POST-OPERATIVE ROD STRAIGHTENING IN THORACOSCOPIC ADOLESCENT IDIOPATHIC SCOLIOSIS CORRECTION IS MORE COMMON WITH SKELETAL IMMATURITY BUT DOES NOT RESULT IN INCREASED ADVERSE OUTCOMES

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Background:

Post-operative rod straightening is a unique phenomenon seen in thoracoscopic fusion for correction of adolescent idiopathic scoliosis (AIS). This has not been previously described in fusion surgeries for spinal deformity correction, and its underlying mechanism remains unknown.

Objective:

To establish whether post-operative rod straightening in thoracoscopic single-rod fusion for AIS correction affects surgical outcomes.

Materials and methods:

We performed a retrospective review of thoracoscopic fusions of AIS Lenke 1 curves in female patients aged 11-20 years old performed between June 2000-July 2013. Patients with post-operative screw pullouts were excluded. Patients with rod straightening (≥5°) (Group 1) on follow-up were compared to those without rod straightening (<5° angular change) (Group 2). Our primary outcome measures were maintenance of overall curve correction over time, complications, and re-operation rates.

Results:

Nineteen of 40 (47.5%) thoracoscopic fusions without screw pullout demonstrated rod straightening (≥5°). Mean angular change of the rods were 7.7±2.7° and 3.2±1.4° in Group 1 (n=19) and Group 2 (n=21) respectively ($p<0.001$). Both groups showed similar, (i) pre-operative main thoracic curve sizes and flexibility, (ii) post-operative curve correction and maintenance of correction, (iii) complication profiles including adding on, loss of correction (>5°), rod breakage, and (iv) re-operation rates. Mean follow-up duration was similar between the groups at 98.6 ± 37.8months (Group 1) and 93.0±43.2 months (Group 2) ($p=0.662$). The proportion of patients with Risser Grade 0-3 at time of surgery was significantly higher in Group 1 at 78.9% (15/19 patients) than Group 2 at 14.3% (3/21 patients) ($p<0.001$).

Conclusion:

Post-operative rod straightening is common in thoracoscopic fusion for adolescent idiopathic scoliosis correction, especially in the skeletally immature, without resultant increase in loss of curve correction, complications, and re-operation rates.