Chiropractic Management of a Patient With Thoracic Pain and a Stable Thoracic Aortic Aneurysm: A Case Report

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Abstract

Objective: The purpose of this case report was to describe chiropractic management of thoracic pain in a patient with a stable thoracic aortic aneurysm.

Clinical Features: An 89-year-old man presented with axial mid- and upper back pain localized predominantly at the T8 and T1 spinal segmental levels. A review of available imaging revealed a stable aneurysmal dilatation of the ascending aorta, which measured 4.3 cm.

Intervention and Outcome: Because the thoracic pain was musculoskeletal in nature and the thoracic aortic aneurysm was stable, mechanical manipulation was provided using the Impulse adjusting instrument. The patient's pain was measured utilizing a numeric rating scale. The patient's thoracic pain improved over the course of treatment.

Conclusion: This patient was successfully treated for thoracic spine pain with a course of chiropractic care using a mechanical adjusting instrument. (J Chiropr Med 2016;xx:1-5)

Key Indexing Terms: *Manipulation; Spinal; Aortic Aneurysm; Thoracic; Chiropractic; Back Pain*

Introduction

The incidence of thoracic aortic aneurysm (TAA) dissection was estimated in a Swedish population-based study at 16.3 cases per 100 000 men and 9.1 per 100 000 women per year.[1] A British population-based study estimated the incidence at 6 cases per 100 000 people.[2] Dissection becomes more likely with age and is most common among those between the ages of 50 and 70. Aortic aneurysms are 2 to 4 times more likely to occur in men than women. Risks for TAA include high blood pressure, smoking, atherosclerosis, family history, connective tissue disorders including Marfan syndrome and Ehlers-Danlos syndrome, and deceleration injury.[3]

An aortic dissection occurs when hypertension, atheroma, trauma, or a connective tissue disorder precipitates a tear in the tunica intima, the innermost layer of the aorta. Blood pools between the intima and media, further separating the layers. The result is an aorta with a true lumen and a false lumen. Usually a re-entrance tear will occur distal to the original tear, allowing blood to pass completely through the false lumen. In other cases, an intramural thrombus may form, altering flow patterns and potentially decreasing maximal shear stress on the artery wall.[4,5] Tearing of the lumen can result in severe intrascapular pain, which cannot be alleviated by changing positions. The mortality rate for elective aneurysm reconstruction is only 5%. Ruptured aneurysms, even those treated with surgical intervention, result in mortality rates as high as 80%.[6-8] Surgical resection is indicated once an ascending aortic aneurysm measures 5.5 cm in diameter. The same is true of a descending aortic aneurysm that measures 6.5 cm in diameter.[4,9] A more proactive approach is suggested for those with connective tissue disorders. For patients with Marfan syndrome or familial TAA, resection should be considered at 5.0 and 6.0 cm for the ascending and descending aorta, respectively.[4]

Dorsalgia, pain in the upper back, is most commonly of musculoskeletal origin, but can also present as a sequela of visceral pathology. Visceral pain referral to the thoracic spine is typically serious, and may be caused by duodenal or stomach ulceration, vertebral body infection, cholecystitis, cancer, pancreatitis, esophageal disorders, or dissection of the aorta. Each condition presents with clinical nuance and may be discerned based on a thorough history and examination.[7]

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Manipulation has been considered a contraindication in patients with aortic aneurysms even though, to date, there are no published reports associating aortic dissection with spinal manipulative therapy.[6,10,11] It has been hypothesized that an increase in intraabdominal or intrathoracic pressure could increase the likelihood of dissection or rupture. This view is being called into question based on examples in which a course of spinal manipulative therapy was administered to patients with an aortic aneurysm, but no adverse events were reported.[6,12] Therefore, the purpose of this report is to describe the chiropractic care of a patient with spine pain and a stable TAA.

