

AB152. Two stage anterior-posterior fusion for double major adolescent idiopathic scoliosis (AIS): saving lumbar levels with improved derotation of the lowest instrumented vertebra

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Background: There is no consensus on the correction of adolescent idiopathic scoliosis (AIS) double major curves. Posterior only fusion may require extensive distal fusion or additional instrumentation, subsequently leading to a variety of complications. Alternatively, an anterior-posterior fusion (APF) is a powerful technique which can save lumbar motion segments while restoring lumbar apical rotation and tilt effectively.

Methods: A retrospective review was performed at our institution (RNOH) for patients undergoing AIS

correction. Two thousand three hundred and fourteen cases from 2006 to 2012 (minimum 2 year follow-up) were identified. Preoperative demographics and mean values of: Standing radiograph Cobb, Harrington Stable Zone, Supine Bending Radiograph Cobb and Postoperative mean values: Correction Rate, Supine Bend Flexibility and Supine Bending Flexibility Index, LIV Tilt and Rotation Perdriolle Grade.

Results: Fifty-eight of 2,314 consecutive AIS cases were managed with a two stage anterior-posterior strategy. Comparison of pre- and post-operative radiographic parameters proved significant for cobb angle (MT: 62.7, 19.5; TL: 59.1, 12.6; $P < 0.001$), thoracic kyphosis (26.36°, 8.59°; $P < 0.001$), lumbar lordosis (59.57°, 50.66°; $P < 0.001$), LIV-ground angle (21.9°, 4.5°; $P < 0.001$), and reduction in Perdriolle grade (1.7, 1.1; $P < 0.001$). On average, the two-stage APF approach saved 1.58 motion segments compared to the HSZ method.

Conclusions: This technique achieved a high postoperative correction rate and supine bend correction index despite differing levels of stiffness, and an LIV of L3 or above was achieved in 90% of cases. The two stage APF surgical strategy attains desirable correction of coronal, sagittal, and rotational alignment in addition to saving lumbar motion segments compared to other methods.

Keywords: Adolescent idiopathic scoliosis (AIS); spinal deformity; spine surgery

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