

14 Year Old with An L5 Central Tear

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Background

A 14 year old male presented on September 5 with the complaint of low back and right buttock pain secondary to kicking a soccer ball in gym class on August 31. He denied any fall or impact injury and points to the right ischial tuberosity as the primary source of pain but also has pain in the right central buttock and central lumbosacral area as well. He had one previous adjustment by another chiropractor in the same office that yielded temporary relief prior to coming to see me. He described his pain as deep ache that is 2/10 at rest but 9/10 when provoked. Sitting and changing positions were most provocative as well as coughing. He finds relief by leaning to the left and when laying supine such as sleeping. Patient denies any changes with bladder or bowel habits and denies any pain into this thigh, calf or foot. Parent stated that he had one other episode of low back pain 2 years prior when playing football but was not taken to a doctor for evaluation. The patient stated that the pain knocked the wind out of him at the time.

Examination

The initial lumbar orthopedic and neurological examination showed lumbar and buttock pain with 20 degrees of flexion and lumbar pain with extension but extension range of motion was not limited. He had no pain with lateral flexion or rotation range of motion. Standing kemp's was bilaterally positive for lumbar pain; seated kemp's was bilaterally positive for slight increase in back pain; heel and toe walk were essentially normal; patellar reflexes were 2+ bilaterally; Achilles' reflexes 2+ bilaterally; prone lumbar flexion reproduced his right



buttock pain; right leg was 3/4 short and a Derefield negative pelvic listing; he had pain with compression of L5 and L4 but not L1-3; bilateral SI compression was negative; Nachlas and Ely's bilaterally were negative; Yeoman's was bilaterally positive for lumbar pain in the L5 area but not in SI joint area; right gluteal muscles were more hypertonic and tender than his left gluteal muscles; left hamstring was short at 40 degrees and his right hamstring short a 35 degrees; right SLR aggravated his right buttock pain at 35 degrees and left SLR was negative and went above 60 degrees; Patrick Fabere was slightly provocative for groin pain bilaterally; myotomes L4-S1 were 5+ bilaterally.

Diagnosis

His initial working diagnosis was lumbosacral sprain/strain with probable lumbar disc bulge.

Prior Treatment

His first adjustment consisted of Thompson drop to the lumbar and pelvis areas with interferential for pain relief. (Cox® flexion distraction was not implemented because the patient technically belonged to the other chiropractor and I was covering for him that day so I followed his treatment plan. However, the parent decided to keep the son under my care.)

Treatment and Outcome

After his first adjustment, he stated he felt some relief and rated his pain down to 7/10 with movement and presented without a left antalgia or favoring his right leg. All other provocative and palliative measures remained the same. Cox® Flexion/Distracton Protocol #2 without cuffs was implemented on the second visit along with interferential to his lumbar area.

On his third visit, he stated he got much relief from his adjustment but fell over another student at school and landed on his back and experienced an increase in his right buttock and right ischial tuberosity pain. He stated he did his leg lift exercises given to him by his previous chiropractor which caused him to feel tingling sensation and pain down his right lateral thigh/calf and into his foot but that this tingling sensation was not present unless he did the exercises.

At this time the lumbar orthopedic examination was repeated and remained the same except with the following changes: right SLR caused right buttock, lateral thigh and calf tingling sensation, positive Cox sign with right SLR; right Bechterew's was positive for anterior/lateral tingling calf pain on right with negative Bechterews on left; dermatomes L4-S1 bilaterally 2+, bilateral gluteal spasm; and the Achilles' and patellar reflexes were 2+ bilaterally. At this time he was referred for lumbar plain films which revealed Modic changes and disc space narrowing with a Schmorl's node at L1/L2 which was presumed to have resulted from his football injury two years prior. He stated his back pain at that time was higher in his spine and pointed to the L1/2 area as the source. No other changes were noted on the radiology report.

Thompson adjusting for the pelvis and Cox® Technic Protocol #2 without cuffs with interferential was implemented with a recommended treatment frequency of three times per week until 50% improved, twice per week until 80% improved and once per week until 100%. (However, due to family issues and the fact that the patient didn't have a driver's license caused his care to be sporadic and irregular.)

On the 5th visit, the patient reported tingling sensation in his right anterior/lateral calf when seated but that his buttock pain was about 40% improved from his initial visit. On October 5, the insurance company authorized an MRI but it was delayed due to financial reasons until October 23. At this time the patient said he was okay going to school and that gym class was easy and didn't aggravate his back.

Imaging: Mid Treatment Plan

The MRI results noted minimal disc annular prominence at L4/5 with no central canal stenosis and with neural foraminal narrowing without effacement. L5/S1 showed a central tear touching the anterior margin of the central canal. There was no lateral recess stenosis and the foramen appeared patent.



On the 7th visit, he reported with an aggravation of his lumbar pain after sitting in a car to drive to Oklahoma and sleeping in hotel beds. He now reports that leaning over improves his lumbar pain but aggravates his right buttock pain and stated he still has some tingling in his right calf but that it is not constant.

On October 25, the 8th visit, the patient stated he was injured in gym class when another student collided with him and he fell. He stated his pain was 8/10 when it happened but was 5/10 after taking 800 mg. of ibuprofen and pointed to L5 and the right ischial tuberosity as the primary source of pain. He denied any thigh/calf or foot pain or tingling sensation. He presented with a left antalgia when seated but not standing, stated he noticed some testicular pain when being driven to the appointment but that the testicular pain was not constant and that his buttock pain was deeper than before. He denied any pain with cough/sneeze or a bowel movement and denied any difficulty in controlling his bladder and bowels.

