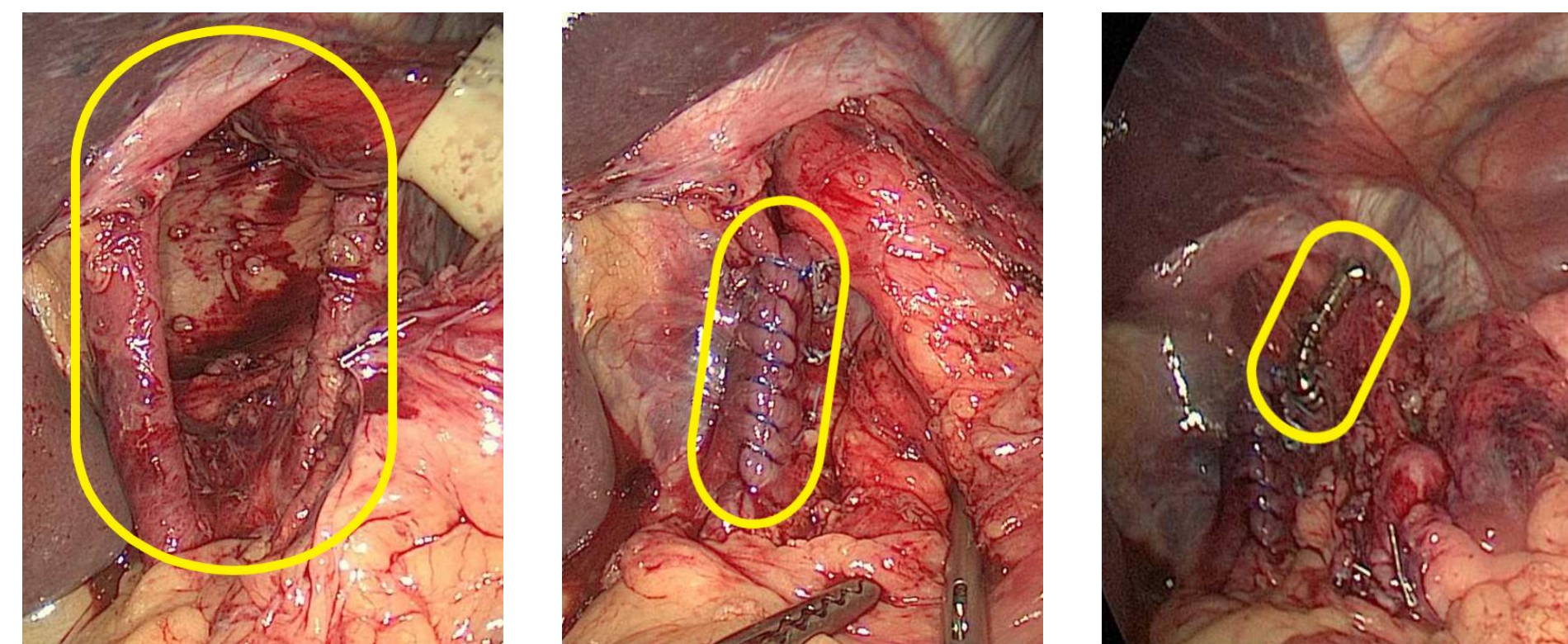


## BACKGROUND

- **Gastroesophageal reflux disease (GERD):** Is a digestive disorder affecting the lower esophageal sphincter, resulting in acid indigestion. GERD is consistently caused by hiatal hernias, which occur when the stomach bulges through the hiatus in the diaphragm.
- **Surgical repair:** A hiatal hernia and GERD can be remediated through surgical hiatal hernia repair and LINX magnetic sphincter placement.

