**What Is the Minimum S1 Transsacral Corridor Width for Transsacral Screw Fixation After Pelvic Ring Injuries?**

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**Purpose:** Sacral dysmorphism is pragmatically defined as sacral anatomy resulting in narrowing of the S1 transsacral (TS) corridor that precludes safe TS screw placement. The degree of narrowing defining sacral dysmorphism remains controversial, ranging from 7 to 10 mm in the literature with 10 mm being the commonly accepted cut-off precluding S1 TS screw fixation. The purpose of this study was to determine what corridor width prevented screw placement and if TS screws could be placed in corridors less than 10 mm safely.

**Methods:** Patients with operative pelvic fractures and preoperative CT scans were included. On the preoperative CT scan, the width of the S1 TS corridor on axial reformatted images (parallel with the S1 body) and the coronal reformatted images (perpendicular to the S1 body) were measured. S1 axial and coronal angles were measured and used to calculate a sacral dysmorphism score. Patients with a postoperative CT scan who underwent S1 TS screw fixation were reviewed to determine if screw placement was intraosseous or extraosseous. Screw breaches through the neural foramen or anterior sacral cortex were documented along with any resulting iatrogenic nerve injury.

**Results:** 290 patients with pelvic ring injuries were identified. 51 (18%) fixation constructs included an S1 TS screw. No S1 TS screws were placed in a corridor with a width <8 mm. The S1 TS corridor width ranged from 8 to 23 mm and 8 to 21 mm in the axial and coronal planes, respectively. Of the 290 patients, 114 (39%) had S1 corridors <8 mm. Patients with S1 corridor width <8 mm were younger (33 vs 43 years; median difference [MD]: 8, 95% confidence interval [CI]: 2 to 18, $P$ =0.01), had a greater S1 axial angle (27° vs 0°; MD: –27, 95% CI: –28 to –25, $P$<0.0001), a greater coronal angle (22° vs 20°; MD: 27, 95% CI –27 to –25, $P$<0.0001), and a greater dysmorphic score (65 vs 58; MD: –81, 95% CI: –86 to –76, $P$<0.001). There were no significant differences in sex, body mass index, or ethnicity between patients with an S1 TS corridor <8 mm and >8 mm. 6 screws were placed in corridors <10 mm in width. The number of extraosseous screws between S1 TS screws placed in corridors <10 mm versus >10 mm was not significantly different (2 of 6 [33%] vs 18 of 27; proportional difference 6%, 95% CI –33% to 39%, $P$ = 1.0). Only one of these extraosseous screws, placed in a corridor >10 mm, resulted in a nerve injury. None of the extraosseous screws placed in corridors <10 mm resulted in nerve injuries.

**Conclusion:** S1 TS corridor narrowing that prohibits TS screw fixation is commonly used to define sacral dysmorphism but the actual corridor width used in the literature varies. Our study revealed that no S1 TS screws were placed in corridors less than 8 mm in width and that screw placement in corridors between 8 and 10 mm was possible with the same risk of cortical breach. The 8-mm cut-off observed in this cohort may help to standardize literature on sacral dysmorphism.