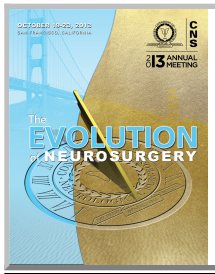

Free Hand Thoracic Pedicle Screw Technique Using a Uniform Entry Point and Trajectory for All Levels: Preliminary Clinical Experience

David A. Stidd MD, MS; Jeffrey Rice MD; Ali A. Baaj MD
Division of Neurosurgery, University of Arizona, Tucson

Introduction

Free hand thoracic pedicle screw placement techniques are well described in the literature. These rely on various starting points and trajectories for each level or segment of the thoracic spine. This is the first study proposing a uniform entry point and trajectory for all thoracic levels during pedicle screw placement.

Methods

We retrospectively reviewed postoperative computed tomography (CT) studies of seventeen consecutive patients who underwent open, free-hand thoracic pedicle screw fixation using our technique. The entry point is always 3 millimeters (mm) caudad to the lateral aspect of the superior articulating facet-transverse process junction, and the rostral-caudal trajectory is always orthogonal to the curvature of the spine at that level. The medial angulation is always 40 degrees at T1, 30 at T2, and 25 from T3-T12. Breach was defined as greater than 25% of the screw diameter residing outside of the pedicle or vertebral body.

Results

Indications for pedicle screw fixation included trauma (65%), infection (24%), tumor (6%) and deformity (6%). A total of 101 thoracic pedicle screws were inserted at the following levels: 12 at T1, 14 at T2, 4 at T3, 5 at T4, 6 at T5, 2 at T6, 6 at T7, 10 at T8, 10 at T9, 16 at T10, 12 at T11, and 4 at T12. There were no medial breaches and six (6) lateral breaches (5.8%). None of the screws had to be repositioned and there were no neurovascular complications associated with the breaches.

Learning Objectives

1. Present technique for thoracic pedicle screw placement

Conclusions

It is feasible to place free hand thoracic pedicle screws using a uniform entry point and trajectory for all levels. The entry point does not have to be adjusted for each level as reported in existing studies. This technique may be easier for trainees to learn and adopt.