motion segment,⁶ and high-velocity low-amplitude (HVLA) manipulation.⁴ The patient in this case was treated with HVLA manipulation to the thoracic spinal segments, mobilisation of the ribs, ischemic compression and cross fibre friction massage beginning at the first treatment. Techniques including acupuncture and cold therapy were also initiated at the first treatment with the intent of decreasing local inflammation and providing analgesia.^{12,13,14,15,16,17} As the patient reported significant improvement in symptoms after one treatment, the same protocol was continued throughout the course of therapy, with the addition of specific exercise prescription and training beginning at visit number six. Exercises were provided as a means of improving overall strength in the area.

There are several factors that may have influenced the favourable outcome of this case. HVLA was used in order to attempt to restore normal motion at the costovertebral, and z-joints of the thoracic spine. Similar to a previous case study regarding costochondritis,⁴ the goal was to “re-establish normal pre-injury distribution of mechanical loads through the targeted spinal articular structures in this case, and to ameliorate irritation to associated costocartilage, costochondral, and chondrosternal joints”.⁴ Acupuncture and ice therapy were used primarily to decrease and control inflammation and provide analgesic effects.^{12,13,14,15,16,17} Soft tissue techniques including ischemic compression and cross fibre friction massage were used to attempt to break down scar tissue that may have been present in the area.⁴ Mobilisation of the ribs involved may have positively affected the articular surface, as well as the adjacent ventral ramus, through stimulation of A-beta fibres.⁶ The stimulation of A-beta fibres may cause the inhibition of afferent nociceptive transmission in the dorsal horn of the spinal cord through the interaction of inhibitory interneurons.⁴

While the speedy decrease of the patient’s reported pain level with the onset of manual therapy seems to indicate a positive response to treatment, it is important to note other possible reasons for the favourable outcome in

this case. As previously mentioned, the natural history of this type of costochondritis is that of a self limiting condition, though it may last up to one year.

Further study is needed to identify specific rehabilitative exercises that may benefit the condition or if exercise prescription is helpful in shortening the condition’s course and promoting stability in the affected region. This research may take the form of further case reports, or a small scale clinical trial to compare the affect of treatment with and without specific exercise prescription.

Conclusion

It is important to remember that the nature of this article is that of a case study and that although favourable results were obtained, methods were only utilized on a single patient. Nonetheless, this case demonstrates that conservative management including manipulation and exercise of benign costochondritis may be beneficial for decreasing pain levels, though it is unclear if it shortens the duration. Conservative management of benign costochondritis should be considered before attempting more invasive procedures such as injections.

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