Treatment of Metastatic Pathologic Fractures with Interbody Distraction and Anterior Column Reconstruction: Operative Technique and Case Series

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Introduction

In the setting of metastatic epidural spinal cord compression (MESCC) and severe pathologic fractures, anterior column reconstruction is often indicated. We describe the use of interbody distraction to restore vertebral body height and correct kyphosis prior to reconstruction with polymethyl methacrylate (PMMA) and report the long-term durability of such reconstruction.

Methods

A single-institution, prospective series of patients with MESCC undergoing decompression, anterior column reconstruction, and posterior instrumentation was analyzed. Routine demographic and perioperative variables were obtained, in addition to pre- and postoperative anterior vertebral body height, posterior vertebral body height, and kyphosis. Student's paired t-tests were then performed to assess the difference in pre-operative and post-operative vertebral body height and kyphosis.

Results

Twenty-one patients underwent single stage posterior decompression with interbody distraction and anterior column reconstruction using PMMA. The median age and KPS were 61 years and 70, respectively. Primary tumors included: renal cell (8), lung (4), multiple myeloma (2), prostate (2), and other (5). Eighteen patients had a single level vertebral body reconstruction and 3 underwent multilevel transpedicular corpectomies. Median survival was 13.3 months. In the immediate postoperative setting, a significant improvement was seen in anterior body height (p=0.0017, 95%CI -4.15, -1.11) and posterior body height (p=0.0116, 95%CI -3.14, -0.45) in all patients, and improved kyphosis was seen in those with oblique endplates (p=0.0002, 95%CI 11.16, 20.27). In the median follow-up time of 13.9 months, we observed 3 cases of asymptomatic PMMA subsidence. One patient required reoperation in the form of extension of fusion.

Conclusions

We describe a technique of interbody distraction easily applied in a single stage transpedicular vertebrectomy for the treatment of pathologic fractures, allowing restoration of vertebral body height and reduction of kyphotic deformity prior to the reconstruction of the vertebral body with PMMA.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) describe the importance of interbody distraction to restore vertebral body height, 2) discuss potential usage o an interbody distractor and PMMA to treat pathologic fractures causing severe anterior column failure.

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