

Predicting the Risk of Revision After Sleeve Gastrectomy

Using Preoperatively Identifiable GERD-Related Risk Factors

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Background:

While medical weight loss management is improving, bariatric surgery remains the most effective option for patients with class 3 (BMI 35–39.9) and class 4 (BMI ≥ 40) obesity, achieving far more durable weight loss than lifestyle or pharmacologic therapies¹. Sleeve gastrectomy (SG) is the most common bariatric surgery performed in the United States, representing over 60% of annual bariatric procedures².

However, recent literature demonstrates increased rates of gastroesophageal reflux disease (GERD) after SG, with incidence of de novo GERD approaching 40% and long-term studies showing significantly higher rates of erosive esophagitis, hiatal hernia, and even de novo Barrett’s esophagus. In many cases, persistent or worsening reflux necessitates revisional surgery³. This study aims to assess whether pre-operatively identified GERD-related diagnoses are predictive of the need for revisional surgery following SG.

Methods:

A retrospective cohort study was performed using the Merative MarketScan Commercial Claims and Encounters database from 2010 to 2022, identifying 46,651 adult patients who underwent SG as an index bariatric surgery. Revisional surgery was identified between 30 days and 3 years after the index operation. Chi-square, Fisher’s and Wilcoxon tests were used to measure associations between revision after SG and age, sex, GERD-related diagnoses, and baseline comorbidities identified on 6-month look-back prior to index SG. On multivariable analysis, a Least Absolute Shrinkage and Selection Operator (LASSO) logistic regression was applied to identify preoperative risk factors that best predict the need for revisional surgery.

Methods:

GERD-Related Diagnoses

- GERD
- Esophageal Dysmotility
- Prior Hiatal Hernia Repair
- Esophagitis
- Peptic Stricture
- Dysphagia
- Barrett’s Esophagus
- Achalasia
- Delayed Gastric Emptying
- Use of Proton Pump Inhibitors
- H2RA/PPI Use
- Prior Gastric Band
- Eosinophilic Esophagitis

Results:

Table 1: ROC Associations

LASSO Selected Variables

Curve	Area	95% CI	Tau-a
Overall Model	0.6353	(0.6145, 0.6560)	0.00769
Female	0.5499	(0.5374, 0.5623)	0.00284
GERD	0.5463	(0.5278, 0.5649)	0.00263
Dysphagia	0.5185	(0.5083, 0.5287)	0.00105
Diabetes (uncontrolled)	0.5487	(0.5360, 0.5614)	0.00277
COPD	0.5296	(0.5165, 0.5427)	0.00168
Mild Liver Disease	0.5156	(0.5086, 0.5226)	0.000887
Prior Hiatal Hernia	0.5043	(0.4962, 0.5124)	0.000245
Grouped Esophageal DX	0.5048	(0.5000, 0.5097)	0.000276
Age	0.5378	(0.5167, 0.5590)	0.00215

Results:

