Impedance Planimetry (EndoFlip®) Reveals Ideal Distensibility Ranges for Optimal Outcomes after Nissen and Toupet Fundoplication

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INTRODUCTION: Previous research has shown that impedance planimetry-based functional lumen imaging probe (FLIP) measurements are associated with patient-reported outcomes after laparoscopic antireflux surgery. We hypothesize that Nissen (NF) and Toupet (TF) fundoplications have different ideal distensibility ranges. These ranges were associated with patient-reported outcomes after laparoscopic antireflux surgery. We hypothesize that Nissen (NF) and Toupet fundoplications (TF) have different ideal distensibility ranges.

METHODS: A retrospective review of a prospectively maintained quality database was performed. Patients who had FLIP measurements during fundoplications between 2013 and 2020 were included. Reflux Symptom Index (RSI), Gastroesophageal Reflux Disease-Health Related Quality of Life Questionnaire (GERD-HRQL), and dysphagia score were collected for up to 2 years postoperatively. The Wilcoxon rank-sum was used to compare between FLIP measurements and outcomes.

RESULTS: One-hundred sixty-three patients (93 TF, 70 NF) were analyzed. Distensibility ranges were categorized as tight, ideal, or loose. The ideal ranges of TF patients with the 30 mL and 40 mL balloon fills were 2.6-4.4 mm²/mmHg and 2.6-3.5 mm²/mmHg, respectively. These ranges were associated with less dysphagia at 1 year compared to the tight group (Table 1, p=0.029). For NF patients, the 30 mL and 40 mL ideal thresholds were at least 2.0 mm²/mmHg and 2.5 mm²/mmHg, respectively. Patients above this threshold had a better quality of life compared to the tight group, reporting better RSI scores at 1 year (p=0.046), and better GERD-HRQL score (p=0.01), less gas bloat (p=0.04), and lower dysphagia scores (p=0.04) at 2 years.

CONCLUSION: Impedance planimetry revealed different ideal distensibility ranges after TF and NF that are associated with improved patient-reported outcomes, suggesting that intraoperative FLIP has the potential to tailor fundoplication.

Table. Patient-Reported Quality of Life Scores by Distensibility Range and Fundoplication Type

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Score ± SD</th>
<th>p</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toupet - 1 yr</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dysphagia score</td>
<td>1.3 ± 0.5</td>
<td>0.029</td>
<td></td>
</tr>
<tr>
<td>Nissen - 1 yr</td>
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<td></td>
<td></td>
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<tr>
<td>Reflux Symptom Index</td>
<td>10.1 ± 6.2</td>
<td>0.046</td>
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</table>

Table. Continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean Score ± SD</th>
<th>Mean Score ± SD</th>
<th>Mean Score ± SD</th>
<th>p</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td><strong>Nissen - 2 yr</strong></td>
<td></td>
<td>N=12</td>
<td>N=15</td>
<td>N=27</td>
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<tr>
<td>GERD-HRQL</td>
<td>8.3 ± 8.0</td>
<td>3.6 ± 4.9</td>
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<td>0.006</td>
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<tr>
<td>Gas/bloat</td>
<td>2.4 ± 1.3</td>
<td>1.4 ± 1.3</td>
<td>-</td>
<td>0.040</td>
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<tr>
<td>Dysphagia score</td>
<td>1.3 ± 0.7</td>
<td>1.0 ± 0.2</td>
<td>-</td>
<td>0.043</td>
<td></td>
</tr>
</tbody>
</table>

Implementation of a Discharge Continuity Patient Initiative to Reduce Emergency Department Visits after Bariatric Surgery

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INTRODUCTION: Postoperative emergency department (ED) visits after bariatric surgery are common and potentially preventable. Outpatient care coordination phone calls have been shown to improve outcomes in several surgical specialties, but this is not well described among bariatric patients. This study evaluated the impact of a structured outpatient continuity phone call after bariatric surgery on 30-day ED visits.

METHODS: A standardized 10-question template for common postoperative issues was administered via phone call within 1 week of bariatric surgery at a single academic center starting May 2020. A retrospective chart review was performed for operative characteristics, 30-day ED visits, and underlying visit reasons before and after initiation of the continuity phone call (before call: 1/2019-4/2020; after call: 5/2020-1/2021). Data were analyzed using descriptive statistics and a 2-sample t-test.

