Challenges in Sports Medicine & Orthopedics

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Figure 1

Figure 2

Figure 3

A 15-year-old female equestrian presents with a 1-month history of increasing pain in her lower back. She states the pain is most intense while she is participating in her sport. She denies any radiating pain to the lower extremities and any direct injury or trauma to the lower back or hips. Examination is noncontributory, except for a positive stork test. Radiographs of the lumbar spine are completed (Figures 1, 2, and 3).

What is your interpretation of the radiographic images?

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ANSWER

Figure 1

Figure 2

Figure 3

The three radiographic images (Figures 1, 2, and 3) reveal a pars interarticularis fracture at L5-S1, with grade II spondylolisthesis of L5-S1. The overall incidence of spondylolysis (pars fracture) is 6%,[1] with the most common mechanism of injury being hyperextension of the lumbar spine accompanied with repeated axial loading. This injury occurs frequently in gymnasts and football players, especially offensive and defensive linemen. When lateral images are inconclusive, oblique images of the lumbar spine often reveal a "Scotty dog" deformity. To identify instability of the involved vertebrae (appreciated by a change in grade of the spondylolisthesis), flexion and extension views of the lumbar spine are recommended. The patient in this case did not reveal instability during either hyperextension or flexion of the lumbar spine (Figures 2 and 3).

Pars interarticularis fractures with resultant grades I and II spondylolisthesis can be managed conservatively with physical therapy (PT) and a back brace to prevent excessive lordosis of the lumbar spine. Typically, the back brace is maintained for at least 8 weeks, and PT is initiated at 2 to 4 weeks post-brace placement. Serial radiographs should be performed every 2 weeks to assess further change of the spondylolisthesis. If the vertebra continues to slip or grade III or IV spondylolisthesis develops, referral to a spine surgeon is recommended. In most cases, patients with pars fractures and grades I and II spondylolisthesis are removed from their sport for at least 2 months. They are only allowed to return to sport if there is radiographic improvement and they are pain free. Magnetic resonance imaging should be ordered if neurological sequelae develop. The patient in this case wore a back brace for 2 months and was able to return to sports activities; however, she was not medically cleared to engage in equestrian or gymnastic events. **EM**

REFERENCE

1. Hu SS, Tribus CB, Tay BKB, Bhatia NN. Disorders, diseases & injuries of the spine. In: Skinner HB, ed. *Current Diagnosis & Treatment: Orthopedics*. 4th ed. United States of America: McGraw Hill Companies; 2006: 221-297.