

A Risk Stratification Tool Based on Inflammatory and Nutritional Biomarkers to Predict Early Mortality After Surgery for Appendicular Bone Metastases

Authors

Ana Valeria Rigolino¹, Glauco José Pauka Mello¹, Matheus Silva Teixeira¹, Pedro Reggiani Anzuatégui¹

Affiliation

¹Hospital Erasto Gaertner, Curitiba, Brazil

Introduction:

Accurate survival estimation is essential for guiding surgical decision-making in patients with bone metastases. Inflammatory and nutritional biomarkers have emerged as potential prognostic indicators; however, their integration into clinically applicable risk stratification tools remains limited.

Methods:

A prospective observational study was conducted including 75 patients undergoing surgery for appendicular skeletal metastases between 2020 and 2024 at a tertiary oncologic center. Preoperative clinical and laboratory variables were collected, including neutrophils, neutrophil-to-lymphocyte ratio (NLR), C-reactive protein (CRP), ferritin, and albumin. Statistical analyses included logistic regression and survival analysis to evaluate associations with 3-month mortality.

Results:

Among the 75 patients included, 30.7% died within three months postoperatively. Hypoalbuminemia, elevated C-reactive protein (CRP), ferritin, neutrophil-to-lymphocyte ratio (NLR), and neutrophil count were significantly associated with early mortality. A composite biomarker profile showed strong prognostic value, with patients presenting three or more abnormal parameters demonstrating a markedly increased risk of death (OR 9.37). Median overall survival was approximately 7 months.

Conclusion:

A simple risk stratification tool based on inflammatory and nutritional biomarkers can identify patients at higher risk of early postoperative mortality. This approach may support clinical decision-making and help tailor surgical strategies in patients with bone metastases.