

Bilateral Sacral Fractures are Highly Associated with Lumbopelvic Instability

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Purpose: Bilateral sacral fractures with associated lumbopelvic instability can lead to neurologic injury and morbidity not seen in other sacral fracture patterns. Although the diagnosis can be missed on plain radiographs as well as cross-sectional imaging, the presence of bilateral sacral fractures seen on axial CT or MRI is thought to be highly suggestive. This study was designed to formally evaluate the effectiveness of using bilateral sacral ala fractures to diagnose lumbopelvic instability.

Methods: A retrospective analysis of all sacral fractures treated at a Level I trauma center from 2000-2014 was undertaken. Unilateral and bilateral sacral ala fractures evaluated with CT or MRI imaging including sagittal reconstructions were included. The presence of an associated transverse fracture with or without sagittal plane deformity was used to define lumbopelvic instability and the Roy-Camille classification system was applied. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated.

Results: Of 1526 diagnosed sacral fractures, 490 with eligible imaging were identified. This included 443 unilateral sacral ala fractures and 47 bilateral sacral ala fractures. 41 (87%) of the bilateral fractures had a transverse component indicating some degree of lumbopelvic instability. 27 (66%) were Roy-Camille Type 1, 11 (27%) were Type 2, and 3 (7%) were Type 3. A review of 443 unilateral fractures demonstrated no lumbopelvic instability. Presence of bilateral sacral ala fractures had 100% sensitivity and 100% NPV for detecting lumbopelvic instability (Table 1).

Conclusion: Bilateral sacral fractures seen on axial cross-sectional imaging are highly suggestive of some degree of lumbopelvic instability and should alert the treating physician to closely scrutinize the sagittal reconstructions.

	+ Lumbopelvic Instability	- Lumbopelvic Instability	
+ Bilateral Sacral Ala Fractures	39	7	Positive Predictive Value: 85% (39/39+7)
- Bilateral Sacral Ala Fractures	0	46	Negative Predictive Value: 100% (46/46+0)
	Sensitivity: 100% (39/39+0)	Specificity: 87% (46/46+7)	

See pages 47 - 108 for financial disclosure information.

POSTER ABSTRACTS