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Adolescent lumbar disc herniation: a case report

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Lumbar spine disc herniations in children are a relatively rare condition reported to occur in less than 3% of those presenting with low back pain. Unlike the adult, the etiology and clinical picture often provides few clues to making the diagnosis. Although conservative management is the treatment of choice, surgical intervention may be required in some cases. The role of spinal manipulation in these cases may be of limited value. A case report is presented that illustrates the difficulty in making the diagnosis and conservatively managing lumbar disc herniations in children.
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KEY WORDS: adolescent, disc herniation, low back pain, manipulation, chiropractic.

L'hernie discale de la colonne lombaire chez les enfants est une condition relativement rare qui se présente chez moins de 3 % des patients qui manifestent des douleurs du bas du dos. Contrairement à l'adulte, l'étiologie et le tableau clinique donnent souvent des indices qui permettent de poser un diagnostic. Bien qu'une prise en charge conservatrice soit le traitement de choix, une intervention chirurgicale peut s'avérer nécessaire dans certains cas. Dans ces cas, la manipulation vertébrale peut n'être que d'une utilité limitée. Nous présentons une étude de cas qui illustre les problèmes auxquels nous nous heurtons lorsque nous tentons de poser un diagnostic et de prendre en charge les hernies discales de la colonne lombaire chez les enfants.
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MOTS CLÉS : adolescent, hernie discale, douleur du bas du dos, manipulation, chiropractie.

Introduction

Lumbar spine disc herniation is a viable though possibly overlooked differential in the diagnosis of children or adolescents with persistent low back and/or leg pain. Relatively common in adults, it is rare but not unknown in youngsters. While the true incidence is not known, studies have shown that of all patients operated upon for disc herniation less than 3% were under 20 years of age.[1–8] In a population of Japanese patients who underwent low back surgery, Kurihara and Kataoka[9] reported that 15% were children or adolescents.

Like the incidence, the etiology and clinical presentation of lumbar disc herniation in the younger age group also differs from that of adults. Although in the latter group it remains an area of controversy, there seems to be some agreement amongst authors that trauma is an etiological factor.[1,2,6,7,10] A known difference is that children and adolescents may or may not have an associated apophyseal ring fracture associated with a disc herniation.[8,9,11]

A case is presented to illustrate the diagnosis of lumbar disc herniation in the adolescent patient. Certain aspects of the clinical picture which may differ from adults will be discussed, as will the treatment and prognosis.

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Case report

A 14-year-old female presented to her chiropractor with a complaint of bilateral low back, right buttock and lateral thigh pain. The onset was insidious with no reported injury or fall. Although the symptoms were noted four weeks previous, they were aggravated after skiing over moguls and bumps. The pain was described as a constant dull ache with "shooting" sensations extending distally along the lateral aspect of the right leg to the knee. The pain was aggravated by sitting and coughing and relieved by supine lying and standing. She reported no bowel or bladder dysfunction. She did not report a history of back pain except that six months prior she had two episodes of low back pain, the first related to having been pushed and landed quite heavily onto her right hip. Both episodes were effectively managed by her chiropractor utilizing side posture lumbar manipulations after two visits.

Examination revealed a healthy, tall and slender young lady in mild discomfort. She walked into the office limping, unable to straighten her right leg. She stood with a mild (about 20 degree) left antalgic posture with her right knee partially flexed. The range of motion of her lumbar spine was markedly restricted in forward flexion. Heel walking was not possible on the right. Reflex and sensory testing of the lower limbs were unremarkable. Straight leg raising was 20 degrees on the right, producing leg pain only, with crossover pain in the right buttock on elevation of the left leg. Passive and resisted external rotation of the right hip produced buttock pain. Muscle tightness was noted in the right hamstring. Lumbar spine and right hip plain routine radiographs were unremarkable.

A diagnosis of L5–S1 nerve root irritation secondary to an L5–S1 disc herniation was made. Treatment consisted of side posture lumbar spinal manipulation, soft tissue therapy to the lumbosacral region, with interferential current therapy applied to the lumbar spine and right hamstring muscle for pain control.

Over the next week the pain continued to worsen and she developed right malleolar pain and began to occasionally feel that her right leg would "give out." The leg pain now exceeded the back pain. The right ankle jerk was found to be slightly depressed, but she was otherwise neurologically intact. She was referred for a neurosurgical consultation. A CT scan revealed a large right L5–S1 disc herniation, apparently compressing the right S1–S2 nerve roots (see Figure 1). The patient was prescribed antiinflammatory medication and referred back to the chiropractor for further conservative therapy in an attempt to resolve the symptoms and signs. Two weeks following the consultation, the pain became unremitting and the patient underwent surgery for removal of a large right sided lateral herniated disc at the L5–S1 level. At four week follow-up, she reported to be pain free and unrestricted in her activities.

