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Definition

1. Spondylolysis is a defect in the pars interarticularis of the vertebra. This defect usually involves the L5 vertebra (95%) [1]. “Spondylo” derives from the Greek word for vertebra, and “lysis” refers to a defect [2] (see Fig. 148.1).
2. Spondylolisthesis is defined as a forward slip of the vertebrae relative to the one below with or without an accompanying pars defect. “Olisthesis” is the Greek word for slippage [2]. The displacement of the vertebra could be secondary to one of the following: a congenital defect, spondylolysis (isthmic spondylolisthesis), degen-

eration of facet joints and/or intervertebral disk degeneration (degenerative spondylolisthesis), trauma, or pathologic [1].

3. Only a subset of patients with spondylolysis will have progression to spondylolisthesis if bilateral defects are present [3].

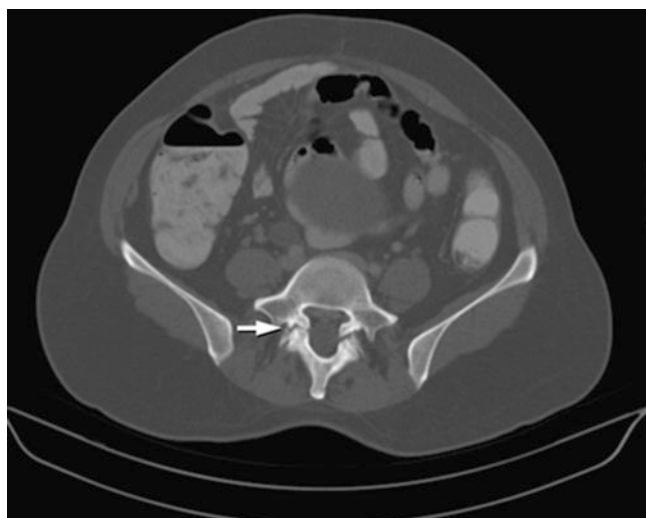


Fig. 148.1 L5 bilateral spondylolysis. Courtesy of Springer. From Benjamin K. Brooks. Lumbar spine spondylolysis in the adult population: using computed tomography to evaluate the possibility of adult onset lumbar spondylosis as a cause of back pain. *Skeletal Radiology*. Jan 1 2009;39(7):669–73

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Incidence

1. The incidence of spondylolysis has been estimated to be 3–7% in the adult population. Spondylolysis is usually present without spondylolisthesis and is generally seen at L5 vertebra. Of interest, spina bifida occulta has also been reported to exist in conjunction with spondylolysis in 30% of cases [4].
2. The incidence of spondylolisthesis has been estimated to be as high as 20.7%, though it is more likely much less with the incidence of isthmic spondylolisthesis estimated at 2.6–4.4% [1, 4]. However, approximately 2–6% of the low back pain population has spondylolisthesis [2]. Degenerative spondylolisthesis is a condition that usually presents before the fourth or fifth decade [5]. However, it can occur earlier and thus may be encountered in parturients, especially as women give birth at an older age.

Etiology

1. As mentioned above, various theories have been postulated to explain the cause of the forward slippage of vertebrae. Spondylolysis may be related to acquired stress secondary to trauma.
2. The Wiltse classification is commonly used to describe the types of spondylolisthesis, and there are others to describe the percentage of slippage [6]. Spondylolisthesis can be divided into dysplastic, isthmic, degenerative, traumatic, pathologic, and iatrogenic subgroups [1]. Degenerative is the most prevalent though isthmic is more

- common in younger patients [2]. Grading varies from type 1 with 25% slippage to higher grades, the worst leading to complete collapse of the vertebra. “Ptosis” in Greek means fall and refers to complete dislocation of the vertebra, spondyloptosis [3].
- At least one study suggests that parity may be a contributing factor for developing degenerative spondylolisthesis later in life. This observation may be related to anatomic changes during pregnancy such as ligament laxity, hormonal effects, and reduced abdominal tone [7].

Symptoms

- Spondylolysis is typically asymptomatic in adults.
- Symptoms of isthmic spondylolisthesis vary from asymptomatic to low back pain and radicular pain [1]. Isthmic spondylolisthesis, the most common type in those under age 30, is a relatively common cause of low back pain in adolescent females, especially those participating in sports such as soccer and gymnastics [2].
- The evolution of the spondylolysis to spondylolisthesis, when it occurs, seems more common in the adolescent years with slower progression in later years [1]. Only a small percentage of asymptomatic patients with bilateral spondylolysis will develop symptomatic progression [3].

Interaction with Pregnancy

There is no literature to suggest worsening of symptoms or disease progression during pregnancy. Patients with high-grade spondylolisthesis may require a surgical delivery as the lumbar displacement may impede a normal spontaneous vaginal delivery [7]. There appears to be no correlation between pregnancy and back pain in patients with spondylolysis or spondylolisthesis. An increase in the percentage of slip (measurement of spondylolisthesis progression) has not been established during or after pregnancy [3].

Management

There is a paucity of literature regarding the management of labor pain or anesthesia for parturients with spondylolisthesis.

- If a patient presents with a diagnosis of spondylolisthesis, X-rays or other neuroimaging should be reviewed, and any neurologic symptoms should be well documented.
- The diagnosis of spondylolysis and spondylolisthesis does not preclude the use of a neuraxial technique.
 - A study by Horduna and Legaye suggests that spondylolisthesis may predispose to miscalculation of the accurate lumbar interspace by one to three segments. The use of ultrasound imaging is recommended for the proper identification of the targeted lumbar interspace [8].
 - In addition, a step-off may be present when palpating the posterior lumbar spine in patients with spondylolisthesis and could alert the anesthesia provider to its presence.
 - As always, the anesthetic plan should be individualized taking into account symptomatology, exam findings, and imaging.
 - Patients with spondylolisthesis could have direct impingement on the spinal canal resulting in a narrowing of the space. In such cases, epidural analgesia should be avoided in the affected segments as placement could theoretically lead to nerve damage.

References

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