## Introduction

### *Background*

The term spondylolisthesis originates from the Greek words "spondylos", meaning vertebra, and "olisthánein" meaning "to slip" (1). It broadly refers to the displacement of one vertebral body over another. In 1976, Wiltse *et al.* (2) classified spondylolisthesis into five categories: dysplastic, isthmic, degenerative, traumatic, and pathological. Epidemiological data on spondylolisthesis varies widely, with reported prevalence ranging from 2.7% to 28% (3,4), influenced by factors such as age, sex, and whether the population is symptomatic or asymptomatic. Spina bifida occulta (SBO) is the most benign form of spina bifida, involves the failure of the laminae to fuse. The prevalence of SBO in adults can be as high as 12.4% (5). While a correlation between SBO and spondylolysis is recognized with prevalence ranging from 22–70% (6), the prevalence of SBO in patients with degenerative spondylolisthesis (DS) undergoing surgery remains unreported. The most common levels of spondylolisthesis are L4/L5 and L5/S1 (4) and whence we elected to only include those levels in our study.

### *Rationale and knowledge gap*

Recognizing SBO during surgical procedures is crucial to mitigate the risk of unintended durotomy and injury to neural elements due to unrecognized bony defects. With the advent of navigated instrumentation and spinal process clamps, awareness of the absence of the spinous process is vital for effective surgical planning. There is no reported prevalence of SBO in a surgical cohort with DS.

### *Objective*

This study aims to quantify the prevalence of SBO in a cohort of surgical patients with either DS or isthmic spondylolisthesis (IS). Most existing studies on spondylolisthesis prevalence focus on asymptomatic populations, neglecting symptomatic surgical cohorts. Our research seeks to raise awareness of SBO and quantify its prevalence among patients treated for symptomatic lower back pathology, categorizing them based on degenerative versus IS and the presence or absence of SBO. We present this article in accordance with the STROBE reporting checklist (available at https://jss.amegroups.com/article/view/10.21037/jss-24-151/rc).

**Highlight box**

**Key findings**

- Prevalence of spina bifida occulta with spondylolisthesis is 14.9%.
- Prevalence of spina bifida occulta with degenerative spondylolisthesis 11.9%.
- Prevalence of spina bifida occulta with isthmic spondylolisthesis is 24.7%.

**What is known and what is new?**

- Prevalence of spina bifida occulta in the general population ranges 7.4–12.4%.
- Prevalence of spina bifida occulta in a surgical cohort focused on the L4–S1 levels is 14.9%.

**What is the implication, and what should change now?**

- Increased awareness of this occult condition to help plan safe surgery on the lumbar spine.
- Careful examination of pre-operative imaging for patients planned for surgery on the lower lumbar spine screening for spina bifida occulta.

## Methods

We performed a cross-sectional retrospective review of patient records from two tertiary hospitals in Sydney (Nepean Public Hospital and Westmead Public Hospital), covering surgeries conducted between January 1st, 2015 and December 31st, 2023. Surgeries were performed by both neurosurgeons and orthopaedic spine surgeons. Inclusion criteria included patients aged over 18 years who underwent surgery at spinal levels L4–S1, with imaging available for review. Exclusion criteria encompassed surgeries at levels other than L4–S1, surgeries conducted prior to the study period, unavailability of imaging, and spondylolisthesis due to causes other than degenerative or isthmic factors, spondylolisthesis at level other than L4–S1 (*Table 1*). Patients' electronic medical records were accessed, and baseline demographic data (age, sex) were collected. Imaging [X-rays, computed tomography (CT), magnetic resonance imaging (MRI)] was reviewed for the presence of spondylolisthesis, its level, aetiology (based on Wiltse classification), grade (according to Meyerding grading), and presence of SBO and its level. Other pathologies like spinal lipoma, limited dorsal myeloschisis and dermal sinus were screened for. Most patients' images were available on the hospitals Picture Archiving and Communication System (PACS); however, some patients had their images done at private radiology providers outside the hospital PACS.