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CT Appearance of the Retroisthmic Cleft

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The most familiar defects in the neural arch of the spine are spina bifida occulta and spondylolysis [1]. A less common neural arch defect is the retrosomatic cleft, the computed tomographic (CT) appearance of which has been described [2]. The least common type is the retroisthmic defect, which is illustrated in this report.

Case Report

A 51-year-old woman with no complaint or history of back pain volunteered for CT examination of the lower lumbar spine in connection with a study of normal spinal measurements. Contiguous 5 mm sections at the two lowest lumbar levels were obtained parallel to the intervertebral disks with a GE CT/T 8800 scanner. Two defects were found in the neural arch of L5. On the right side a narrow defect was found in the lamina behind the isthmus (pars interarticularis) (fig. 1). The retroisthmic defect was characterized by regular osseous margins, small spurs of bone near the defect, and sclerosis and thickening of the contiguous neural arch. On the left side was a pars interarticularis defect with no sclerotic reaction. The intervertebral disks, facet joints, and vertebral alignment were normal.

Discussion

The radiographic appearance of a retroisthmic cleft was first described by Brocher [3], who named it and distinguished it from eccentrically located spina bifida. Retroisthmic clefts have been found in one anatomic specimen and radiographically in four patients [3–5]. All were unilateral; four were in L5 and one in L4. The retroisthmic cleft, unlike the retrosomatic cleft [2], has no predilection for women. Although the reported patients had lower back pain, retrosomatic clefts have been considered incidental [5]. Our case, an asymptomatic woman, supports this view.

In axial CT images a retroisthmic cleft may be confused with the more common pars defect (spondylolysis). However, a pars defect is located anterior to the lower facet joint, whereas a retroisthmic cleft is behind it, as our case illustrates.

Three cases of retroisthmic clefts with associated contra-

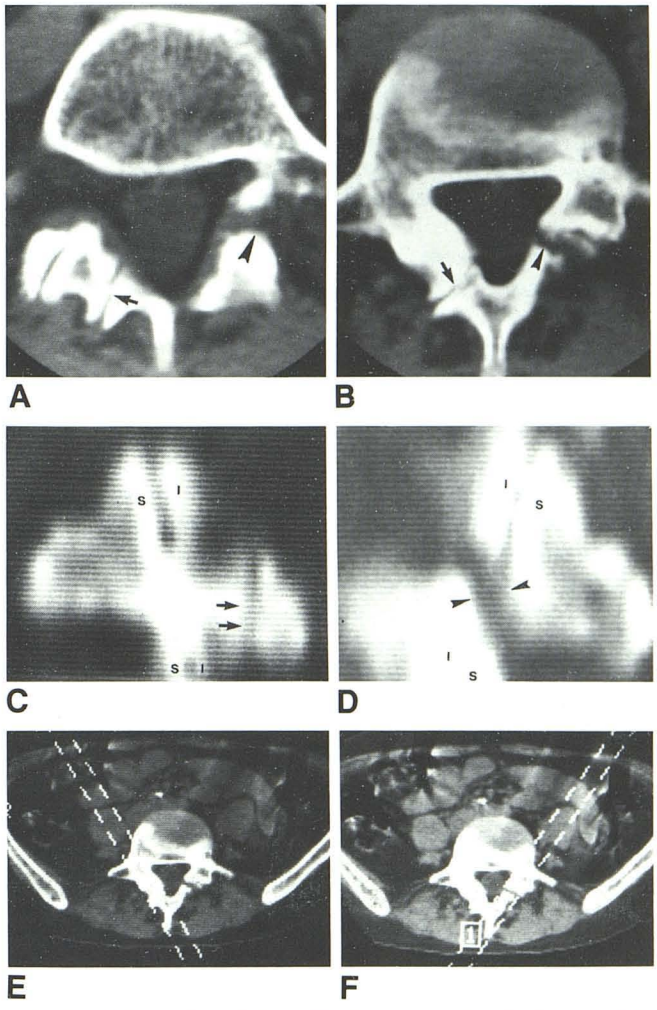

Fig. 1.—**A**, Retroisthmic cleft in right lamina (*arrow*) and spondylolysis in left pars (*arrowhead*) of L5 neural arch. Retroisthmic cleft is posterior and spondylolysis is anterior to facet joint. **B**, Higher section through L5 shows sclerotic right pars interarticularis and both defects. **C** and **D**, Reformatted oblique sections show location of retroisthmic cleft in lamina (*arrows*) and pars defect (*arrowheads*). S = superior articular process; I = inferior articular process. **E** and **F** show orientation of reformatted images in **C** and **D**, respectively.

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lateral spondylolysis in the same vertebra have been reported [3, 6]. The association of the two clefts in four of six cases is more than coincidental, since spondylolysis occurs with an incidence of 5%–7% [7, 8]. A sclerotic reaction in the retroisthmic defect opposite a unilateral spondylolysis in our case and in two others [9, 10] suggests a fatigue fracture etiology [11, 12]. Neither the CT appearance nor the clinical history of our case suggests an acute fracture. The CT appearance of retroisthmic clefts should be sufficiently distinctive to be distinguished from a neural arch fracture or a spondylolysis.

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