Obesity: What’s the Big Deal?

Amy Doran, MD
March 7, 2020
Outline

• **Obesity Impact on GI Illnesses**
  – GI symptoms
  – Malignancy
• **Treatment: Lifestyle Approach**
  – Nutrition
  – Behavioral counseling
• **Treatment: Medical Intervention**
• **Treatment: Endoscopic Intervention**
• **Treatment: Surgical Intervention**
  – GI role pre-procedure
  – GI role post-procedure complications
# Obesity Impact on GI Symptoms

Table 2. Leading Diagnoses in the Ambulatory Setting for Gastrointestinal, Liver and Pancreatic Disorders in the United States, 2010

<table>
<thead>
<tr>
<th>Rank</th>
<th>Diagnosis</th>
<th>Office visits</th>
<th>ED</th>
<th>Hospital outpatient department</th>
<th>Total</th>
<th>ICD-9-CM codes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abdominal pain</td>
<td>9,232,817</td>
<td>6,475,136</td>
<td>970,318</td>
<td>16,678,271</td>
<td>789.00</td>
</tr>
<tr>
<td>2</td>
<td>Gastroesophageal reflux and reflux esophagitis</td>
<td>6,222,275</td>
<td>294,942</td>
<td>549,992</td>
<td>7,087,209</td>
<td>530.11, 530.81</td>
</tr>
<tr>
<td>3</td>
<td>Hemorrhoids</td>
<td>3,592,943</td>
<td>120,128</td>
<td>226,505</td>
<td>3,939,576</td>
<td>455</td>
</tr>
<tr>
<td>4</td>
<td>Constipation</td>
<td>2,905,705</td>
<td>530,827</td>
<td>280,129</td>
<td>3,716,681</td>
<td>564.0</td>
</tr>
<tr>
<td>5</td>
<td>Nausea and vomiting</td>
<td>1,404,564</td>
<td>1,969,494</td>
<td>215,701</td>
<td>3,590,214</td>
<td>787.0</td>
</tr>
<tr>
<td>6</td>
<td>Abdominal wall and inguinal hernia</td>
<td>2,852,677</td>
<td>204,375</td>
<td>422,937</td>
<td>3,479,988</td>
<td>550, 553.0, 553.1, 553.2, 553.9</td>
</tr>
<tr>
<td>7</td>
<td>Malignant neoplasm of the colon or rectum</td>
<td>2,420,463</td>
<td>2,420</td>
<td>386,783</td>
<td>2,809,666</td>
<td>153, 154</td>
</tr>
<tr>
<td>8</td>
<td>Diverticular disease</td>
<td>2,275,438</td>
<td>262,910</td>
<td>195,771</td>
<td>2,734,119</td>
<td>562.1</td>
</tr>
<tr>
<td>9</td>
<td>Diarrhea</td>
<td>1,943,572</td>
<td>533,181</td>
<td>197,071</td>
<td>2,673,824</td>
<td>787.91</td>
</tr>
<tr>
<td>10</td>
<td>Gastritis and dyspepsia</td>
<td>1,902,993</td>
<td>472,165</td>
<td>234,836</td>
<td>2,609,994</td>
<td>536, 538.8</td>
</tr>
<tr>
<td>11</td>
<td>Irritable bowel syndrome</td>
<td>2,290,460</td>
<td>24,121</td>
<td>89,170</td>
<td>2,403,751</td>
<td>564.1</td>
</tr>
<tr>
<td>12</td>
<td>Crohn’s disease</td>
<td>1,722,664</td>
<td>44,641</td>
<td>121,256</td>
<td>1,888,561</td>
<td>555</td>
</tr>
<tr>
<td>13</td>
<td>Choledolithias</td>
<td>872,040</td>
<td>355,504</td>
<td>119,166</td>
<td>1,346,710</td>
<td>574</td>
</tr>
<tr>
<td>14</td>
<td>Dysphagia</td>
<td>1,021,034</td>
<td>38,264</td>
<td>113,664</td>
<td>1,172,962</td>
<td>787.2</td>
</tr>
<tr>
<td>15</td>
<td>Rectal bleeding</td>
<td>648,827</td>
<td>176,160</td>
<td>61,772</td>
<td>886,759</td>
<td>569.3</td>
</tr>
<tr>
<td>16</td>
<td>Benign neoplasm of colon and rectum</td>
<td>726,675</td>
<td>144,775</td>
<td>871,450</td>
<td>211.3, 211.4</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Pancreatitis</td>
<td>409,882</td>
<td>320,418</td>
<td>91,492</td>
<td>821,772</td>
<td>577, 577.1</td>
</tr>
<tr>
<td>18</td>
<td>Ulcerative colitis</td>
<td>633,445</td>
<td>17,166</td>
<td>72,763</td>
<td>723,374</td>
<td>556</td>
</tr>
<tr>
<td>19</td>
<td>Hepatitis C infection</td>
<td>563,442</td>
<td>19,496</td>
<td>90,334</td>
<td>673,272</td>
<td>070.41, 070.44, 070.51, 070.54, 070.7</td>
</tr>
<tr>
<td>20</td>
<td>Appendicitis</td>
<td>317,374</td>
<td>195,150</td>
<td>128,524</td>
<td>641,048</td>
<td>540, 541, 542</td>
</tr>
<tr>
<td>21</td>
<td>Hepatitis, unspecified</td>
<td>554,749</td>
<td>3212</td>
<td>9573</td>
<td>567,534</td>
<td>573.3</td>
</tr>
<tr>
<td>22</td>
<td>Chronic liver disease and cirrhosis</td>
<td>438,914</td>
<td>30,084</td>
<td>78,957</td>
<td>547,955</td>
<td>671</td>
</tr>
<tr>
<td>23</td>
<td>Barrett’s esophagus</td>
<td>389,739</td>
<td>47,083</td>
<td>416,822</td>
<td>530.85</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td>Celiac disease</td>
<td>23,521</td>
<td>4472</td>
<td>27,993</td>
<td>573.0</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Source: National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey (http://www.cdc.gov/nchs/ahcd.htm).

