

THE POSTERIOR CERVICAL LATERAL MASS PLATING TECHNIQUE*

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ABSTRACT :

Ten cases who underwent posterior cervical lateral mass plating were evaluated. There were 7 males and 3 females with an average age of 37 years (range 16-55 years). Diagnoses were traumatic cervical instabilities in 6, tuberculosis in 3, and neurofibromatosis in 1 case. Five patients had no neurological deficit, 2 had partial deficits, and 3 had complete neurological deficits. Combined anterior and posterior fusions were performed in tuberculosis and neurofibromatosis cases.

AO 3.5 mm 1/3 tubular or reconstruction plates were used for fixation. Magerl technique is employed for screw placement.

There were no early post operative complications related to plate-screw fixation.

Eight cases could be followed-up more than 6 months with an average of 16 months (range 6-31 months). Solid fusions were obtained and, implant failures were not observed in these cases. All partial neurologic deficits improved.

Posterior cervical lateral mass plating technique was found to be safe and efficacious.

Key Words: Cervical vertebrae, Bone plates.

INTRODUCTION

Instrumentation of cervical spine has not been frequently employed possibly because of the frequency of the lumbar spine surgeries are more and stabilization of the cervical spine usually limited to wiring techniques. Inadequate stabilization of these type of surgeries has caused to some surgeons to develop newer and stronger fixation techniques such as plate-screw fixation. Anterior and posterior plating techniques has been described. Although biomechanical studies revealed that posterior plating systems are stronger than anterior ones, clinical results of anterior plates has shown that they can provide efficient clinical stability with reasonable complication rates (1, 8, 9). However, all cervical spine pathologies can not be managed with anterior approaches, such as locked facet dislocations, vertebral body infections and serious instabilities. In above mentioned cases more stable posterior plating techniques are used. The aim of this study is to present the technique of posterior cervical lateral mass plating and the results that we obtained in our cases.

PATIENTS and METHODS

Ten cases who underwent posterior cervical lateral mass plating were evaluated. There were 7 males and 3 females with an average age of 37 years (range 16-55 years). Diagnoses were traumatic cervical instabilities in 6, tuberculosis in 3, and neurofibromatosis in 1 case. Five patients had no neurological deficit, 2 had partial deficits, and 3 had complete neurological deficits. Combined anterior and posterior fusions were performed in tuberculosis and neurofibromatosis cases. In the combined fusion cases, anterior fusions were performed in the first stage and, posterior procedures were done one or two weeks later.

AO 3.5 mm 1/3 tubular or reconstruction plates were used for fixation. Magerl technique is employed for screw placement (figs 1, 2).

Cervical collars were used for immobilization for 6 weeks.

RESULTS

There were no early post operative complications related to plate-screw fixation.

Eight cases could be followed-up more than 6 months with an average of 16 months (range 6-31 months). Solid fusions were obtained and, implant failures were not observed in these cases. All partial neurologic deficits improved.

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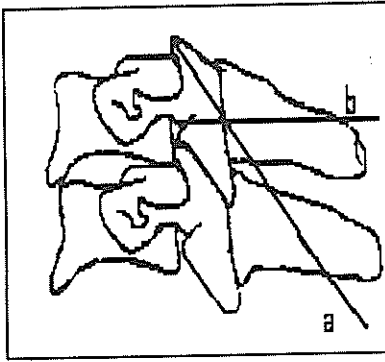


Figure 1a. Screw directions in sagittal plane (line a: Magerl technique, line b: Roy-Camille technique)

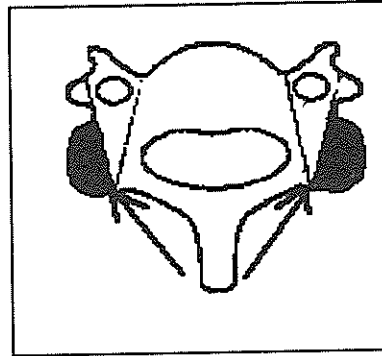


Figure 1b. Screw direction in axial plane

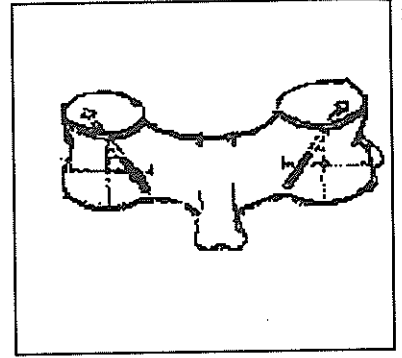


Figure 1c. Screw insertion technique according to Magerl.

