SIPS: Stomach Intestinal Pylorus Sparing Surgery

Why a loop and new approach makes sense!

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Lenox Hill Hospital
Northern Westchester Hospital Center
NSLIJHS
Disclosures

Covidien/Medtronic  Principal Investigator of SIPS registry, teaching consultant

Ethicon J & J  teaching consultant

ValenTX  SAB

Surgiqquest SAB
Upsets Happen
Duodenal Switch

- Extremely effective weight loss procedure
- Excellent resolution of comorbid conditions, with favorable long term results for weight loss and diabetes
- Accounts for <5% of currently performed bariatric surgery\(^1\) due to concerns of technical difficulty, malnutrient deficiency, and postoperative frequent bowel movements

\(^1\)Estimate of Bariatric Surgery Numbers, ASMBS, March 2014
Five-Year Outcomes After Laparoscopic Gastric Bypass and Laparoscopic Duodenal Switch in Patients With Body Mass Index of 50 to 60
A Randomized Clinical Trial

- DS had greater GI complaints and re-operations
- RYGB 13 BMI Units  DS 22 BMI Units
- Patient satisfaction equal
- Editorial: Beware of DS
- RYGB not effective enough
- DS too effective for certain patients
Bariatric surgery = Sum of Gastric and Intestinal Contribution
Why does Bariatric Surgery Work?

Mechanical

Neurologic

Adjustable Gastric Band (AGB)
Roux-en-Y Gastric Bypass (RYGB)
Vertical Sleeve Gastrectomy (VSG)
Biliopancreatic Diversion With a Duodenal Switch (BPD-DS)

The food-gut-brain axis

Food

specific nutrients

GUT hormones via circulation

Vagus Nerve

Caudal brainstem

Higher brain centres

Hypothalamus

Hormonal
What is the best pouch?

Vertical Sleeve

Advantages

- Long narrow (wider for DS)
- Resection = hormonal reduction, reduces chance of ulcer disease
- High pressure
- Preserves pylorus
- Anastomosis lower protected by liver
To Roux or Not?

Advantages

- Avoids bile reflux
- Long term studies show endoscopic advantage and lower Visick score post gastrectomy
- Reduces theoretical risk of cancer
- Lower marginal ulcer than Billroth II
- Tradition and accepted practice

Disadvantages

- Extra anastomosis and mesenteric defect
- Pedicle graft
- Roux stasis and interrupts intestinal pacemaker
- Marginal ulcer rare after DS
- Returns bile to where it originated

Do they go away post pyloric?
SIPS Approach

**SIPS**

- Slightly larger sleeve (42 bougie)
- Attachment to Mid gut (not distal ileum)
- Preserve adequate bowel to prevent short bowel (3m)
- Combines ghrelin suppression with activation of the ileal brake
- Sleeve with intestinal shortening and stimulation of distal intestine
This is not a Mini Gastric Bypass
International Data


5) Similar reports from France and other European centers

6) Sum total is equal or better wt loss to rygb, revision rate comparable, conversions secondary to bile reflux gastritis do not seem high. Risk of peptic ulcer also lower
Obesity Treatment: Control Glucose and Insulin Fluctuations

RYGB PROMOTES GLUCOSE AND INSULIN PEAK
1:2-hour glucose ratio at baseline, 6, 9 and 12 months by surgery
RESPONSE TO GLUCOSE TOLERANCE TESTING AND SOLID HIGH CARBOHYDRATE CHALLENGE: COMPARISON BETWEEN ROUX EN Y GASTRIC BYPASS, VERTICAL SLEEVE GASTRECTOMY AND DUODENAL SWITCH.

Mitchell S Roslin MD FACS, , Yuriy Dudiy MD, Andrew Brownlee MD, Joanne Weiskopf PA, Paresh Shah MD FACS
1-hour: fasting insulin ratio at Baseline, 6, 9 and 12 months by surgery
1-hour: fasting glucose ratio at baseline, 6, 9 and 12 months by surgery.
Methods

- IRB approved retrospective analysis of patients who met NIH criteria for obesity surgery, and underwent SIPS procedure.
- All procedures were performed by two surgeons at three centers
  - Lenox Hill Hospital – NY, NY
  - Northern Westchester Hospital Center – Mount Kisco, NY
  - Bariatric and Metabolic Institute – Salt Lake City, UT
Inclusion Criteria

- Procedure performed January 2013 – July 2014
- Age 18-65
- SIPS as the initial primary bariatric surgery
- All bariatric conversions excluded
Technique

- Bougie size (42F)
- Length of bypass (300cm common limb)
- Hand sutured duodeno-intestinal anastomosis
## Preoperative Characteristics

<table>
<thead>
<tr>
<th>No. of patients</th>
<th>129 (Utah: 92, NY: 37)</th>
</tr>
</thead>
</table>

### Preoperative Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>49.98 ± 12.86</td>
</tr>
<tr>
<td>Weight (lbs)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>315.39 ± 74.51</td>
</tr>
<tr>
<td>Height (in)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>66.69 ± 3.68</td>
</tr>
<tr>
<td>BMI&lt;sup&gt;a&lt;/sup&gt;</td>
<td>49.72 ± 9.65</td>
</tr>
<tr>
<td>Male</td>
<td>84 (65.1 %)</td>
</tr>
<tr>
<td>Female</td>
<td>45 (34.9%)</td>
</tr>
<tr>
<td>Ideal Body Weight (lbs)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>139.15 ± 24.78</td>
</tr>
<tr>
<td>Excess Body Weight (lbs)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>175.88 ± 65.73</td>
</tr>
</tbody>
</table>

