Surgical Considerations in the Morbidly Obese Patient

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Objectives

1. Discuss pre-operative optimization
2. Describe tools for intra-operative surgical management
3. Identify methods to address obesity management
4. Review the impact of obesity on overall health and the economy

Disclosures

- Advisory board/Consultant
  - Clovis
  - AstraZeneca
  - Iovance
- Data monitoring committee
  - Genentech
Surgical Considerations in the Morbidly Obese Patient

Introduction
- Currently, in the United States
  - 39.6% of all adults are obese
  - 41.6 million women (38.3%) are obese
  - 40.2% of middle aged and 37% 60 and over
  - 6.6% are morbidly obese (BMI over 40)

Introduction
- Associated with ~280,000-400,000 deaths/year
- 2nd most common cause of preventable death
- Life expectancy
  - Rate of death is 20-50% higher in the overweight
  - 6-7 years lower in obese vs non-overweight
  - 30% increase in overall mortality for each 5 kg/m^2 increase in BMI

Obesity Trends 2018

The impact of obesity in the US

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Surgical Considerations in the Morbidly Obese Patient

The morbidity of obesity
- Psychosocial dysfunction
- Stroke
- Dementia
- Sleep apnea
- Asthma
- Diabetes mellitus
- Kidney disease
- Dyslipidemia
- Circulatory thromboembolic disease
- Incontinence
- Infection/skin changes
- Osteoarthritis
- Gout
- Cancer

Obstetric morbidity
- Pregnancy loss/recurrent miscarriage
  - Congenital anomalies/stillbirth
  - Maternal medical co-morbidities
    - Cardiac dysfunction, sleep apnea, gestational diabetes, fatty liver disease, pre-eclampsia
  - Increased risk of c-section, endometritis, wound complications
  - Neonatal injury

Malignant obesity
- 357,900 estimated cases of US cancers that are preventable each year
  - Obesity related
    - Endometrial
    - Esophageal
    - Colorectal
    - Breast
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Malignant obesity
- Obesity increases the likelihood of dying from cancer overall

Accounts for 20% of cancer deaths in women

Surgical considerations and challenges

Preoperative considerations
- Is surgery necessary?
- Are there alternative options?
- Can surgery be delayed to allow for pre-operative optimization?
- Specific risks
  - Discuss priorities of procedure
    - E.g., omitting lymph node dissection
  - How do we address obesity after surgery?
Cardiac considerations

- Coronary disease
  - 20% increased risk for each 5 kg/m² higher BMI
  - Higher risk with 1 waist circumference and waist-to-hip ratio
- Heart failure in women
  - Obesity attributes to 14% of cases
  - Increased risk of 20% for each 5 kg/m² higher BMI
  - Risk increases 7% in women for each 1 kg/m² in BMI >30
- Arrhythmias

Cardiac considerations

- Post-operative myocardial infarctions

<table>
<thead>
<tr>
<th>Type of procedure</th>
<th>Risk of MI</th>
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</thead>
<tbody>
<tr>
<td>Minor surgery</td>
<td>&lt;1%</td>
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<tr>
<td>Uncomplicated abdominal surgery</td>
<td>1-5%</td>
</tr>
<tr>
<td>Emergent/complicated surgery</td>
<td>&gt;5%</td>
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</tbody>
</table>

Cardiac considerations

- Cardiac evaluation
  - ECG
  - Stress test
  - Echocardiogram (ejection fraction)
  - Cardiology consultation
- Preoperative anesthesia consult
  - Regional versus general anesthesia
  - Volume replacement
Airway/pulmonary management
- Difficult intubation/ventilation
  - May be exacerbated by surgical approach/positioning
  - Decreased neck mobility, narrowing of pharyngeal space
- Respiratory complications
  - Obstructive sleep apnea (OSA)
  - Rate of OSA is ~43% in patients with BMI > 40
  - Associated with respiratory complications

Pulmonary management
- In general, consider supplemental oxygen in high risk patients
  - BMI > 40
  - ASA score of 3 or higher
  - Snoring history
- Unknown benefit of screening for sleep apnea
- Routine pulmonary function tests are not recommended

Diabetes mellitus
- Over 80% attributable to obesity
  - 2.5x risk with weight gain of 5 - 10 kg
  - 6x risk with BMI > 35
- Tight glycemic control can reduce hospital stay
- Consider pre-operative hemoglobin A1C
- In diabetics or high risk patients
Surgical Considerations in the Morbidly Obese Patient

Miscellaneous preoperative considerations

- Possible need for intensive care or stepdown unit
- Physical deconditioning
  - Discuss physical activity prior to surgery
  - Plan for rehabilitation postoperatively

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Antibiotic prophylaxis

<table>
<thead>
<tr>
<th>Group</th>
<th>Cefazolin (mg/kg)</th>
<th>Tissue level (µg/ml)</th>
<th>Bactericidal level in skin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Incision</td>
<td>Closure</td>
</tr>
<tr>
<td>Normal</td>
<td>1 g IV</td>
<td>6.0</td>
<td>4.1</td>
</tr>
<tr>
<td>Obese</td>
<td>1.7</td>
<td>1.98</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 g SQ</td>
<td>0.96</td>
<td>1.74</td>
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<tr>
<td></td>
<td>1 g IV*</td>
<td>4.0</td>
<td>2.03</td>
</tr>
<tr>
<td></td>
<td>2 g IV*</td>
<td>7.3</td>
<td>4.1</td>
</tr>
</tbody>
</table>

