



POSNA

The Core Curriculum

Spondylolysis

Objectives

1. Define spondylolysis
2. Describe the anatomic features of spondylolysis
3. Discuss the genetic features of spondylolysis
4. Discuss the age of onset of spondylolysis and its natural history
5. Describe symptoms of spondylolysis and physical findings
6. Discuss imaging of spondylolysis
7. Discuss an approach to treatment of spondylolysis, including indications for surgery and choice of procedure

Discussion points

1. Can you draw the "scotty dog" seen on the oblique radiograph and label the anatomic features?
2. Is there a single etiology for spondylolysis? Defend your answer with pertinent references.
3. What features indicate a favorable response to brace treatment?

Discussion

Spondylolysis is relatively common in children and adolescence. The term, spondylolysis is customarily described as being from the Greek words for vertebra (spondylo) and defect (lysis). The anatomic feature of spondylolysis is thus a defect in the pars interarticularis, and implied is that there is no forward slip of the superior vertebra, in which case the term spondylolisthesis is used. The two conditions are intertwined when assessing the literature of early childhood. Spondylolisthesis has been described in a newborn and young children. Whether the cause of spondylolisthesis in these young children is related to the anatomic defect described in older children as spondylolysis is debatable, even though spondylolysis is often thought of as a precursor to spondylolisthesis. The study most often quoted for natural history or spondylolysis is that of Frederickson, who studied the outcome of first grade children in the mid 1950's. The incidence of spondylolysis was 4.4% at age 6, and progressed to 6 % in adulthood. Slippage was quite high, 68% in first graders, and 74% in adulthood. Progression of slip or symptoms were absent in their series. A hereditary tendency has been noted in this study and others. A particularly high incidence has been documented in Eskimos, including children.

Spondylolysis has often been described as secondary to trauma, and has not been found in non-ambulatory adults. It is more common in athletes involved in sports that involve repetitive loading, twisting, of flexion and extension of the spine. When symptomatic, localized pain is present and

increased by hyperextension of the back. Hamstring spasm or contracture may be evident. The defect (fracture?) may be visible on the lateral and/or oblique radiographs. MRI has been reported as useful for early diagnosis of lesions not radiographically visible, it has also been criticized as too sensitive. SPECT scanning has been described as predictive of a positive response to brace treatment. CT scanning is also frequently used. Response to brace treatment is much more predictable when the lesion is of recent onset and there is no sclerosis of the bone edges of the defect. Whether "chronic" lesions with sclerosis and "acute" defects without sclerosis are of the same etiology is conjectural. Braces used to treat spondylolysis maintain the low back in flexion, to counteract the documented stress placed on the pars when the back is extended. Alternating flexion and extension appears to be most inimical. Abdominal strengthening, hamstring stretching, and postural control of lumbar lordosis may also be effective in patients not participating in active sports. For patients with refractory pain, surgical stabilization is reliably effective in relieving symptoms. Posterolateral fusion is most often used, although attempts at direct repair of the defect have also been successful.

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