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Assessing the Prognostic Value of NLR, PLR, APRI, SII, and Liver Function Tests for Fistula Formation after Colorectal Cancer Surgery

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Abstract

Background: This study evaluates the predictive value of preoperative inflammatory markers (NLR, PLR, APRI, SII) and liver function tests in determining the risk of fistula development post-colorectal cancer surgery. The objective was to determine the association between elevated marker levels and fistula risk and establish thresholds for preoperative risk stratification.

Methods: A retrospective cohort study was conducted at the "Pius Brinzeu" Clinical Emergency Hospital from 2018 to 2023, analyzing data from 219 patients undergoing colorectal cancer surgery.

Results: Among the markers studied, the Systemic Inflammation Index (SII) with a cutoff >460.5 showed the highest sensitivity (75.6%) and specificity (71.3%), resulting in an AUC of 0.774 ($p=0.001$). Albumin levels <2.9 g/dL also significantly predicted fistula occurrence with 77.3% sensitivity and 73.8% specificity (AUC 0.788, $p<0.001$). Neutrophil to Lymphocyte Ratio (NLR) and Platelet to Lymphocyte Ratio (PLR) presented cutoffs of >3.95 and >191.6 respectively, demonstrating substantial predictive value with AUCs of 0.732 and 0.746 ($p<0.001$ and $p=0.001$, respectively).

Conclusions: Elevated levels of specific preoperative inflammatory markers and liver function tests are significantly associated with the risk of developing fistulas in patients undergoing colorectal cancer surgery. These findings support the integration of these biomarkers into preoperative evaluations to enhance patient risk stratification and optimize surgical outcomes, providing a valuable tool for clinical decision-making in colorectal surgery settings.

Key words: colorectal cancer, general surgery, oncology