



Prevalence of occult spina bifida in isthmic versus degenerative spondylolisthesis: retrospective radiographic review of consecutive surgical patients

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Background: Spondylolisthesis is defined as the anterior or posterior translation of one vertebral body over another. Spina bifida occulta (SBO) is a developmental anomaly characterized by the incomplete fusion of the laminae of one or more vertebral arches along the midline. Currently, there is no documented prevalence of SBO in patients with degenerative spondylolisthesis (DS) undergoing spinal surgery. This study aims to estimate the prevalence of SBO in patients with DS undergoing spine surgery and compare it with that in patients with isthmic spondylolisthesis (IS) undergoing surgery.

Methods: Our study is a cross-sectional retrospective review of consecutive patient records from two major tertiary hospitals in Sydney, Australia, covering the period from January 1st, 2015 to December 31st, 2023. Patients diagnosed with spondylolisthesis at spinal levels L4/L5 or L5/S1 were identified and screened for the presence of SBO.

Results: Among the patients who underwent spinal surgery, 23.4% were found to have spondylolisthesis due to either degenerative changes or isthmic pars defects at L4/L5 or L5/S1. Within the DS group, the prevalence of SBO was 11.9% (all at the S1 level), while 24.7% of the IS group exhibited SBO. The male-to-female ratio for patients with IS and SBO was 3.6:1, compared to 0.66:1 for those with DS and SBO.

Conclusions: SBO is a frequently overlooked anatomical variation in adult spine surgery, particularly in cases of degenerative and IS. With a prevalence of 11.9% in DS, it is crucial for spine surgeons to be vigilant, especially during open posterior lumbar spine fusion surgeries, to prevent unintended durotomy and neurological damage. Awareness of the absence of the S1 spinous process is essential for effective surgical planning, particularly when using navigated spinous process clamps for pedicle screw placement.

Keywords: Spina bifida occulta (SBO); degenerative spondylolisthesis (DS); isthmic spondylolisthesis (IS)

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