Revisional Procedures for Nonresponders to Gastric Bypass

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Case Example

52 y/o female with open roux en Y gastric bypass 15 years ago.

Initial weight 285

Lost to 174

Regained to 190

What do you do?
Case Example

52 y/o female with open roux en Y gastric bypass 15 years ago.

Initial weight 285
Lost to 174
Regained to 235

What do you do?
Case Example

52 y/o female with open roux en Y gastric bypass 15 years ago.

Initial weight 285

Lost to 174

Regained to 295

What do you do?
Roux-en-Y Gastric Bypass

Revisions

Check for Gastrogastric fistulas
EGD, UGI, CT
A small fistula could be significant
Add restriction or malabsorption
Endoluminal plication
Banding the Bypass
Revising the Bypass
BPD

ASBS
Treatment for Enlarged Pouch or Persistent Stricture
Banded gastric bypass

- Pouch
- Adjustable Band
- Port
- Bypassed Stomach
- Roux Limb
- Space between band and jejunum

Bessler et al, Columbia University
Bypass to BPD without Pouch modification
### Gastric Bypass Revision-Higa

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Years Follow Up</th>
<th>Absolute % EWL</th>
<th>Total Final % EWL</th>
<th>BMI Drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass to Fixed Band Bypass</td>
<td>2.3</td>
<td>28%</td>
<td>64%</td>
<td>7</td>
</tr>
<tr>
<td>Bypass Pouch Revision</td>
<td>3.0</td>
<td>30%</td>
<td>62%</td>
<td>7.5</td>
</tr>
<tr>
<td>Intestinal Malabsorption Revision</td>
<td>3.4</td>
<td>42%</td>
<td>73%</td>
<td>11</td>
</tr>
</tbody>
</table>

BMI drop of 6-7 at a year
Final %EWL 59-60%
## Revision Complications

<table>
<thead>
<tr>
<th></th>
<th>Revision</th>
<th>Primary</th>
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</thead>
<tbody>
<tr>
<td>Stenosis</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Leaks</td>
<td>15%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Bleeding</td>
<td>4%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>
Reduced Robotic Complications

<table>
<thead>
<tr>
<th></th>
<th>Standard Laparoscopy</th>
<th>Robotic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stenosis</td>
<td>15%</td>
<td>3%</td>
</tr>
<tr>
<td>Leaks</td>
<td>15%</td>
<td>1%</td>
</tr>
<tr>
<td>Bleeding</td>
<td>4%</td>
<td>2%</td>
</tr>
</tbody>
</table>
# Revisional Bariatric Surgery at the University of Texas Houston—Wilson

## Revisional Cases 2010-2014 (191)

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Band to Bypass</td>
<td>47</td>
</tr>
<tr>
<td>Band to Sleeve</td>
<td>33</td>
</tr>
<tr>
<td>Band to BPD</td>
<td>4</td>
</tr>
<tr>
<td>Band to Band</td>
<td>9</td>
</tr>
<tr>
<td>Sleeve to Sleeve</td>
<td>7</td>
</tr>
<tr>
<td>VBG to Bypass</td>
<td>22</td>
</tr>
<tr>
<td>Molina to Bypass</td>
<td>10</td>
</tr>
<tr>
<td>Sleeve to Bypass</td>
<td>5</td>
</tr>
<tr>
<td>Bypass to Bypass</td>
<td>39</td>
</tr>
<tr>
<td>Nissen to Bypass</td>
<td>6</td>
</tr>
<tr>
<td>Bypass to BPD</td>
<td>4</td>
</tr>
<tr>
<td>BPD reduction</td>
<td>5</td>
</tr>
</tbody>
</table>

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## Robotic Adhesiolysis in Revisional Bariatric Surgery

Todd A. Worley, MD  
Erik B. Wilson, MD

*The University of Texas Health Science Center at Houston*  
&  
*Minimally Invasive Surgeons of Texas*
Robotic Revisional Bariatric Surgery

