

Assessing the Capability of Preoperative Hematocrit in Predicting Ulnar Nerve Decompression Surgery Outcomes

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Background

Low preoperative hematocrit has been linked in numerous surgical disciplines to adverse postoperative outcomes. Cubital tunnel syndrome comprises the second most frequent peripheral neuropathy and understanding drivers of complications is necessary for prevention. Therefore, the present study aims to analyze the impact of preoperative hematocrit on short-term ulnar nerve decompression outcomes.

Methods

Ulnar nerve decompression surgeries (CPT 64718) were queried from the American College of Surgeons National Quality Improvement Program (NSQIP) database from 2005-2020. The primary variables of interest were preoperative serum hematocrit values, taken within 90 days. Additional covariates spanned preoperative and operative characteristics for each case. Outcomes included return to operating room, non-home discharge, extended postoperative LOS (defined by the 75th percentile value in our cohort), medical complications, and wound complications. Per NSQIP, outcomes were reported within 30 days postoperatively. Cases missing data for any variables of interest, or cases that expired in hospital or left against medical advice, were excluded.

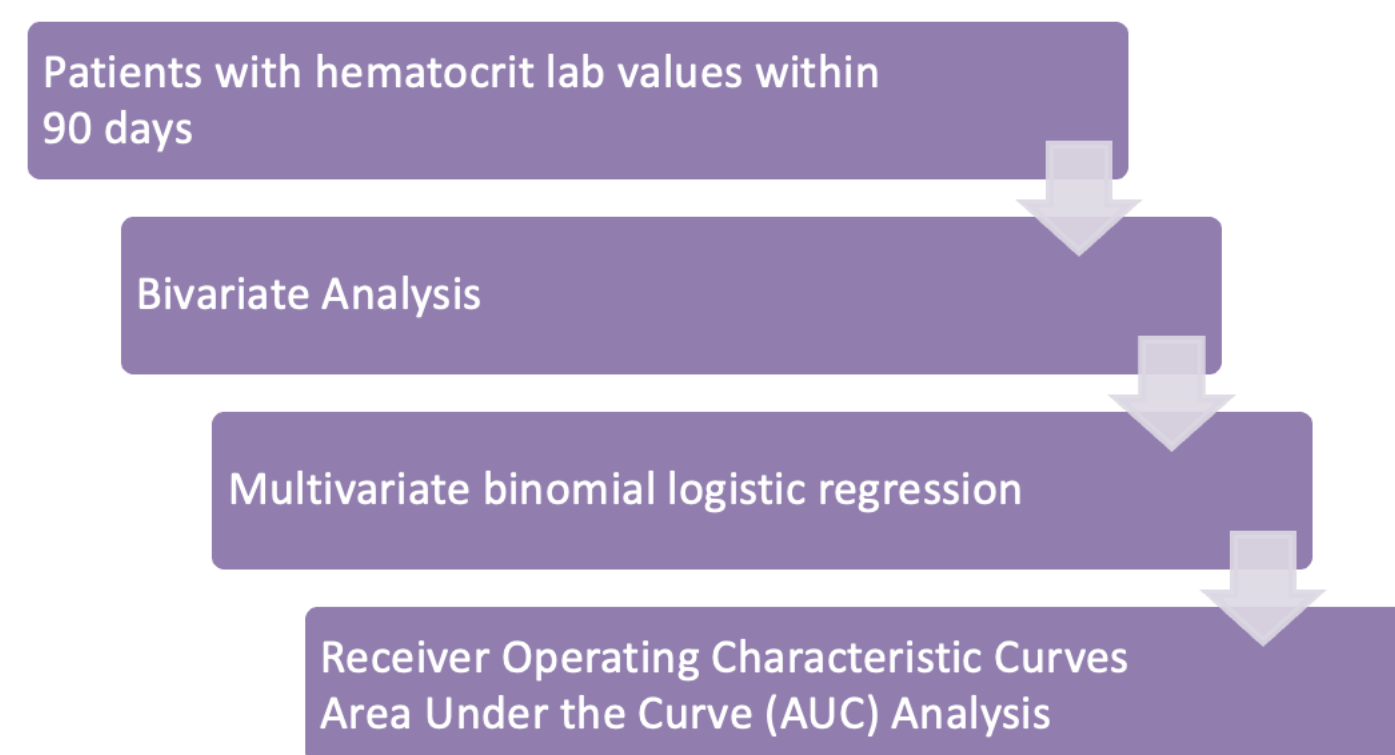


Table 1. Bivariate and Multivariate Results

Outcome Variable	Hematocrit		
	Bivariate P-value	Multivariate Adjusted OR (95% CI)	Multivariate P-value
Return to the Operating Room	0.020*	0.899 (0.820, 0.987)	0.025*
Non-Home Discharge	<0.001*	0.947 (0.882, 1.018)	0.142
Any Wound Complication	0.079	—	—
Any Medical Complication	<0.001*	0.871 (0.794, 0.955)	0.003*
Extended Length of Stay	<0.001*	0.952 (0.906, 0.999)	0.048*

