



Validation of the ACS NSQIP Surgical Risk Calculator among Patients with Early Gastric Cancer Treated with Laparoscopic Gastrectomy

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Objectives of the Study

The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) risk calculator is useful in predicting postoperative adverse events; however, its accuracy in specific disorders is unclear. We validated the ACS NSQIP risk calculator in patients with gastric cancer undergoing laparoscopic curative surgery.

Introduction

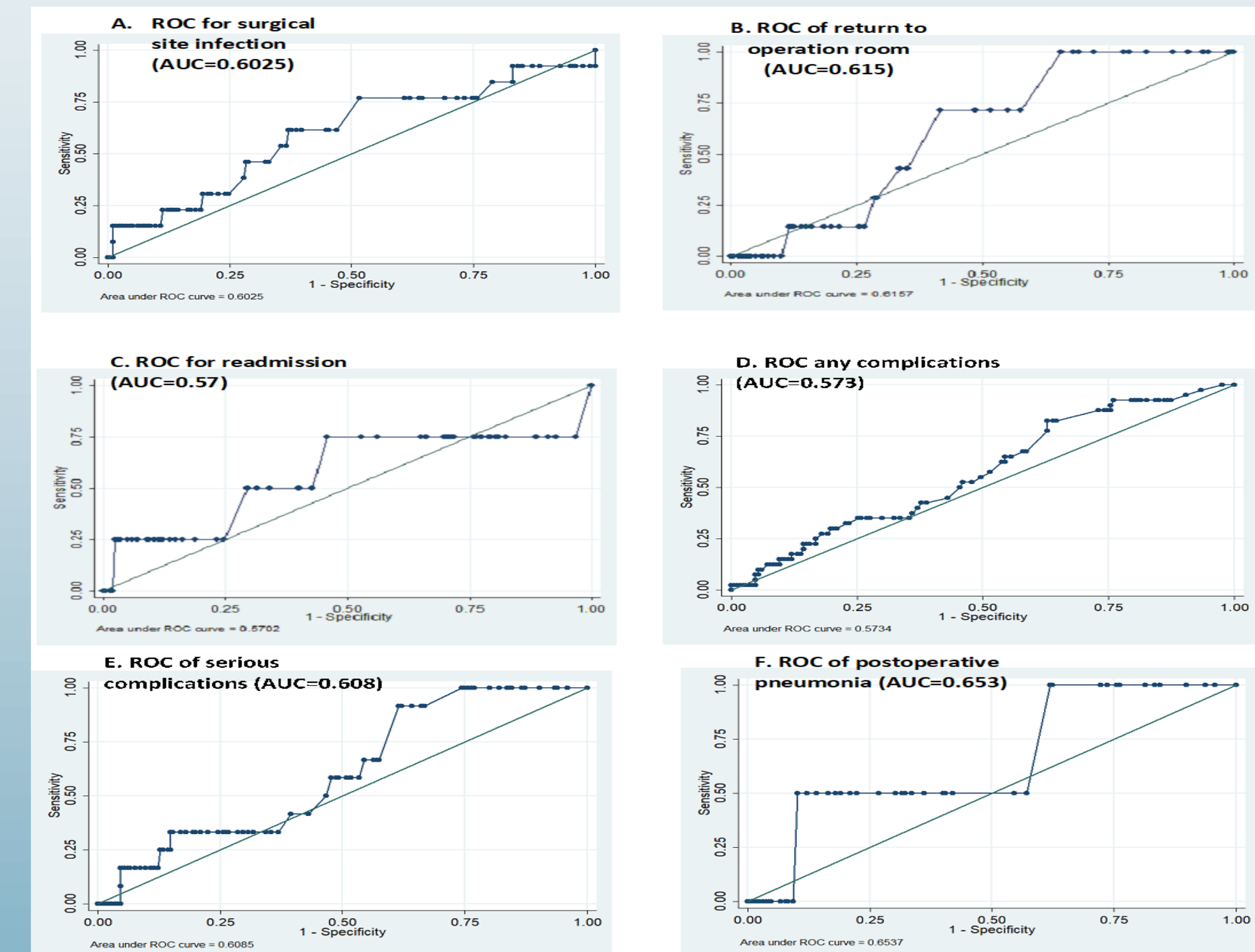
- The incidence of gastric cancer varies among different countries and regions.
- Korea and Japan show the highest incidence of gastric cancer, whereas Europe and the United States have shown a steady decrease in newly diagnosed gastric cancers.
- Despite the decline in incidence, gastric cancer remains the second leading cause of cancer death and the fourth most common malignancy worldwide.
- Surgical resection is still the curative modality for treating gastric adenocarcinoma.
- The American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) has established an online surgical risk calculator (<http://www.riskcalculator.facs.org>).
- It has been quite useful for predicting mortality in several procedures and for improving surgical quality in participating hospitals by using ACS NSQIP variables.
- The accuracy of the ACS NSQIP surgical risk calculator was variable when tested among patients with gastric cancer.
- Given the differences between the West and East in terms of patient characteristics, surgical approach, and outcomes, our aim in this study was to examine the ability of the ACS NSQIP risk calculator to estimate short-term surgical outcomes among a specific group of patients with gastric cancer treated with a minimally invasive approach.

