Comparison of the effects of three-dimensional correction on idiopathic scoliosis:
Vertebral coplanar alignment vs Derotation technique

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Objective: To compare the effects of three-dimensional correction and the post-surgical results of vertebral coplanar alignment (VCA) technique against derotation technique on idiopathic scoliosis (IS).

Methods: 22 IS patients were included in VCA group, with Lenke type 1(n=15) and 2(n=7). An additional 22 IS patients were included in Derotation group, with Lenke type 1(n=14) and 2(n=8). Radiographic parameters included the Cobb angle, thoracic kyphosis (by radiography), and apical vertebral rotation (by computed tomography). The Scoliosis Research Society (SRS)-22 scores were evaluated at the final follow-up visit.

Results: No difference in correction rate of the major curve Cobb angle between the two groups was noted (VCA group 70.9%, Derotation group 67.4%; P>0.05). After the surgery, no difference in the thoracic kyphosis was noted between the two groups (P>0.05), no patient experienced flatback in VCA group, but two patients in Derotation group. Correction rates of RAsag, RH, AVB-R and ARSD were 55.2%, 57.4%, 28.9% and 76.3% in VCA group and 18.2%, 38.6%, 19.2% and 53.5% in Derotation group, respectively, and were statistically different between the two groups (P<0.05). Patients were followed for an average of 19.1 months in VCA group, and 22.5 months in Derotation group showing no significant loss of correction. There were no differences in SRS-22 scores between the two groups. There were no aortic or neurological complications.

Conclusion: VCA could achieve as good correction and clinical outcome as the derotation technique in treating Lenke type 1 and 2 IS. But VCA could obtain superior correction of the rotation deformity.