Discussion

Whether the presentation of lumbar disc herniation in children or adolescents differs from that of adults remains controversial. The diagnostic confusion with young patients can be attributed to the physician's failure to recognize this entity. Adolescents and children are capable of manifesting the same signs and symptoms of lumbar disc herniation as adults. The apparent differences in presentation are reported in the pattern of clinical findings which may be demonstrated. Accordingly, pain in younger patients is more often the complaint rather than the objective findings. However, they may demonstrate marked restriction of lumbar range of motion, antalgic posture or scoliosis, with a markedly positive straight leg raise and often an abnormal shuffling gait.[1,4,5,7,9,10] The case presented above fits nicely into this description, as the patient had predominantly leg pain and severe restriction in her straight leg raising due to nerve tension which also affected her ability to ambulate.

The clinical findings noted in the presented case are not unlike those reported by Bulos[3] who found that physical signs were more pronounced than pain symptoms in their study's group. Kurihara and Kataoka[9] suggested decreased lumbar lordosis, scoliosis and vertebral muscle spasm are much more common signs in young patients. Most authors agree that hard neurological signs are seen less frequently in adolescents than they are in adults diagnosed with disc herniation.[1,4,5,7,8,9,10]

However, this is not always the case as Bradford and Garcia[2] and Nelson et al.[6] found when they failed to demonstrate a significant difference between the clinical presentation in adults and their younger counterparts. Similar to adults, the pain on presentation may be primarily leg pain[5,6] or initially back pain with subsequent development of leg pain.[2,4,7,10]

When a disc herniates in an adolescent, it may be associated with a fracture of the apophyseal ring. Hashimoto et al.[11] compared signs, symptoms and imaging