Obesity Impact on GI Symptoms

Obesity Impact on GI Symptoms

• Esophagus
  – GERD increased 50%
  – Erosive esophagitis increased 50%
  – Barrett’s esophagus increased 2x

• Gallbladder
  – Gallstones increased 2-3x
  – Cancer increased 35-80%

• Pancreas
  – Cancer increased 35%
  – Morbidity from acute pancreatitis outcomes increased 20-50%
Obesity Impact on GI Symptoms

- Liver
  - NAFLD increased 3 fold
  - Cirrhosis increased 30-50%
- Colon
  - Advanced polyps increased 50%
  - Cancer increased 2 fold
- General GI
  - Irritable bowel increased 3 fold
    - Constipation, diarrhea, flatus
Outline

• Obesity Impact on GI Illnesses
  – GI symptoms
  – Malignancy

• **Treatment: Lifestyle Approach**
  – Nutrition
  – Behavioral counseling

• Treatment: Medical Intervention

• Treatment: Endoscopic Intervention

• Treatment: Surgical Intervention
  – GI role pre-procedure
  – GI role post-procedure complications
Treatment Considerations

NEJM, October 1999
Treatment Considerations

- Surgery
  - BMI >40
  - BMI >35 co-morbidities

- Pharmicotherapy
  - BMI > 30
  - BMI >27 co-morbidities

- Lifestyle modification
  - BMI >30
Treatment: Lifestyle Approach

- Activity increase
- Behavior change
- Cognitive change
- Dietary change
- Social support
Treatment: Lifestyle Approach

• Motivational Interviewing
  – Engage: establish a trusting relationship
  – Focus: habits/patterns patient wants to change
  – Evoke: elicit motivation, confidence
  – Plan: develop practical steps

