Anterior Intrapelvic Plating of the Sacroiliac Joint: A Cadaveric Quantification of Visualized Area With Case Series

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Purpose: The anterior intrapelvic (AIP) approach is a well-known approach for fixation of acetabular fractures traditionally stopped at the anterior aspect of the sacroiliac (SI) joint. There are no descriptions or case studies of continuing the exposure more medially than the SI joint for reduction and fixation of SI joint disruptions. The aim of our study is to qualitatively describe the structures encountered during cadaveric dissection, as well as quantitatively describe the area available on the sacrum for both reduction and plating.

Methods: The modified Stoppa approach was performed in 5 fresh cadavers. The area available for plate and screw placement on the anterior sacrum was exposed bilaterally. A 2.5-mm drill bit demarcated the extent of bone that was available for plate and screw placement. After drill bit demarcation, all soft tissue was removed and the area of the sacrum that was delineated by the drill holes was marked (Fig. 1). Calibrated digital images of the demarcated areas of exposure were taken, and the total surface area available for clamp and plate placement was calculated.

Results: The anterior sacral visualization was on average 1007 ± 231 mm3. The cranial/caudal dimension at greatest length was 39.78 ± 6.91 mm, and the greatest length medial to the SI joint was 30.91 ± 3.43 mm. The anatomic restraints to visualization were the S1 nerve root inferiorly, the internal iliac vessels medially, and the external and internal iliac vessels superiorly. All exposures had area available for clamp placement in addition to at least 1 large fragment plate with a sacral screw. Large fragment plates had an area overlying the sacrum of 360 mm3; all sacrums had an area for at least 2 plates.

Conclusion: The AIP approach is easily expanded to the anterior sacrum with adequate exposure for reduction and plating of the SI joint. There is sufficient bony anatomy for dual plating and visualization of neural and vascular structures. In addition to the cadaveric quantification, this approach has been utilized in a series of 4 patients with APC (anterior posterior compression)-3 pelvic ring injuries (Fig. 2).