Higher Preoperative SINS Score Predicts Earlier Mortality in Patients with Metastatic Spine Disease

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Introduction

The Spinal Instability Neoplastic Score (SINS) is utilized to identify patients with spinal metastatic disease who are likely to benefit from surgical stabilization. The score was first introduced to stratify patients into stable, potentially unstable, and unstable categories using variables such as vertebral body involvement, location of disease, and severity of kyphosis (1) This scoring system allows more uniformity in treatment and has demonsrated excellent intra-rater reliability in subsequent studies. (1-3) Traditionally, patients who are regarded as unstable are the most likely candidates for surgical intervention. This study looked specifically at the outcomes following surgery for SINS stable and unstable patients.

Methods

Patients from a single academic health system were reviewed over a five-year period. One hundred and two patients were identified with metastatic disease and eighty-five patients had preoperative imaging available for SINS scoring. Mortality data was collected from a database of death certificates with a minimum one-year follow up for all patients. Univariate and multivariate survival analyses were performed via Cox Proportional Hazards regression. Chi-squared and Student t-tests were utilized as univariate statistical tests of categorical and continuous data, respectively.

Results

Sixty patients were classified as "SINS stable" (or potentially unstable; SINS = 12) and twenty-five patients were classified as "SINS unstable" (SINS = 13). Demographics were comparable (SINS stable: 62 years, 57% male; SINS unstable: 60 years, 48% male; p's > 0.5). Sixty percent of SINS stable patients died, with a mean time from surgery to death of 228 days while 72% of SINS unstable patients died, with an average time from surgery to death of 108 days. Mortality within 30 days was higher for SINS unstable patients (31.5%) as compared to the SINS stable patients (5.2%, p = 0.009). Unstable SINS score was a significant predictor of time to death (Hazard Ratio (HR) = 1.13, p = 0.007)

Conclusions

Our results suggest that spine instability as measured by SINS parameters may have predictive value for early mortality and overall survival. The authors acknowledge that this data set reflects a small patient sample size, as well as a clinically heterogeneous sample, however this data suggests that unstable patients are significantly more likely to die within thirty days of surgery. While this may be due to more advanced disease, and future studies are needed to determine overall disease burden as a factor in patient survival, the complexity of the surgery required for unstable patients may also play a role in early mortality following spinal

Learning Objectives

By the conclusion of this session, participants should be able to 1) describe the importance of the SINS score in identifying patients who may benefit from surgery, 2) discuss, in small groups how unstable SINS score may predict early mortality and 3) identify an effective treatment for metastatic spine disease

References

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