

# CASE STUDY

## Improved Health Outcomes in a Woman Experiencing Chronic Post-Partum Low Back Pain

Marie Hoying, DC<sup>1</sup> & Joel Alcantara, DC<sup>2</sup>

### Abstract

**Objective:** To describe the outcomes related to chiropractic in a woman with post-partum back pain.

**Clinical Features:** A 33-year-old female presented for chiropractic consultation and care with chronic low back pain that began in pregnancy approximately three years prior. History revealed that she had a C-section due to a small pelvic opening. An A-P lumbosacral radiograph demonstrated significant left sacral displacement relative to the median plane.

**Intervention and Outcomes:** Following the Pierce Results System, the patient was cared for with high velocity low amplitude thrust adjustments assisted with drop table technique. Chiropractic care was administered to the patient over two visits. After one sacral adjustment, comparative radiographic assessment revealed a 72% correction of the sacral subluxation and she had complete relief of symptoms.

**Conclusions:** This case report provides supporting evidence that women suffering from pelvic and low back pain post-partum may benefit from chiropractic care. Research on the relationship between pelvic subluxation should be further conducted.

**Key Words:** *Pregnancy, Chiropractic, Subluxation, Adjustment, Pierce Results System, Low back pain*

### Introduction

The prevalence of pregnancy-related low back pain ranges from 4 to 76.4 % depending on definition used.<sup>1</sup> Unfortunately, the condition is not self-limiting to pregnancy and in addition with consequences of childbirth (i.e., perineal tears and damage to the striated muscles and nerve supply of the pelvic floor)<sup>2</sup>, women continue to suffer in the postpartum period. It's estimated that approximately 80% of women will report mild complaints of low back pain and pelvic pain in the postpartum period, 13% will report moderate pain and 7% will report very serious complaints.<sup>3</sup> In a follow-up study of 632 women that have delivered, the majority of women reported

'recurrent' or 'continuous' pain at 12 months postpartum had not sought any healthcare services during the past 6 months (N = 91, 64.1 %). However, 59.3 % (N = 16) women with 'continuous' pain did report that they had sought healthcare services the past 6 months compared to 30.4 % (N = 35) of women with 'recurrent' pain at 12 months postpartum. The most sought healthcare service was physical therapy/medical care along with acupuncture and chiropractic.<sup>4</sup>

A study found that pelvic girdle pain may influence women's lives for months and years after delivery.<sup>5</sup> Health care

1. Private Practice of Chiropractic, Dublin, OH
2. Research Director, the International Chiropractic Pediatric Association (Media, PA) and Senior Research Consultant, Sherman College of Chiropractic, Spartanburg, SC

professionals should appreciate, focus and understand the daily experiences of women with pelvic girdle pain in the postpartum period to help improve care strategies for these patients.

Towards these efforts to inform clinical practice we describe the successful care of a patient suffering from low back pain that began during pregnancy and into the post-partum period three years later.

### Case Narrative

A 33-year-old female patient presented to the office with a primary complaint of low back pain. The low back pain began approximately three years prior while pregnant with her first child. The patient described her pain complaint as a dull ache that is consistently notable 3-4 times a week. She provided a pain rating (0=no pain; 10=maximum pain) of 4/10 on average and a 6/10 at its worst. According to the patient, sleep was the only thing she noticed that provided her relief while strenuous activities and cleaning made her back pain worse. The patient indicated that her pregnancy associated with her low back pain resulted in a Cesarean section. She recalled that her OBGYN informed her that she was not capable of having a vaginal birth due to her pelvic diameter being too small for a natural childbirth.

Other subjective complaints that the patient presented with included headaches, neck pain, dizziness and lightheadedness, upper back pain, right foot pain and a very reactive gag reflex.

### Examination

A chiropractic examination was performed following the Pierce Results System (PRS) analysis.<sup>6</sup> A paraspinous thermal analysis using the Tytron C5000 instrument in conjunction with the Platinum System infrared thermography camera to obtain a full spine thermographic pattern was performed. The initial thermal scans revealed that the patient had multiple asymmetries present along her paraspinous regions. There were severe hyperthermic zones greater than 0.8°C in the lumbar spine and sacral regions at the initial reading. In the cervical and upper thoracic spine, there were severe hypothermic zone greater than 0.8°C.

A set of static film radiographs were obtained. The AP lumbosacral radiographic analysis (see Figure 1) revealed that the sacrum was displaced to the left by 21mm relative to the median plane. Lumbar body rotation was found on the same side of sacral displacement at vertebral levels L<sub>5</sub>, L<sub>4</sub>, L<sub>3</sub>, L<sub>2</sub> and L<sub>1</sub> and later confirmed on video-fluoroscopy. Utilizing the Pierce Results system of analysis, the chiropractic listing is referred to as a left EX ilium.

