

CASE REPORT

Identifying and Treating Concurrent Referred and Musculoskeletal Back Pain Using an Osteopathic Approach

Pedro C. De Castro, DO¹; Kenneth A. Zaremski, DO²

¹ Kansas City University Department of Osteopathic Manipulative Medicine in Kansas City, Missouri
² Kansas City University Department of Osteopathic Manipulative Medicine in Kansas City, Missouri

KEYWORDS	ABSTRACT
Osteopathic manipulative treatment	OMT is often used to treat musculoskeletal pain complaints. OMT can also help reveal and treat referred pain from visceral dysfunctions. This case illustrates the evaluation and treatment of both local tissue dysfunction and visceral sources of a single patient's pain.
Referred pain	A 44-year-old female presented with 10 years of thoracic pain medial to the inferior angle of the right scapula and 2 to 3 years of right-sided lumbar back pain near L4. Physical therapy, chiropractic, and massage therapy briefly reduced both, but failed to provide resolution. Imaging was reported as unremarkable. Medical history included gallstones with subsequent cholecystectomy, and multiple renal calculi requiring stent placement. Examination revealed rib and thoracic dysfunctions that reproduced the patient's symptoms. They were successfully treated with OMT but failed to significantly reduce her pain. Given the cholecystectomy, a referred pain pattern was then considered. Tissues at the former base of the gallbladder were restricted, which was treated with myofascial release, resulting in immediate resolution of her thoracic back pain. Two weeks later, a viscerosomatic cause for her lumbar back pain was sought, given the history of renal lithiasis, but there were no transabdominal visceral findings. The local lumbar dysfunction was successfully treated with OMT, showing it to be effective in complete and longstanding symptom resolution.
OMT	
Viscerosomatic reflex	
Chronic back pain	This case illustrates the benefit of seeking a visceral cause despite the appearance of local mechanical/tissue dysfunction pain. Similarly, despite a high likelihood of a viscerosomatic cause, local somatic dysfunction may still be causative, despite the prior failure to resolve with similar musculoskeletal treatments.

INTRODUCTION

Osteopathic manipulative medicine (OMM) is a treatment modality taught in osteopathic medical schools and used primarily by osteopathic physicians. It is often, but not solely, used to treat musculoskeletal pain. OMT has shown to be effective in helping treat other medical conditions related to the viscera, such as pneumonia^{1,2} and sinusitis.³ Visceral irritation has the potential to cause predictable referred pain patterns⁴ as well as palpable somatic changes due to viscerosomatic reflexes.⁵ These

viscerosomatic changes can occur due to irritation or inflammation of the organ itself, the organ's capsule, or the surrounding fascia.⁵ This is the case of a 44-year-old female who presented with chronic thoracic and lumbar back pain, both of which had potential for visceral source. It was considered that both her thoracic and lumbar back pain may have been referred pain, given the long duration of symptoms, previous cholecystectomy surgery, multiple renal lithiasis episodes, and failure to resolve with other musculoskeletal treatments.

CASE PRESENTATION

A 44-year-old female presented to the OMM clinic with 10 years of continuous dull, achy, right midthoracic pain inferior and medial to the scapular border, and 2 to 3 years of continuous dull, achy right low lumbar pain at the level of L4, 2 inches lateral to spinous process. Neither had pain radiation or an inciting event.

CORRESPONDENCE:
Kenneth A. Zaremski | KZaremski@kansascity.edu

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She had tried physical therapy, chiropractic, and massage therapy, which only reduced but never resolved either pain, and improvements in both only ever lasted a few days. She denied numbness, tingling, loss of strength or coordination, or loss of bowel or bladder control. The patient reported having X-ray, magnetic resonance imaging (MRI), and computed tomography (CT) scans of both thoracic and lumbar spine. While these images were not accessible, the patient reported that various practitioners identified “no significant findings that would explain [her] pain.” Past medical history included passing approximately 20 kidney stones between 2022 and 2024 with the assistance of stent placement, gallstones with subsequent cholecystectomy, and four pregnancies. She also had a tonsillectomy and right plantar fascia surgery. Her medications were prescription cholestyramine and semaglutide, as well as vitamin B₁₂, vitamin D, and iron supplements. She walked two times per week for exercise and worked on a computer all day. Examination showed two+ pulses in all distal extremities and two+ deep tendon reflexes in the biceps, brachioradialis, patellar and Achilles tendons bilaterally. Bilateral strength was 5/5 in elbow flexion and extension, shoulder abduction, knee flexion and extension, and hip flexion. Sensation was intact to light touch in the C6-C8 and L4-S1 dermatomes bilaterally, except for diminished sensations in the lateral third of both the dorsal and plantar aspects of the right foot, which the patient attributed to her previous plantar fascia surgery. The hip drop test was negative. T7 was F RR SR, T8 was E RL SL, and the right rib 7 was posteriorly translated. Lumbar evaluation and treatment were deferred for the second visit.

