

# An Osteopathic Approach to Uterine-Induced Low Back Pain: A Case Report

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## CASE REPORT

### Abstract

Uterine-induced low back pain is primarily caused by pregnancy. More than 50% of women will experience it while pregnant.<sup>1</sup> Many of these changes are postural in nature and can last into the postpartum period.<sup>1-3</sup> There is also increased stress placed about the uterosacral ligaments and sacrum.<sup>1,4-6</sup> Back pain related to intrauterine devices (IUD) is less common than pregnancy-induced back pain, but it is still commonly present and is a common enough adverse reaction that it is listed on the package insert.<sup>7</sup>

An osteopathic approach to uterine-induced low back pain looks at the structural and functional changes caused by changes in the uterus and the resultant changes on the remainder of the body. The present case depicts this approach and possible anatomic reasoning to why and how this pain is present.

### Introduction

The uterus is a muscular organ located in the female pelvis. As the gravid uterus grows, it places pressure on the structures of the pelvis, including the muscles, ligaments, and bones. It causes an anterior pelvic tilt, an increased lumbar lordosis, and postural compensation of the thoracic spine, neck, and head. Relaxin and other hormones also contribute to pelvic instability and resultant pelvic and low back pain.<sup>3</sup> The IUD directly irritates the uterus,<sup>8-12</sup> potentially causing facilitation about the thoracolumbar segments (T10-L2) via the inferior hypogastric nerves. These nerves are transmitted via the uterosacral ligaments and therefore could contribute to sacral pain as well.<sup>2</sup> Osteopathic manipulative medicine dictates that structure and function are interrelated and if something is changing the structure, then the function also must be impaired. The present case depicts that an osteopathic approach, including osteopathic manipulative treatment (OMT), for low back pain was helpful for the patient and can be advantageous for future patients.

### Case Presentation

A 40-year-old, G2P2002, woman presented to the clinic with 9 years of persistent, mild to moderate, achy, non-radiating, right-sided lower back and right hip pain. It worsened during her preg-

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Disclosures: none reported.

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Submitted for publication February 12, 2019; manuscript accepted for publication July 22, 2019.

Dr. Kanze prepared this manuscript as one of the requirements to earn fellowship in the American Academy of Osteopathy. The Committee on Fellowship in the AAO provided peer reviewing for this article, and it was edited to conform to the AAOJ's style guidelines.

nancies, after the birth of each child 8 and 5 years previously and more recently after the insertion of an intrauterine device (IUD).

Each child was born via spontaneous vaginal delivery. The patient's pain somewhat decreased after delivery and then returned. Her symptoms were also temporarily alleviated in the past with stretching and osteopathic manipulation. Associated symptoms were positive for right lateral ankle paresthesias which had been present since an ankle fracture 16 years prior to presentation. She denied any other symptoms, including nocturnal awakening, change in bowel or bladder habits, and increased pain with coughing, sneezing, or defecation. On review of systems, she denied fever, chills, night sweats, vomiting, diarrhea, chest pain, urinary symptoms, and weakness. She acknowledged having abdominal pain, neck pain, and bilateral shoulder pain, however.

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The patient's medical history is significant for a mild dextroscoliosis, endometriosis, and gestational diabetes with cholestasis and a prolonged labor during her second pregnancy. Her trauma history revealed a concussion, a right ankle fracture, a fall onto left hip, a motor vehicle accident, and multiple falls in sports. She played competitive lacrosse, field hockey, and basketball, and she enjoys skiing and snowboarding. Her surgical history is significant for a laparoscopy for ovarian cysts and endometriosis, in vitro fertilization, and wisdom teeth extraction. She quit smoking in 2002, denied illicit drug use, and drinks alcohol on occasion. She was a full-term, vaginal birth without instrumentation or complication. Her mother has depression, while her father and 2 brothers have hypertension. She has no known allergies to food or medications but does avoid gluten and dairy. She had a Mirena (levonorgestrel-releasing) IUD during her initial consultation, and took fish oil, multivitamins, dehydroepiandrosterone, and a supplement called DIMension 3.

A physical exam revealed a physically fit, 40-year-old, 5'9", 155-pound, woman in no acute distress. Her blood pressure was 108/76 mmHg with a heart rate of 72 beats per minute and a respiratory rate of 16 breaths per minute. Her neck was supple and displayed a full active range of motion. The cardiac exam showed a regular rate and rhythm without murmurs, rubs, or thrills. The respiratory exam was clear to auscultation bilaterally without rhonchi, rales, or wheezes. Her abdomen was soft, non-tender, and non-distended with positive bowel sounds and without rebound, guarding, or organomegaly. Her gait was normal, and she displayed full active and passive range of motion of the hips bilaterally.