• SMART Goals
  – Specific
  – Measurable
  – Attainable
  – Rewards
  – Timeframe
Treatment: Lifestyle Approach

• Importance of Self Monitoring
  – Dietary
  – Activity
  – Weight
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# Treatment: Medical Intervention

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>Trade Name</th>
<th>Mechanism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlistat</td>
<td>Xenical, Ali</td>
<td>Intestinal Lipase Inhibitor</td>
</tr>
<tr>
<td>Lorcaserin</td>
<td>Belviq</td>
<td>Selective Serotonin Agonist: Satiety</td>
</tr>
<tr>
<td>Phentermine-topiramate</td>
<td>Qsymia</td>
<td>Stimulant/anti-seizure: Satiety</td>
</tr>
<tr>
<td>Naltrexone-bupropion</td>
<td>Contrave</td>
<td>Opioid antagonist/norepinephrine and dopamine reuptake inhibitor: Satiety</td>
</tr>
<tr>
<td>Liraglutide</td>
<td>Saxenda</td>
<td>GLP-1 receptor agonist: Satiety and delayed gastric emptying</td>
</tr>
</tbody>
</table>
## Treatment: Medical Intervention

<table>
<thead>
<tr>
<th>Drug</th>
<th>Loss relative to Baseline Weight (%)</th>
<th>&gt;5% Loss of Baseline Weight (patient %)</th>
<th>&gt;10% Loss of Baseline Weight (patient %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orlistat 60mg</td>
<td>7-8.6, 5-10.2</td>
<td>48, 35-72</td>
<td>24.4-31, 13.5-38.9</td>
</tr>
<tr>
<td>Orlistat 120mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lorcaserin 10mg</td>
<td>4.7-5, 4.5-5.8</td>
<td>40.2-44.7, 37.5-47.2</td>
<td>17.4-18, 16.3-22.6</td>
</tr>
<tr>
<td>Lorcaserin 20mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phentermine-topiramate 7.5mg/46mg</td>
<td>5.1-7.8, 9.8-10.9</td>
<td>44.9-62, 66.7-70</td>
<td>18.8-37, 47.2-48</td>
</tr>
<tr>
<td>Phentermine-topiramate 15mg/92mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Naltrexone-bupropion 16mg/360mg</td>
<td>5, 6.1-9.3</td>
<td>39, 48-66.4</td>
<td>20, 25-41.5</td>
</tr>
<tr>
<td>Naltrexone-bupropion 32mg/360mg</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liraglutide 3.0mg (injection)</td>
<td>8</td>
<td>63.2</td>
<td>33.1</td>
</tr>
</tbody>
</table>
Treatment: Medical Intervention

- Orlistat
  - Cramps, flatulence, incontinence, oily stool
- Lorcaserin
  - Headache, dizziness, nausea, dry mouth, constipation, hypoglycemia. Avoid in renal and hepatic insufficiency
- Phentermine-topiramate
  - Dry mouth, taste disturbance, constipation, paraesthesias, depression, anxiety, insomnia. Teratogenic.
- Bupropion-naltrexone
  - Nausea, constipation, headache, vomiting, dizziness, insomnia, dry mouth, hypertension
- Liraglutide
  - Nausea, vomiting, diarrhea, constipation, hypoglycemia, injection site reactions, increased lipase
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• Treatment: Medical Intervention

• **Treatment: Endoscopic Intervention**

• Treatment: Surgical Intervention
  – GI role pre-procedure
  – GI role post-procedure complications
Treatment: Endoscopic Intervention

• Intragastric balloons
  – 1985: Garren Edwards Gastric Bubble
    • Adverse events: gastric mucosal ulceration, small bowel obstruction requiring surgical resection
  – 1990s: Orbera
    • Silicone balloon filled to 450-700cc saline mixed with methylene blue
    • Endoscopic placement and removal
    • Inadvertent balloon rupture
      – -> blue urine
    • In place 6 months
Treatment: Endoscopic Intervention

