

## Anatomic Variability of 120 L5 Spondylolytic Defects

**Study Design** Adult human osteologic specimens were assessed for spondylolytic defects and characterized.

**Objectives** To characterize and determine the prevalence of spondylolytic defects in an osteological collection.

**Methods** Lumbar vertebrae from the Hamann-Todd Osteological Collection at the Cleveland Museum of Natural History were examined. Digital images of specimens with L5 isthmic spondylolytic defects were analyzed, examining the distance of the pars defect in the sagittal plane in relation to the caudal aspect of the pedicle.

**Results** There were 95 bilateral complete (BC), 16 unilateral incomplete (UI), 5 unilateral complete (UC), and 4 unilateral complete defects with an incomplete defect on the contralateral side. The mean distance of BC defects from the pedicle and inferior vertebral end plate was 4.03 mm and 4.88 mm, respectively. The mean distance of the defect from the inferior end plate on the left and right sides were 5.31 mm and 4.44 mm, respectively ( $p = 0.001$ , correlation coefficient = 0.56). The mean distance of UI and UC defects from the inferior end plate was 6.38 mm and 2.6 mm, respectively.

**Conclusion** L5 spondylolytic defects were found in 3.87% of the sample. This large-scale description of isthmic spondylolytic defects reveals that significant variability exists in the location of the defect. The anatomic location of the pars defect likely plays a role in the development of L5 nerve root compression and radiculopathy in this clinical scenario. Classifying these defects might allow surgeons to better identify those patients who might benefit from fusion alone without posterior decompression.

## 120 個 L5 椎弓峽部缺陷結構上的變異

**研究設計** 以成人骨骼標本進行評估椎弓峽部的缺陷和特點。

**目標** 描繪和確定椎弓峽部缺陷在人體骨骼收集中的發生率。

**方法** 由克利夫蘭自然歷史博物館，Hamann-Todd Osteological Collection 取得的腰椎進行了檢查。標本的數碼影像和與 L5 峽部椎弓峽部的缺陷進行了分析，研究關節間部在矢狀面的距離與椎弓根尾部的關係。

**結果** 有 95 個雙邊完整 (BC)，16 個單邊不全 (UI)，5 個單側完整 (UC) 和 4 個單側完全缺陷與對側不完整缺陷。從椎弓根到 BC 缺陷和下部椎骨端板到 BC 缺陷的平均距離分別是 4.03 毫米 4.88 毫米。從缺陷到下端板的左側和右側的平均距離分別為 5.31 毫米和 4.44 毫米，( $p = 0.001$ ，相關係數 = 0.56)。從 UI 和 UC 缺陷到下端板的平均距離分別是 6.38 毫米和 2.6 毫米。

**結論** 在樣本中 L5，3.87% 發現有椎弓峽部缺陷。大規模描述椎弓峽部缺陷顯示缺陷的位置有顯著的變異。關節間部的解剖部位在 L5 神經根的壓迫和神經根病的臨床情況的發展扮演重要的角色。將這些缺陷分類可能幫助到外科醫生能夠更好地確定那些患者能從融合中受益而毋須後路減壓。