A set of cervical radiographs were also taken. The neutral lateral cervical radiograph revealed a military or straight neck reading +500cm using an AcuArc ruler. According to the Pierce Results System, a normal neutral cervical spine should be lordotic with a measurement of +17cm.

Video-fluoroscopy was utilized in conjunction with the static film radiographic analysis. This examination showed multiple vertebral levels with inter-segmental locking. Cervical flexion

locks were present at the C<sub>4</sub> and C<sub>0</sub> vertebral levels. Thoracic extension lock was found at the T<sub>1</sub> vertebral body. Upon cervical rotation, the C<sub>2</sub> vertebral body was found to be locked to the left relative to C<sub>1</sub>. Thoracic rotation locking was found at the vertebral levels of T<sub>1</sub> and T<sub>2</sub> to the left and right rotation locking at the T<sub>3</sub> vertebral body. In the lumbar spine, there was decreased motion during left lateral flexion at the vertebral levels of L<sub>5</sub>, L<sub>4</sub>, L<sub>3</sub>, L<sub>2</sub>, and L<sub>1</sub>. The chiropractic thermographic and radiographic examination revealed that multiple vertebral subluxations were present. These findings were correlated to the kinesiopathological and neuropathological components of the VSC model proposed by Lantz.<sup>7</sup>

Following the Pierce Results System guidelines, manual and manually-assisted instrument and pressure spinal adjustments were utilized to correct the patient's vertebral subluxations. The sacral rotation was addressed on the second visit. One, posterior to anterior toggle set was performed on the patient's left sacrum with a contact between the posterior superior iliac spine (PSIS) and S<sub>2</sub> tubercle. The chiropractic contact was a thumb contact reinforced by the opposite hand's pisiform. A high velocity, low amplitude thrust was delivered to the sacrum assisted by a pelvic drop piece on the Zenith model 230 plus table. With the patient prone, pressure adjustments were also performed on the L<sub>5</sub> -L<sub>1</sub> vertebra bodies. The chiropractor utilized a thumb contact reinforced by the opposite hand's pisiform just lateral to the spinous process on the lamina. For each vertebral body, a high velocity, low amplitude thrust was made to these vertebral bodies assisted by a lumbar drop piece on the Zenith model 230 plus table.

The patient returned to the office six days later. She reported at that time that she did not experience a single bout of low back pain since her adjustments 6 days prior. This led the doctor to perform a follow up post AP lumbosacral x-ray to document changes to the normal alignment of the spine. The A-P radiographic analysis (see Figure 2) revealed that the sacrum was displaced 6mm relative to the relative to the median plane. This was a 72% improvement relative to the initial A-P radiographic analysis.

### Discussion

A plethora of physiological and anatomical changes occur in a woman's body during pregnancy. The consequences of these changes may result in symptoms of low back pain, pelvic girdle pain, upper and lower extremity problems as well as urinary incontinence.<sup>8</sup>

It is acknowledged that the pregnancy-related MSK complaints may be as a result from increased levels of relaxin loosening pelvic ligaments during pregnancy.<sup>9</sup> However and of interest by chiropractors are the biomechanical factors (i.e., posture) that may play a role in these pregnancy-related complaints. Consider the pregnant woman demonstrating a sway-back posture. Her upper trunk is displaced posteriorly when compared to her lower body. This sway-back posture increases the tone of back muscles to maintain thoracic kyphosis, shift the center of gravity further backward, while the head shifts forward to compensate for the change in center of gravity and concomitant increased muscle tone in the neck and shoulders. The result is neck pain and low back pain.

Of interest in this case report is clinical pelvimetry. Pelvimetry is of hybrid origin with the Latin word pelvis, meaning basin and the Greek word metron for measure. Pelvimetry therefore means to measure the pelvis.<sup>10</sup> This can be performed manually with a caliper or radiographically. In the case described, the woman had a Caesarean birth due to inadequate room in her pelvic opening. In a study to identify risk factors of cesarean section due to cephalopelvic disproportion. Surapanthapisit et al.<sup>11</sup> found that risk factors for Caesarean section due to cephalopelvic disproportion were estimated fetal weight > 3,000 g, pre-pregnancy BMI > or = 25 kg/m<sup>2</sup>, nulliparity and the inadequacy of clinical pelvimetry. Stålbjerg et al.<sup>12</sup> that a narrow pelvic outlet is associated with an increased risk of emergency CS because of protracted labor.