- Gastric Bypass to Gastric Bypass
Revisional Endoscopy

- Pouch and Stoma Dilation
- Stoma Injection
- Stoma Suturing/Plication
- Pouch Suturing/Plication
Background
Modifiable risk factors for weight regain after RYGB

Gastrogastric fistula

Gastrojejunal stoma dilation
Post-RYGB weight loss correlated to outlet diameter

**Post-RYGB EWL at Upper Endoscopy**

<table>
<thead>
<tr>
<th>Normal Anatomy</th>
<th>Abnormal Anatomy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pouch &amp; stoma normal</td>
<td>Pouch &amp; stoma enlarged</td>
</tr>
<tr>
<td><strong>64.7%</strong></td>
<td><strong>p=0.004</strong></td>
</tr>
<tr>
<td>Pouch enlarged, stoma normal</td>
<td>Pouch enlarged, stoma normal</td>
</tr>
<tr>
<td><strong>41.5%</strong></td>
<td><strong>p=0.001</strong></td>
</tr>
<tr>
<td>Pouch normal; stoma enlarged</td>
<td>Pouch normal; stoma enlarged</td>
</tr>
<tr>
<td><strong>44.2%</strong></td>
<td><strong>P&lt;0.001</strong></td>
</tr>
<tr>
<td><strong>47.9%</strong></td>
<td></td>
</tr>
</tbody>
</table>

- Multivariate analysis identified stoma diameter was independently associated with weight regain

“Stoma diameter should be regarded in a manner similar to gastrogastroduodenal fistulae or other post surgical complications”

1. Influence of pouch and stoma size on weight loss after gastric bypass, Bipan Chand. et al.
2. Gastrojejunal Stoma Diameter Predicts Weight Regain after Roux-en-Y Gastric Bypass, Christopher C. Thompson, et al
Endoluminal Injection of Anastomosis with Sclerosant

Pre injection

Post Injection
Endoluminal Injection of Anastomosis with Sclerosant

- 28 patients underwent injections with sodium morrhuate around their anastomosis over a 3 year period

- 8-20 cc (14.5 cc) injected to achieve a diameter of 1.2 cm or less (2.3 average injection sessions)

- Goal was to achieve weight loss of >75 % of the weight the patient gained after nadir weight

Endoluminal Injection of Anastomosis with Sclerosant

- 18/28 (64%) achieved success
  - 1 patient developed stenosis requiring balloon dilatation x 2.

- Mean follow up 18 months

- Mean weight loss 22.3 (± 9.2 kg)

Gastric Bypass Revision
Follow-up Endoscopy

Patient 5: -3 lbs

Initial procedure

20 mm

4 mm

3 months

22 mm
Follow-up Endoscopy

Patient 14:
-31 lbs

Initial procedure

3 months

C. Thompson, et al
**Procedure: Tissue Preparation**

- Ablate mucosa circumferentially around the outlet – 360 degrees / 1 cm wide
- Desired tissue effects: light char with no impact to sub-mucosa
- Argon Plasma Coagulation is recommended
  - Specific settings will vary based on
    - Duration of Activation
    - Power Setting
    - Probe Distance
  - Samples settings:

<table>
<thead>
<tr>
<th>Precise</th>
<th>Forged</th>
<th>Pulsed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effect 5</td>
<td>Watts: 20-40</td>
<td>Watts: 20-40</td>
</tr>
<tr>
<td></td>
<td>Flow: 0.7-1.0</td>
<td>Effect 2</td>
</tr>
</tbody>
</table>

- Cautery may also be used if APC is unavailable
- (Optional) Tissue is brushed with wire brush - may increase bleeding and affect visibility

**Gas Management**
- Inject 50cc of dilute simethicone in the Roux limb
**Procedure: Suturing – Outlet (Con’t)**

**Interrupted**

**Figure of 8**

**Vest-over-pants**

**Pursestring**

**Objective:** Reduce outlet to a target size of 5-8mm
- 2-3 sutures placed in / around the outlet to achieve this objective
- A variety of suturing patterns may be used: Interrupted, Purse-String, Vest over pants
- Stitching pattern used may need to be tailored to the specific outlet shape
- Final outlet size is assessed with a diagnostic scope. The scope should not be able to pass through the outlet.
  - Add additional stitches as required.
- (Optional) Pneumatic Balloon inflated to 6-8mm to calibrate final outlet diameter

