

Postoperative Prognostic Nutritional Index (PNI) is a Predictor of Short-Term Mortality Following Pulmonary Lobectomy

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Introduction:

- Prognostic Nutritional Index (PNI) is a marker of immuno-nutritional status calculated inexpensively with routine CBC and CMP lab values.
- PNI is a proven robust predictor of adverse patient outcomes in lung cancer patients and surgical oncology patients in general.
- This analysis seeks to determine the utility of postoperative PNI monitoring in risk stratification.

PNI=(10*albumin [g/dL])+(0.005*total lymphocyte count [/mm³])

Objective:

- Determine the prognostic value of immediately postoperative PNI in predicting outcomes following Robotic Assisted Pulmonary Lobectomy by analyzing both acute complications and long-term outcomes.

Methods:

- Study Design: Retrospective Cohort Analysis,
- Population: Robotic Assisted Pulmonary Lobectomy (RAPL) from 2010-2025,
- Inclusion Criteria: CBC and CMP labs drawn immediately following surgery (PACU and/or POD1).
- Outcomes:
 - The primary outcome analyzed was in-hospital mortality.
 - Secondary outcomes included cardiac and respiratory complications, prolonged air leak >5 days, chest tube duration, and hospital length of stay (LOS).
- Statistics: Chi-square, Mann Whitney U, and multivariable logistic and linear regression were performed using SPSS v30.

Table 1. Preoperative Demographics

Variable	Value
Age (years)	69.1 ± 9.7
Sex	
Male	255 (45.0%)
Female	312 (55.0%)
Race	
White	504 (88.9%)
Black	12 (2.1%)
Hispanic	31 (5.5%)
Asian	12 (2.1%)
Other	7 (1.2%)
Smoking Status	
Never	114 (20.1%)
Former	357 (63.1%)
Current	95 (16.8%)
BMI (kg/m²)	27.9 ± 5.6
FEV1 (% predicted)	0.90 ± 0.19
Number of Segments Resected	4.1 ± 1.2
Immediate Postop PNI	43.5 ± 9.9

Table 2. Preoperative Comorbidities

Variable	Value
Hypertension	360 (63.5%)
Hyperlipidemia	315 (55.6%)
COPD	164 (28.9%)
Diabetes Mellitus	85 (15.0%)
Chronic Anemia	122 (21.5%)
GERD	171 (30.2%)
CAD / Prior MI	124 (21.9%)
Atrial Fibrillation	58 (10.2%)
Peripheral Vascular Disease	47 (8.3%)
Obstructive Sleep Apnea	68 (12.1%)
Asthma	43 (7.6%)
CVA	25 (4.4%)
Carotid Stenosis	25 (4.4%)
CHF	17 (3.0%)
Pulmonary Embolism / DVT	19 (3.4%)
Kidney Disease	39 (6.9%)
Cirrhosis / Liver Failure	5 (0.9%)
Previous Cancer	242 (43.9%)

Conclusions:

- Postoperative PNI within one day following operation was a significant independent predictor of in-hospital mortality, despite Postoperative PNI not being a significant independent predictor of any specific postoperative complications or of delayed recovery.
- Therefore, Postoperative PNI shows some capacity in risk stratification, but further analysis with multi-institutional cohorts is necessary to further elucidate the impact of postoperative PNI on outcomes following pulmonary lobectomy.

Results:

- Out of 859 total patients, 567 patients (mean age 69.1 years; mean body mass index [BMI] 27.9 kg/m2; mean postop PNI 43.5) had required data and were included.
- Postoperative PNI was not significantly associated with respiratory complications (p=0.710).
- Postoperative PNI was not independently associated with cardiac complications (Odds Ratio [OR]=0.952; 95% confidence interval [CI]=0.904-1.002; p=0.061), prolonged air leak (OR=1.004; 95%CI=0.985-1.023; p=0.711), chest tube duration (B=0.001; 95%CI=−0.005 to 0.007; p=0.654), or hospital LOS (B=−0.002; 95%CI=−0.007 to 0.003; p=0.474).
- Postoperative PNI was a significant independent predictor of in-hospital mortality (OR=0.790, 95%CI=0.651-0.960, p=0.018).

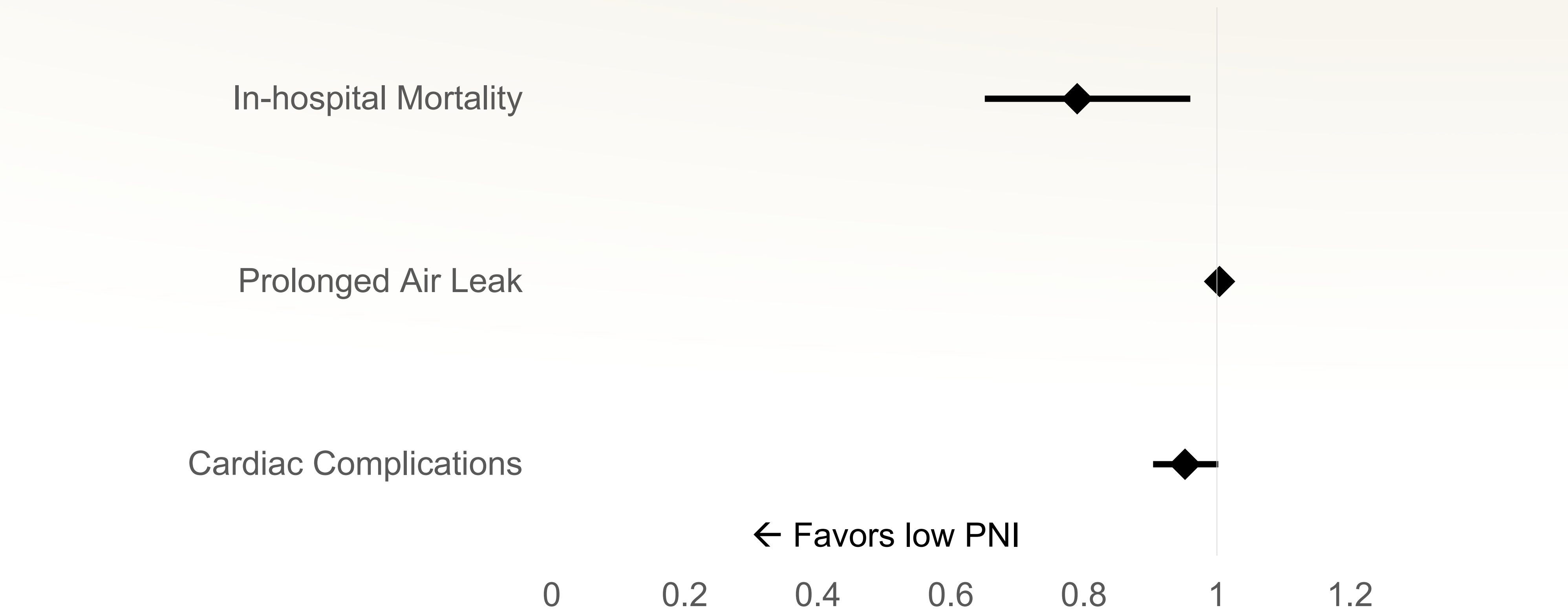


Figure 1. Forest plot of outcomes analyzed with multivariate regression



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