Materials and Methods:

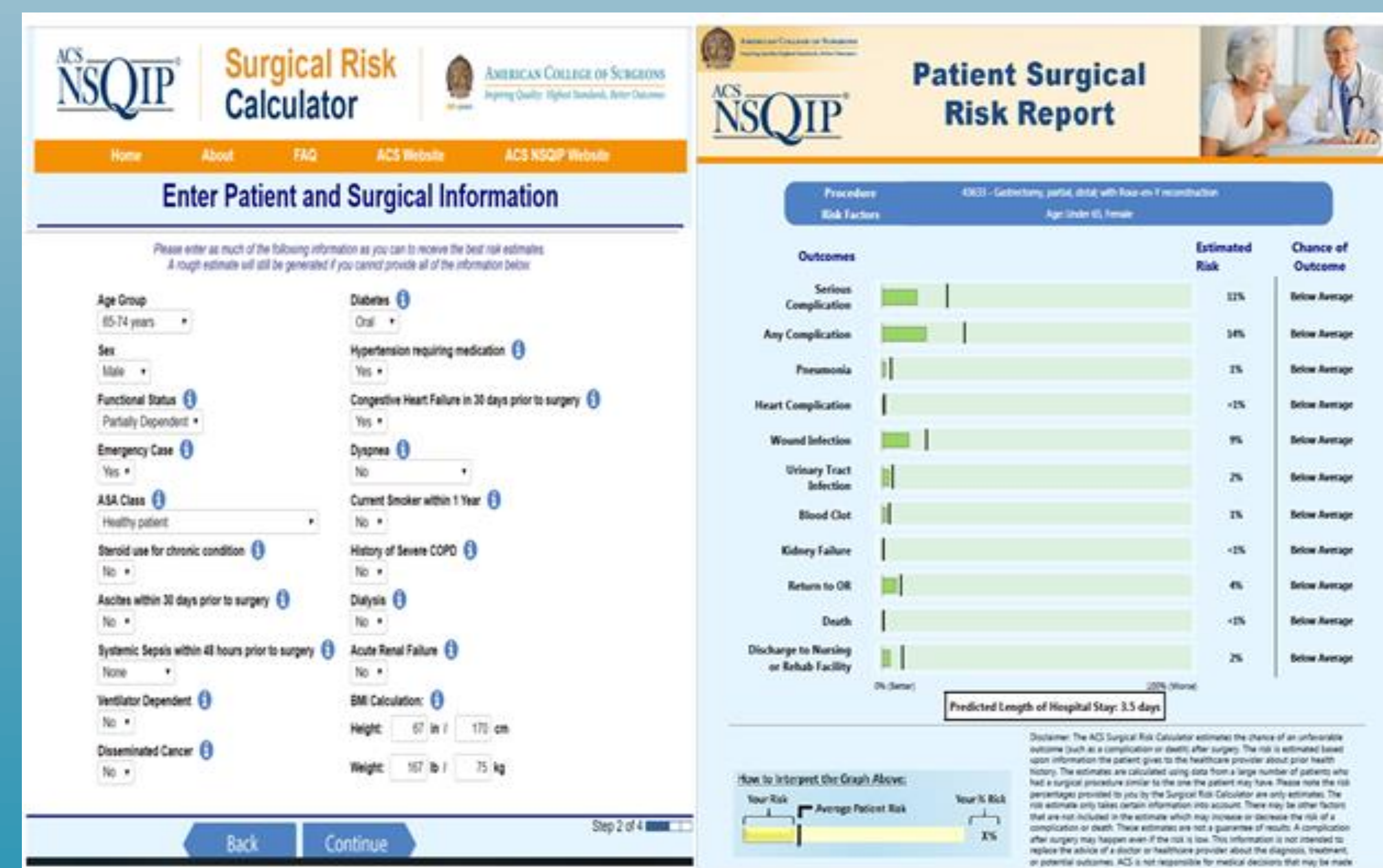
- A prospectively collected database of 207 consecutive patients who underwent laparoscopic gastrectomy for early gastric cancer (EGC) at Asan Medical Center Hospital between January 2018 and January 2019 was reviewed.
- Subsequently, the data were retrospectively analyzed using ACS NSQIP variables. Actual surgical and non-surgical outcomes were documented.
- Preoperative patient factors were entered into the NSQIP online risk calculator at the ACS NSQIP surgical risk calculator's website (<http://www.riskcalculator.facs.org>). The results were then compared with actual patient outcomes.
- The performance of the ACS NSQIP calculator in predicting risk was evaluated using two metrics: C-statistic and Brier score.