The neurologic exam revealed that cranial nerves II-XII were grossly intact, her L4 and S1 reflexes were 2/4 bilaterally, and her strength in the lower extremities was 5/5 at the hip flexors, adductors, abductors, hamstring, quadriceps, foot dorsiflexors, and plantar flexors. The straight leg raising tests were negative bilaterally, seated and supine.

The osteopathic structural exam depicted an anterior head carriage. A lumbar dextroscoliosis of less than 10° with the apex about L2-3. The patient's left leg was visually one eighth of an inch shorter than the right at the medial malleoli and tibial tuberosities. She had a right torsion of the sphenobasilar synchondrosis with underlying dural restriction in the right tentorium cerebelli and falx cerebri that pulled to a C2 flexed, rotated and side-bent right, then onto the sacrum at S2. The sternum had an overall fascial restriction with a preference in right side bending. T12 was extended, rotated and side-bent to the right and facilitated; L2-5 neutral, side-bent right, rotated left; a left-on-left sacral torsion; left anterior innominate; fascial restrictions of the uterus and right ovary; tight and ten-

der right psoas; and a right internally rotated tibia. The uterine and ovarian restrictions were diagnosed by feeling a deep pull centrally and then deep and to the right with the left hand on the sacrum and the right hand on the abdomen. There was an overall fascial pull from the right tibia through the sacrum into the lumbar spine and umbilicus.

### **Treatment**

After verbal consent was obtained, treatment commenced with ligamentous articular strain (LAS) to the right psoas and then continued with a variation of the sciatic nerve release of the right leg utilizing acupuncture points (Bladder 25 in the right sacroiliac (SI) joint, Bladder 40 in the right popliteal fossa and Kidney 1 about second and third metatarsals just distal the cuneiforms).<sup>13,14</sup> These points were treated manually without acupuncture needles. LAS was then applied to the tibial torsion. Next, muscle energy was applied to the left anterior innominate.<sup>15</sup> Much of the lumbar curvature resolved after these treatments, and the remaining lumbar and thoracic dysfunction were treated with LAS.<sup>16</sup>

Osteopathic cranial manipulative medicine (OCMM) was then directed to the right torsion of the sphenobasilar synchondrosis with balanced membranous tension utilized to balance the dural strains.<sup>17</sup> The sternum and cervical dysfunctions were then balanced with LAS.<sup>16</sup> The abdominal and visceral restrictions were treated via LAS to the abdominal wall and presacral fascia and sacrum<sup>16</sup> while balancing the uterus.<sup>4</sup>

The patient reported decreased back, neck, shoulder, hip, and abdominal pain immediately after her initial treatment. Her short leg was determined to be functional as it visually resolved. The medial malleoli and tibial tuberosities were equal after this treatment. The dextroscoliosis was decreased and the psoas tension was reduced. She was informed that there was a large fascial pull towards her uterus and that removal of the IUD could quite possibly decrease her back pain. She was sent home with instructions to have her IUD removed and to return after removal.

The patient had her IUD removed prior to her next appointment, 1 month after her initial visit. At the time, she reported that since her first treatment with OMT and the removal of her IUD, her right sacral and hip pain were greatly decreased.<sup>4</sup> She began hamstring stretches on her own and noted these alleviated her pain as well. The second visit revealed a normal gait with anterior head carriage. The dextroscoliosis was no longer present. The right torsions of the SBS had recurred as had the dural tug to C2 and S2. T12 extended, rotated and side-bent right once again was present and was thought to be due to facilitation from the uterus. The right SI joint was ten-

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der to palpation and had a fascial pull anteriorly towards the uterus. There was a right inguinal ligament tender point. The right psoas was again tight but looser than the initial visit. The overall fascial pull in the body resided about the right psoas and ascended thru the uterus, sternum, T12, then superiorly into the cranium. This was similar to the pull at the first visit and was thought to be secondary to uterine irritation. Treatment, once again, commenced at the right psoas with LAS, then counterstrain to the inguinal tender point, followed by LAS and OCMM for the remaining dysfunctions. She noted feeling better during her supine treatment but had pain in the right SI upon sitting. A seated, long lever LAS was then applied to the right SI with resolution of her pain. She noted “feeling great” after this treatment and was sent home with instructions based on Phillip Greenman DO, FAAO’s “exercise prescription for the lower quarter” including the pelvic clock and stretches for her piriformis, psoas, hamstring, and shoulders.<sup>18,19</sup> She was instructed to perform these at least twice per day and follow up in 4 to 6 weeks or sooner if not doing better.