• Intragastric balloons
  – ReShape Duo
    • Endoscopically inserted and retrieved
    • Saline-methylene blue filled, 900cc total
    • Two independent balloons
Treatment: Endoscopic Intervention

• Intragastric balloons
  – Obalon
    • Swallowed as capsule, confirmed with fluoro
    • Gelatin capsule dissolves
    • Inflate with gas
    • 3 balloons swallowed 4 weeks apart
    • Endoscopically removed in 6 mo
Treatment: Endoscopic Intervention

- Aspiration therapy
  - Aspire Assist
    - Gastrostomy tube
    - 20 min after meal aspirate 30%
    - Est 15-20 min
    - Count on device can lock
Treatment: Endoscopic Intervention

- Endoscopic sleeve gastroplasty
  - Overstitch
    - Full thickness sutures
    - Prepyloric antrum to GEJ
    - Required double channel scope
Treatment: Endoscopic Intervention

The Impact of Intragastric Balloons on Obesity-Related Co-Morbidities: A Systematic Review and Meta-Analysis

Violeta B. Popov, MD, PhD, Amy Ou, MD, Allison R. Schulman, MD and Christopher C. Thompson, MD, MHS

OBJECTIVES: Therapies less invasive than surgery and more effective than lifestyle and pharmacotherapy are needed to contend with the obesity epidemic. Intragastric balloons (IGBs) are a minimally invasive endoscopic weight loss method recently approved for use in the US. The purpose of the study is to assess the effect of IGBs on metabolic outcomes associated with obesity.

METHODS: MEDLINE, Embase, and Cochrane Database were searched through July 2016. Dual extraction and quality assessment of studies using Cochrane risk of bias tool were performed independently by two authors. Primary outcomes included the change from baseline in metabolic parameters. Secondary outcomes included resolution and/or improvement in metabolic co-morbidities and association with baseline parameters.

RESULTS: 10 randomized controlled trials (RCT) and 30 observational studies including 5,668 subjects were analyzed. There was moderate-quality evidence for improvement in most metabolic parameters in subjects assigned to IGB therapy as compared to conventional non-surgical therapy in RCTs: mean difference (MD) in fasting glucose change: $-12.7 \text{ mg/dl} \ (95\% \text{ CI } -21.5, -4)$; MD in triglycerides: $-19 \text{ mg/dl} \ (95\% \text{ CI } -42, 3.5$; MD in waist circumference: $-4.1 \text{ cm} \ (95\% \text{ CI } -6.9, -1.4$; MD in diastolic blood pressure: $-2.9 \text{ mmHg} \ (95\% \text{ CI } -4.1, -1.8$. The odds ratio for diabetes resolution after IGB therapy was $1.4 \ (95\% \text{ CI } 1.3, 1.6$. The rate of serious adverse events was $1.3\%$.

CONCLUSIONS: IGBs are more effective than diet in improving obesity-related metabolic risk factors with a low rate of adverse effects, however the strength of the evidence is limited given the small number of participants and lack of long-term follow-up.
Treatment: Endoscopic Intervention

• Orbera:
  – TBWL median 12% (9.3%-21%)
  – Statistically significant weight loss compared to pharmicotherapy

• ReShape Duo:
  – EWL 25.1% compared to lifestyle modification 11.3% (REDUCE trial)
  – At 1 year balloon group maintained 64% of weight loss
Treatment: Endoscopic Intervention

