

Quantifying Physiologic Parameters of the Gastroesophageal Junction During Robotic Sleeve Gastrectomy and Identifying Predictors of Post-Sleeve Gastroesophageal Reflux Disease

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Background: Sleeve gastrectomy is among the most commonly-performed procedures for morbid obesity. However, patients occasionally develop post-sleeve gastroesophageal reflux disease (GERD). Identifying patients most at-risk for this complication remains difficult. We aimed to correlate intraoperative physiologic measurements of the lower esophageal sphincter (LES) at the gastroesophageal junction (GEJ) during robotic sleeve gastrectomy in an attempt to identify predictors of post-sleeve GERD.

Methods: A retrospective chart review of a prospectively maintained database identified 28 patients in whom robotic sleeve gastrectomy was performed utilizing EndoFLIP™ technology between January and September 2021. Intraoperative LES measurements at the GEJ including cross-sectional area (CSA), distensibility index (DI), intra-balloon pressure, and high-pressure zone (HPZ length) were correlated with post-operative GERD.

Results: GEJ CSA, pressure, and DI increased over the course of the surgery (CSA pre-op: 31 (IQR 19.3-39.5) mm^2 vs. post-op: 67 (IQR 40.8-95.8) mm^2, $p<0.001$; pressure: 25.8 (IQR 20.2-33.1) mmHg vs. 31.5 (IQR 28.9-37.0) mmHg, $p=0.007$; DI 1.1 (IQR 0.8-1.8) mm^2/mmHg vs. 2.0 (IQR 1.2-3.0) mm^2/mmHg, $p=<0.001$), whereas HPZ length decreased (2.5 (IQR 2.5-3) cm vs. 2.0 (IQR 1.3-2.5) cm, p=0.022).

Twenty-three patients (82.1%) completed a post-operative GERD questionnaire. Fifteen (65.2%) had no GERD before or after surgery; 5 (21.7%) reported new post-sleeve GERD; 3 (13.0%) reported exacerbation of pre-existing GERD. Patients with new or worsening GERD symptoms had higher post-sleeve DIs (3.2 (IQR 1.9-4.5) mm^2/mmHg vs. 1.5 (IQR 1.2-2.4) mm^2/mmHg, $p=0.024$) and lower post-sleeve LES pressures (29.9 (IQR 26.3-32.9) mmHg vs. 35.2 (IQR 31.0- 38.0) mmHg, $p=0.023$) than those without.

Conclusions: An increase in GEJ CSA, pressure, and DI, and a decrease in GEJ length can be expected during robotic sleeve gastrectomy. Patients with new or worsening post-sleeve GERD symptoms have higher post-sleeve DI and lower post-sleeve LES pressure than their asymptomatic counterparts.

