Spondylolysis in a Collegiate Quarterback: Diagnosis and Treatment
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Background: Spondylolysis is a unilateral or bilateral bony defect of the pars interarticularis, which forms the vertebral arch of the spinal column. Spondylolysis is the most common cause of low back pain in adolescent athletes, occurring 23-63% in the athletic population compared to 3-10% in the general population. Repetitive and excessive hyperextension activities may lead to the development of spondylolysis, with most cases occurring at L5 (71%-95%) vs L4 (5%-23%). Spondylolysis tends to occur more in gymnastics, football, weight lifting, rowing, volleyball, and diving due to repetitive hyperextension and trunk rotation motions, increasing compressive and shear stresses to the lumbar spine. If not correctly identified and managed, spondylolysis can cause a forward slippage of the vertebral body, resulting from bilateral fracture of the pars interarticularis, producing a spondylolisthesis. Therefore, rehabilitation should be focused on therapeutic strengthening and flexibility training, including treating any hip or hamstring contractures. Patient: A 20-year-old male college quarterback experienced pain, tingling, and weakness radiating into left foot during throwing motions. Symptoms were reported approximately 1 week into preseason training and initially reported as posterior lower leg pain. Athlete stated his left leg felt “weird” sometimes during practice; he described weakness and pain when planting and pushing off and had numbness and tingling in toes during some activity. Initial evaluation: positive point tenderness along peroneal longus tendon and posterior compartment of the left lower leg. Decreased dermatome sensation L3, L4, L5 and weakness in myotome assessment L3, L4, and L5 of left leg. Bilateral strength WNL for all hip, knee and ankle motions expect knee extension, which was 4/5. Positive pain found with all ankle resistive ROM. Clinical findings: positive Valsalva maneuver, Quadrant, Milgram’s, Slump, Bowstring, and Straight Leg Raise tests; negative Hoovers and Well SLR. Deep Tendon Reflex of patellar tendon and Achilles tendon both intact. Flexibility assessment found tight hip flexors, internal rotators and positive FABERS. Intervention: Unresolved lower leg pain required further evaluation and diagnostic testing. Differential Diagnosis: spondylolysis, spondylolisthesis, intervertebral disc pathology, sciatic nerve impingement, and diskitis. X-rays of the lumbar spine showed a possible spondylolysis at L5 on the left posterior oblique view. MRI imaging confirmed mild spondylotic changes to L5-S1 and a left sided pars interarticularis defect to L5. Physician recommendation: limit activity until symptoms resolve. Rehabilitation focused on increasing core strengthening, hip flexibility, and lumbopelvic stability. Pain was managed with OTC NSAIDS and electrical stimulation to the paravertebral muscles. Comparative Outcome: Anti-rotational exercises were included into the rehabilitation protocol to increase rotary stability. Athlete was cleared for non-traditional spring training 6 months later. Studies comparing different nonoperative treatments reported bracing together with exercises emphasizing lumbar extension, range of motion and strengthening exercises focusing on lumbar flexion, and strengthening specific abdominal and lumbar muscles had the most improvement. Conclusion: With return to play protocols for sport activities, the outcome of conservative treatment seems to be satisfactory in athletes. According to Iwamoto 87.5% of athletes returned to sport activities after average of 5.4 months of rest and anti-lordotic. Similarly, 89.3% of athletes managed to return to their same level of competitive activities within an average of 5.5 months after the start of non-operative treatment. Clinical Bottom Line: Early diagnosis is crucial in the treatment of spondylolysis, and a period of rest can lead to full recovery in most patients. After 6 months of focused rehabilitation, the athlete was cleared to return to football and participated in non-traditional practices. Surgical intervention has been proven to be successful, but should only be suggested when the conservative treatment fails. Word Count: 584