*denotes statistical significance as defined by p<0.05.
Abbreviations: Confidence Interval (CI), Odds Ratio (OR)

Figure 1. ROC Curves for Female Patients

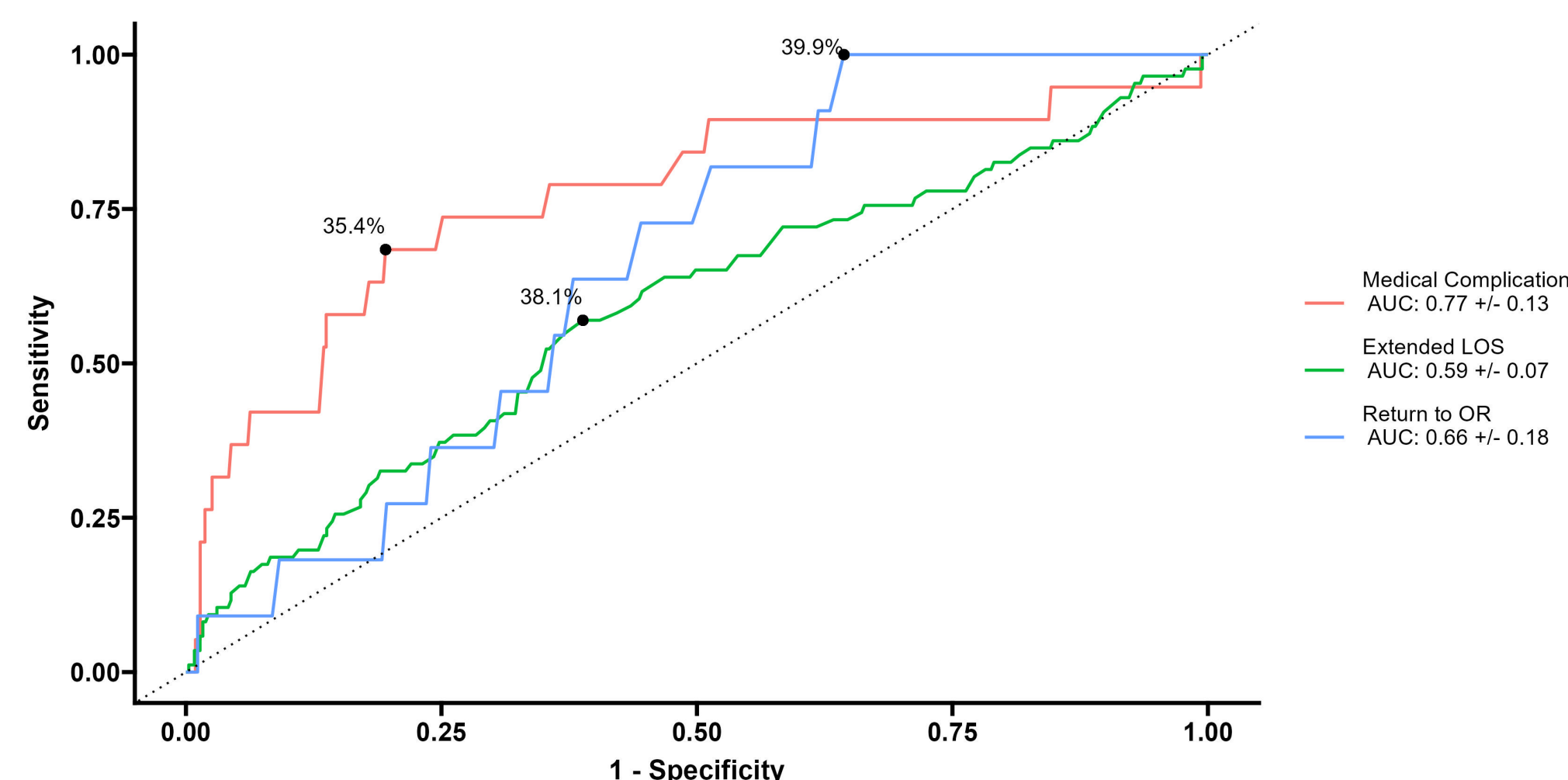
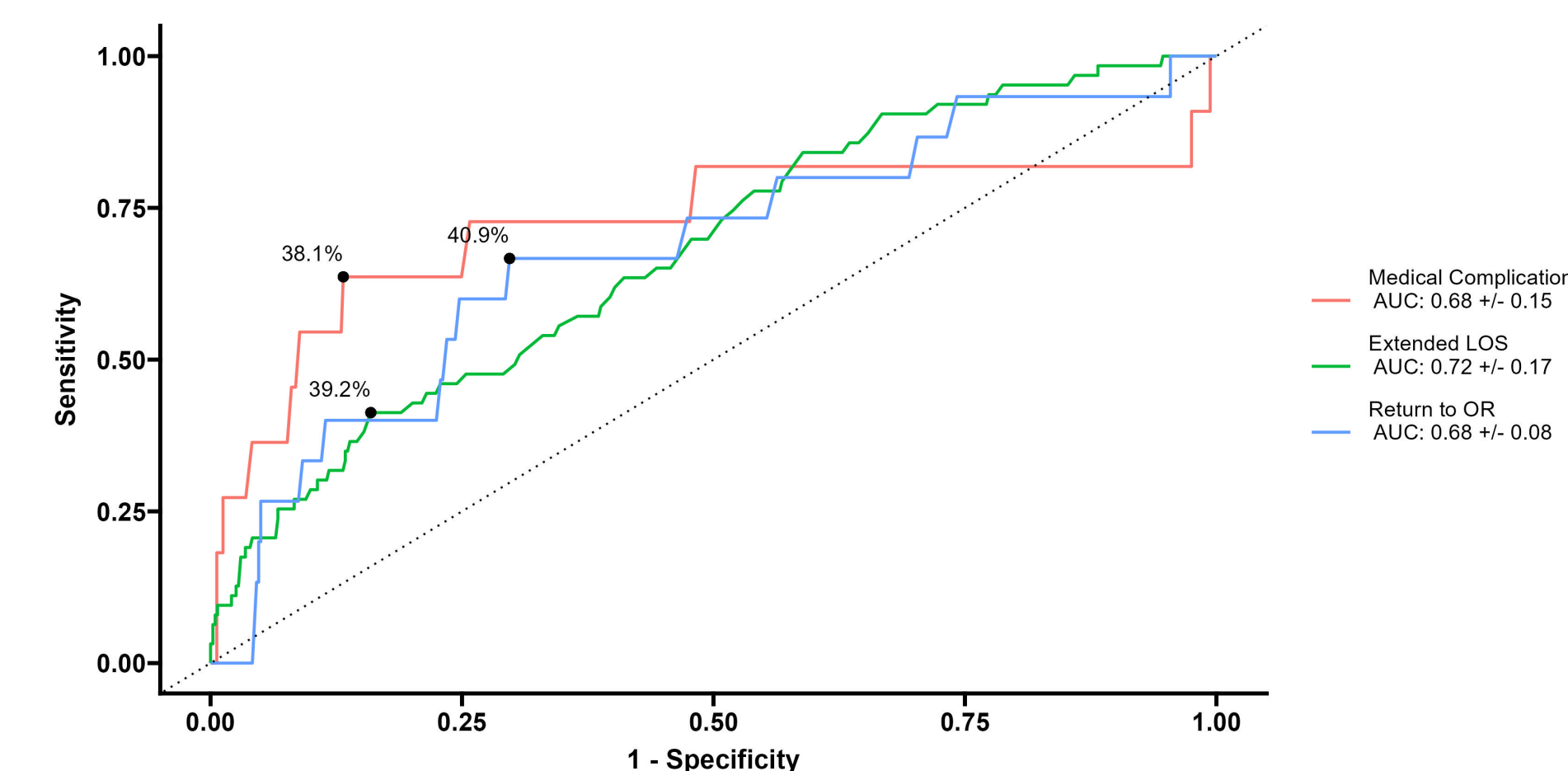


