A COMPUTED TOMOGRAPHY (CT) ANALYSIS OF 1595 SCREWS USING THE NOVEL MEDIAL WALL GLIDE TECHNIQUE FOR PEDICLE SCREW INSERTION IN NON-DYSPLASTIC PEDICLES IN ADOLESCENT IDIOPATHIC SCOLIOSIS (AIS) PATIENTS

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Background:

All pedicle screw construct is commonly utilised in AIS corrective surgeries due to its superior biomechanical properties and better correction rate. Nevertheless, pedicle screw malposition can result in serious adverse outcomes in AIS surgeries.

Objectives:

To assess the accuracy and safety of a novel medial wall glide technique for pedicle screw insertion in non-dysplastic pedicles (grade A and B).

Materials and methods:

Retrospective study in which 157 AIS patients underwent posterior spinal fusion were recruited. A pedicle probe was used to palpate the medial wall of the pedicle. The probe was advanced until 15-20mm deep. A gliding manoeuvre along the medial wall of the pedicle was used to create a channel for screw insertion. Pedicle sound was used to palpate all cortices to ensure pedicle integrity prior to screw insertion. Post-operative CT scans were used to assess medial, lateral, superior and inferior perforations using the Gertzbein and Robbins classification modified by Rao *et al*. Anterior perforations were classified using the Hansen-Algenstaedt *et al* grading.

Results:

1595 screws were analysed. When the lateral perforations of T1-T12 region were excluded, the overall perforation was 11.3% with 10.3% grade 1, 0.9% grade 2 and 0.1% grade 3 perforations. Medial, anterior and inferior perforation rates were 6.8%, 2.2% and 0.1%, respectively. The highest perforation rate was found at L1-L2 regions (22.4% and 20.8%, respectively). No neurologic complications or abutment to vital structures were observed.

Conclusion:

The overall perforation rate in the medial wall glide technique for pedicle screw insertion among AIS patients was 11.3%. The highest perforation rate was found at L1-L2 region. The critical perforation rate (grade 2 and 3) was 1.0%.