Which Bariatric Surgery Patients Benefit From Prophylactic Caval Filtration

VEITH Symposium 2016

Nothing to Disclose

In Memorium

St. John’s University Professor Kaurie Sivells

Morbid Obesity Comorbidities

- Hypertension
- Type II DM
- Degenerative joint and disc disease
- GERD
- Sleep Apnea Syndrome

- Obesity Hypoventilation Syndrome
- Severe venous stasis disease
- Abdominal wall hernias
- Pseudotumor cerebri

Morbid Obesity Surgery

- Surgical weight-loss procedures relieve most comorbidities
- Elective procedure
- Young, High-risk patients
- Patients expect no complications and immediate weight loss

BACKGROUND

- Morbid obesity BMI > 40 kg/m²
- Increased prevalence in U.S.A.
- NIH Consensus Panel
Morbid Obesity Surgery Complications

- Pulmonary Embolism
- DVT
- Atelectasis
- Cholelithiasis
- Peritonitis
- Incisional Hernia

- Acute Gastric Distention
- Internal Hernias
- Stomal Ulceration
- Stomal Stenosis
- Staple-line disruption
- Nutritional Disorders

PULMONARY EMBOLISM

- Most common unexpected cause of death in perioperative period
- Incidence of 2-4%
- Controversy on prevention of PE

Indications For IVC Filter Placement*

- DVT
- PE
- Pulmonary Hypertension

* Sugerman et al., 2001

CONTROVERSY

Systemic compression devices and subcutaneous heparin

VS.

IVC filter

PULMONARY EMBOLISM

Normal Pulmonary Artery
Right Pulmonary Artery Embolus
Initial 22-month Period
July 1999 to April 2001

- 193 patients - open gastric bypass
- 8 patients had IVC filter placed
- Despite this 4 patients had a PE
- All 4 patients had a BMI > 55

BMI > 55

Patients with a BMI > 55 undergoing open gastric bypass surgery have a 10-fold increased risk for PE (RR=10.2, 95% CI 5.8-18; P<.001)

21-month period
May 2001 – January 2003

- 181 patients – gastric bypass
- 33 patients - BMI>55
- All 33 patients had IVC filter

IVC Filter Placement in Patients with BMI > 55*

<table>
<thead>
<tr>
<th>Patients BMI &gt; 55</th>
<th>IVC Filters</th>
<th>PE Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>31 (1999-2001)</td>
<td>8</td>
<td>17% (4/23)</td>
</tr>
<tr>
<td>33 (2001-2003)</td>
<td>33</td>
<td>0% (0/33)</td>
</tr>
</tbody>
</table>

*Gargiulo, Veith, Lipsitz et al., JVS, 2006

PE & BMI > 55

There was a 100% reduction in the risk of PE among patients with a BMI > 55, and it is our recommendation that IVC filters are placed prior to open gastric bypass procedures.*

*Gargiulo, Veith, Lipsitz et al., JVS, 2006

PE & BMI > 55

Experience with inferior vena cava filter placement in patients undergoing open gastric bypass procedures

Nicholas J. Gargiulo III, MD, Frank J. Veith, MD, Evan C. Lipsitz, MD, William D. Suggs, MD, Toloue Obid, MD, PhD, and Elliot Goodman, MD, Bronx, NY


IVC filter placement and BMI > 55 kg/m²

- PE incidence
- PE mortality
24-month Period
August 2001 to August 2003

- 219 patients – laparoscopic gastric bypass
- DVT/PE prophylaxis
- IVC Filters for Hx DVT/PE

Demographics
Laparoscopic vs. Open

<table>
<thead>
<tr>
<th>Demographics</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average BMI</td>
<td>52</td>
<td>51</td>
</tr>
<tr>
<td>DM</td>
<td>21% (45/213)</td>
<td>20%  (39/193)</td>
</tr>
<tr>
<td>HTN</td>
<td>37% (78/213)</td>
<td>36%  (69/193)</td>
</tr>
<tr>
<td>OHS</td>
<td>22% (46/213)</td>
<td>19%  (37/193)</td>
</tr>
</tbody>
</table>

Total Operative Time
Laparoscopic vs. Open

<table>
<thead>
<tr>
<th>Total Operative Time</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>OR Time</td>
<td>2 to 3 hours</td>
<td>2 to 3 hours</td>
</tr>
</tbody>
</table>