Figure 2. ROC Curves for Male Patients



Results

A total of 945 patients were analyzed in our cohort (Average Age: 56.0 years, Males: 52.5%, Average Hematocrit: 40.57%). Upon bivariate analysis, patients who experienced return to the operating room, non-home discharge, medical complications, and increased LOS had significantly decreased hematocrit levels (p<0.05) (Table 1). Multivariate logistic regression revealed that increases in hematocrit significantly decreased the odds of return to the operating room (aOR: 0.899, p=0.025), medical complications (aOR: 0.871, p=0.003), and increased LOS (aOR: 0.952, p=0.048). Among female patients, predictive hematocrit cutoff values of ≤ 38.1% (AUC: 0.59, p=0.013) for extended length of stay and ≤ 35.4% for medical complications (AUC: 0.77, p<0.001) were identified (Figure 1). Among male patients, hematocrit lab values of ≤ 39.2% (AUC: 0.68, p<0.001) for return to operating room, ≤ 40.9% (AUC: 0.68, p=0.018) for return to operating room, and ≤ 38.1% (AUC: 0.72, p=0.012) for medical complications were identified (Figure 2).

Conclusions

Patients with low hematocrit experienced increased postoperative morbidity after ulnar decompression. These findings can help inform patient-provider discussions preoperatively and aid in optimal timing of surgical intervention.