

Development of a Web-Based Nomogram for Predicting Survival in Patients with Esthesioneuroblastoma Using SEER Database

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BACKGROUND

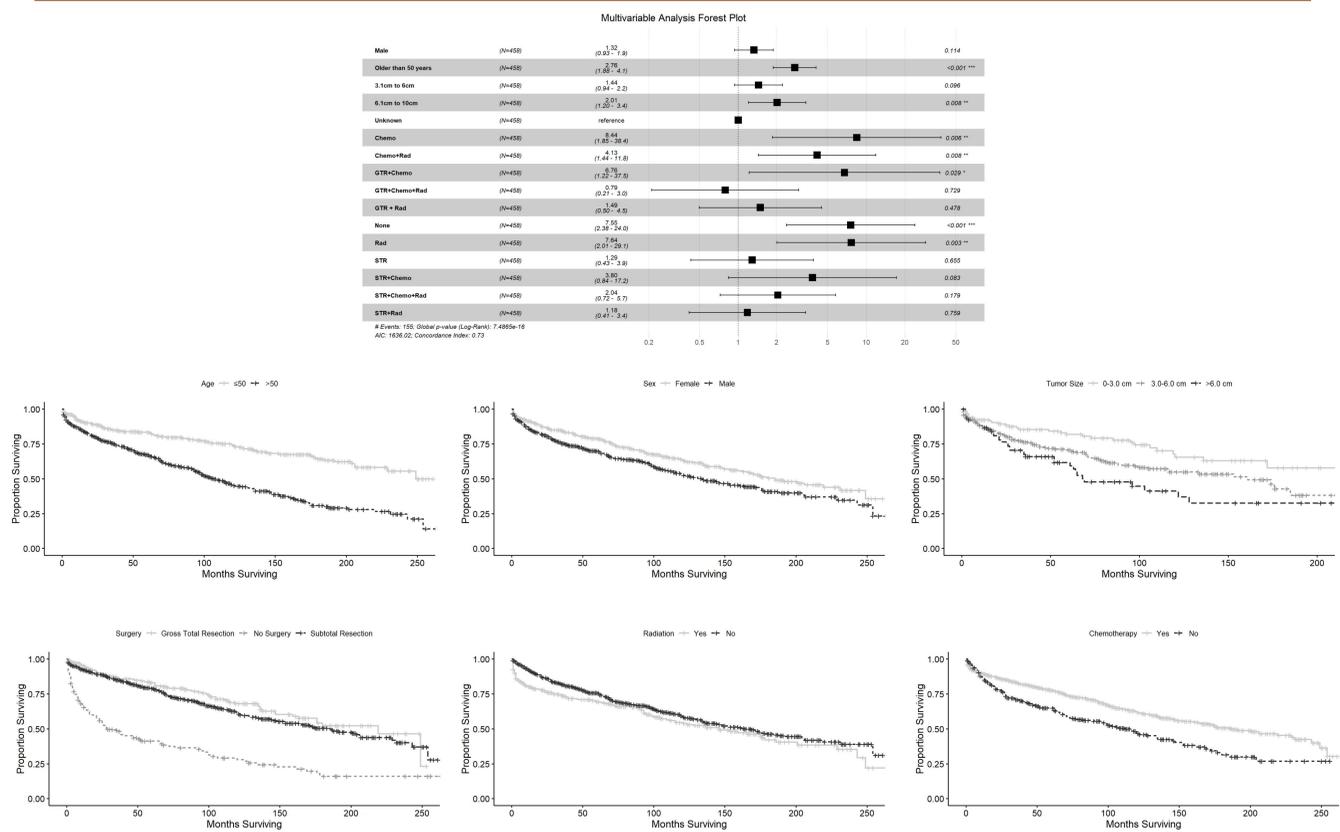
- Esthesioneuroblastoma (ENB) is a rare malignant tumor of the olfactory epithelium accounting for 3–6% of sinonasal cancers.
- Owing to its low incidence, current literature is largely limited resulting in variability in reported prognostic factors and treatment recommendations.
- Management typically involves surgical resection with or without adjuvant radiation and/or chemotherapy, but the survival impact of these strategies remains incompletely defined.
- While staging systems such as Kadish classification are commonly used, no widely available predictive model exists to provide individualized survival estimates.
- Using a large national SEER cohort, we sought to identify independent determinants of overall survival and develop a validated, web-based nomogram to assist in personalized prognostication.

Clinical Challenge:
ENB survival varies widely, and clinicians lack a practical tool to provide individualized prognostic estimates during treatment planning discussions.

METHODS

- Retrospective Cohort Study
 - SEER database (2000–2020)
 - N = 941 patients with ENB
 - Histology Code: 9522/3 – Olfactory neuroblastoma
 - Primary outcome: Overall Survival
 - Variables: age, sex, race, year of diagnosis, tumor size, tumor location, treatment modality
- Statistical Analysis:
 - Cox proportional hazard model Univariate and Multivariable analysis
 - Kaplan-Meier survival curves
 - Nomogram predicting 5- and 10-year OS
 - Internal validation (calibration + ROC)
- Development of Web-Based Nomogram App
link: <https://abhibhutada.shinyapps.io/estapp/>

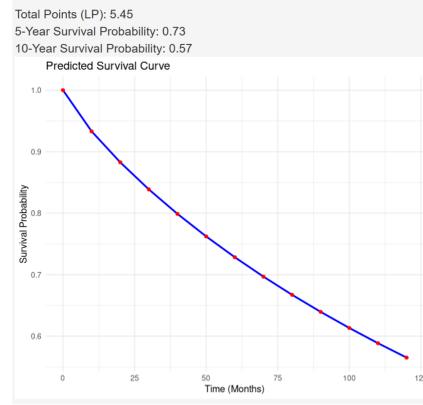
RESULTS



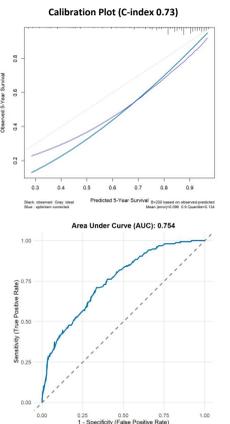
Nomogram-Based Survival Prediction

Sex: Male
Age: Older than 50 years
Race: Hispanic
Location: Central Nervous System
Size: 3.1cm to 6.0cm
Treatment: GTR+Chemo+Rad
Calculate

Results



Nomogram Performance



DISCUSSION

- Age and tumor size emerged as the strong predictors of survival, reinforcing their importance in risk stratification and treatment planning.
- No significant survival difference was observed between GTR and GTR with adjuvant radiation, suggesting that complete resection may remain the cornerstone of therapy when feasible.
- Our findings support a multimodal treatment paradigm but emphasize the importance of GTR in optimizing outcomes.
- The web-based nomogram demonstrated good discrimination (C-index 0.73, AUC 0.75), supporting its potential clinical utility for individualized survival prediction.
- This tool may facilitate shared decision-making and patient counseling, particularly in cases where treatment strategy is uncertain.

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