Iliosacral screw

Iliosacral screw placement is ubiquitous and now part of the surgeon's pelvic trauma armamentarium. More recent evidence supports sacroiliac arthrodesis for treating sacroiliac joint (SIJ) dysfunction in select patients. Regardless of the surgical indication, there are currently no studies examining lag screw compression biomechanics across the SIJ. The objective of this biomechanical investigation was to quantify iliosacral implant compressive loads and to examine the insertion torque and compressive load profile over time.

Methods: Eight human cadaveric pelvic specimens underwent SIJ fixation at S1 and S2 using 11.5 and 10.0 mm iFuse-TORQ Lag implants, respectively, and standard 7.3 mm trauma lag screws. Load decay analysis was performed, and insertion and removal torques were measured.

Results: For both implants at S1 and S2 levels, the load relaxed 50% in approximately 67 min. Compressive load decay was approximately 70% on average occurring approximately 15 h post-insertion. Average insertion torque for the 11.5 mm TORQ implant at S1 was significantly greater than the trauma lag screw. Similarly, at S2, insertion torque of the 10.0 mm TORQ implant was greater than the trauma lag screw. At S1, removal torque for the 11.5 mm TORQ implant was higher than the trauma lag screw; there was no significant difference in the removal torque at S2.

Conclusions: In this study, we found that a novel posterior pelvic implant with a larger diameter, roughened surface, and dual pitch threads achieved improved insertion and removal torques compared to a standard screw. Load relaxation characteristics were similar between all implants.