According to the Pierce Results System<sup>13</sup>, there are nine specific qualities for a normal pelvis: 1) a heart shaped pelvic opening, 2) almond shaped obturator foramen, 3) level sacral base, femur heads, and iliac crests, 4) the coccyx sitting an inch and a half directly above the pubic symphysis, 5) both iliums are the same width side to side, 6) Absent lumbar body rotation, 7) a lateral lumbar curve from +19cm to +24cm measured with an AcuArc ruler, 8) both ischial tuberosities have the same distance from the inferior portion of the film, and 9) the film would be symmetrical if superimposed from side to side. The initial AP lumbosacral radiographic analysis of the patient revealed that the sacrum was displaced to the left of the median plane by 21mm, resulting in the pelvic opening being asymmetrical. The left ilium was narrowed compared to the right ilium. The left obturator foramen had an appearance that was larger and wider than the right obturator foramen. Left body rotation was also present. These are all indicators of an abnormal pelvis according to the Pierce Results System.

Studies support the notion that this was essentially the pelvic state of the patient prior to being pregnant, during pregnancy and in the post-partum period. Huerta-Enochian et al.<sup>14</sup> evaluated the stability of the maternal pelvis over the course of the third trimester and the puerperium. Eighteen pregnant patients were recruited to undergo comparative magnetic resonance-based pelvimetry and fetal ultrasonography at 37 to 38-weeks of gestation. Most of the patients were recruited from a study of women who planned a trial of labor after a previous cesarean delivery for cephalopelvic disproportion. Patients then underwent magnetic resonance-based pelvimetry within 3 days and at 3 months after delivery. Statistical analysis of the 18 patients determined that pelvic measurements did not demonstrate change over the course of the study. The authors concluded that there is relative stability of pelvic measurements through the course of pregnancy and delivery. Incorporating five observers and 500 pelvimetric measurements, Keller et al.<sup>15</sup> found no pelvimetric differences between pregnant and nonpregnant women, nor any correlation between pelvimetric profile and parity. O'Brien et al.<sup>16</sup> found that postpartum pelvimetry has the same association with fetal-pelvic disproportion as antepartum pelvimetry. In the case report described, following a trial of chiropractic care, we can observe from the comparative radiograph that the sacrum was only displaced 6mm from the center and correlated with improved symptoms of low back pain as reported by the patient.

Recent publications document the effectiveness of chiropractic

care during pregnancy. Bernard and Tuchin<sup>17</sup> described the chiropractic care of a pregnant 35-year-old woman experiencing insidious moderate to severe pregnancy-related lumbopelvic pain and leg pain at 32 weeks' gestation. Pain limited her endurance capacity for walking and sitting. Clinical testing revealed a left sacroiliac joint functional disturbance and myofascial trigger points reproducing back and leg pain. The patient was cared for with chiropractic spinal manipulation, soft tissue therapy, exercises, and ergonomic advice in 13 visits over 6 weeks. She consulted her obstetrician for her weekly obstetric visits. At the end of treatment, her low back pain reduced from 7 to 2 on a 0-10 numeric pain scale rating. Functional activities reported such as walking, sitting, and traveling comfortably in a car had improved. Peterson et al.<sup>18</sup> reported positive outcomes in 115 pregnant patients with low back or pelvic pain under chiropractic care based on significant reductions in NRS and Oswestry scores. George et al.<sup>19</sup> performed a prospective, randomized trial of 169 women receiving a multimodal approach of musculoskeletal and obstetric management (i.e., MOM group) compared to standard obstetric care to reduce pain, impairment, and disability in the antepartum period. The results demonstrated that the MOM group experienced significant mean reductions in NRS scores and Quebec Disability Questionnaire scores from baseline to follow-up evaluation. The group that received standard obstetric care demonstrated no significant improvements.

Of particular interest in this case report are changes observed in pelvic function following chiropractic spinal manipulation. Haavik et al.<sup>20</sup> investigated whether a single session of spinal manipulation of pregnant women can alter pelvic floor muscle function as measured using ultrasonographic imaging. In a prospective, comparative study, transperineal ultrasonographic imaging was used to assess pelvic floor anatomy and function in 11 primigravid women in their second trimester and 15 nulliparous women. Following bladder voiding, 3-/4-dimensional transperineal ultrasonography was performed on all participants in the supine position. Levator hiatal area measurements at rest, on maximal pelvic floor contraction, and during maximum Valsalva maneuver were collected before and after either spinal manipulation or a control intervention. The authors found that levator hiatal area at rest increased significantly after spinal manipulation in the pregnant women, with no change post-manipulation in the nonpregnant women at rest or in any of the other measured parameters. Spinal manipulation of pregnant women in their second trimester appears to relax their pelvic floor muscles. Our case report provides changes in structure resulting in improved symptoms and function. To date and to the best of our knowledge, this is the first reporting in the literature of corrective changes in pelvic structure following chiropractic care in the post-partum period.