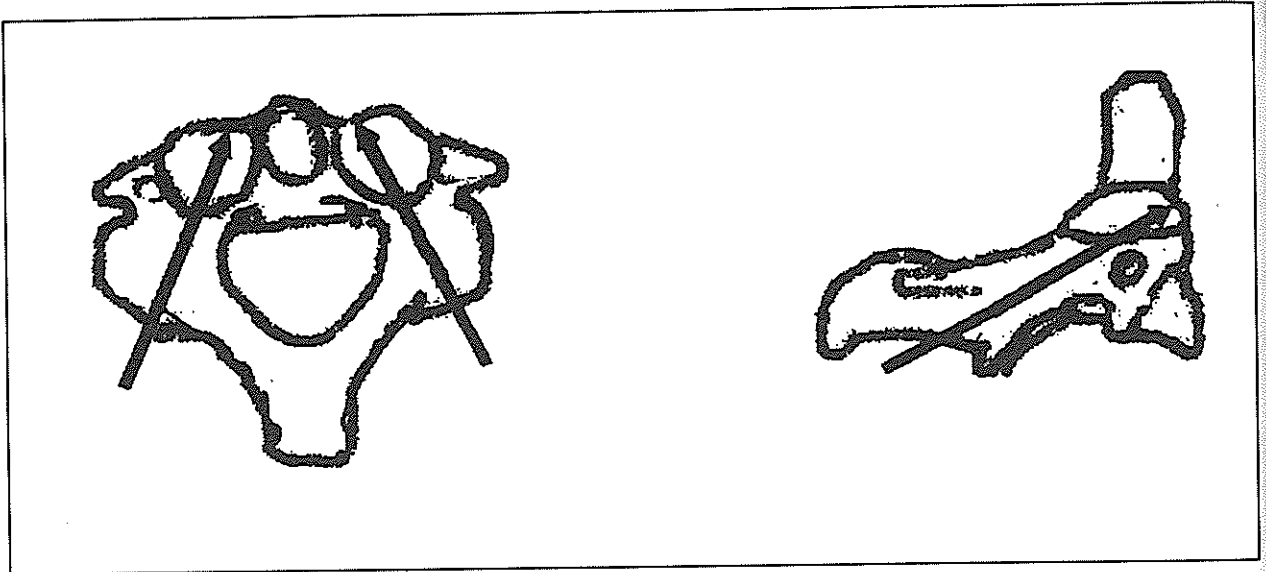


Figure 2. Screw placement for the second cervical vertebra

DISCUSSION

Although the classic wiring techniques are suitable for tension band effect in flexion, it is questionable whether they provide enough stability in axial rotation and extension especially highly instable conditions (1, 7, 9). On the other hand, in cases with poor bone quality, fractured lamina and post laminectomy status, posterior wiring and clamp systems can not be used. Because of these reasons, posterior lateral mass plating provides very good and suitable fixation technique. There are different types of plates and two techniques

of screw placement within the lateral mass. Magerl advocates to insert the screws oblique plane parallel to the articular lines in sagittal plane and 25 degrees laterally in the axial plane (1, 10, 12). On the other hand, Roy-Camille (11), inserts the screws perpendicular in the sagittal plane and 10 degrees in the axial plane. Bicortical purchase is mandatory in both techniques. The risk of injury to the nerve root is lesser in the Roy-Camille's method but, the inferior facet is in greater danger of screw penetration and screw excursion in the bone is shorter (5, 7).

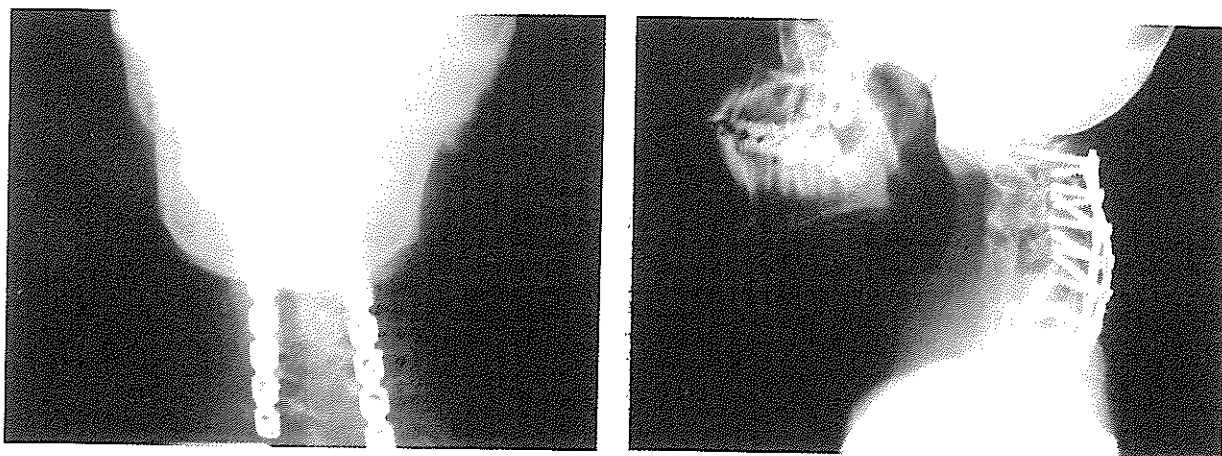


Figure 3. Radiographs at the sixth month of follow-up of the neurofibromatosis case that was treated by combined fusion.

a: A-P radiograph

b: Lateral radiograph

Although posterior lateral mass plating is a demanding technique, clinical series have reported few complications (2, 4, 6, 7, 11, 12). Roy-Camille et al. (11) reported no secondary loosening in 85.2% of their cases. Magerl did not observe pseudoarthrosis using his hook plate (12). Graham et al (7) reported nerve root injury rate of 1.8% per screw. There is no report on the vertebral artery injury. In our series we have not observed any complication.

Posterior plating systems seems to be safe but, this type of surgery should only be performed by experienced spine surgeons who especially have special interest on cervical spine for not only to minimise complications but also to select proper patients by using sophisticated imaging and diagnostic techniques.

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