Figure 1: Model ROC Curve

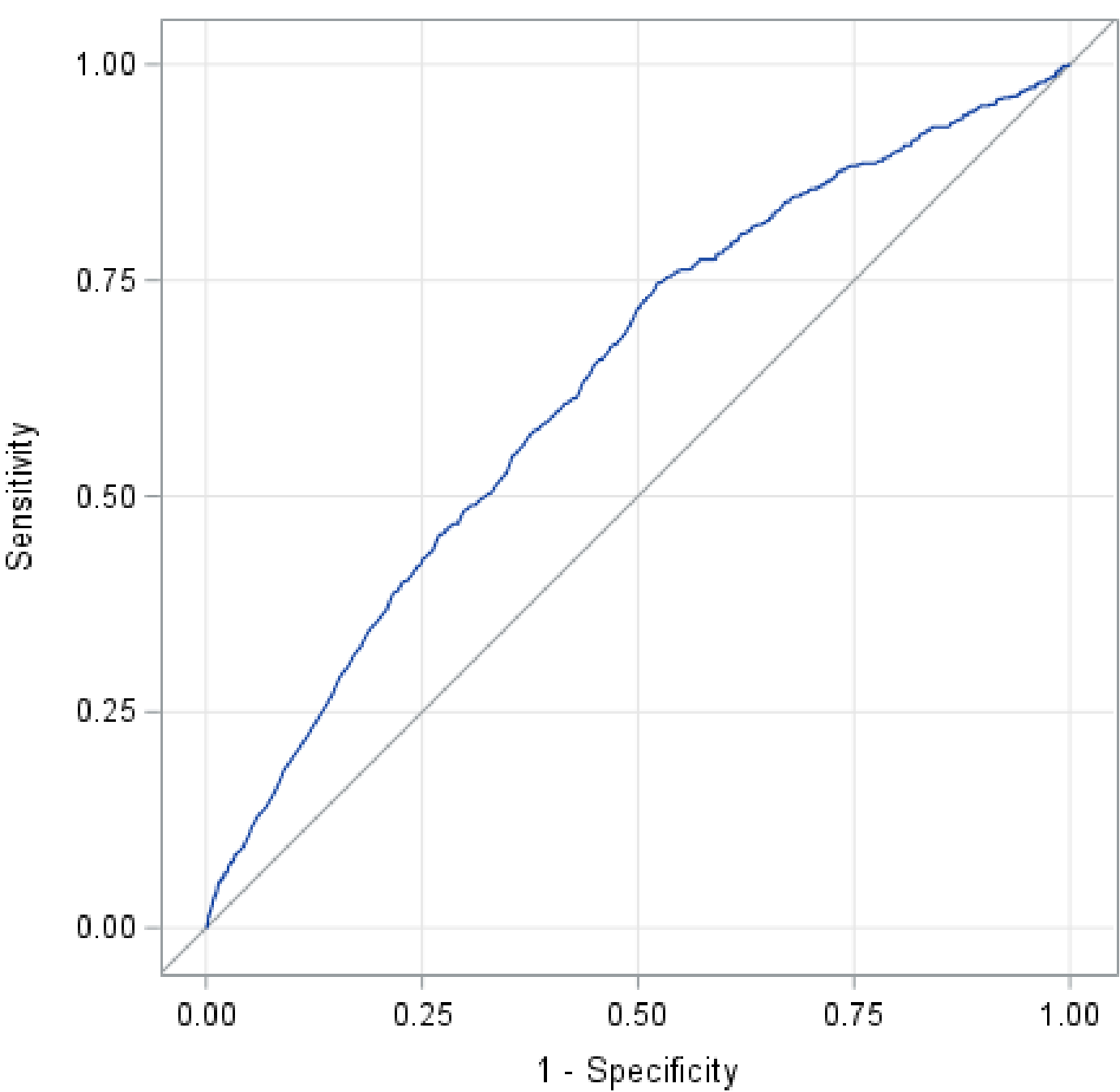
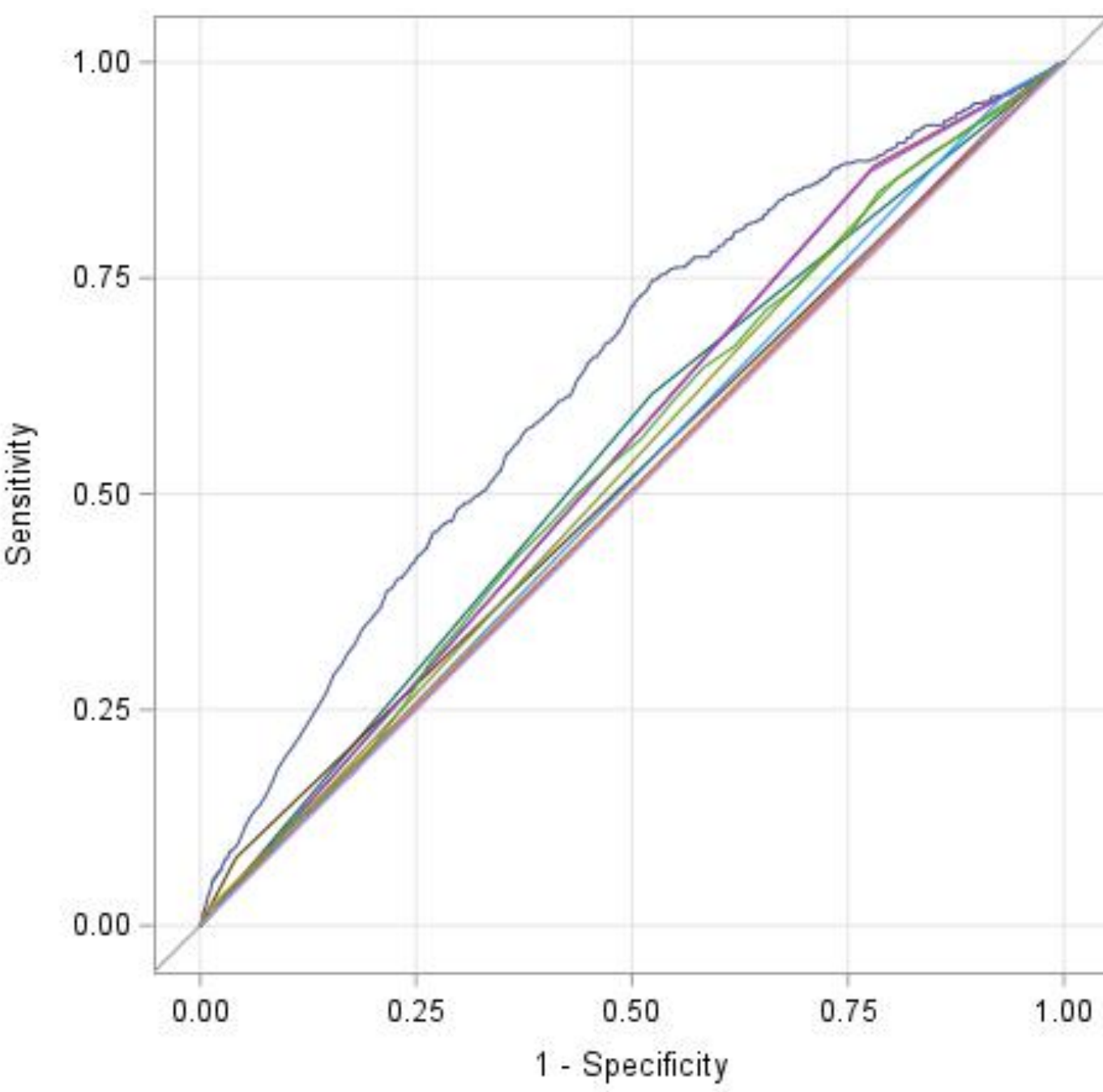


Figure 2: Compared ROC Curves



Conclusions:

- Our predictive model demonstrated moderate ability to predict the need for revisional surgery after sleeve gastrectomy.
- Although the overall model showed modest performance, individual GERD-related variables alone contributed minimal discriminatory value, highlighting the multifactorial nature of revisional risk.
- Next Steps: Further refinement of the model to create the most reliable predictive tool.

References :

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