The clinical purpose of our case report was to acknowledge that fetal-pelvic disproportion, particularly in women at risk (eg, those with a history of prolonged labor and/or cesarean section) may benefit from chiropractic care prior to, during and after their pregnancy. Labor terminating in Caesarean section is associated not only with maternal pain and discomfort but also with an increase in endomyometritis; amniotic infection; prolonged hospital stay; and higher risk for the new-born.<sup>21-22</sup>

In the post-positivist paradigm of research, we wish to acknowledge the lack of generalizability of the case presented due to the confounding effects (i.e., placebo, the natural history, subjective validation, and patient bias). However, in the tradition of constructivism, research emphasizes the meaning of the human experience. As such, case reports are epistemologically in harmony with our patient and clinical experiences and therefore forms a basis for generalization and informs our conviction that chiropractic is effectiveness in similar patients (i.e., women suffering from low back pain in the post-partum period) as described in this case report.

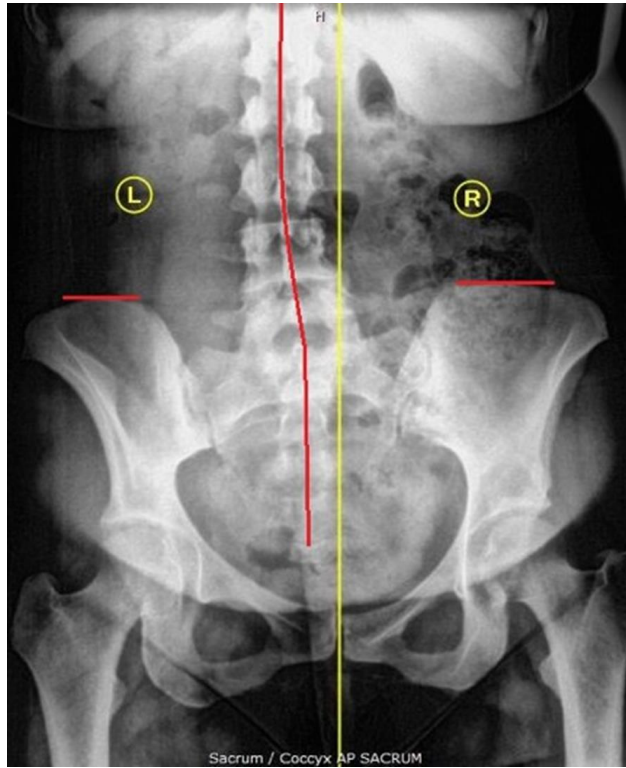
## Conclusion

This case report provides supporting evidence that pregnant women may benefit from chiropractic care prior to, during and after their pregnancy. We support further investigation in this area of chiropractic care.