*Modified Vest-over-pants - suture flows through stoma*
Comparison of Endoscopic Suturing Devices – 12 month results

1. Randomized Double-Blind Sham-Controlled Trial of TORe for Weight Regain: Single-Center Results , Thompson et al. (DDW 2013)
2. Stoma size critical to 12-month outcomes in endoscopic suturing for gastric bypass repair. Thompson et al. (Surgery for Obesity and Related Diseases , June 2012, p. 282-7.)
Endoscopic Treatment Options – Clinical Summary

% Excess Weight Loss at 6 Months

- OverStitch ESS (n=59)¹ 20.4%
- EndoCinch (n=59)¹ 8.1%
- Sham (n=26)² -1.8%
- Sclerotherapy (n=203)³ 10.1%

1. Comparison of a Suction-Based Superficial Suturing Device With a Full-Thickness Suturing Device for TORe, Thompson et al. (DDW 2013)
2. Randomized Double-Blind Sham-Controlled Trial of TORe for Weight Regain: Single-Center Results, Thompson et al. (DDW 2013)
3. Comparison of Full-Thickness Sutured TORe and Endoscopic Sclerotherapy, Thompson et al. (DDW 2013)
# Meta-Analysis

## 6 Months Weight Loss

<table>
<thead>
<tr>
<th>Group by Type</th>
<th>Study Name</th>
<th>Statistics for each study</th>
<th>Weight Loss (Kg) 6 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endocinch</td>
<td>Thompson 2013</td>
<td>Mean: 4.500, Lower Limit: 2.898, Upper Limit: 6.102, Total: 50</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Endocinch</td>
<td>Horgan 2010</td>
<td>Mean: 6.500, Lower Limit: 5.296, Upper Limit: 7.704, Total: 112</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Endocinch</td>
<td></td>
<td>Mean: 5.621, Lower Limit: 4.116, Upper Limit: 7.127, Total: 11</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Overstitch</td>
<td>Ujiki 2014</td>
<td>Mean: 5.600, Lower Limit: 1.936, Upper Limit: 9.264, Total: 11</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Overstitch</td>
<td>Kumar 2014</td>
<td>Mean: 10.600, Lower Limit: 10.141, Upper Limit: 11.059, Total: 59</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Overstitch</td>
<td>Kumar_2_2014</td>
<td>Mean: 10.200, Lower Limit: 9.508, Upper Limit: 10.892, Total: 26</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Overstitch</td>
<td></td>
<td>Mean: 10.006, Lower Limit: 8.847, Upper Limit: 11.165, Total: 1</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Sclerotherapy</td>
<td>Abu Dayeh 2012</td>
<td>Mean: 5.400, Lower Limit: 3.933, Upper Limit: 6.867, Total: 90</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Sclerotherapy</td>
<td></td>
<td>Mean: 5.400, Lower Limit: 3.222, Upper Limit: 7.578, Total:</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Stomaphyx</td>
<td>Goyal 2013</td>
<td>Mean: 3.800, Lower Limit: 1.011, Upper Limit: 6.589, Total: 10</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Stomaphyx</td>
<td>Mikami 2010</td>
<td>Mean: 8.700, Lower Limit: 4.143, Upper Limit: 13.257, Total: 14</td>
<td><img src="image" alt="Graph" /></td>
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<tr>
<td>Stomaphyx</td>
<td>Eid 2014</td>
<td>Mean: 5.600, Lower Limit: 3.934, Upper Limit: 7.266, Total: 36</td>
<td><img src="image" alt="Graph" /></td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>Mean: 6.687, Lower Limit: 3.986, Upper Limit: 9.388, Total:</td>
<td><img src="image" alt="Graph" /></td>
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</tbody>
</table>
# Meta-Analysis

