Images in Spine Surgery: Isthmic Spondylolisthesis in Children

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A twelve year old boy insidiously developed back pain, located in the lumbosacral region, over a period of 6 months. The pain was moderate to severe in intensity and exacerbated with activities like walking and running. The back pain did not radiate below the mid thighs. No weakness, sensory disturbances or bladder/bowel dysfunction were noted. There was no history of trauma in the past. The pain was restricting the patient from participating in day to day activities and sports and he had to take regular analgesia for the last 4 months. X-rays of his lumbosacral spine showed an isthmic spondylolisthesis at L5 - S1 Level with anterolisthesis (forward slippage) of L5 over S1 (Grade I-II). Bracing was employed but did not work for this child. He underwent posterior instrumentation and fusion with autograft.

Patient's pain improved in the early postoperative period and at 6 months of follow-up was completely pain free and showing signs of fusion on radiographs.

Figure 1. Preoperative x-rays, lateral view, Isthmic Spondylolisthesis at L5 - S1 with the body of L5 slipping forward. The arrow points to the defect in the Pars interarticularis of the L5 vertebra. There is no lumbosacral kyphosis present at this level.

Figure 2. Postoperative x-ray lumbosacral spine, showing instrumentation using pedicle screw instrumentation at L5 and S1 levels.

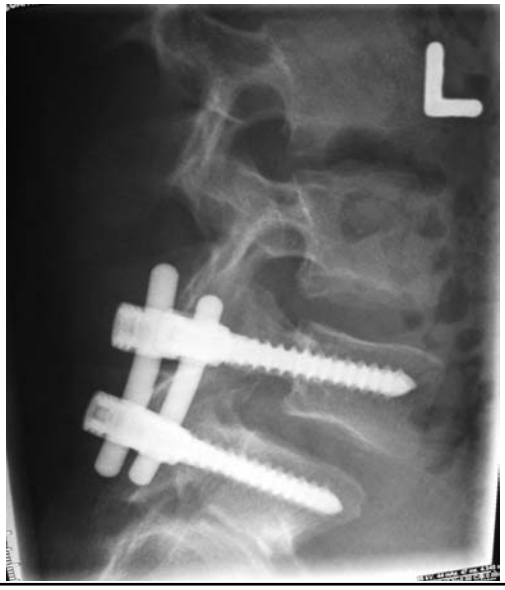

Figure 3. Postoperative X-ray Lateral View, showing posterior instrumentation using pedicle screws. There is some reduction of the slip compared with the preoperative X-rays.

Commentary

Spondylolysis is a defect in pars interarticularis of a vertebra. Isthmic spondylolisthesis is defined as the forward slippage of a vertebra over the adjacent caudal vertebra due to the pars interarticularis defect. The exact cause of spondylolysis and spondylolisthesis is unknown. Theories have indicated hereditary factors, a congenital predisposition, trauma, posture, growth, and biomechanical factors. Severity of slippage is classified into four grades by Meyerding, with grade I as 0- 25% slip, to grade IV which is 75 to 100% slip. Spondyloptosis is a condition where the rostral vertebra undergoes complete slip and lies in front of the caudal vertebra. The management plan1,2,3 usually employed for children with spondylolisthesis is as follows: In a slippage of up to 25% in an asymptomatic child, observe with radiographs, until the end of growth. The child is advised to avoid an occupation with heavy labor but no activicity restriction are recommended . In a slip of 26-50% in an asymptomatic child it is advised not to participate in contact sports. In a slip of less than 50% in a symptomatic child nonoperative therapy like exercises, brace and activity modification are recommended. If the pain persists, fusion should be performed. A slippage of more than 50% in a growing child, with or without symptoms, should be treated surgically. Most authors recommend fusion in situ (without reduction of slip). Reduction of a high grade slip may cause neurologic injury to the nerve root due to traction, which may be permanent in some cases.

References

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