

Prognostic Factors for Survival in Surgical Series of Symptomatic Metastatic Epidural Spinal Cord Compression: A Prospective North American Multi-Centre Study in 142 Patients

Anick Nater-Goulet MD; Michael G. Fehlings MD, PhD, FRCS(C), FACS; Lindsay Tetreault Bsc; Branko Kopjar MD; Paul M. Arnold MD; Mark B. Dekutoski MD; Joel Finkelstein MD; Charles Fisher MD; John France MD; Ziya L. Gokaslan MD; Laurence D. Rhines MD; Peter Rose; James M. Schuster MD

Results



Introduction

Metastatic Epidural Spinal Cord Compression (MESCC) affects up to 10% of cancer patients. If left untreated, MESCC leads to debilitating pain, irreversible neurological deficits associated with shortened survival and worsened quality of life. This study aims to identify the key survival predictive factors in MESCC patients who were surgically treated for a single symptomatic lesion.

Methods

142 MESCC patients were enrolled in a prospective NA multi-center study and followed for 12 months. Using univariate analyses, Kaplan-Meier methods, and log-rank tests the predictive value of several clinical variables were assessed. Non-collinear predictors with p < 0.05 in univariate analyses were included in the final Cox proportional hazards model.



| Variable | Value | n (142) |
|--|-----------------------------|---------|
| Age, mean years (SD; median; range) | 59.4 (11.97; 59.5; 29 - 85) | 142 |
| Female | 59 (41.5%) | 142 |
| Comorbidities | 108 (76.0%) | 142 |
| Cardiovascular | 80 (74.0%) | |
| End-stage renal disease | 1 (0.9%) | |
| Diabetes | 16 (14.8%) | |
| Psychiatric | 15 (13.9%) | |
| Stroke | 1 (0.9%) | |
| Site of primary tumor | | 142 |
| Lungs | 34 (23.9%) | |
| Kidney | 22 (15.5%) | |
| Breast | 21 (14.8%) | |
| Prostate | 19 (13.4%) | |
| Gastrointestinal | 10 (7.0%) | |
| Unknown | 17 (12.0%) | |
| Other | <u>19 (13.4%)</u> | |
| Other metastasis located outside the spine | 86 (60.6%) | 142 |
| Bone metastases | 18 (20.9%) | 86 |
| Visceral metastases | 44 (51.2%) | 86 |
| Both bone and visceral metastases | 24 (27.9%) | 86 |
| Number of vertebral body involved | | 142 |
| _1 | 99 (69.7%) | |
| 2 | 17 (12.0%) | |
| 3 | 19 (13.4%) | |
| >4 | 7 (4.9%) | |
| Ability to walk 4 steps independently | 102 (71.8%) | 142 |
| Bladder Bowel dystunction | 24 (16.9%) 17 (12.0%) | 141 |





Figure 2

| Univariate analysis | | | | | |
|--|-------|---------------|----------|--|--|
| Predictors | HR | 95% CL | р | | |
| Growth of primary tumor (ref: Tomita Grade 1 vs Tomita Grade 2 & 3) | 2.433 | 1.449 - 4.085 | 0.0008 | | |
| Gender (ref: Female vs Male) | 1.592 | 1.027 - 2.469 | 0.0377 | | |
| Visceral metastasis (ref: no vs yes) | 2.212 | 1.432 - 3.419 | 0.0003 | | |
| Extraspinal bony metastasis (ref: no vs yes) | 1.858 | 1.204 - 2.868 | 0.0052 | | |
| Body Mass Index (BMI) | 0.945 | 0.907 - 0.984 | 0.0062 | | |
| SF-36 physical component score | 0.949 | 0.924 - 0.974 | < 0.0001 | | |
| EQ-5D score | 0.300 | 0.129 - 0.694 | 0.0049 | | |
| Oswestry Disability Index (ODI) score | 1.014 | 1.003 - 1.024 | 0.0119 | | |

Table 2

| Cox regression analysis | | | | |
|--|-------|----------|--|--|
| Predictors | HR | р | | |
| Growth of primary tumor (ref: Tomita Grade 1 vs Tomita Grade 2 & 3) | 2.818 | 0.0007 | | |
| Visceral metastasis (ref: no vs yes) | 2.005 | 0.0044 | | |
| SF-36 physical component score | 0.945 | < 0.0001 | | |
| Table 3 | | | | |

Conclusions

Slow growing tumor (Tomita Grade 1), absence of visceral metastasis, and lower degree of preoperative physical disability, as reflected by a higher score on the SF-36 physical component questionnaire, are good predictive factors for survival in selected patients who underwent surgical treatment for a focal symptomatic MESCC lesion.

References

(1) Prasad D & Schiff D. Malignant spinal-cord compression. Lancet Oncol. 2005; (2) Sciubba DM et al. Diagnosis and management of metastatic spine disease. A review. J Neurosurg Spine. 2010; (3) Loblaw DA & Laperriere NJ. Emergency treatment of malignant extradural spinal cord compression: an evidencebased guideline. J Clin Oncol. 1998; (4) Patchell RA et al. Direct decompressive surgical resection in the treatment of spinal cord compression caused by metastatic cancer: a randomised trial. Lancet. 2005