Transpedicular screw fixation (TPSF) of the cervical spine provides excellent biomechanical stability

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Introduction: Transpedicular screw fixation (TPSF) of the cervical spine provides excellent biomechanical stability; however, this technique requires a good understanding of the anatomy of the pedicles in order to avoid damaging nearby neurovascular structures. We aim to evaluate the morphometry of subaxial cervical spine pedicles among Arabs.

Methods: This cross-sectional study involved a retrospective review of computed tomography (CT) scans of normal cervical spines of 99 Arab adults. A total of 990 pedicles (198 pedicles at each vertebral level; including right and left pedicles) were evaluated. Ten morphometric measurements were obtained. Data were analyzed using a p-value of ≤0.05 as the cut-off level of statistical significance.

Results: Our sample included 63 (63.6%) males and 36 (36.4%) females, with a mean age of 35.5±16.5 years. The morphometric parameters of C3 to C7 cervical spine pedicles were larger in men compared to women. The outer pedicle width (OPW) was <4.5 mm in more than 25% of all subjects at C3 to C6 vertebrae. Among females, this was seen in more than one-third at C3 to C6 vertebrae. Statistically significant differences in the OPW between males and females were noted at C3 (p=0.032) and C6 (p=0.004).

Conclusions: For the majority of our subjects, inserting screws in the pedicles of C3 to C7 vertebrae is feasible. In order to avoid serious intraoperative complications, the spine surgeon should properly assess the morphometry of the pedicles preoperatively for Arab patients undergoing TPSF surgery at the level of the cervical spine.

Role of MRI in evaluation of bone tumors and tumor-like lesions

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The diagnosis of osseous neoplasms relies predominantly on their systematic analysis on plain radiographs with attention to features like location, margins and zone of transition, matrix, perioskeletal reaction, cortical destruction, soft tissue component, number of lesions. MRI further helps narrowing the differential or making a specific diagnosis in problematic cases due to its excellent contrast resolution and ability to demonstrate the components like cartilage, fat, vascular tissue, hemorrhage and necrosis. It is also more sensitive to detect radiographically subtle marrow lesions. Moreover, it provides additional crucial information required for local staging and surgical planning like degree of intramedullary extension, involvement of muscle compartments, neurovascular bundles, presence of skip lesions, invasion of adjacent physeal plates and intra-articular extension. Additionally, contrast enhanced MRI helps in differentiating solid from cystic lesions and demonstrating tumoral enhancement characteristics along with depicting most vascularized components. Biopsies done under MRI guidance help in avoiding sampling necrotic tissues. It also helps in follow-up of these cases and assessing treatment response to neoadjuvant therapy. I will share my experience with MR evaluation of bone tumors.

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