Topics in Diagnostic Imaging

Chiropractic Management of Low Back Pain in a 75-Year-Old Man With Bilateral Developmental Hip Dysplasia

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Abstract

Objective: The purpose of this case report is to describe chiropractic management of an elderly man with untreated bilateral hip joint dysplasia presenting with mild acute mechanical low back pain.

Clinical Features: A 75-year-old man presented with an insidious-onset intermittent low back pain of 3 days' duration. Physical examination findings supported a mechanical cause for mild acute low back pain. Plain radiography revealed dysplasia of hip joints with absence of femoral heads and necks and bilateral high dislocation.

Intervention and Outcome: Chiropractic management included vibration, mobilization, light drop-piece adjustments of the lower lumbar and sacroiliac joints, and recommendation of the use of heat at home. Treatments were given 3 times over the course of 1 week. The low back pain intensity over this period dropped from 5 to 0 on an 11-point numerical rating scale, and the patient was discharged.

Conclusion: This patient with substantial postural and gait abnormalities as a result of severe bilateral hip dysplasia associated with an unusual pattern of osteoarthritic change in the spine responded favorably to a short course of chiropractic care.

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Introduction

Developmental dysplasia of the hip (DDH), also known as *congenital hip dislocation* or *congenital hip*

dysplasia, represents a broad range of severities from mild transient neonatal hip instability to total hip dislocation.¹ Dysplasia is an alteration in cell growth resulting in cells that differ in size, shape, and

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appearance producing abnormal growth and development. In developed countries, DDH is encountered in 1 per 100 newborns, making it a commonly diagnosed and treated neonatal condition.² This is in contrast to developing countries where untreated cases are common.³ Developmental dysplasia of the hip was commonly diagnosed by plain radiography or computed tomographic scans in those older than 6 months. More recently, ultrasound imaging has become the preferred method for DDH diagnosis.^{1,4}

The normal development of the hip is dependent on proper formation of the triradiate cartilages forming the acetabulum and a spherical femoral head that is well centered. This normal development provides stability to the femoral head in the acetabular fossa and is partly dependent on the absence of abnormal laxity in the hip joint capsule.⁵ However, in the presence of hip joint instability, the femoral head can subluxate or dislocate and may even form a pseudoarthrosis.⁵ High dislocation of the femoral head and a fibrous pseudoacetabular formation can occur, preventing further superior migration of the femur during weight bearing.⁶ In less severe cases of dysplasia that do not involve dislocation of the femoral head, DDH causes hip joint degeneration. It is interesting that acetabular dysplasia was reported to be responsible for approximately 80% of osteoarthritis (OA) of the hip in Japan.⁷ Similarly, a recent study of a population-based sample of 842 participants in France has confirmed that even mild acetabular dysplasia is related to hip OA.⁸ Risk factors for DDH include family history, female sex, congenital calcaneovalgus foot deformity, breech presentations, and swaddling of infants.^{1,9}

It is important to note that untreated DDH, particularly when unilateral, may cause asymmetrical joint loading manifesting as leg length discrepancy (LLD), gait abnormalities, and biomechanical effects such as muscle weakness, abnormal joint movement, and knee and foot disorders.¹⁰ There is evidence suggesting that, without correction, functional impairment due to DDH is common and worsens with age.¹⁰ However, there are instances where cases of untreated dislocation are without notable complications and remain pain free.¹¹ Generally, in situations of high dislocation due to DDH, the acetabulum is small, is porotic, and may be poorly shaped. The superiorly migrated femoral head is small and dysplastic, and the femoral neck is anteverted.¹²

At present, there is only one other published case series that describes the chiropractic management of low back pain in a patient with hip dysplasia.¹³ Therefore, the purpose of this case report is to describe

chiropractic management of an elderly man with untreated bilateral hip joint dysplasia presenting with mild acute mechanical low back pain.

Case Report

A 75-year-old retired white man presented with an insidious-onset intermittent low back pain of 3 days' duration. It was described as 5/10 on the numerical rating scale-11 in terms of severity at its worst and was reported as 0 (absent) at best. He felt pain in the midline at the lumbosacral level, which was aggravated by lumbar flexion as when doing up his shoelaces. No radiation or referral of the pain was reported; and the patient denied any paresthesia, numbness, or muscle weakness in the legs. The patient had a history of mild intermittent spinal pain since he was in his thirties lasting no more than a day or two and had not produced any impairment or disability. However, this time, his low back pain had persisted for 3 days and was more severe; hence, he sought chiropractic care. The pain was dull and relieved by rest or heat and aggravated by pulling himself up into the bus that he drove on occasion. He also mentioned that he had had an abnormality with his hip joints since birth. Nevertheless, he reported that his hip condition had not impaired his activities and therefore he had not sought to have it treated. He stated that he had participated in physical activities while growing up without any impairment or pain. In addition, he had worked as an insurance salesman in adulthood (an occupation that required a lot of driving) until retirement. He had no relevant family or medical history, had not suffered any trauma in the past, had not been hospitalized, and was not taking any medications.

The patient was 155 cm tall and weighed 70 kg (body mass index = 29.1). The patient's thighs appeared short, and the gluteal muscles seemed round and bulky. A severe LLD of approximately 45 mm was measured on prone leg length check, with the short leg being on the right side. The patient stood and walked with almost maximal plantar flexion of the right ankle, which compensated for the LLD. Moderate joint stiffness and muscular hypertonicity were found at L4/5 and L5/S1 spinal levels. Lumbar ranges of motion (ROM) were full and only painful at end-ROM in lateral flexion or rotation to either side. Hip ROM on both sides were within the normal range and pain free. Result of orthopedic and neurologic examination of the lumbar spine and lower extremities was unremarkable.

Given the patient's age and the insidious onset of low back pain, he was referred for radiographic examination of his lumbopelvic region.

Plain film radiography demonstrated that lumbar lordosis was increased, and mild intervertebral joint degeneration was present at all lumbar levels. Large anterior osteophytes were seen at L1/2 and T12/L1 levels. Disk spaces were relatively spared throughout the lumbar spine. It also revealed that the hips were dislocated, and the femoral heads and necks had not formed. Both acetabulae were shallow and dysplastic. No pseudoarthroses were present, and the sacroiliac joints were normal (Figure 1).

This patient was managed with 3 sessions of a combination of physical treatments, over a period of 7 days, given to the lumbar spine. These included mobilization of the L4/5 and L5/S1 facet joints and sacroiliac joints in the prone position using gentle to moderate posterior to anterior manual pressure and light Thompson drop-piece adjustments to these joints to

release joint fixations; vibration over the lumbar erector spinae muscles to decrease their tension (using the Therapist's Select percussion massager by HoMedics Australia); and application of heat at home to the lumbar spine in the supine position to maintain muscle relaxation. Following this course of treatment, the patient became asymptomatic (NPS = 0/11). He returned to his preonset status and resumed his daily activities. The patient provided consent for the use of his clinical information for publication in this case report.

Discussion

Cases of untreated unilateral DDH with chronic dislocation are rare but may present to chiropractors as LLD, scoliosis, and gait disturbances. However, when the condition is bilateral, normal biomechanics are disturbed but may not cause significant side-to-side asymmetry. This patient's case demonstrates that DHH

Figure 1. Conventional radiographs of the lumbopelvis show increased lumbar lordosis and intervertebral joint degeneration present at all lumbar levels. Large anterior osteophytes are seen at the T12/L1 and L1/2 levels. The hips are dislocated, and the femoral heads and necks have not formed. Both acetabulae are shallow and dysplastic. No pseudoarthroses are present, and the sacroiliac joints are normal.

and bilateral high dislocation of the femurs can be painless and may not cause functional impairment for a considerable period of the patient's life. This patient's presentation was typical of minor to moderate acute mechanical low back pain concomitant with bilateral hip dysplasia that was largely coincidental. In cases like this where a pseudojoint does not form, soft tissue structures take on the role of transferring the weight of the torso to the legs. This is consistent with a report in which a 74-year-old male cadaver was found to have bilateral high femoral heads 9 cm above the acetabular fossa with only a thickened fibrous capsule as the major structure preventing further superior migration of the femur upon weight bearing.¹⁴

The pattern of joint degeneration in the lumbar spine of this patient was different to that commonly seen in people of this age. Common degeneration of the lumbar spine primarily affects the lower lumbar motion segments, whereas this case showed sparing of the disk spaces at these levels and degeneration at the thoracolumbar junction. This may reflect the abnormal biomechanical loading of this patient's spinal joints when upright and during gait. It is likely that the transfer of compressive forces during gait at the junction between the femurs and the pelvis was cushioned by soft tissue structures leading to preservation of the lower lumbar disks and facet joints.

Pain and increased levels of substance P in the serum and hip joint synovium have been reported in DDH¹⁵ presumably as a result of altered biomechanics causing excessive or abnormal joint loading. However, in this case, chronic hip pain was not reported. Consistent with this notion are 2 reported cases of elderly patients who had suffered chronic dislocation of a surgically replaced femoral head without suffering pain from any bony or soft tissue structure on the side ipsilateral to the dislocation.^{16,17} This case indicates that, unlike acquired hip joint dysfunction, developmental abnormalities of the hip joints (even when severe), leading to substantial biomechanical alterations in posture and gait, may not cause pain almost throughout life. It also indicates that a severe change in biomechanics of the spine as a result of the absence of hip joints produces a very different pattern of osteoarthritic change in the lumbar spine likely as a result of the alteration in the pattern of joint loading.

Limitations

Several limitations exist in the present study. Firstly, a case report cannot establish the relationship between abnormal biomechanics (due to the absence of the hip

joints) and the pattern of OA observed. This relationship is simply implied based on the understanding of clinical biomechanics. Secondly, the extent to which these anatomical hip joint abnormalities contributed to the development of the mild mechanical low back pain cannot be determined in a case report. Thirdly, the findings in this case may or may not be representative of other cases with the similar gross developmental abnormalities of the hip joints. To be able to make general statements about DDH and its relationship to low back pain, one would need to carry out a large cohort study. Lastly, it is possible that the patient may have improved because of the normal course of the condition.

Conclusion

This case demonstrates that substantial postural and gait abnormalities as a result of severe bilateral hip dysplasia associated with an unusual pattern of osteoarthritic change may lead to virtually no pain or disability throughout life. It also demonstrates that mechanical low back pain in patients with DDH may respond favorably to chiropractic care.

Funding Sources and Conflicts of Interest

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