Intraoperative Long Cassette Films to Guide Spino-Pelvic Kickstand Placement in Adult Thoracolumbar Deformity Correction

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Introduction

Maintenance of normal coronal balance can be a challenge in select cases of adult spinal deformity correction.

Methods

Patients with adult thoracolumbar spinal deformity between October 2017 and June 2019 with coronal plane deformity undergoing open segmental decompression with spino-pelvic fixation and deformity correction had intraoperative anteroposterior long cassette radiographs (APLCR) from fusion apex to sacrum prior to final rod placement. Coronal deviation of the apex of the construct was measured as the horizontal distance between the apex level plumb line to the central sacral vertical line (APL-CSVL). In patients with persistent intraoperative coronal deviations, a Kickstand rod was placed. This supplemental rod was anchored to the construct via a pair of side to side connectors and to an iliac screw. A distractor was expended between a vice grip plyer on the kickstand and side-to-side connector to apply a lateralizing force to reduce the degree of deviation. APL-CSVL was measured on APLCR pre-, intra-, and postoperatively.

Results

A total of 15 patients underwent T3-Ilium fusion with spinal deformity correction with intraoperative APLCR; 7 underwent Kickstand placement. Mean preoperative APL-CSVL was similar between cohort (4.3 cm vs 2.2 cm, \( p = 0.09 \)), while intraoperative APL-CSVL was greater in the kickstand cohort (4.3 cm vs 0.6 cm, \( 9 < 0.001 \)). Mean postoperative APL-CSVL was similar between groups (2.1cm vs 1.8cm, \( p = 0.37 \)). Patients with kickstands demonstrated significant reduction in APL-CSVL postoperatively (\( p = 0.01 \)).

Conclusion

Intraoperative APLCR during long segment thoracolumbar deformity correction provided excellent screening for persistent coronal imbalance. Kickstand applications allowed for excellent maintenance of coronal balance.