Assessment Of Prevertebral Visceral Relations To Thoracic Spine In Lenke Type 1 And 2 Adolescent Idiopathic Scoliosis Patients– A CT Evaluation

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INTRODUCTION:
Posterior instrumentation with pedicle screws is the gold standard treatment for corrective scoliosis surgery. Although safe, risk of complications do remain and are potentially devastating. A thorough understanding of anatomy is invaluable in minimizing the risk of complications.

MATERIALS & METHODS:
40 patients with Lenke Type 1 and 2 curves were studied. Preoperative Computed Tomography (CT) scans were obtained and the relationship of the prevertebral structures to the thoracic spine were measured and analyzed via SPSS. Measurements were based on a Cartesian coordinate system.

RESULTS:
The trachea was located to the right side of the vertebral body and screw insertion at all levels were safe. The aorta was found to start in anterolateral position at T4, moves posterolaterally until the apex and swings back anterolaterally until the apex where it crosses the midline. There was a positive correlation between curve severity and length of aortic distance and angle. The larger the Cobb angle, the further and more angled the aorta was at the apex. The proximal thoracic and lower thoracic-thoracolumbar junctions were identified as danger zones for screw insertion.

DISCUSSIONS:
The safest zone for pedicle screw insertion would be at the apex of the curve, where the distance of the aorta is furthest away and not in line with ideal screw trajectory. The aorta is closest to the vertebral body at the proximal thoracic region, but the aortic angle is wide. The lower thoracic-thoracolumbar junction is where the aorta is most in line with ideal screw trajectory and would be in danger in case of anteriorly perforated screw.

CONCLUSION:
There is a paradoxical relationship between risk of aortic injury in AIS patients with more severe curves. Care should be taken when inserting screws at the proximal thoracic and lower thoracic-thoracolumbar junction.

REFERENCES: