DISTRIBUTION OF DYSPLASTIC PEDICLES IN SEVERE IDIOPATHIC SCOLIOSIS PATIENTS (COBB ANGLE ≥90°) BASED ON ZONAL CLASSIFICATION: A COMPUTED TOMOGRAPHY STUDY OF 2652 PEDICLES

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Background:

High prevalence of dysplastic pedicles was reported in scoliosis patients.

Objective:

To investigate the prevalence and distribution of dysplastic pedicles among severe idiopathic scoliosis (IS) patients according to the zonal classification.

Materials and methods:

Scoliosis curves were divided into eight zones. CT scans were used to measure pedicle width, then classified into Type A: cancellous channel >4mm; Type B: cancellous channel 2 to 4mm; Type C, cortical channel of 2 to 4mm; type D, cortical or cancellous channel of less than 2mm. Types B, C, and D were dysplastic pedicles while Types C and D were narrow dysplastic pedicles.

Results:

The mean Cobb angle for main thoracic (MT) and lumbar curves were 106º ± 11.7 and 100.7º ± 7.0. The prevalence of Type A pedicles is 738 (27.8%); Type B: 907 (34.2%); Type C: 830 (31.3%) and Type D: 177 (6.7%). The prevalence of dysplastic pedicles (sum of Type B, C and D) was 1914 pedicles (72.2%), and narrow dysplastic pedicles (sum of Type C and D) was 1007 pedicles (38.0%). Concave PT zone has the highest prevalence of dysplastic pedicles (100%), followed by transitional PT/MT zone (94.0%) and concave MT (88.4%). Narrow dysplastic pedicles were highest in concave PT zone (83.7%), transitional PT/MT zone (75.8%) and concave MT (58.5%). Zones with fewer narrow dysplastic pedicles include transitional MT/L zone (18.6%) and convex L zone (18.4%).

Conclusion:

The prevalence of dysplastic and narrow dysplastic pedicles in severe IS patients were 72.2% and 38%. Concave PT zone has the highest prevalence of dysplastic pedicles and narrow dysplastic pedicles (100% and 83.7%), followed by the transitional PT/MT zone (99.1% and 75.8%) and concave MT zone (85.4% and 58.5%).