### Rates of Comorbidities

<table>
<thead>
<tr>
<th>Condition</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sleep Apnea</td>
<td>60 (46.51%)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>52 (40.31%)</td>
</tr>
<tr>
<td>GERD</td>
<td>47 (36.43%)</td>
</tr>
<tr>
<td>Hypertension</td>
<td>56 (43.41%)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Values are expressed as means ± SEM
<table>
<thead>
<tr>
<th></th>
<th>Utah</th>
<th>NY</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>No. of Patients</strong></td>
<td>92</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>**Age (years)**a</td>
<td>50.81 ± 12.66</td>
<td>44.54 ± 12.38</td>
<td>0.005</td>
</tr>
<tr>
<td>**BMI (kg/m2)**a</td>
<td>49.67 ± 10.02</td>
<td>49.61 ± 8.74</td>
<td>0.487</td>
</tr>
</tbody>
</table>

*aValues are expressed as mean ± SEM*
Scatter Plot demonstrating percentage weight loss for each patient at respective intervals.
### Post-op complications

<table>
<thead>
<tr>
<th>Condition</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td>2</td>
<td>1.55%</td>
</tr>
<tr>
<td>Abdominal hematoma</td>
<td>4</td>
<td>3.10%</td>
</tr>
<tr>
<td>Intra abdominal collection</td>
<td>1</td>
<td>0.77%</td>
</tr>
<tr>
<td>Dysphagia requiring Intervention</td>
<td>1</td>
<td>0.77%</td>
</tr>
</tbody>
</table>

### Procedure Time

<table>
<thead>
<tr>
<th>(Minutes)&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>145.29 ± 42.42</td>
</tr>
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</table>

### Length of Hospital Stay

<table>
<thead>
<tr>
<th>(Days)&lt;sup&gt;a&lt;/sup&gt;</th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>2.24 ± 1.29</td>
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</tbody>
</table>

### Readmission<sup>b</sup>

<table>
<thead>
<tr>
<th>Time</th>
<th>Count</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;30 days</td>
<td>2</td>
<td>1.55%</td>
</tr>
<tr>
<td>&gt;30 days</td>
<td>1</td>
<td>0.77%</td>
</tr>
</tbody>
</table>

### Reoperations

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (0.77%)</td>
</tr>
</tbody>
</table>

<sup>a</sup>Values are expressed as mean ± SEM

<sup>b</sup>Data available from NY subset
<table>
<thead>
<tr>
<th></th>
<th>&lt;3 months (n=129)</th>
<th>3-6 months (n=129)</th>
<th>6-9 months (n=69)</th>
<th>9-12 months (n=22)</th>
<th>&gt;12 months (n=12)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total body Weight loss (lbs)</strong></td>
<td>30.64 ± 16.39</td>
<td>73.46 ± 31.04</td>
<td>101.9 ± 37.15</td>
<td>137.96 ± 46.68</td>
<td>129.90 ± 32.52</td>
</tr>
<tr>
<td><strong>Total body Weight loss (%)</strong></td>
<td>9.59 ± 4.09</td>
<td>22.25 ± 6.04</td>
<td>31.23 ± 7.05</td>
<td>36.90 ± 9.31</td>
<td>40.56 ± 5.06</td>
</tr>
<tr>
<td><strong>Excess weight loss (%)</strong></td>
<td>17.77 ± 8.02</td>
<td>41.67 ± 13.72</td>
<td>60.35 ± 16.87</td>
<td>63.25 ± 18.48</td>
<td>72.51 ± 13.90</td>
</tr>
<tr>
<td><strong>BMI reduction (kg/m²)</strong></td>
<td>4.97 ± 2.35</td>
<td>11.30 ± 3.91</td>
<td>15.52 ± 4.46</td>
<td>21.21 ± 6.85</td>
<td>20.83 ± 4.02</td>
</tr>
<tr>
<td><strong>Excess BMI reduction (%)</strong></td>
<td>20.98 ± 9.99</td>
<td>47.30 ± 15.37</td>
<td>69.40 ± 21.31</td>
<td>73.07 ± 26.05</td>
<td><strong>83.04 ± 16.99</strong></td>
</tr>
</tbody>
</table>

Values are expressed as mean ± SEM
Average Percentage Total body Weight Loss in SIPS

Post Operative Months
Average Percentage Excess BMI loss in SIPS

Post Operative Months
Average Percentage Excess BMI loss
NY vs Utah

Post Operative Months
Conclusion

- Early results show that SIPS is an effective weight loss procedure, with equivalent results across two separate centers.

- Key beneficial aspects of procedure include:
  - Gastrectomy reducing ghrelin
  - Attachment 3 meters from colon activates hind gut receptors
  - Adequate length avoiding consequences of short bowel syndrome

- Short term results did not show any negative aspect of a lack of roux limb
  - No evidence of afferent loop syndrome
  - No subjective bile reflux gastritis
Conclusion

- Acceptable morbidity:
  - No evidence of any small bowel obstructions or internal hernia
  - One postoperative therapeutic endoscopy
  - No leaks

- Analyzing NY Data – in first 30 patients, no hypoalbuminemia or critical deficiencies on follow lab work
Future Questions will focus on quantifying GI side effects and quality of life in comparison to other current bariatric procedures.

All short term data – will need to analyze long term effects of the operation, and whether the low morbidity remains constant.
Murphy’s Law

“If anything can go wrong, it will”