

## Spondylolisthesis: An Elusive Cause of Low Back Pain

By Whitney Lowe, LMT

Low back pain (LBP) is one of the most prevalent orthopedic problems in the world. Yet, the cause of much LBP is poorly understood, which sometimes leads to improper treatment. Many times LBP is caused by muscular tightness or myofascial trigger point activity, and is effectively treated with massage. However, serious structural problems can exist in the spine. These conditions need to be referred to a physician for proper evaluation. Spondylolisthesis is just such a problem.



**Figure 1:**

Lateral view of the lumbar spine showing pars interarticularis.

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*& Wilkins. All rights reserved. The term *spondylolisthesis* is derived from the Greek *spondylo*, meaning*

*"spine," and *listhesis*, "to slide down an incline." Spondylolisthesis results from a stress fracture in a region of the vertebra called the *pars interarticularis* (**Figure 1**). Left untreated, the stress fracture might fully*

*separate, causing one vertebra to slip forward in relation to another (**Figure 2**). The slippage is most*

*common at the articulation between L5 and S1 junction due to the downward pull of gravity and the anterior and inferior sloping of the L5-S1 junction. If only a stress fracture exists without the vertebral sliding, the*

condition is called *spondylolysis*. Because the stress fracture occurs before the forward slippage of the vertebral body, spondylolysis generally is a precursor to spondylolisthesis.

The compressive forces that aggravate the condition are magnified if the individual has an exaggerated lumbar lordosis. When the lumbar lordosis is increased, the posterior vertebral arch bears a greater percentage of the upper body weight.

In addition, the exaggerated lordosis tilts the lower lumbar vertebrae even farther in an anterior and inferior direction, making forward slippage more likely.

Individuals engaged in certain sports or occupations are particularly susceptible to spondylolisthesis, especially if it involves repetitive flexion and extension of the spine. It is common in gymnastics, rowing, diving, swimming (especially the butterfly), tennis, wrestling, weightlifting and football. An increased incidence also has been identified in loggers and soldiers carrying heavy backpacks.<sup>1, 2</sup> The condition is prevalent in adolescents due to the extremes of physical exertion in athletics and bones that are not fully formed.<sup>3</sup> Females are affected more often than males, possibly due to strength differences in bone structure.



**Figure 2:**

Forward slippage of the L5 vertebra on the sacrum.

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*& Wilkins. All rights reserved.* Hamstring tightness is evident in many individuals with spondylolisthesis.

The hamstrings tighten in an effort to posteriorly rotate the pelvis. The posterior pelvic rotation decreases the potential for forward slippage of the lower lumbar vertebra and helps stabilize the lumbar region.<sup>1</sup>

The most common symptom in spondylolisthesis is dull, aching pain in the lower lumbar or upper sacral region. Pain also extends into the buttocks or posterior thigh in some cases. The client generally reports some repetitive flexion or extension activity prior to the onset of symptoms. Consider the client's report of recent activities that might produce aggravating stress on the posterior vertebral arch, especially if there is a corresponding exaggerated lumbar lordosis.

There usually is tenderness in the soft tissues in the lower lumbar and upper sacral region. However, the tenderness usually is not the primary pain-producing sensation of the stress fracture or vertebral slippage. Attempting to palpate tissues in this region also can produce pain because there is anterior pressure being applied to the vertebral structures. The anterior pressure might push the vertebra further into the position of slippage and aggravate the pain. In addition to tenderness, hypertonicity in the lumbar erector spinae, quadratus lumborum, gluteals and hamstring muscles is likely.

In spondylolisthesis, pain increases with lumbar extension. Flexion decreases the pain, as this motion pushes the vertebra back toward the normal position. Pain might be aggravated during either lateral flexion or rotation, although there is not a clearly established pattern of this pain. Hip flexion with the knee in extension generally is limited due to hamstring tightness.



**Figure 3:**

One leg lumbar extension test. A special test called the one-leg lumbar extension test might help isolate spondylolysis or spondylolisthesis. To perform this test, the client is standing on one leg and balancing. While in this position, the client attempts to bend backward, thus extending the spine (**Figure 3**). The test is repeated on the opposite side. If back pain is felt during the spinal extension, there is a strong likelihood of a stress fracture in the pars interarticularis. If the stress fracture is only on one side, standing on the ipsilateral leg produces more pain.

If spondylolisthesis is suspected, the client should be referred to a physician for appropriate evaluation. Forward slippage of the vertebra has to be confirmed by X-ray and is not testable with physical examination alone. Soft-tissue therapies like massage can be helpful in reducing overall muscular hypertonicity associated with spondylolisthesis, but it's important to consult with the client's physician about appropriate

treatment goals. For example, working on the hamstrings to relax their hypertonicity actually could be detrimental to the condition because the hamstring tightness is helping reduce forward vertebral slippage. Awareness of conditions such as spondylolisthesis highlights the importance of proper assessment so an appropriate referral and/or treatment approach can be developed.

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