RESULTS: A total of 461 patients were identified (n=275 before call, n=186 after call). Operative case volumes were 70% sleeve gastrectomy and 30% gastric bypass. Starting May 2020, 67% of patients successfully received the continuity phone call. Overall, 27 (5.9%) ED visits occurred, 20 before call and 7 after call timeframes. The top 4 reasons for ED visits included diet intolerance, abdominal pain, constipation, and wound problems. Average monthly ED visits significantly decreased from 7.3% before call to 2.6% after call timeframes (p=0.04) (Figure).

CONCLUSION: Standardized postoperative continuity phone calls are a promising adjunct in bariatric surgery care coordination and may help reduce ED visits. Next steps include continued preoperative education improvements, optimization of discharge medications, and larger scale data collection efforts.
Laparoscopic Vertical Sleeve Gastrectomy in Nonhuman Primates Modulates Visceral Adipose Tissue Inflammation with a Decrease in CD40-expressing Cells

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INTRODUCTION: Obesity is a disease of low-grade inflammation of the visceral adipose tissue (VAT), which is associated with development of metabolic disease and related comorbidities. The costimulatory receptor CD40 is expressed by antigen-presenting cells and induces inflammation once bound by sCD40L on T cells, and is likely a critical player in VAT inflammation. Bariatric surgery is the most effective treatment for metabolic disease and reduces VAT inflammation, yet its effect on CD40 expression is not described. We sought to evaluate CD40 expression in the VAT after vertical sleeve gastrectomy (VSG) in a preclinical nonhuman primate model.

METHODS: Six spontaneously obese macaques underwent laparoscopic VSG or sham surgery (division of the omentum/short gastrics without sleeve creation). CD40 immunohistochemistry was performed on VAT from the day of surgery and 1 year postoperatively using a Dako Autostainer. A multiplex cytokine assay was used for peripheral serum analysis.

RESULTS: One year after VSG, CD40-expressing cells in the VAT were significantly reduced compared to sham surgery (percent change from preoperative values: -0.73±0.27 vs 0.43±0.29, p=0.04). Peripheral serum sCD40L was not significantly different between VSG or sham surgery.

CONCLUSION: In this translational model, we observed a significant reduction in CD40+ cells in the VAT after VSG, indicating a reduction in VAT inflammation resulting in improved systemic insulin sensitivity. These findings enhance our understanding of the role of CD40 signaling in chronic VAT inflammation and suggest costimulation blockade as a possible therapeutic target to improve the success and durability of bariatric surgery for patients with metabolic syndrome.

Microbiota Transplant Recapitulates the Metabolic Effects of Sleeve Gastrectomy

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INTRODUCTION: Sleeve gastrectomy (SG) is the most commonly performed bariatric procedure in America. Notwithstanding its clinical success, SG’s mechanisms remain elusive. While numerous works have shown associations between the gut microbiome and post-SG physiology, none have proven causality. Here, we investigate the independent metabolic effects of the post-SG microbiome using a germ-free (GF) microbiota transplant model.

METHODS: 12-week-old male diet-induced-obese (DIO) C57BL/6J mice were randomized to SG or sham surgery. Four weeks post-surgery, ceca from these donor mice were harvested, pooled, and gavaged into GF mice (Fig 1B). After cecal microbiota transplant (CMT), recipient mice were fed high-fat-diet and housed in sterile barrier facility. After 4 weeks, oral glucose tolerance and metabolic Comprehensive Lab Animal Monitoring System studies were performed.

RESULTS: In donor mice, SG resulted in significant weight loss (Fig 1A). Ex-GF mice receiving SG microbiota (SG-R) exhibited significantly greater weight loss than recipients of sham microbiota (sham-R) (Fig 1C). SG-R mice showed improved oral glucose tolerance (Fig 1D) and lower overnight fasting glucose (Fig 1E). At sacrifice, SG-R mice had significantly less visceral adipose tissue (Fig 1F) and lower adiposity (Fig 1G). Moreover, SG-R mice showed continuously elevated respiratory-exchange-ratio (RER)