

Introduction

The treatment of metastatic disease of the spine is associated with significant morbidity. However, decompression and stabilization is often indicated. Weighing the risks and benefits of surgical intervention is a clinical challenge, and different scales have been proposed to assist in decision making. Psoas muscle volume measurements have been proposed as a potential biomarker for frailty, and their use in prognostication of this population may offer important clinical benefits.

Methods

We retrospectively reviewed 88 patients who underwent surgery for metastatic spine tumors. Psoas muscle volume was measured at the level of the L4 pedicle at the time of surgery, and data was collected on gender, histology, date of death, complications, and medical comorbidities. Statistical analysis was performed using linear regression and ANOVA tests.

Results

There were 38 female and 50 male patients reviewed. Linear regression analysis demonstrated a positive relationship between psoas muscle volume and days of survival post operatively. This relationship was more pronounced when stratified by gender, particularly in women. Patients with preoperative psoas muscle volume < 800 mm² had significantly shorter survival than patients with preoperative psoas muscle volume > 1000 mm² (158 vs 271 days, $p = 0.03$). Psoas muscle volume < 700 mm² in females was associated with worse survival than psoas muscle volumes measuring > 700 mm² (64 days vs 353 days, $p < 0.01$). Psoas muscle volume also demonstrated a positive relationship with survival in men, though less robustly than the observed association in women.

Conclusions

Psoas muscle volumes demonstrate a positive and statistically significant relationship with life expectancy following surgery for the treatment of metastatic spine tumors. Predication of life expectancy of patients with metastatic spine tumors remains a clinical challenge, and measurement of psoas muscle volumes offers an objective, measurable, and replicable technique that has the potential to assist clinical decision making.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) Describe the importance of estimating prognosis in patient with metastatic disease of the spine, 2) Discuss, in small groups, the technique for measuring psoas volumes and their relationship to patient survival, 3) Identify an effective decision making strategy for treatment of metastatic disease of the spine.

References

Zakaria HM, et al. "Application of morphometric analysis to patients with lung cancer metastasis to the spine: a clinical study." *Neurosurgical focus* 41.2 (2016): E12.

Ebbeling, L., et al. "Psoas: lumbar vertebra index: central sarcopenia independently predicts morbidity in elderly trauma patients." *European Journal of Trauma and Emergency Surgery* 40.1 (2014): 57-65.