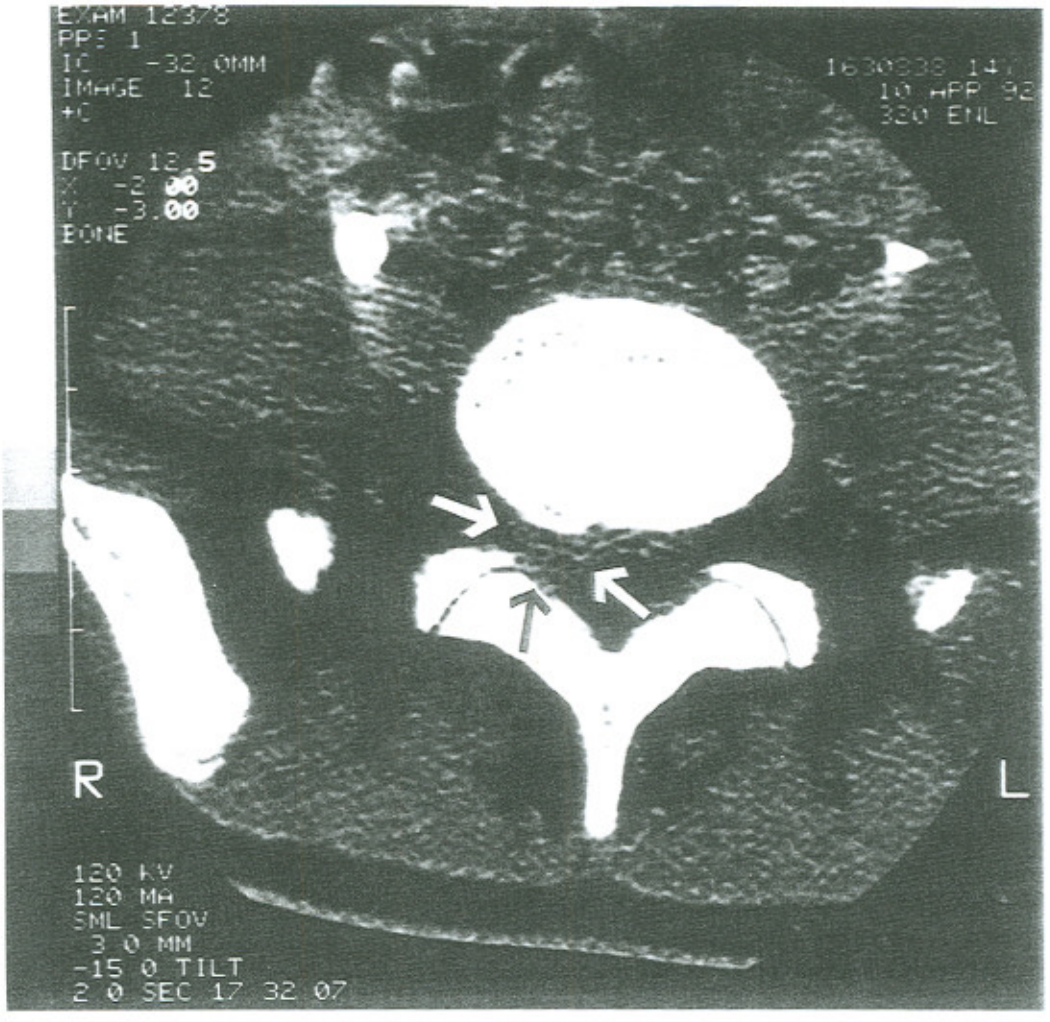

Figure 1 Coronal computer tomography scan at the L5–S1 level, demonstrating a large discal herniation which is apparently compressing the S1–2 nerve roots.

findings of patients with these two different pathological presentations. In 100% of patients with associated apophyseal ring fracture the disc herniated centrally. Patients with herniation alone typically demonstrated posterolateral herniation. An equal percentage in each group reported a history of trauma. Trends in the physical findings, which were not statistically significant, included bilaterally positive straight leg raising more commonly in the group with ring fracture. Unilaterally positive straight leg raising, decreased motor and sensory findings were more prevalent in the group without ring fracture. However, due to the small sample size reported in this study, these findings may not indicate true differences.

The role that trauma and degenerative changes may play in the etiology of adolescent lumbar disc herniations is unclear. As the ring apophysis has not yet undergone osseous fusion with the vertebral body in the adolescent, this junction is usually considered weaker than that in a mature spine. This inherent weakness may account for the possibility of an associated ring fracture with a herniation. For a herniation to occur without an associated ring fracture it seems reasonable to consider that the disc may be structurally abnormal. In Borgesen and Vang's series,[1] degenerative changes were found in disc material from all 29 patients (average age 16.8 years, average duration of symptoms 4.2 years). One third of Bradford and Garcia's[2] cases showed histological evidence of degeneration. The degenerative changes however were not often significant enough to completely account for the herniation but they may be a predisposing factor.[9]

A more logical etiology is trauma. Trauma is frequently believed to precipitate the herniation,[2,3,5,6,7,9,12] with reportedly 30–60% of herniations occurring following trauma.[2] Sports injuries are more often the attributed cause

in children and adolescents, although lifting injuries also occur.[5,9] Chronic, repetitive trauma has also been implicated.[6]

The major stumbling block in the management of adolescents with disc herniations is that the diagnosis is frequently delayed.[4,5,7] This may in part be due to its relative rarity. However, with children and adolescents there are other conditions with potentially more serious consequences which must be ruled out first; namely, disc infection and spinal tumor.[4,12]

Conservative treatment is the agreed upon first choice of care. Several authors have reported successful outcomes when using conservative measures, including bed rest, analgesics, corsets, heat and other physical therapies.[4,8,10] Others, however have reported more variable outcomes.[2,7,10] Bulos[3] reported that adolescents responded less favorably than adults to conservative measures. Kurihara and Kataoka[9] emphasized that prolonged periods of conservative care are not justified in the treatment of children and adolescents with herniated discs whose disability persists.

Manipulation was not mentioned as a component of conservative care in any of the above studies. There is evidence to suggest that manipulative therapy may be of benefit in treating some cases of disc herniation.[8,12] Unfortunately, this evidence is based upon single case studies and the results of management may differ if a larger study sample is used in order to capture those that also do not respond, as in the patient reported herein.

In this case, the patient had previously responded to conservative care and a similar trial was instituted at the time of the last presentation. As outlined in the Clinical Guidelines For Chiropractic Practice In Canada, the progression in neurological signs and the worsening of symptoms prompted a surgical consult. Following the consult, the patient was referred back to the chiropractor for a second trial of therapy with concurrent anti-inflammatory medication. The ongoing monitoring prompted a referral back to the surgeon as a result of the unremitting pain and neurological deficits.

Notwithstanding the response to conservative care, care must be taken to monitor the patient for any progression or change in neurological status. Indications for surgery differ slightly from adults and include: strongly positive Laseque's test, restricted lumbar range of motion with an associated guarding scoliosis,[1] or persistent positive signs despite adequate conservative care.[5] Results following surgery have been reported to be good to excellent in 70–90% of cases.[5,6,9] In a long term follow-up study, Kurihara and Kataoka[9] reported no abnormal radiographic findings in 15 of 26 cases, with 17 patients being asymptomatic and 8 reporting mild symptoms that did not affect their activities of daily living.

Conclusion

Disc herniation in the adolescent is a rare cause of low back pain. Due to the differences in the clinical presentation of this condition compared to the adult, it may not be high on the differential list of clinicians. This report illustrated many of the controversial issues and the difficulty faced in assessing and managing adolescents with lumbar disc herniations.

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