The patient returned to the office twice more over the following 2 months reporting that the pain had been steadily decreasing during that time until starting a new aggressive yoga program. She still said, however, that she felt better overall. At visit 3, the majority of her previous dysfunctions had recurred but were not causing her extreme discomfort to the point where “she felt like she could cancel but didn’t.” At the following visit (visit 4), most of her chronic dysfunctions were no longer present. Her right SBS torsion had returned, and she was noted to have L3-L5 neutral side-bent right, rotated left; a right-on-right sacral torsion; a right anterior innominate; and a large compressed feeling from her right tibia at the ankle through the tibialis muscles in the knee and ascending into the right hip and sacroiliac joint. The central fascial pull to her uterus had resolved. Facilitated segments were absent as well. Treatment was initiated to her ankle with a percussion hammer, and as the tissues released in this area, the tissue in the pelvis and sacrum also relaxed. These areas were then balanced with LAS, and OCMM was directed to her cranial dysfunction.<sup>16,17</sup> Due to the nature of her aggressive yoga routine, she was instructed to come back in 2 to 4 weeks if symptoms were still present. She returned 2 months later noting that her low back and hip pain were completely resolved.

## Discussion

The patient presented to the office with long standing right-sided low back and hip pain that was greatly increased during her pregnancies and after the insertion of an intrauterine device (IUD).<sup>2,3,7</sup> Both scenarios result in changes to the uterus and have been known to cause low back pain.<sup>2,3,7</sup>

Pregnancy-induced back pain is quite common as over 50% of women will experience it while pregnant.<sup>1</sup> In pregnancy, the majority of back pain is a result of the increasing size of the uterus and the subsequent increased lumbar lordosis and the hormone relaxin.<sup>1,3,5,6,20</sup> These postural changes, in turn, affect the ligaments, nerves, and joints of the surrounding areas and can persist for years postpartum.<sup>1-3</sup> In addition, there is increased stretch and weight placed on the sacrogenital (rectouterine) folds, specifically the reinforced uterosacral ligaments, and these too can cause pain.<sup>2,4,6</sup> These folds and ligaments are partially responsible for the stabilization of the uterus, and any alteration to the uterus would, therefore, alter these ligaments.<sup>1,4-6</sup> Structurally, they also cause a “relatively fixed point” or fulcrum, around which the uterus can rotate and antevert.<sup>4</sup>

These uterosacral ligaments attach to the isthmus of the uterus, the cervix, the rectum, and the anterior portion of the sacrum (S2-S4) and contain smooth muscle, nerve fibers, and fibrous tissue.<sup>5,6</sup> Pain signaling from the myometrium is primarily via the embedded inferior hypogastric (pelvic plexus) nerves in the uterosacral ligaments and commonly refers to the back.<sup>6</sup> The inferior hypogastric (pelvic) plexus nerves originate from the spinal segments of T10-L2.<sup>2,5,6</sup> The parasympathetic innervation to the uterus is from the spinal segments of S2-S4.<sup>2</sup> The uterosacral ligaments attach to the anterior portion of the sacrum<sup>5,6</sup> from S2-S4 and can “fix the sacrum” anteriorly.<sup>4</sup> This fixation most likely places a force upon the nerves producing neural as well as sacral dysfunction, both of which can result in lower back pain.<sup>4</sup>

IUD-related back pain is less common, although it is listed on the package inserts as a side effect.<sup>7</sup> This patient’s history and osteopathic exam revealed that in addition to her sports-related and postpartum mechanical somatic dysfunction, the presence of an IUD was a major contributor for her current back pain. She had a large fascial pull towards the midline of her pelvis that did not dissipate despite treating her somatic dysfunctions in the area. This could be directly caused by one of the primary functions of the IUD, namely irritation of the uterus.<sup>8-12</sup> The device is inserted into the uterine fundus and therefore can irritate the fundus itself.<sup>7</sup> Another function of hormone secreting IUDs is continuously releasing hormones into the uterus.<sup>8-12</sup> This thickens cervical mucus, thereby preventing passage of the sperm into the uterus.<sup>8-12</sup> The device also can hinder sperm survival time and alter the endometrium, preventing implantation.<sup>7</sup>

Uterine irritation, either by pregnancy or in this case the IUD, can cause facilitation of the thoracolumbar (T12-L2) segments via the inferior hypogastric nerves. As these nerves are transmitted via the

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uterosacral ligaments, irritation of these ligaments either directly or from uterine irritation could prove how facilitation of the thoracolumbar segments occurs with uterine irritation.<sup>2</sup> These ligaments could also help prove why pelvic rock technique helps with premenstrual syndrome and heavy periods as there is a direct ligamentous connection as well as a parasympathetic connection.<sup>2</sup>

## Conclusion

In this case, irritation of the uterus by both pregnancies and usage of an IUD, caused significant back and hip pain. After the birth of each child and again after the removal of the IUD, the pain decreased. The second tenet of osteopathic medicine clearly states that structure and function are interrelated and that impaired structure can alter function and altered function can cause symptomatology.<sup>2</sup> This case illustrates this, as removal of the device was the impetus for decreased pain that was further reduced with osteopathic manipulative treatment.

