

Publication

Accuracy of pedicle screw placement in the thoracic and lumbosacral spine using a conventional intraoperative fluoroscopy-guided technique: a national neurosurgical education and training center analysis of 1236 consecutive screws

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OBJECTIVE: Pedicle screw placement is a very common procedure used to stabilize all three columns of the thoracic and lumbar spine. The purpose of this study is to evaluate the incidence of screw misplacement and related complications in patients who underwent fluoroscopy-guided transpedicular screw fixation at a neurosurgical teaching institution. **METHODS:** We retrospectively reviewed consecutive patients who underwent fluoroscopy-guided transpedicular screw fixation from January 2007 to May 2011 in the Department of Neurosurgery, Kantonsspital Aarau, a certified Swiss National Neurosurgical Education and Training Center. The accuracy of the pedicle screw trajectory was assessed using reconstructed postoperative axial, sagittal, and coronal computed tomography images. The displacement was classified as minor (≤ 2 mm), moderate (2.1-4 mm), and severe (> 4 mm). **RESULTS:** A total of 1236 pedicle screws were placed in 273 consecutive patients in the thoracic and lumbosacral spine. All surgeries were performed under the supervision of 7 board-certified neurosurgeons and faculty members. A total of 17 surgeons, including trainees, participated in all procedures. A total of 247 (20%) screws breaching the pedicle were identified, with 135 (10.9%) minor violations, 65 (5.3%) moderate violations, and 47 (3.8%) severe violations. Sixteen (5.9%) patients developed postoperative radiculopathy. All of these patients belonged to the subgroup of severe screw displacement. **CONCLUSIONS:** The data presented confirm that for a training and education center, transpedicular fluoroscopy-guided screw fixation remains a technically demanding procedure. As defined in this study, neurological symptoms are likely associated only with severe screw misplacement.

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