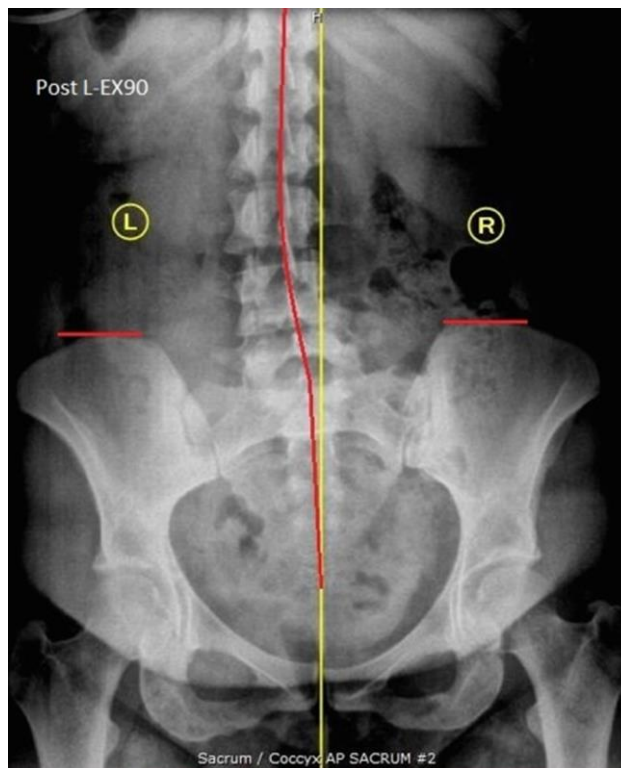
## References

1. Kanakaris NK, Roberts CS, Giannoudis PV. Pregnancy-related pelvic girdle pain: an update. *BMC Med* 2011;9:15
2. Allen RE, Hosker GL, Smith AR, Warrell DW. Pelvic floor damage and childbirth: a neurophysiological study. *Br J Obstet Gynaecol* 1990;97(9):770-9
3. Wu WH, Meijer OG, Uegaki K, Mens JM, van Dieen JH, Wuisman PI, et al. Pregnancy-related pelvic girdle pain (PPP), I: Terminology, clinical presentation, and prevalence. *Eur Spine J* 2004;13:575-89.
4. Bergström C, Persson M, Mogren I. Sick leave and healthcare utilisation in women reporting pregnancy related low back pain and/or pelvic girdle pain at 14 months postpartum. *Chiropr Man Therap* 2016;24:7
5. Engeset J, Stuge B, Fegran L. Pelvic girdle pain affects the whole life--a qualitative interview study in Norway on women's experiences with pelvic girdle pain after delivery. *BMC Res Notes* 2014;7:686
6. Pierce Results System. Accessed Aug 26, 2016 at: <http://www.pierceresults.com>
7. Lantz CA. The vertebral subluxation complex part 2: neuropathological and myopathological components. *Chiropractic Research Journal* 1989; 1(3):23
8. Ramachandra P, Maiya AG, Kumar P, Kamath A. Prevalence of musculoskeletal dysfunctions among Indian pregnant women. *J Pregnancy* 2015;2015:437105
9. Kristiansson P, Svårdsudd K, von Shoultz B. Serum relaxin, symphyseal pain, and back pain during pregnancy. *Am J Obstet Gynecol* 1996;175:1342-7
10. Yeomans ER. Clinical Pelvimetry. *Clin Obstets Gynecol* 2006; 49(1):140-46
11. Surapanthapisit P1, Thitadilok W. Risk factors of Caesarean section due to cephalopelvic disproportion. *J Med Assoc Thai* 2006;89 Suppl 4:S105-11
12. Stålberg K, Bodestedt A, Lyrenäs S, Axelsson O. A narrow pelvic outlet increases the risk for emergency cesarean section. *Acta Obstet Gynecol Scand* 2006;85(7):821-4
13. Pierce WV. Results. Dravosburg, Pa: X-Cellent X-ray Company
14. Huerta-Enochian GS, Katz VL, Fox LK, Hamlin JA, Kollath JP. Magnetic resonance-based serial pelvimetry: do maternal pelvic dimensions change during pregnancy? *Am J Obstet Gynecol* 2006;194(6):1689-94
15. Keller TM, Rake A, Michel SC, Seifert B, Efe G, Treiber K, Huch R, Marincek B, Kubik-Huch RA. Obstetric MR pelvimetry: reference values and evaluation of inter- and intraobserver error and intraindividual variability. *Radiology* 2003;227(1):37-43
16. O'Brien K, Rode M, Macones G. Postpartum X-ray pelvimetry. Its use in calculating the fetal-pelvic index and predicting fetal-pelvic disproportion. *J Reprod Med* 2002;47(10):845-8
17. Bernard M, Tuchin P. Chiropractic Management of Pregnancy-Related Lumbopelvic Pain: A Case Study. *J Chiropr Med* 2016;15(2):129-33
18. Peterson CK, Mühlemann D, Humphreys BK. Outcomes of pregnant patients with low back pain undergoing chiropractic treatment: a prospective cohort study with short term, medium term and 1 year follow-up. *Chiropr Man Therap* 2014;22(1):15
19. George JW, Skaggs CD, Thompson PA, Nelson DM, Gavard JA, Gross GA. A randomized controlled trial comparing a multimodal intervention and standard obstetrics care for low back and pelvic pain in pregnancy. *Am J Obstet Gynecol* 2013;208(4):295.e1-7
20. Haavik H, Murphy BA, Kruger J. Effect of Spinal Manipulation on Pelvic Floor Functional Changes in Pregnant and Nonpregnant Women: A Preliminary Study. *J Manipulative Physiol Ther* 2016;39(5):339-47
21. Blanchette H. The rising cesarean delivery rate in America: what are the consequences? *Obstet Gynecol* 2011;118(3):687-90
22. Glavind J, Uldbjerg N. Elective cesarean delivery at 38 and 39 weeks: neonatal and maternal risks. *Curr Opin Obstet Gynecol* 2015;27(2):121-7

**Figures**



**Figure 1.** Anteroposterior radiographic study of the patient.



**Figure 2.** Comparative A-P radiographic study demonstrating correction of sacral deviation.