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SAFETY AND ACCURACY OF THE DIRECT PEDICLE INSERTION TECHNIQUE FOR ANTERIOR PEDICLE SCREW PLACEMENT IN THE SUBAXIAL CERVICAL SPINE

INTRODUCTION

We developed an anterior pedicle screw (APS) fixation technique for multilevel cervical corpectomy and spinal fusion. The notable technical features of our APS placement are the direct insertion of guide wires into the pedicles and reverse penetration of graft using the guide wires. In this study, we investigated the safety and accuracy of the direct pedicle insertion (DPI) technique.

METHODS

This study included 38 patients who underwent two-to four-level cervical corpectomy and fusion using APSs. After corpectomy, the pedicles on the right side were visualized using oblique fluoroscopy. A guide wire was inserted into the pedicle directly through the inner wall of the excavated vertebral body until it perforated the skin at the posterolateral area of the neck. The fibular autograft was tamped gently into the place without guide wire interference. The graft was penetrated in the reverse direction by the guide wires. Cannulated screws were inserted into the pedicles through the graft along the guide wires. The placement of APSs was assessed with CT image.

RESULTS

A total of 105 APSs were placed in the 38 study patients, 103 of which (98.1%) were accurately positioned in the pedicles. No vertebral artery injury or graft dislodgement was noted. Neurological improvement was seen in all patients after surgery.

DISCUSSION

In traditional posterior pedicle screw insertion or transgraft APS insertion using fluoroscopic pedicle axis view, the distance from the entry site to the pedicle is longer, which provides a small area for safe screw insertion. However, the entry site in the DPI technique is the pedicle itself, which provides a larger area for safe screw insertion. Moreover, the vertebral artery is located at the lateral aspect of the entry site, and the dura is directly visible in the surgical field. In addition, the optimal entry site for the APS can be identified using oblique fluoroscopy, which allows accurate insertion of the APS.

CONCLUSION

The present study showed the safety and absence of technical difficulty of the DPI technique for APS placement. APS fixation could be useful for rigid fixation of the grafted bone anteriorly during multilevel cervical corpectomy and spinal fusion.