Initial assessment suggested that the rib and thoracic somatic dysfunctions were likely causing her symptoms. Successful treatment with OMT utilizing high-velocity low-amplitude (HVLA) to the thoracic spine and rib balance ligamentous tension (BLT) techniques only mildly reduced the patient's pain. The history, findings, and lack of response to initial treatment led us to consider a referred pain pattern with viscerosomatic reflexive tissue dysfunction. Palpation of the fascia of the hepatoduodenal ligament and the region of the former base of the gallbladder found them to be both restricted and congested, and palpation reproduced her thoracic back pain. These tissues were then successfully treated with direct myofascial release. While monitoring the location of thoracic pain, significant warmth was palpated during the release of the abdominal fascial tissue restrictions. Immediately thereafter, the patient reported significant reduction of thoracic back pain and tenderness. Posttreatment assessment was that intraabdominal soft tissue dysfunction was causing referred pain to the posterior midthoracic region medial to the right scapula and reflexively inducing the rib and vertebral dysfunctions.

The patient returned for reevaluation 2 weeks later, upon which she reported, “I have had constant [posterior thoracic] pain for 10 years; it is now completely gone.”

The patient's low back pain persisted unchanged from the first visit: around L4, worse at night, and improved by sleeping on her left side with occasional “muscle spasms” in the area. The history of the stent placement and kidney stones, and prior viscerosomatic dysfunction, gave us a high level of suspicion of—and prompted an immediate search for—a similar viscerosomatic cause. Osteopathic examination found L2 to be F RR SR, right posteriorly rotated innominate, a left on right sacral torsion, and fascia bogginess 1 cm superior to right posterior superior iliac spine (PSIS). There was, however, no somatic dysfunction found of the kidneys, ureter, or bladder, or the deep abdominal fascia along their path. Assessment was somatic dysfunction of lumbar, pelvic, and sacral regions but not referred pain or viscerosomatic reflexive changes.

The patient was successfully treated with muscle energy to the lumbar, pelvis, and sacrum, and counterstrain technique to the posterior iliolumbar fascia, with significantly improved symptoms at the end of the visit. The patient was not seen for a follow-up evaluation but during a social encounter several weeks later, the patient reported persistent total resolution of all symptoms.

DISCUSSION

The patient reported that neither multiple practitioner evaluations, nor X-ray, MRI, or CT scans of both thoracic and lumbar spine found “anything that would explain [her] pain.” (These images were unavailable.) With response to treatment of the intraabdominal fascia, we conclude that her midthoracic back pain was referred pain from fascial restrictions due to a previous cholecystectomy surgery. The pattern of referred pain from gallbladder to the scapular region is documented in the literature and textbooks.^{4,6-8} As the gallbladder is sympathetically innervated by spinal roots of T5-T9, it can cause viscerosomatic dysfunctions anywhere within this spinal level range.⁵ This patient's pain pattern appeared to be present, despite the removal of the gallbladder, and was likely due to postsurgical fascial restrictions.

The organs sympathetically innervated by spinal roots of T10-L2 include the kidney, ureter, and bladder⁵—locations consistent with affected organs within the patient's history and the found L2 dysfunction. Following a similar thought process from the last visit and considering the patient's similar failure to respond to prior outside treatments, a search for visceral dysfunction was undertaken. No significant visceral source was found to relate to her lumbar back pain and palpation of the intraabdominal tissues failed to reproduce lumbar symptoms. Her lumbar

pain resolved with local musculoskeletal treatments of the lumbar spine, pelvis, and sacrum.

This case is an interesting example where both local musculoskeletal and distant referred pain were present at the same time and each pain had significant potential for having either a visceral or a direct musculoskeletal source. This case highlights the need to keep suspicions high and pursue alternative sources for musculoskeletal pain.

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