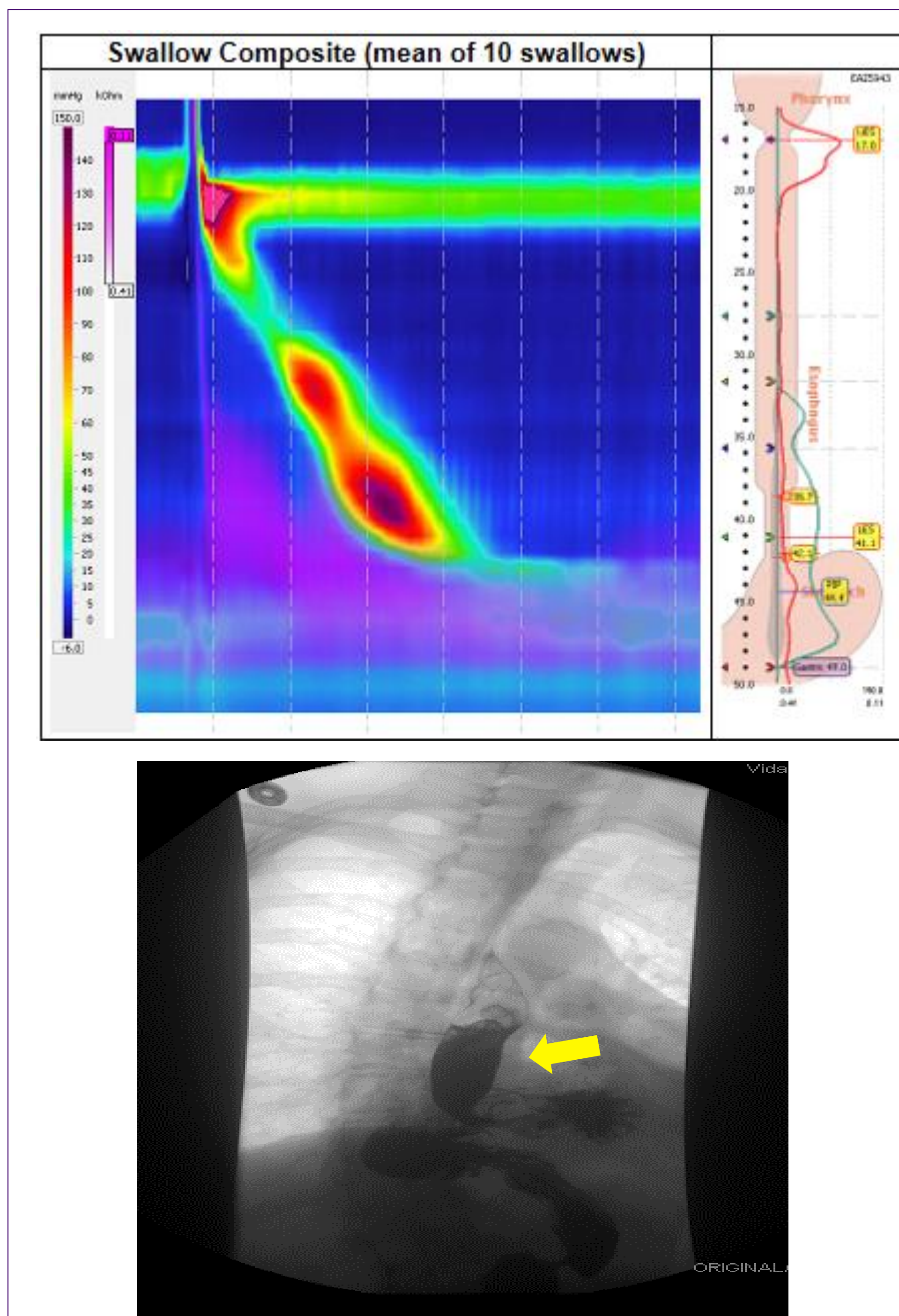


**Figure 1.** The left image shows an unrepaired hiatal hernia. The middle image shows a repaired hiatal hernia. The right image shows the LINX magnetic sphincter.

## INTRODUCTION

- Before surgical intervention a patient must have the esophagus preoperatively evaluated.
- **Esophageal manometry:** During an esophageal manometry a pressure sensitive catheter goes through the nose into the stomach while the patient swallows. The patient cannot always tolerate swallowing with the catheter during a manometry.
- **Marshmallow-bagel upper GI study:** This preoperative evaluation eliminates the issues with catheter placement as it has the patient swallow a barium soaked marshmallow and bagel instead.
- Swallowing is tracked via X-ray through the junction of the stomach and esophagus.

## INTRODUCTION



**Figure 2.** The top image is produced by an esophageal manometry. The yellow arrow in the bottom X-ray images indicate barium soaked marshmallow/bagel boluses.

## OBJECTIVES

- The purpose of this study was to compare surgical outcomes in patients who underwent a marshmallow-bagel upper GI study or a esophageal manometry.
- **Null hypothesis of this study:** There will be no difference in surgical outcomes including complications, resolved symptoms, presence of difficulty swallowing, hospital readmission, LINX band-removal, esophagogastroduodenoscopy, and proton pump inhibitors use.

## METHODS

### Retrospective Chart Review

81 Hiatal hernia and reflux surgery patients were identified and divided into two separate groups.

- **Group one:** Included patients who had been evaluated using esophageal manometry techniques. 72 patients made up this group.
- **Group two:** Included patients who had been evaluated using the marshmallow-bagel swallow study. 9 patients made up this group.

Data collected from the medical chart of the surgical patients contained demographic information, conditional surgical information, and surgical outcome data.