Case Presentation

An 89-year-old white man was referred to the chiropractic clinic for spinal pain with a provisional diagnosis of chronic back strain. The patient presented with axial mid- and upper back pain localized predominantly at the spinal segments of T1 and T8. He reported transient back pain over previous decades, but stated that his back pain had been exceptionally bad over the last 8 years. Sitting and being sedentary were listed as provocative for his thoracic spine pain. Extension of the patient's arms and neck, as well as manual traction of the cervical spine, was palliative for his thoracic spine pain. He described his pain as burning and rated the severity at 3/10 at that time, with flare-ups as high as 7/10. The patient's medical/surgical history was significant for bilateral leg surgeries for shrapnel, repair of bilateral inguinal hernia, hypertension, and TAA. His hypertension was controlled with atenolol. The patient had seen a doctor of chiropractic in the 1960s and 1970s with reportedly favorable results. The patient denied any alcohol or tobacco use. The examination and history were complicated by the patient's severe hearing and visual impairments, the latter caused by macular degeneration. The patient was only able to hear when the examiner spoke loudly and within a specific vocal range. On subsequent visits, the patient was accompanied by his son, who assisted with communication.

Physical examination revealed the absence of bilateral biceps deep tendon reflex and diminished right patellar reflex, graded +1/4. The left patellar reflex was graded +2/4. Triceps, brachioradialis, and Achilles deep tendon reflexes were graded +2/4 bilaterally. The patient's vitals were within normal ranges, with a blood pressure of 132/74 mm Hg. Carotid, radial, and posterior tibial pulses were equal with normal rate and rhythm. No abnormalities were detected with heart or lung auscultation. No subclavian or carotid bruits were noted. No bruit of the abdominal aorta or pulsatile mass was detected on examination. Pain in the area of T1 and T8 was reproduced on palpation. Moderate hypertonicity was noted in the trapezius bilaterally. Motion palpation revealed intersegmental hypomobility in the thoracic spine.

A review of available imaging revealed a stable aneurysmal dilatation of the ascending aorta. The diagnosis of TAA was made with computed tomography by a radiologist on March 15, 2012; the dilatation measured 4.1 cm in diameter. A consult was made to a vascular surgeon by his primary care provider. The vascular surgeon recommended annual surveillance and referral should the aneurysm grow to measure 5 cm. Studies were performed at 6 months, 12 months, and 2 years after the original diagnosis, over which time the aneurysm had increased in diameter by 0.2 cm to measure 4.3 cm. Based on repeat measurements revealing little change in diameter, the radiologist labeled the TAA as stable (Figs 1[13] and 2). Following examination by the doctor of chiropractic, the patient was diagnosed with midback pain and thoracic somatic dysfunction, as well as TAA without rupture.

Intervention and Outcome

It was decided that because the thoracic pain was characteristically musculoskeletal and the TAA was stable, manipulation was not strictly contraindicated.

Manipulation of the thoracic spine was performed using the Impulse adjusting instrument (Neuromechanical Innovations, Chandler, AZ). The choice of instrument-assisted manipulation of the thoracic spine was made to minimize compressive force in the area and limit increases in intrathoracic pressure. The impulse adjusting instrument was used on its second setting, as recommended by the manufacturer for treatment of the thoracic spine, producing an estimated peak force of 200 N.[14]

The patient underwent a course of spinal manipulation at a frequency of 1 visit per week for 4 weeks, followed by 3 additional visits over 2 months. Spinal manipulation was accompanied by manual massage of the upper trapezius and cervical paraspinal musculature.

At each visit, the patient was asked to rate his thoracic spine pain on the numeric rating scale before and after treatment. Prior to treatment, the patient reported 3/10 pain with episodes as severe as 7/10. After initial treatment, the patient reported an immediate and marked ameliorative effect. Pretreatment numeric rating scale on the fourth visit was recorded at 1/10, with resolution of pain posttreatment. On the seventh visit, the patient's thoracic pain was rated at 0/10 pretreatment, and the patient was released from the clinic.

Trapezius hypertonicity improved incrementally with treatment, such that by the third visit the muscles exhibited a normal tonicity.

An annual computed tomography scan was performed between the sixth and seventh visits to monitor changes in dimension of the TAA. No changes were detected and the aneurysm was determined to have remained stable