Balloon Related Adverse Events

<table>
<thead>
<tr>
<th>Adverse event</th>
<th>ReShape (%)</th>
<th>Orbera (%)</th>
<th>Obalon (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vomiting</td>
<td>86.7</td>
<td>86.8</td>
<td>17.3</td>
</tr>
<tr>
<td>Nausea</td>
<td>61.0</td>
<td>75.6</td>
<td>56.0</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>54.5</td>
<td>57.5</td>
<td>72.6</td>
</tr>
<tr>
<td>Gastric ulcer</td>
<td>35.2&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0</td>
<td>0.9</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>17.8</td>
<td>21.3</td>
<td>16.9&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Eructation</td>
<td>16.7</td>
<td>24.4</td>
<td>9.2</td>
</tr>
<tr>
<td>Abdominal discomfort</td>
<td>13.3</td>
<td>6.3</td>
<td>0</td>
</tr>
<tr>
<td>Abdominal distension</td>
<td>11.0</td>
<td>17.5</td>
<td>14.6</td>
</tr>
<tr>
<td>Erosive gastritis</td>
<td>9.1</td>
<td>0.6</td>
<td>7.1&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>GERD</td>
<td>6.8</td>
<td>30.0</td>
<td>(see dyspepsia)</td>
</tr>
<tr>
<td>Erosive esophagitis</td>
<td>0.4</td>
<td>0.6</td>
<td>1.8</td>
</tr>
<tr>
<td>Constipation</td>
<td>5.3</td>
<td>0</td>
<td>2.7</td>
</tr>
<tr>
<td>Diarrhea</td>
<td>3.0</td>
<td>13.1</td>
<td>8.3</td>
</tr>
</tbody>
</table>

GERD, gastroesophageal reflux disease; SAE, serious adverse event.

<sup>a</sup>After design modification of the distal tip of the ReShape Balloon, the ulcer rate decreased to 10%.

<sup>b</sup>Composite of erythema, erosion, inflammation, or polyp.

<sup>c</sup>Composite of dyspepsia and GERD.
Treatment: Endoscopic Intervention

• Aspiration therapy
  – 52 weeks: mean 31.5% EWL (12% TBW)
  – Failed placement in 3%
    • Gastric varices, failure to transilluminate
  – Adverse events:
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Treatment: Surgical Intervention

Gastroenterologist role pre-procedure?

Pre-surgical Endoscopy

Routine Screening Endoscopy before Bariatric Surgery: Is It Necessary?

Victoria Gómez, MD,1 Rajat Bhalla, MD,2 Michael G. Heckman, MS,3 Paul T. Kröner Florit, MD,1 Nancy N. Diehl, BS,3 Bhupendra Rawal, MS,3 Scott A. Lynch, MD,4 and David S. Loeb, MD1

**Background:** Routine esophagogastroduodenoscopy (EGD) prior to bariatric surgery has not been consistently shown to change the management of the patient. A study was performed to estimate the proportion of patients undergoing bariatric surgery evaluation who had abnormal findings on preoperative EGD that resulted in alteration of management and, second, to evaluate potential risk factors for occurrence of abnormal findings on the EGD.

**Methods:** An observational, retrospective study in which all 232 patients who were cleared to undergo bariatric surgery and who underwent preoperative EGD between 2006 and 2013 were included at a single tertiary dedicated bariatric center for weight loss management. Abnormal findings on screening EGD and medical or surgical management alteration based on the EGD findings were reviewed.

**Results:** Abnormal findings on screening EGD were found in 143 patients (61.6%). Thirty-five patients had medical management altered (15.1%), while four patients (1.7%) had surgical management altered. Being aged >55 years and the presence of gastroesophageal reflux disease were associated with occurrence of an abnormal finding on screening EGD.

**Conclusions:** While abnormalities on preoperative EGD are often found in patients undergoing bariatric surgery evaluation, rarely do the findings change surgical management. Alternative methods for screening for common GI conditions should be considered in appropriate patients.
Treatment: Surgical Intervention

Gastroenterologist role post-procedure

• SIBO
• Vitamin malabsorption
• Symptoms
  – Nausea
  – Vomiting
  – Diarrhea
  – Constipation
Treatment: Surgical Intervention

Gastroenterologist role post-procedure
Review

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Thank you!