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Review Article

Spondylectomy in the Treatment of Neoplastic Spinal Lesions – A Retrospective Outcome Analysis of 582 Patients Using a Patient-Level Meta-Analysis

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ARTICLE INFO

Article history:

Received: 23 November, 2020

Accepted: 8 December, 2020

Published: 18 December, 2020

Keywords:

Spondylectomy

spinal chordoma

spinal sarcoma

spinal metastasis

ABSTRACT

Background: En-bloc spondylectomy in the treatment of spinal tumors is a complex procedure with potential complications. This study aims at identifying predictors of postoperative complications, lesion recurrence and overall survival.

Methods: A systematic review of the literature was conducted, and patient-level data extracted from the included studies. Multiple linear-regression models were calculated to predict the occurrence of postoperative complications, lesion recurrence and overall survival based on age, tumor etiology, surgical approach, mode of resection (en-bloc versus intralesional), tumor extension based on Weinstein-Boriani-Biagini classification system and number of levels treated.

Results: Data of 582 individual adult and pediatric patients were extracted from the literature; Patient characteristics are: 45% female, median age of 46 years (range 5-78); most common etiologies were: sarcoma (46%), metastases (31%) and chordoma (11%). The surgical technique was: anterior (2.5%), combined (45%) and posterior approach (52.4%); 68.5% underwent en-bloc spondylectomy; average levels resected were 1.6 (1-6); 65% of patients had neurologic deficits at presentation, average survival was 2.6 years; Direct procedure-related complications were observed in 17.7%, with the most prevalent being CSF leaks, wound infections and neural injury. For postoperative complications, recurrence and 5-year survival significant regression equations were found ($F(7,90)=2.57$, $p=0.018$) with an R^2 of 0.1; ($F(5,147)=2.35$, $p=0.044$) with an R^2 of 0.07 and ($F(4,101)=7.2$, $p=0.01$) with an R^2 of 0.38. Odds ratio for predicted complications was 1.35 for en-bloc resection and 1.25 for more than one level treated. The odds ratio for tumor recurrence was 0.78 for en-bloc resection; odds ratio for 5-year survival were 0.79 for increased patient age, 0.65 for increasing tumor grade, 0.79 for tumor dissemination at diagnosis and 1.68 for en-bloc resection.

Conclusion: En-bloc spondylectomy provides improved survival and lower recurrence rates but also higher operative complication rates when compared to intralesional resections. Interestingly the complication rate was not influenced by tumor stage (WBB scale) and tumor etiology.

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