A Nomogram to Predict Prolonged Total Length of Stay Following Curative Intent Cytoreductive Surgery

Ryan Griffin, BS, Robert Torphy, MD, PhD , Salvador Rodriguez Franco, MD, Martin McCarter MD, Ana Gleisner MD, PhD, Benedetto Mungo, MD, Steven Ahrendt, MD

University of Colorado Anschutz Medical Campus, Department of Surgery

University of Colorado Anschutz Medical Campus

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Background

- Cytoreductive surgery (CRS) with or without heat intraperitoneal chemotherapy (HIPEC) is associated with significant post-operative morbidity and mortality.

- A previous study at our institution identified readmission rates following CRS/HIPEC was 12.6%, 18.9%, and 23.1% at 30-days, 60-days, and 90-days.

- The impact of these readmissions on total hospital length of stay is often overlooked.

- Readmission following major cancer surgery is associated with poor long-term outcomes and significantly increases healthcare costs.

Methods

- Retrospective cohort study of a prospectively maintained database of adult patients undergoing curative intent CRS with or without HIPEC from January 2017 – January 2020.

- Variables examined included numerous preoperative and perioperative characteristics.

- Total length of stay was determined by the addition of the initial length of stay plus any readmission days
  - A prolonged length of stay was defined as a total length of stay greater than 14 days.

Results

AUC = 0.74 (95% CI, 0.67-0.82)
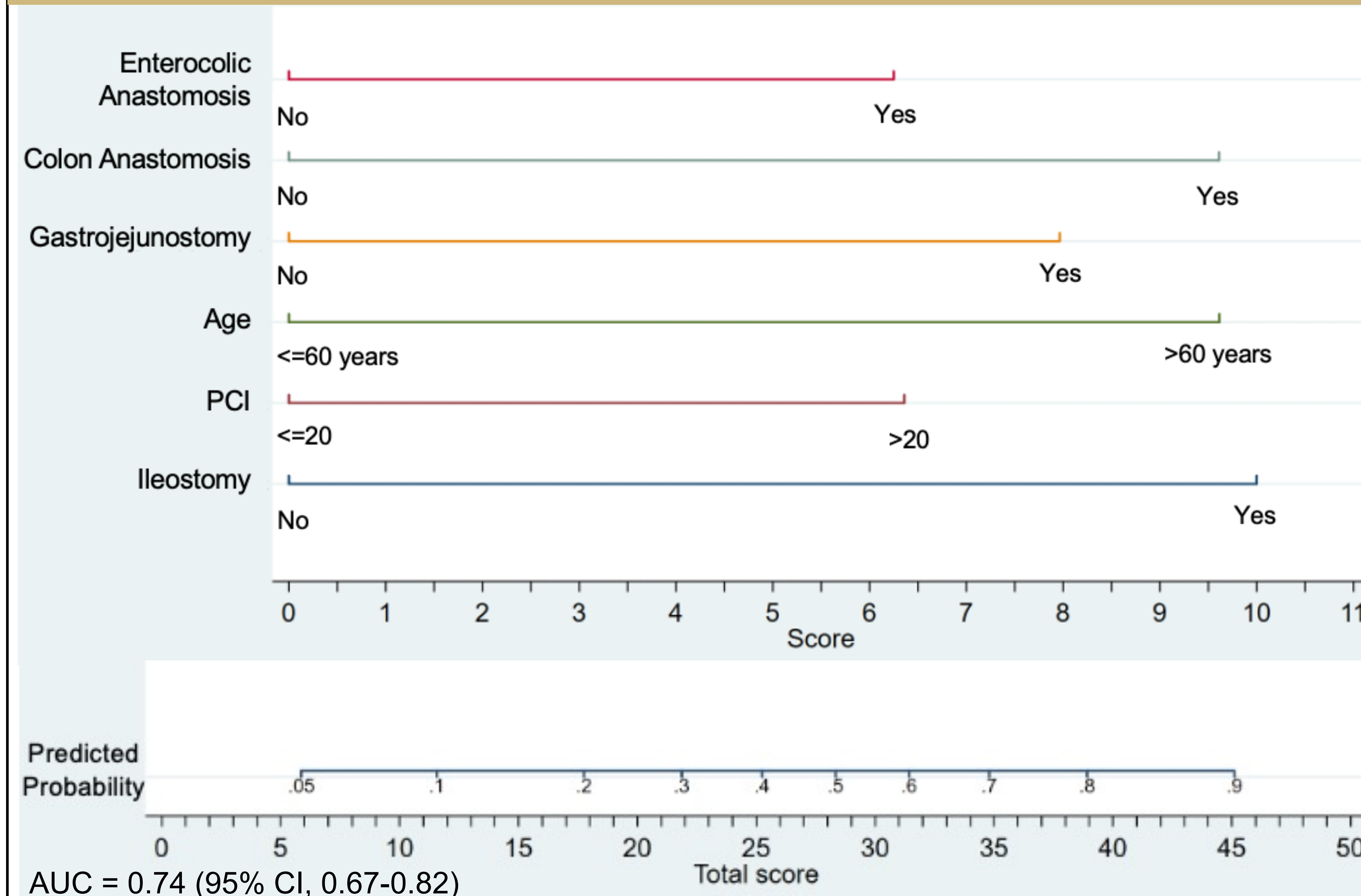
- Axes 1 to 6 contain a line for each significant variable in the model and the possible outcomes. Axis 7 labeled "Score" is the point value assigned for the given outcome for each variable. For an individual patient, point values for each variable should be summed together. Following addition of the scores, the predicted probability of a prolonged length of stay can be obtained by using the scale for total score.

- A patient who scores 18 points using this nomogram would have a 20% predicted probability of having a prolonged length of stay (>14 days). Using this cutoff value, the nomogram has a sensitivity of 75.0% and a specificity of 73.9%.

Conclusions

- Using this nomogram postoperatively, it is possible to predict which patients are at high-risk of having a prolonged length of stay.

- Patients identified as high-risk should undergo an auxiliary high-risk pathway which may include:
  - Early inpatient and home parenteral nutrition
  - Routine screening for infection, and
  - Aggressive physical therapy among other interventions

Future Directions

- Finalizing the high-risk pathway and formally implementing the nomogram scoring system at our institution.

- Determine if use of nomogram and high-risk pathway decrease the number of patients experiencing a prolonged length of stay.

- External validation of this nomogram to a larger database.

Disclosures