

Development Of Clinical Prediction Models For Postoperative Survival And Quality Of Life In Patients With Metastatic Epidural Spinal Cord Compression Who Underwent Surgical Treatment

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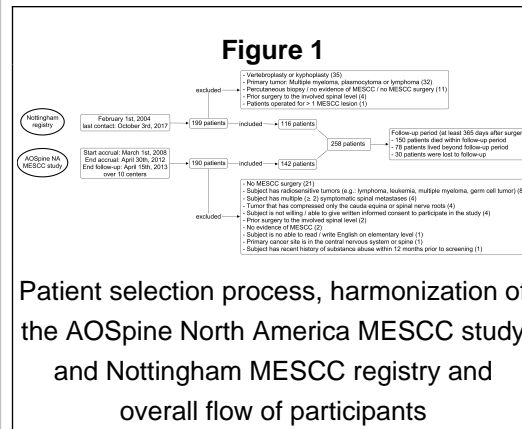
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Introduction

Surgery is generally considered for patients with metastatic epidural spinal cord compression (MESCC) with an estimated life expectancy of at least 3 months. None of the existing clinical prognostic models (CPMs) of survival for patients with MESCC are consistently used [1] and to date, no CPMs exist to predict quality of life (QoL). This study aims to develop the first CPMs of survival and QoL for surgical patients with MESCC in accordance with the Transparent Reporting of a multivariable prediction model for Individual Prognosis Or Diagnosis (TRIPOD) guideline.

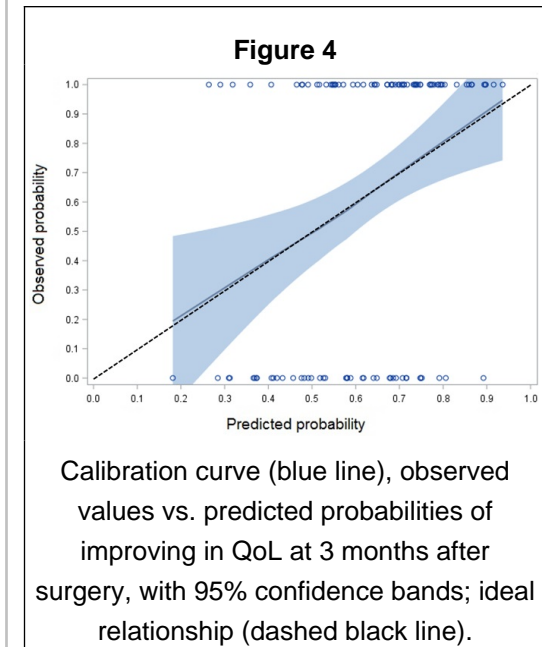
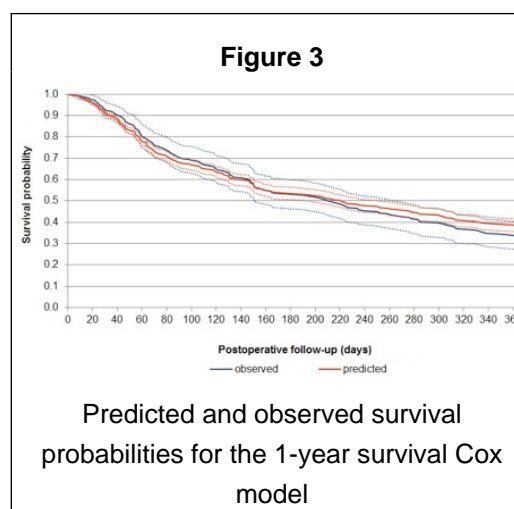
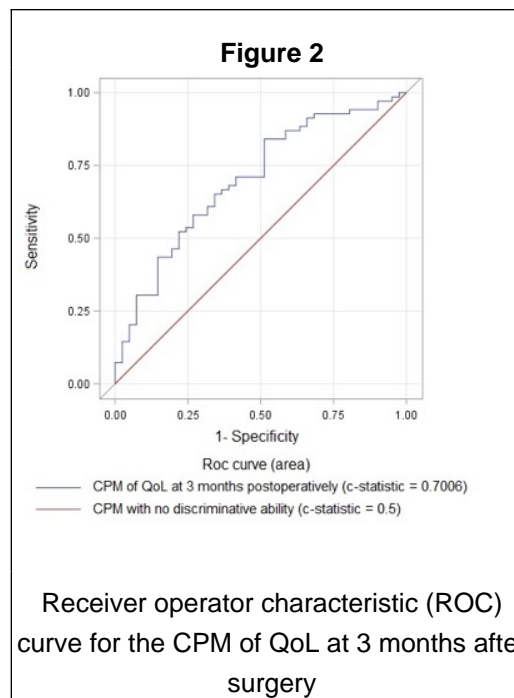
Methods

Data from 258 surgical patients with MESCC from the AOSpine North American MESCC study and Nottingham MESCC registry were used. The creation of multivariable CPMs of one-year survival and QoL, using Cox model and logistic regression, was driven using a manual backward elimination process. The outcome measure for CPMs of QoL was the minimal clinical important difference (MCID) in EQ-5D scores of at least 0.06. Collinearity, interactions and assumptions were assessed. Internal validation was performed using 200 bootstrap iterations; calibration and discrimination were evaluated.



Results

Higher score on SF-36 physical component score (PCS) was associated with longer postoperative survival (HR: 0.96) while the type of primary tumor other than breast, thyroid, and prostate (unfavorable, such as lung, HR: 2.57; others, HR: 1.20), presence of organ metastasis (HR: 1.51), MESCC treated with radiotherapy prior to surgery (HR: 1.53) and male sex (HR: 1.58) were not. The optimism-corrected c-statistic was 0.69 (95% CI: 0.64-0.73). Factors related with improved QoL at 3 months after surgery were KPS <70% (OR: 2.50), living in NA (OR: 4.06), SF-36 PCS (OR: 0.95) and mental component (OR: 0.96). The optimism-corrected c-statistics was 0.74 (95% CI: 0.68-0.79) (Figure 2). Calibration for the CPMs of survival and QoL at 3 months was very good (Figure 3 and 4, respectively).



Conclusions

We have developed and internally validated the first CPMs of survival and QoL at 3 months after surgery in patients with MESCC following the TRIPOD guideline. A web-based calculator providing these prognostic probabilities will be available to assist clinical decision-making in this complex patient population.

Reference

[1] Nater A et al. Key Preoperative Clinical Factors Predicting Outcome in Surgically Treated Patients with Metastatic Epidural Spinal Cord Compression: Results from a Survey of 438 AOSpine International Members. World Neurosurg 2016; 93: 436-48 e15.