Low Back Pain in a Female Varsity Ice-Hockey Player

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LOW BACK PAIN is experienced by upwards of 80% of the general population at some point in their lives.¹ There are numerous causes of low back pain, including muscular, ligamentous, bony, and articular sources. One common source is an intervertebral disk. Many times, people with evidence of damage to a disk on diagnostic imaging do not present any overt signs of disk pathology. Disk pathology can take many forms. One specific injury that is often overlooked or not considered is damage to the vertebral endplate, which is associated with development of Schmorl’s nodes. Schmorl’s nodes (Figure 1) are the result of protrusion of the intervertebral-disk nucleus pulposus through an endplate fracture. Diagnostic images demonstrate “pits that form from localized underlying trabecular bone collapse which are linked to trauma.”²(p116) They were first described in 1927 by German pathologist Christian G. Schmorl.³ McGill² found that they are commonly seen with repeated compressive forces in a neutral spine. The endplate fractures are often misdiagnosed as disk herniations because of “the flattened interdiscal space seen on planar X-rays.”²(p50) Many patients describe hearing a “pop” at the instant of the injury, which McGill documents as an “audible ‘pop’ at the instant of endplate fracture”² when compressing pig spines in vitro in a laboratory. Some patients present with acute symptoms after the injury, whereas others do not display any overt signs or symptoms. This might result from biomechanical changes accompanying the fracture.² Changes include loss of disk space and impingement of the nerve-root space by osseous structures or soft tissue. This case review describes a female varsity ice-hockey player who presented with low back pain. I will employ a timeline method of presentation of symptoms because it best demonstrates the changes in her status.

Case History

JD is a healthy 21-year-old female varsity ice-hockey player who first presented to the athletic therapy clinic in October. In her adolescent years, she had played both soccer and ice hockey at a competitive level. Initially she had experienced right-side lumbar pain radiating into her right buttock that was aggravated by activity and by sitting and standing for long periods of time. No specific positions or activities reduced or...
alleviated her symptoms. She described the pain as constant and dull, with an occasional episode of sharp, shooting pain. She had pain with active flexion, left-side flexion, and left rotation on the right side of her spine, specifically at the L2–L3 level. She had pain on palpation over the right facets of L2 and L3. The team physician assessed her in November and diagnosed mechanical low back pain. She was treated with local modalities, ultrasound to the right lumbar-facet joints, stretching, core strengthening, and interferential stimulation and improved over the next few weeks. Her progress is described sequentially as follows.

**March.** She returned to the clinic with a recurrence of her pain, which was controlled fairly quickly. She had recurring, intermittent episodes of pain followed by improvement in the next few weeks.

**October.** JD returned to play and experienced radicular symptoms including tingling along the posterior aspect of her right buttocks and leg and down into the plantar aspect of her right foot, aggravated by prolonged sitting. Her L2–S2 myotomes, dermatomes, and patellar and Achilles reflexes were equal and within normal limits. Her low back pain was reproduced by straight-leg-raise (SLR) and slump tests. Her back pain subsided, but she continued to have varying amounts of tingling and numbness in her foot. The team physician prescribed NSAIDs.

**November.** Because of the location and nature of her symptoms and a growing concern about spondylolysis, X-rays were ordered. The X-rays were negative for any spondylolytic changes.

**December.** JD was referred to a local physiotherapist for another opinion. Two treatments were performed involving manual therapy, exercise, and therapeutic modalities, with no relief of her symptoms.

**January.** A CT scan was ordered and performed in February 2005. No specific abnormalities were observed.

**February/March.** JD reported more frequent tingling and numbness down her right leg and foot localizing in her heel, which were worsened by short periods of standing or sitting (for less than 15 min). She was referred to a spine surgeon for examination and had magnetic resonance imaging (MRI) performed before her assessment. The surgeon informed her that she was not a surgical candidate. April. JD was assessed by a spine researcher. He found a few minor postural factors contributing to her pain but identified nothing significant. While reviewing the MRI he noticed a number of Schmorl’s nodes at multiple lumbar levels (Figure 1). He advised her to reduce her physical training regimen, change from running to fast walking for cardiovascular fitness until she could perform the exercise without pain, perform neural flossing, and then begin a gradual return to higher level activity. She had a slight reduction in symptoms but still experiences local lumbar pain and some distal pain in her right foot.

**Treatment Interventions**

A variety of therapeutic treatments have been attempted with JD. She has been reluctant to reduce her activity level during the varsity season, which likely contributes to a worsening of her symptoms. She had been prescribed NSAIDs to reduce local inflammation. Ultrasound and interferential electrical stimulation were used to manage localized symptoms. Manual therapy and muscle-energy techniques were performed in the clinic to correct pelvic misalignments. Therapeutic stretching focusing on regional tightness was also performed. Manual lumbar traction with a traction belt was performed as described in Porterfield and DeRosa. Specific trunk-strengthening exercises designed as per McGill were also instituted. These exercises included cat/camel, side bridge, and bird dog, all incorporating an abdominal bracing technique. Sport-specific pulley exercise simulating shooting or passing and incorporating abdominal bracing was gradually introduced. More advanced pulley crossover drills, Plyoball™ (JumpUSA.com, Sunnyvale, CA) tossing, and advanced trunk-stability exercises were supervised in the clinic. The vast majority of these exercises did not exacerbate her symptoms while or after she performed them. Nerve flossing, as described by McGill, was initiated in an attempt to reduce the peripheral symptoms. McKenzie prone and standing extension exercises were attempted but did not reduce symptoms.

**Discussion**

There are a few important points to consider from the review of this case. The first is that back pain is relatively common in high-level, intensely trained, competitive athletes. During various periods of a