Results

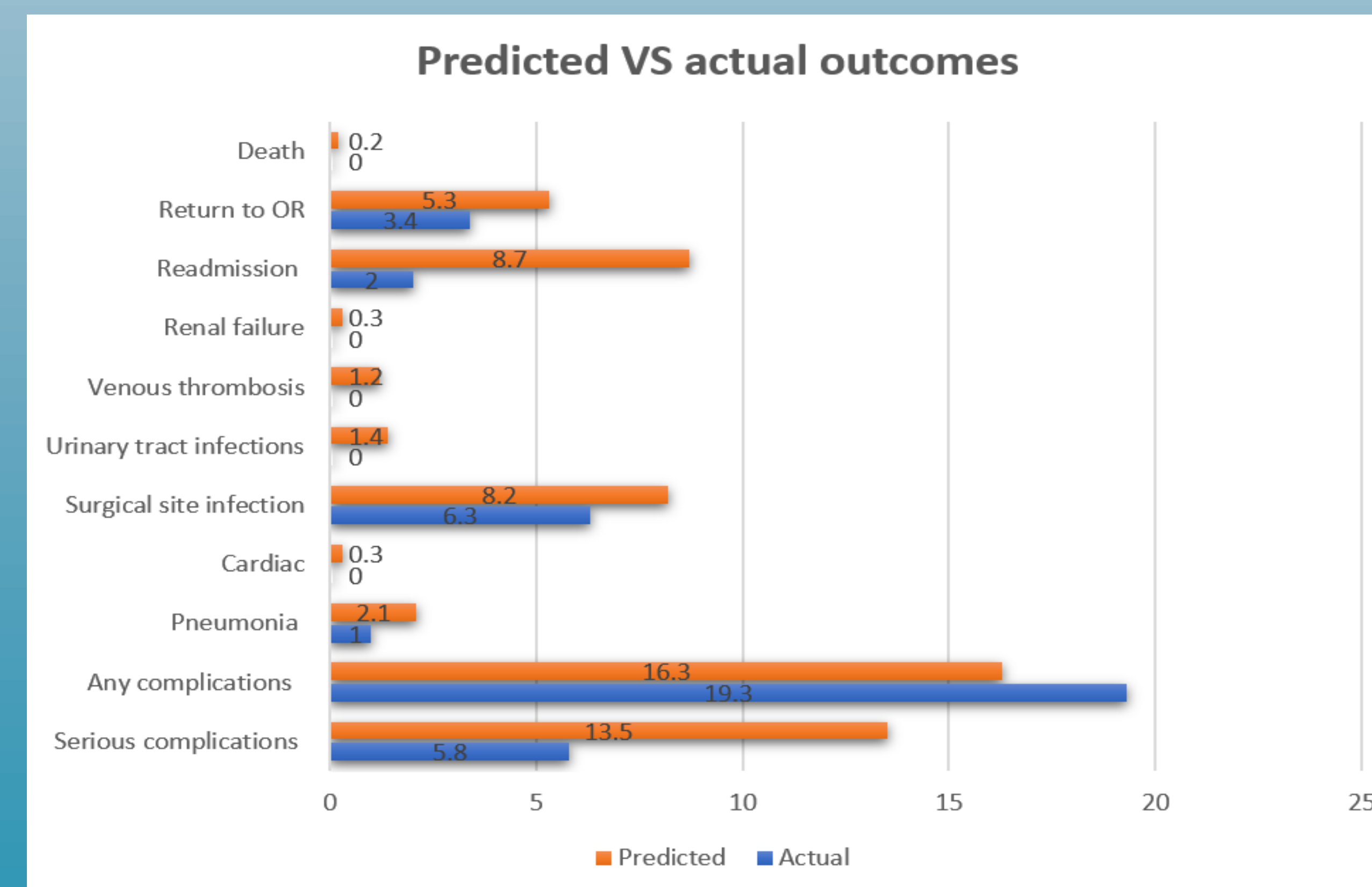
- Most of the patients underwent distal gastrectomy with Roux-en-Y reconstruction (74.4%). Mortality, venous thromboembolism, urinary tract infection, renal failure, or cardiac complications were not observed.
- All C-statistics were less than 0.7, and the highest was for pneumonia (0.65; 95% confidence interval: 0.58–0.71).
- Brier scores ranged from 0.01 for pneumonia to 0.155 for any other complication. Overall, the risk calculator was inconsistent in predicting the outcomes.
- Taking the modal analyses results into consideration, the ACS-NSQIP appears to be variable and somewhat inconsistent in predicting outcomes for patients with EGC treated with laparoscopy.



ROC curve analysis showing the calculation of area under the curve (AUC)



ACS NSQIP online surgical risk calculator and the risk report (<http://www.riskcalculator.facs.org>)



The actual percentage of outcomes (blue) vs. Predicted mean (red) of surgical outcomes

Conclusion

- Although the ACS NSQIP surgical risk calculator is a valuable tool in predicting short-term surgical outcomes, it showed low predictive ability for postoperative adverse events after laparoscopic gastrectomy for patients with early gastric cancer.
- Further research to adjust the risk calculator among these patients may improve its predictive ability.