## 12 Months Weight Loss

### Weight Loss (kg) 12 Months

<table>
<thead>
<tr>
<th>Group by Type</th>
<th>Study name</th>
<th>Weight Loss (kg)</th>
<th>Mean</th>
<th>Lower limit</th>
<th>Upper limit</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Endocinch</td>
<td>Kumar 2014_E</td>
<td>2.900</td>
<td>2.645</td>
<td>3.155</td>
<td>59</td>
<td></td>
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<tr>
<td>Endocinch</td>
<td></td>
<td>2.900</td>
<td>-0.508</td>
<td>6.308</td>
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<tr>
<td>Overstitch</td>
<td>Ujiki 2014</td>
<td>7.500</td>
<td>1.890</td>
<td>13.110</td>
<td>5</td>
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<tr>
<td>Overstitch</td>
<td>Kumar 2014_O</td>
<td>8.600</td>
<td>7.962</td>
<td>9.238</td>
<td>59</td>
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<tr>
<td>Overstitch</td>
<td>Kumar 2_2014</td>
<td>9.400</td>
<td>8.247</td>
<td>10.553</td>
<td>26</td>
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<tr>
<td>Overstitch</td>
<td></td>
<td>8.798</td>
<td>6.470</td>
<td>11.126</td>
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<tr>
<td>Sclerotherapy</td>
<td>Loewen</td>
<td>8.600</td>
<td>7.670</td>
<td>9.530</td>
<td>71</td>
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<tr>
<td>Sclerotherapy</td>
<td>AbuDayyeh 2012</td>
<td>1.450</td>
<td>-1.847</td>
<td>4.747</td>
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<tr>
<td>Sclerotherapy</td>
<td></td>
<td>6.051</td>
<td>3.224</td>
<td>8.878</td>
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</tr>
<tr>
<td>Stomaphyx</td>
<td>Mikami 2010</td>
<td>10.000</td>
<td>1.998</td>
<td>18.002</td>
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<tr>
<td>Stomaphyx</td>
<td>Eid 2014</td>
<td>4.300</td>
<td>2.547</td>
<td>6.053</td>
<td>45</td>
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<tr>
<td>Stomaphyx</td>
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<td>5.224</td>
<td>1.724</td>
<td>8.725</td>
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<tr>
<td>Overall</td>
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<td>5.913</td>
<td>3.119</td>
<td>8.707</td>
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</table>
## Meta-Analysis

### 18 Months Weight Loss

<table>
<thead>
<tr>
<th>Study name</th>
<th>Mean</th>
<th>Lower limit</th>
<th>Upper limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abu Dayyeh 2012</td>
<td>2.000</td>
<td>-3.910</td>
<td>7.910</td>
</tr>
<tr>
<td>Kumar 2014</td>
<td>11.500</td>
<td>10.193</td>
<td>12.807</td>
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<tr>
<td></td>
<td>7.205</td>
<td>-2.062</td>
<td>16.472</td>
</tr>
</tbody>
</table>

**Weight Loss (kg) 18 Months**

![Graph showing weight loss data with confidence intervals](image-url)
Revisional Pathway

* Dedicated Revisional Seminar with surgeons, bariatricians, dieticians, psychologists

* Aggressive Education
  * 1-3 Preoperative Nutrition Visits
  * Preoperative Weight Loss Goal
  * Online/Apps for Measurements
    * Food Journaling
    * Weight Recording
    * Goal Setting

* Aggressive Psychological Evaluation
  * Food Addiction Group

* Thorough Mechanical Evaluation
  * UGI, EGD, CT
  * Resting Metabolic Rate and Body Composition
Bypass Revisional Guidelines

Weight regain 10-30 pounds/increasing appetite only
   Endolumenental outlet/pouch plication
   Pharmacotherapy

Weight regain 30-90 pounds
   Anatomic corrections of bypass with pouch and limbs

Weight regain >90 pounds/Failure to Loose
   Anatomic corrections of bypass with pouch and limbs
   Intense psych evaluation and food addiction counseling
   Consider BPD after careful screening (RMR)
Thank You

Erik B. Wilson, MD, FACS
Professor and Vice Chair of Surgery
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