Case Reports

Chiropractic Care of Acute Low Back Pain and Incidental Spina Bifida Occulta: A Case Report

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Abstract

Objective: The purpose of this case report is to describe chiropractic care of an adolescent with acute low back pain and incidental finding of spina bifida occulta managed with high-velocity low-amplitude manipulation.

Clinical Features: A 10-year-old boy was referred for chiropractic care by his pediatrician for the management of low back pain after a fall 3 days prior. Examination and medical records revealed the patient also had spina bifida occulta at the level of L5.

Intervention and Outcome: High-velocity low-amplitude treatment for lower back pain showed resolution of patient's pain after 6 visits. No adverse effects were reported.

Conclusion: An adolescent patient with lower back pain and incidental finding of spina bifida occulta improved with a course of care that included with high-velocity low-amplitude manipulation therapy.

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Introduction

Low back pain is common, and chiropractic manipulative therapy is frequently used for treatment of acute low back pain.¹ High-velocity low-amplitude (HVLA) has been demonstrated to be an effective treatment modality for the management of acute low

back pain when compared to standard medical care.¹ High-velocity low-amplitude adjustments have been proven to be a superior treatment compared to prescription nonsteroidal anti-inflammatory drugs.²

Spina bifida occulta (SBO) is a common anomaly of the spine present at birth.³ It is a condition arising during neurological development that is the result from the neural tube failing to close, which normally closes by the fourth week of gestation. In the spine, this developmental abnormality typically presents as an incomplete fusion of the lamina without affecting the spinal cord.^{3–5} According to clinical studies, around 20% of the population may have SBO.^{6,7} It usually is

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present at the levels of the 5th lumbar and 1st sacral vertebra.^{6,8,9} Spina bifida occulta in most cases is asymptomatic, but symptoms among the population may include back pain, enuresis, motor or sensory dysfunction, and posterior disc herniation.^{7,9,10} Fusion of vertebral lamina forms the spinous process, and this process serves as attachment sites for many extensor muscles. Muscles such as the multifidus are essential in trunk stability and play a role in lumbar support and posture.¹¹ Spina bifida occulta is classified as a congenital anomaly, which may present with other conditions of the spine such as disc herniation and spondylolysis.^{9,12,13} Spina bifida occulta can go undiagnosed and may only present as a nonunion of the spinous process seen on radiographs.

Physical examination findings often include a patch of hair present on the dermis above L4/L5 segments.¹⁴ Decreased range of motion in the spine and pain with extension are other possible findings. Postnatal diagnosis of SBO is best found initially with the use of radiographs of the lumbar spine.^{9,15} Radiograph findings can be confirmed using computerized tomography or magnetic resonance imaging. However, after SBO has been diagnosed, clinicians may be unclear if HVLA can be used as a treatment for those patients who also have low back pain.

Currently, there are no published manuscripts stating that adolescents with lower back pain along with SBO can be treated successfully with HVLA. Therefore, the purpose of this article is to describe chiropractic management of a 10-year-old adolescent with lower back pain and incidental finding of SBO.

Case Report

A 10-year-old boy was referred for chiropractic care for lower back pain and muscle spasm by his pediatrician. During history taking at the chiropractic office, the mother expressed concern about her son's spinal deformity at the initial encounter and was protective of him and had limited him from strenuous activities. Upon inquiry, the patient and his mother reported that the achy pain was localized to the lower lumbar spine at a 5/10 severity using a numeric rating scale. The mechanism of injury was from a fall onto the patient's right side with his right forearm and right hip striking the ground, immediately resulting in lower back pain. This occurred 3 days before the office visit. Bending, playing, and general activity all worsened his lower back pain, while ice was the only palliative

factor. Past history included a motor vehicle accident 1 year prior with no residual injuries. Thoracic radiographs taken at the time revealed no evidence of osseous or joint pathology. Lumbar radiographs demonstrated an SBO at L5 (Fig 1).

Range of motion was restricted in the lumbar spine, and pain was reproduced during extension and left lateral bending. Postural changes included an anterior and high left shoulder along with mild scoliosis that produced left rib humping on Adam test. Straight leg raise test and Valsalva test were both negative. Kemp test reproduced lower back pain as well as provocation of the fourth and fifth lumbar vertebrae. Spasm was noted on the right lumbar erector spinae musculature. All lower extremity reflexes, motor strength, and sensation were intact. The diagnoses of lumbago,

Fig 1. a, Anteroposterior view of patient's lumbopelvic spine demonstrating SBO. The SBO in this particular case was a nonunion with less than 1 mm gap. b, Close-up of SBO.

muscle spasm, and lower lumbar segmental dysfunction were made. Incidental findings of SBO were also made from the patient history and old radiographs.

