REDISTRIBUTION OF THORACIC KYPHOSIS IN LENKE 1 AND 2 ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS) USING A PROXIMAL KYPHOTIC ROD-CONTOURING TECHNIQUE

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Background:
Restoration of thoracic kyphosis in AIS patients is important to realign cervical lordosis and lumbar lordosis. The conventional differential rod-contouring technique may lead to proximal junctional kyphosis.

Objective:
To report the post-operative radiological sagittal profile (minimum 2 years follow-up) for Lenke 1 and 2 AIS patients who underwent posterior spinal fusion (PSF) with a proximal kyphotic rod-contouring technique.

Materials and methods:
Lenke 1 and 2 AIS patients who underwent PSF with proximal kyphotic rod-contouring technique between year October 2018 to December 2020 in a single tertiary center were recruited retrospectively. The following parameters were measured: Sagittal vertical axis (SVA), C2-C7 angle, T1 slope angle, lumbar lordosis angle, T1-T5, T2-T5, T1-T12, T2-T12, T5-T12 kyphotic angles and upper instrumented vertebrae (UIV)-T12 kyphotic angle. Data were analyzed to determine changes in sagittal parameters post-operatively.

Results:
There were 58 patients (12 male, 46 females) consisting of 44 (75.9%) Lenke 1 and 14 (24.1%) Lenke 2 patients. Post-operatively, the mean T1-T5 and T2-T5 kyphotic angles increased significantly by 4.7 ± 9.0° ($p<0.001$) and 4.4 ± 8.3° ($p<0.001$) respectively while the mean T5-T12 kyphotic angle was reduced significantly by 5.8 ± 10.7° ($p<0.001$). However, there was a significant reduction of 3.6 ± 12.1° ($p=0.027$) in lumbar lordosis. The mean C2-C7 kyphotic angle was reduced by 2.1 ± 11.9° ($p=0.181$) while the T1 slope angle increased by 1.3 ± 6.2° ($p=0.110$) but there was no statistical significance.

Conclusion:
PSF with proximal kyphotic rod-contouring technique increased the thoracic kyphosis proximally at T1-T5 and T2-T5 regions but reduced at T5-T12 level. The cervical lordosis and T1 slope had improved, however, without statistical significance.