On examination it was noted his lumbar erector spinae muscles were in spasm, prone lumbar flexion and right yeoman's caused L5 pain, positive SLR at 35 degrees for right calf pain, seated Bechterews and Kemps were bilaterally negative; standing kemps was bilaterally negative; Achilles and patellar reflexes were 2+ bilaterally;



heel and toe walk essentially normal; myotomes and dermatomes for L4-S1 were 5+ bilaterally; and a negative bilateral SI compression as well as compression of L5.

At this time, his treatment plan consisting of Thompson adjustment for the pelvis and Cox protocol #2 without cuffs with interferential was continued. The patient was advised of cauda equina syndrome symptoms and to report to the emergency room if they developed. At this time the patient was taken out of school.

October 31, the patient reported less testicular pain, the absence of thigh and calf pain and rates his lumbar pain 6/10 when seated and 3/10 when standing. He is no longer taking ibuprofen regularly but on an as needed basis. He presents with normal gait but sits with left antalgia.

On November 3, his 12th visit, his testicular pain was gone; he was able to sit without antalgia and stated his low back pain was much better. On November 14, his 14th visit, he reports that he no longer had testicular pain or thigh/calf pain and although he still has constant lumbar pain it was down to 2/10. He stated that he is doing some of the Cox stretching exercises but not the strengthening exercises.

On November 26th, patient reported that he was 95% improved and that he was virtually pain free except when he did a sudden movement. He stated he was no longer doing his Cox exercises and for the first time right calf atrophy was noted and verified with measurement. His right calf measured 15 7/8 inches and his left 16 3/10 inches midline. Patient failed to return for follow up visits.

In total, this patient was treated for a total of 15 adjustments over 11 weeks.

Discussion

This was an interesting case on many levels.

1. Research has shown that 50% of females by the age of 18 and males by the age of 20 will experience at least one episode of low back pain. (8) The young man has had two significant episodes by the age of 14 and despite numerous aggravations and re-injuries he had a full recovery. Correlating with this phenomenon, research has also shown that the annulus begins to degenerate in the second decade of life which is the ages of 10-19. (7) Epidemiological research has shown that the incidence of low back pain most commonly occurs in the third decade of life and increases until age 60-65 then gradually declines. (11)
2. This case reminds us that the motor nerve while not compressed enough to demonstrate myotomal losses on exam, can be affected resulting in late onset atrophy of the gastrocnemius. Takashi (1) tells that it takes approximately 100mmHG or more for foot drop to occur and that neurologic deficits require between 50-75 mmHG pressure to develop. Given the transient radicular pain, the lesion was not inducing enough pressure on the root to cause any deficit functioning.
3. Often lumbar bulges are provocative with flexion range of motion in the early stages of inflammation but nonetheless, respond to flexion adjusting as did this patient with flexion eventually being palliative for lumbar pain due to shifting body weight anteriorly. Although nerve root tension signs are associated mostly with the SLR and Bechterews, this patient experienced increased right buttock pain with trunk flexion as well. While the annulus can also refer pain into the buttock area, this patient stated that trunk flexion caused the same



buttock pain as the SLR. Although this patient had tingling sensation in his right anterior/lateral calf, he never complained of any type of leg pain.

4. Testicular pain is an uncommon symptom with lumbar herniations and more commonly associated with L1 nerve root compression as the contents of the scrotal sac are innervated by sympathetic fibers from T1-L1. However, the skin of the scrotal sac is innervated from somatic branches of the S2,3 nerve roots (9) and possibly these roots were affected by the central tear in this L5 annulus.

5. Seated postures which provoke lumbar pain are usually associated with contained annular lesions in which at least one lamellar ring is intact containing the nucleus because of increased intradiscal pressures in the seated position. Because this patient experienced lumbar pain throughout and seated postures remained provocative, it was a good indication the annulus remained intact. Seated postures cause higher intradiscal pressures than standing postures by comparison as well as supine or prone postures. (6)

6. Deep buttock (greater sciatic notch area) and ischial tuberosity pain are associated with nerve root compression and referral from the sciatic roots. Initially the right SLR was positive for an increase in right buttock pain. This patient's ischial tuberosity was not tender to the touch as would be expected if he had a localized condition such as ischial bursitis. However, his right gluteal muscles were very hypertonic and tender as compared to his left side, and some of the ischial tuberosity pain could have been myofascial referral from these muscles.

7. Modic changes are bone marrow and endplate lesions first describe in the 1980's (4) and are most commonly associated with degenerative changes or trauma. Modic changes are uncommon in younger populations even with a degenerative disc. (5)

8. Standing extension drives up epidural pressures more than seated and prone postures which explains why Standing Kemps was consistently positive. (2)

9. While surgery was never discussed in this case, an important paper was published in 2012 that noted that 1.5% of low back pain patients who initiated care with a chiropractor ended up having back surgery as compared to 42.7% who first went to a surgeon. (10) Dr. Frymoyer reminds us that patients with disc lesions rarely need surgery even those with foot drop and that delaying surgery for up to 12 weeks has no adverse effects, however, cauda equina syndrome is an acute surgical condition. (3) Fortunately, this young man didn't rupture his L5/S1 annulus despite his numerous aggravations and falls and surgery never came up in the discussion with his parents.

10. It needs to be noted how cost efficient chiropractic care is for back pain. Complementary and alternative medicine services in the U.S. are approximately \$9 billion market annually. The findings of one research study suggests "that any attempt to reduce national health care spending by eliminating coverage for complementary and alternative medicine would have little impact at best. Should some form of complementary and alternative medicine-for example, chiropractic care for back pain- be proven more efficient than allopathic and specialty medicine, the inclusion of complementary and alternative medicine providers in new deliver systems such as accountable care organization could help slow growth in national health care spending. (12)

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