Treatment is based on the fact that the body is a unit; the body has self-healing and self-regulating mechanisms; and structure and function are interrelated. Therefore, the fourth tenet of osteopathic medicine, specifically, rational treatment, which is based upon the above 3 tenets, dictated this patient's successful treatment.<sup>2</sup> Future studies are required to confirm that OMT can prevent and treat uterine-induced low back pain.

## Acknowledgements

I would like to acknowledge Wm. Thomas Crow, DO, FAAO, for his assistance with the FAAO project and Kylie Ann Kanze, DO, for being my editor.

## References

1. Benzon H, Rathmell JP, Wu CL, Turk D, Argoff CE, Hurley RW. *Practical Management of Pain [e-book]*. Philadelphia, PA: Elsevier Health Sciences; 2013:483-488.
2. American Osteopathic Association. *Foundations of Osteopathic Medicine*. Philadelphia, PA: Lippincott Williams & Wilkins; 2010:3,157-158,968-973.
3. Hensel KL, Carnes MS, Stoll ST. Pregnancy research on osteopathic manipulation optimizing treatment effects: the PROMOTE study protocol. *J Am Osteopath Assoc*. 2016;116(11):716-724.
4. Barral JP. *Urogenital Manipulation*. Anderson S, Bensky D, translation eds. Seattle, WA: Eastland Press; 2006;24,118-120,142,170-173.
5. Standring S, Ellis H, Healy J, et al. *Gray's Anatomy: The Anatomical Basis of Clinical Practice*. 39th ed. London, England: Churchill Livingstone; 2005:1333-1335.
6. Valia FA. Reproductive anatomy: gross and microscopic, clinical correlations. In: Lobo RA, Gershenson DM, Lentz GM, Valea FA, eds. *Comprehensive Gynecology [e-book]*. Philadelphia, PA: Elsevier Health Sciences; 2016:48-76e1.
7. Mirena [package insert]. Whippany, NJ: Bayer Healthcare Pharmaceuticals; 2008.
8. Paul S. Dry 'intrauterine swimming pool' for the sperm—a potential new mechanism of action of levonorgestrel-releasing intrauterine system (LNG-IUS, Mirena) as a contraceptive. *Obstet Gynecol Int J*. 2016;5(2):00149.
9. Degroot LJ, Jameson JL, De Kretser DM, eds. *Endocrinology: Adult and Pediatric*. Philadelphia, PA: Elsevier Saunders; 2016:2303-2304.
10. Hardeman J, Weiss BD. Intrauterine devices: an update. *Am Fam Physician*. 2014;89(6):445-450.
11. Croxatto HB. Copper-T intrauterine device and levonorgestrel intrauterine system: biological bases of their mechanism of action. *Contraception*. 2007;75(6):S16-S30.
12. Stanford JB, Mikolajczyk RT. Mechanisms of action of intrauterine devices: update and estimation of postfertilization effects. *Am J Obstet Gynecol*. 2002;187(6):1699-1708.
13. Deadman P, Mazin A, Baker K. *A Manual of Acupuncture*. East Sussex, UK: Journal of Chinese Medicine Publications; 1998;286-287, 299-301,336-338.
14. Barral JP, Croibier A. *Manual Therapy for the Peripheral Nerves*. Edinburgh, Scotland: Elsevier Health Sciences; 2007:223-236.
15. Nicholas AS, Nicholas EA. *Atlas of Osteopathic Techniques*. Philadelphia, PA: Lippincott Williams & Wilkins; 2008:231.
16. Speece CA, Crow WT, Simmons SL. *Ligamentous Articular Strain: Osteopathic Manipulative Techniques for the Body*. Rev ed. Seattle, WA: Eastland Press; 2009:73-74,86-91,94,101-110.
17. Magoun HI. *Osteopathy in the Cranial Field*. 3rd ed. Boise, ID: Sutherland Cranial Teaching Foundation; 1976:60-64,96-106,343.
18. DeStefano LA. *Greenman's Principles of Manual Medicine*. 4th ed. Baltimore, MD: Lippincott Williams & Wilkins; 2011; 479-511.
19. King HH, ed. *Greenman's Works: The Collected Works of Philip E. Greenman, DO, FAAO*. Indianapolis, IN: American Academy of Osteopathy; 2010:357-364.
20. Tiran D. Structural reflex zone therapy in pregnancy and childbirth: a new approach. *Complement Ther Clin Pract*. 2009;15(4):234-238 ■