



# Spondylolisthesis in Sports



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Spondylolisthesis is a common orthopedic problem seen in the general population including athletes. It manifests itself often in sports especially football and gymnastics due to the high level of stress placed on the lumbar spine, especially in hyperextension. The term spondylolisthesis is derived from the Greek word spondylos meaning vertebra and olisthesis meaning to slip. Thus it is defined as a forward slippage of one vertebra on the vertebra to the right (figure 1). It can occur at any level of the vertebral column, but it is more common in the lumbar spine especially the lumbosacral junction, L5-S1. It is seen in about 5% of the general population and has a strong familial tendency. It is seen in family members 30% of the time. The Eskimo population has the highest incidence of spondylolisthesis, which approaches 50%.

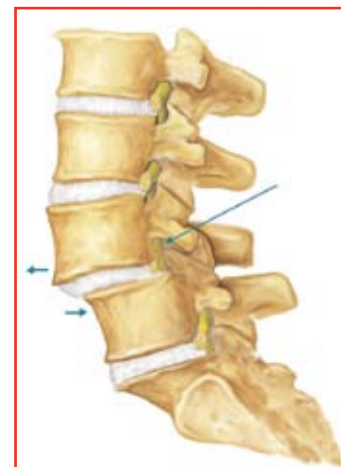


Figure 1

Other common lumbar spine injuries seen in football include strains and sprains, fractures, and degenerative disc disease usually manifesting itself as disc herniation. Most of these injuries including spondylolisthesis can be treated conservatively with modalities excluding surgery. Only the athlete still experiencing difficulty after extensive conservative care is considered for surgery.

#### Classification of spondylolisthesis:

The most common type of spondylolisthesis seen in athletes is the spondylolytic spondylolisthesis or one with pars defects or pars fractures. The pars is an area of thin bone on the lamina between the facet joints and is susceptible to fracture with repetitive motion. The types of spondylolisthesis are:

- 1.) Spondylolytic
- 2.) Degenerative
- 3.) Traumatic
- 4.) Congenital
- 5.) Pathologic
- 6.) Post surgical

#### X-ray findings:

Spondylolisthesis is seen on radiographs as a slippage of one lumbar vertebra on an inferior lumbar vertebra. Often pars defects are seen in the slipped vertebra. The degree of slippage is quantified using the Meyerding classification:

Grade 0	no slippage
Grade 1	1% to 25% slippage
Grade 2	26% to 50% slippage
Grade 3	51% to 75% slippage
Grade 4	75% to 100% slippage

The pars fractures can be seen on the lateral radiograph but are best seen on the oblique radiographs. The oblique view will illustrate the “Scottish terrier” with the defect in the dogs “neck” which is the defect in the pars interarticularis (figure 2).



Figure 2

#### Evaluation:

The evaluation of the patient with a spondylolisthesis starts with a physical exam. These patients will demonstrate stiffness and pain in the low back especially in extension. Flexion of the lumbar spine is often painless, but extension from a flexed position can be

quite painful. Point tenderness is often elicited over the lumbar spine. The neurologic exam is often normal, but at times weakness can be seen in the lower extremities due to nerve compression.

Plain radiographs with 5 views of the lumbar spine should be obtained: AP, lateral flexion, lateral extension and bilateral obliques. An MRI is helpful to evaluate the spine looking specifically at the discs and nerve roots. Nerve root compression is not uncommon and these patients will present with back pain as well as leg pain or weakness.

#### Treatment

Most patients can be treated non-surgically. Rest, heat anti-inflammatory medications, bracing and physical therapy will get most patients better in a few months. When mobility returns and pain subsides, they can return to sporting activities.

Occasionally surgery is needed for the athlete with spondylolisthesis who did not respond to conservative care measures. The two goals of surgery are:

- 1.) Relieve neurologic compression
- 2.) Obtain spine stability with a fusion.

Today, instrumentation (pedicle screws and rods) are used to obtain a solid fusion of the spondylolisthesis (figure 3). This often requires obtaining bone graft from the iliac crest. The rehabilitation of the athlete undergoing fusion is typically 4-6 months long, but the athlete is allowed to return to full contact sports when a solid fusion has been obtained. These patients do remarkably well and many have gone on to play football in the NFL.

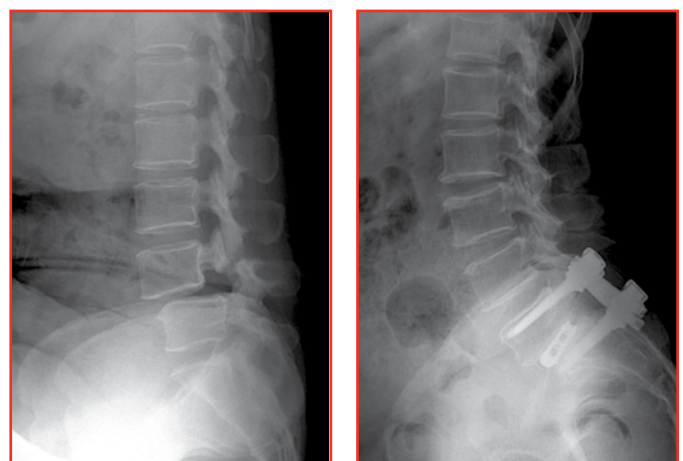


Figure 3