DVT/PE Prophylaxis
Laparoscopic vs. Open

<table>
<thead>
<tr>
<th>DVT/PE Prophylaxis</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical</td>
<td>SCD</td>
<td>SCD</td>
</tr>
<tr>
<td>Pharmacologic</td>
<td>Heparin</td>
<td>Heparin/ LMWH</td>
</tr>
</tbody>
</table>

BMI > 55
Laparoscopic vs. Open

<table>
<thead>
<tr>
<th>BMI &gt; 55</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>109/213</td>
<td>31/193</td>
</tr>
<tr>
<td>BMI &gt; 55</td>
<td>51%</td>
<td>16%</td>
</tr>
</tbody>
</table>

PE
Laparoscopic vs. Open

<table>
<thead>
<tr>
<th>PE</th>
<th>Laparoscopic</th>
<th>Open</th>
</tr>
</thead>
<tbody>
<tr>
<td>PE</td>
<td>0.5% (1/213)</td>
<td>2%   (4/193)</td>
</tr>
<tr>
<td>PE &amp; BMI &gt; 55</td>
<td>0% (0/109)</td>
<td>17%  (4/23)</td>
</tr>
</tbody>
</table>
CONCLUSION I

Pulmonary embolism rarely occurs during laparoscopic gastric bypass

CONCLUSION II

Prophylactic IVC filters are probably not required for patients with a BMI > 55 undergoing laparoscopic gastric bypass

RECOMMENDATION

IVC Filter Placement

<table>
<thead>
<tr>
<th></th>
<th>Laparoscopic</th>
<th>Open</th>
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<tbody>
<tr>
<td>DVT</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>PE</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Pulm HTN</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>BMI &gt; 55</td>
<td>No</td>
<td>Yes</td>
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From the Society for Clinical Vascular Surgery

The incidence of pulmonary embolism in open versus laparoscopic gastric bypass

Nicholas J. Gargiulo III, MD, Frank J. Veith, MD, Evan C. Lipsitz, MD, William D. Suggs, MD, Takao Ohki, MD, PhD, Elliot Goodman, MD, Pratt Vemulapalli, M.D., Karen Gibbs, M.B., and Jaba Teliavou, Bronx, NY


IVC placement in laparoscopic BMI > 55 kg/m²

No change in PE rate
**RECOMMENDATION**

<table>
<thead>
<tr>
<th>IVC Filter Placement</th>
<th>Laparoscopic</th>
<th>Open</th>
<th>Robotic</th>
</tr>
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<tbody>
<tr>
<td>DVT</td>
<td>Yes</td>
<td>Yes</td>
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**OBJECTIVES**

Determine long term sequelae of IVC filter placement in morbid obese patients undergoing gastric bypass procedures.

**Indications For IVC Filter Placement in Gastric Bypass Patients**

- BMI > 55 kg/m²*
- DVT/Venous Stasis
- PE
- Pulmonary Hypertension
- Hypercoagulable states
* Gargiulo, Veith, Lipsitz et al., JVS, 2006

**Strategies for IVC Filter Placement in the Morbid Obese Patient**

- Heavy duty 6500 Skytron table
- Retraction of abdominal pannus
- Ultrasound guidance
- Selective catheterization of left and right renal veins
8 YEAR PERIOD
• 571 patients open gastric bypass
• 58 IVC Filters
• Operating Room
• Femoral Percutaneous Approach
• Portable Imaging System

IVC Filters
• Trapease (35)
• Simon-Nitinol (9)
• Greenfield (2)
• Bard Recovery (12)
Bard Recovery Filter

Greenfield Filter

Follow-up
- History
- Physical Exam
- KUB
- Duplex

Filter Malposition
- IVC Filter Tilt
- IVC Filter Migration

Thrombotic Events
- Deep Venous Thrombosis
  1/58
- Pulmonary Embolus
  0/58
- IVC Thrombosis
  1/58

Deep Venous Thrombosis (Insertion-Related)
One Patient
Rx with IV Heparin and Coumadin
Dx Prothrombin 20210 gene mutation
**IVC Thrombosis**

**One Patient**

IVC thrombosis with *phlegmasia*

Rx B/L above knee amputations

Died 3 months later

**Conclusion I**

IVC filter placement in morbid obese patients is safe (56/58 patients without long-term complications)

**Conclusion II**

Patients with hypercoagulable disorders and complications related to the gastric bypass procedure may be managed with more aggressive anticoagulation strategies