Part of the initial chiropractic management was a review of findings and reassurance to the mother and patient, which included an explanation that SBO is generally benign in most cases. Patient treatment began with instrument-assisted joint mobilization of the lower lumbar spine, specifically L4 and L5 and soft tissue vibration therapy to address the erector spinae muscle spasm. Ergonomic advice was also given to both the patient and his mother to limit high-stress positions for the lumbar spine during the acute stage of his lower back pain. On the second visit, HVLA side-posture manipulation was utilized for the lumbar spine, specifically L4/L5 with mammillary contact point with an inferior-to-superior line of drive. Vibration therapy was continued along with the HVLA. High-velocity low-amplitude, as described by Goertz et al, is a single load or impulse thrust to body tissues performed by a doctor of chiropractic (DC).¹ In this case, the patient position was side lying with superior knee and hip flexed and adducted across the midline. The DC stands facing the head of the table and stabilizes the patient shoulder with DC's hand and the patient's superior leg with DC's hip. A mammillary contact is made with DC's free hand to perform a short, quick, controlled thrust into the segmental levels of L4-L5 of the lumbar spine.

After 6 patient visits utilizing HVLA, the patient's lower back pain had resolved (pain reported at 0/10). Throughout the course of care, no adverse effects were reported. Cross crawl exercises were prescribed for him to continue at home to stabilize and strengthen the lumbar spine musculature. Follow-up visits at the 1-, 2-, and 5-month mark, the patient remained pain free with no restriction in range of motion and full participation in all activities.

Discussion

In the case of this adolescent patient, low back pain was present after a traumatic fall, and he was referred by his pediatrician for chiropractic care. An incidental finding of SBO was present, which was the mother's main concern. With around 20% of the population having SBO, chiropractic physicians are very likely to encounter this incidental finding in their practices.^{6,7} Anomalies within the spine are not uncommon, but are sometimes overlooked due to their benign presenta-

tion.⁶ Few studies examine the utilization of HVLA in patients with SBO and lower back pain. This report demonstrates the viability of HVLA once neurological signs and symptoms such as motor or sensory loss are ruled out in the management of an adolescent with lower back pain and SBO at the fifth lumbar vertebrae. Chiropractic physicians must first be aware of potentially more serious conditions that can be associated with SBO, such as genitourinary signs and symptoms and although rare, tethered cord syndrome.¹⁴ Tethered cord syndrome is defined as increased tension on neural structures, resulting in pain.¹⁶ Clinicians should be cautious of tethered cord syndrome and other red flags. If no major complication is identified from the presentation of SBO, it is possible that weakness of the abdominal and spinal muscles due to a low level of physical fitness could contribute to the patient's low back pain.¹⁷

The presence of SBO reduces attachment sites for multifidi muscles, leading to proprioception impairment that could contribute to lower lumbar instability.¹¹ With an increase in instability, this can lead to a higher incidence of low back pain.¹⁸ Addition of strength exercises and ergonomic correction with the HVLA chiropractic adjustment helps eliminate lower back pain.¹⁹ High-velocity low-amplitude has been shown to improve postural sway and accuracy in patients with low back pain, although it is unknown if the same results would be produced in patients with SBO and lower back pain.¹⁹

Spina bifida occulta has been described as a promoter of lower back pain because of increased stress on vertebral structures due to hypoplastic formation.²⁰ With nonunion of a vertebral spinous process, possible stress may be placed on the pars interarticularis. As an adolescent continues to mature, there is an increase of pressure on the membrane where the SBO is located.²⁰ New bone formation may fill the defect, but is not likely. Because there is an exposed membrane and stress from the rest of the developing skeleton, low back pain may increase in a patient with SBO.¹⁰ Studies have demonstrated that children with SBO in the lumbar region may also have degenerative changes accompanying this anomaly.^{14,15} Degenerative changes can lead to potential low back biomechanical faults as these children progress into adulthood. The accompanying changes could include disc herniation, spondylolysis and even visceral complaints such as constipation.^{7,14}

Currently, there are no specific treatments for low back pain with an asymptomatic SBO. The purpose of this study was to focus on chiropractic care for

symptomatic low back pain in an adolescent with incidental finding of SBO. Although some evidence has been shown that SBO does not have an impact on spinal function, there may be future complications, such as disc herniation, lower lumbar spine instability, and spondylolysis.¹⁴ Lumbar range of motion with SBO may have the same movement patterns as an intact lumbar spine, although this does not take into consideration activities of daily living of the individuals.⁶ As previously stated, SBO can possibly lead to degenerative changes in the future and should be considered when developing a treatment plan for a patient with lower back pain.

Limitations

This was the report of one patient, and each case of SBO is unique. Therefore, the findings of this case cannot be extrapolated to other cases. He had experienced a traumatic fall and a previous car accident, which may have been the contributing factors of low back pain. Research obtained stated that presence of SBO in lumbar spine could present with worse pain, which may be unrelated in this case due to child's previous history. Other limitations include patient subjective response due to patient age. Psychosocial elements from the mother's concern of her child's condition could have exacerbated the child's pain response. As well, the patient's improvement may be attributable to the normal course of low back pain. Further research should be considered on the use of conservative therapies in patients with lower back pain and findings of SBO.

Conclusion

This case report describes the resolution of lower back pain in an adolescent patient with an incidental finding of L5 SBO who was treated with HVLA manipulation. This study demonstrates that HVLA was beneficial for this patient's lower back pain and that there were no adverse reactions, despite the presence of a coincidental SBO.

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No funding sources or conflicts of interest were reported for this study.

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