Identification of Subtle Residual Sacroiliac Joint Flexion in AO/OTA 61-C1.2 (APC3) Pelvic Injuries After Anterior Fixation
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Purpose: Fixation of AO/OTA 61-C1.2 (APC [anterior-posterior compression] 3) pelvic fractures may entail provisional anterior fixation followed by reduction of the sacroiliac joint (SIJ) and posterior fixation. Differentiating SIJ widening from hemipelvis flexion or extension is difficult. We sought to identify a radiographic marker for posterior flexion or extension malreduction in the setting of a reduced anterior ring.

Methods: Anterior and posterior ligamentous structures were cut in 8 cadaveric pelves. The anterior ring was held reduced with Kirschner wires; flexion and extension deformities resulting in 1 cm displacement at the SIJ were created and a lateral compressive force applied. The SIJ was assessed using fluoroscopy. The direction of lateral and AP displacement relative to the contralateral joint was assessed via inlet while lateral and superior displacement was assessed using outlet views. Displacement direction was compared between flexion and extension models using Fisher’s exact test.

Results: On outlet views, all flexed hemipelves showed caudal ileal translation at the superior SIJ, in contrast to all extended hemipelves showing cranial translation (P <0.0005). There were no significant differences in lateral translation on outlet (P = 1.0) or inlet (P = 0.077) views nor AP translation on inlet views (P = 0.199) between the flexion and extension malreductions.

Conclusion: The direction of vertical displacement at the superior SIJ on the outlet view can differentiate between flexion and extension hemipelvis deformity in APC3 injuries with residual malreduction after provisional anterior fixation. This may require further reduction prior to lag screw compression.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.