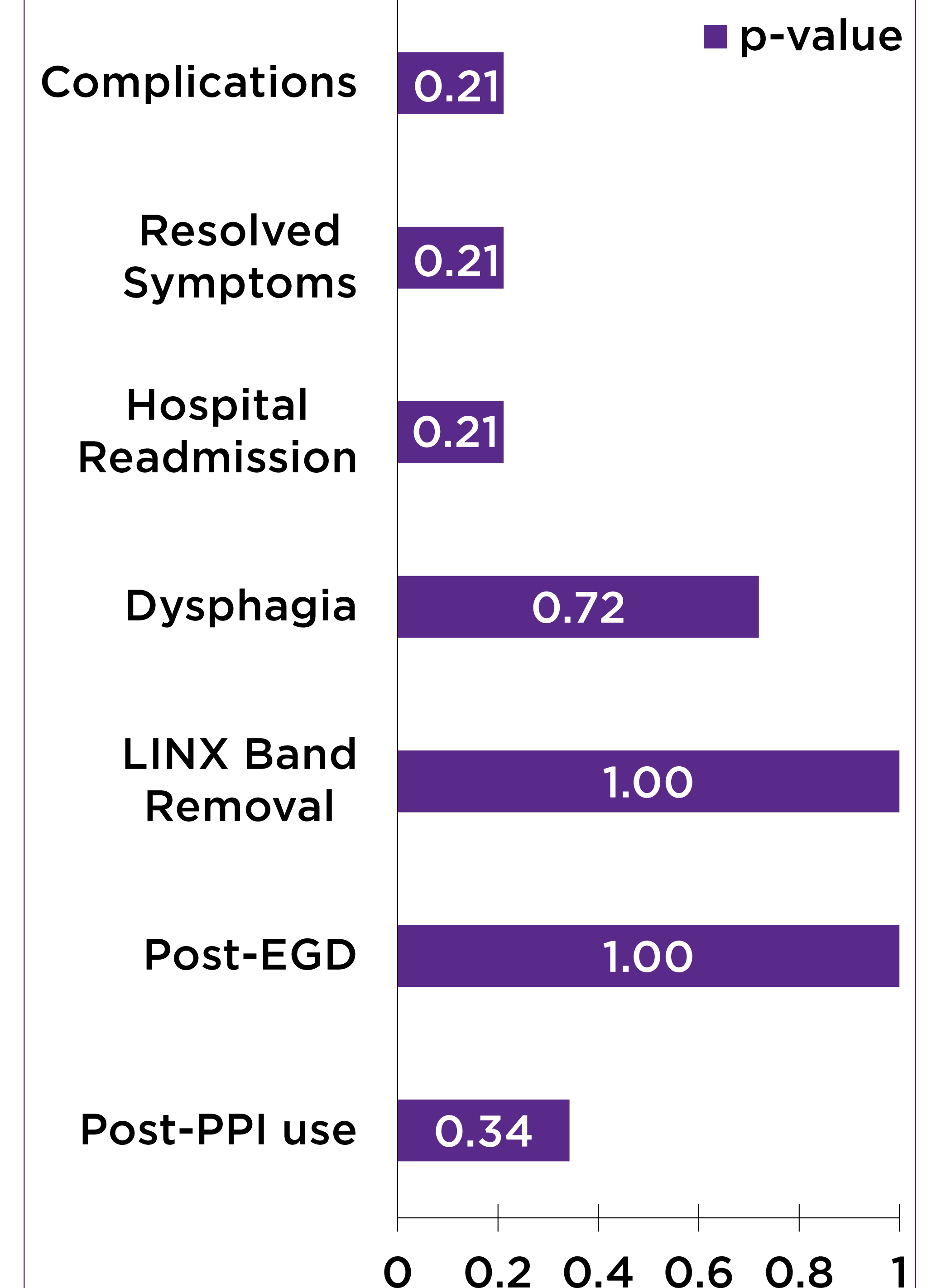
- **Demographics:** gender, age, and body mass index score (BMI)
- **Surgical conditions:** previous operation for anti-reflux, previous proton pump inhibitor use, previous gastropexy surgery, size of LINX inserted, operation time, blood lost during operation, and hernia size
- **Surgical outcomes:** presence of dysphagia, complications, resolved symptoms, hospital readmission, LINX band removal, esophagogastroduodenoscopy, and proton pump inhibitors use.

### Statistical Analysis

- **Qualitative data analysis:** Fisher's exact test to calculate a p-value of statistical difference in the two patient groups
- **Quantitative data analysis:** T-test to calculate a p-value of statistical difference in the two patient groups.

## RESULTS

### Surgical Outcomes



P-value of  $\leq 0.05$  indicates evidence against the null hypothesis

## CONCLUSIONS

- All surgical outcomes measured showed no statistical significance upon analysis.
- This failure to reject the null hypothesis supports the marshmallow-bagel upper gastrointestinal study as a valid alternative for preoperative evaluation of paraesophageal hernia patients