* 2 g over 80 kg and 3 g over 120 kg (cefazolin)
Surgical Considerations in the Morbidly Obese Patient

**Surgical approach**

- **Vaginal approach**
  - Better outcomes
  - Fewer complications
  - Lowest risk, recommended
  - Exposure/access may be impeded

ACOG committee opinion 619;2015

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**Surgical approach**

- **Laparotomy**
  - Selection of the incision
    - Midline/Transverse
    - Skin traction
  - Avoid area under panniculus
  - Concomitant panniculectomy

ACOG committee opinion 619;2015

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**Surgical approach**

- **Minimally invasive approach**
  - Comparable outcomes
  - Decreased perioperative complications
  - Increased procedure time
  - Increased cardiopulmonary management challenges
  - Use bony landmarks

ACOG committee opinion 619;2015.

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Surgical Considerations in the Morbidly Obese Patient

Surgical positioning

- Know the table capacity
- Have patient position herself
- Adequate padding
  - Reduce risk of pressure ulcers
  - Don’t forget about the arms
- Trendelenberg position
  - Base/pad to stabilize patient
  - Slow tilt will allow the body to acclimate to ventilation

Surgical positioning devices

Pink pad®

TrendGuard®

Lithotomy positioning

- Candy cane-shaped stirrups
  - More operating space
  - May lead to extreme knee and hip abduction
- Boot-type stirrup (Bariatric stirrups)
  - Better lower extremity alignment and safety
  - Less maneuverability
  - Decreased surgical site access
  - Use additional padding to avoid neural injuries
Surgical Considerations in the Morbidly Obese Patient

Surgical Instruments
- Instrument mobility may be affected by thickness of the abdominal wall
  - Optimize exposure

Abdominal Wall Complications
- Obesity has higher rates of the following:
  - Surgical site infections
  - Wound separations
  - Hernias
  - Fascial closure
    - Continuous mass closure favored over interrupted
    - Less wound complications
    - Decreased operative time

Subcutaneous/Skin Complications
- Subcutaneous closure during C-section
  - Wound disruption 14.5% versus 26.8%
  - Seroma 5.1% versus 17.2%
- Drain placement
  - Inconclusive results but likely no difference
- Skin closure (suture versus staples)
  - Suture closure was associated with a 57% decrease in wound complications
  - Overall, inconclusive studies

References:
- Novetsky. Gynecol Oncol. 2014.
**Post-operative considerations**

**Surgical site infections**

- Approximately 274,000-600,000 cases/year
  - Longer hospital stays
  - Higher readmission rates
  - Excess cost of ~$10,000/patient
  - Intra-operative efforts to reduce rates
  - Preoperative antibiotics
  - Skin antisepsic agents
  - Chlorhexidine-alcohol

References:

**Prevention/reduction techniques**

- Perioperative glycemic control
  - Increased risk with every 40 point increase
- Perioperative normothermia
- Decreased wound infection and lower length of stay
- Perioperative oxygenation
- Improved infection rate with FiO2 of 80% compared to 35%
- Proper post-operative wound care

References:
Surgical Considerations in the Morbidly Obese Patient

Negative pressure wound therapy
- Applied over an closed incision
  - Lower rate of wound dehiscence and infections
  - Only small studies/case reports published
  - Cost of care: 33% rate reduction for benefit

Venous thromboembolic disease
- Prophylaxis in moderate risk patients
  - Obesity
  - Gynecologic surgery >45 minutes
  - Not at major risk for bleeding
- Recommended regimens
  - Low molecular weight heparin
  - Low-dose unfractionated heparin OR
  - Mechanical prophylaxis with intermittent pneumatic compression

Managing obesity
- Address with patients as early as possible
  - BMI >25
- Assess the patient’s readiness
- Build a partnership to promote change
- Discuss medical benefits
  - Cancer is a teachable moment
- Provide resources and encouragement
Online resources
- www.cancer.org/healthy/eathealthylgetactive/  
- www.acefitness.org/acefit/  
- www.heart.org/HEARTORG/GettingHealthy/PhysicalActivity/  
- www.cdc.gov/physicalactivity/everyone/guidelines  
- www.choosemyplate.gov  
- www.eatright.org  
- www.livestrong.org  
- www.aicr.org

Addressing obesity
- Discuss potentially protective interventions  
  - Contraceptive counseling  
    - Birth control pills  
    - Levonorgestrel intra-uterine device

Addressing Obesity
- Surgical intervention: Bariatric surgery  
  - Candidates  
    - BMI ≥ 40 kg/m2 or > 35 kg/m2 with comorbidities  
    - Failed attempts at diet and exercise  
    - Free of psychological disease  
    - Well informed and motivated
**Bariatric surgery**

- In 2008, 220,000 people had weight loss surgery
  - Less than 1% of eligible candidates
  - Complication rate ~20%, mortality rates 0.1%-1.1%
  - Most successful method of weight loss
  - Results in improvement/resolution of co-morbidities (60-80%)
  - Improved quality of life

**Impact of bariatric surgery on Ob/Gyn**

- Pregnancy outcomes
  - Should wait until stabilization of weight loss
  - Lower rates of gestational diabetes
  - Ensure nutritional supplementation (reports of neural tube defects)
- Fertility outcomes
  - Improved fertility rates (contraceptive counseling)
  - Improved outcomes associated with assisted reproductive technology

**Impact of bariatric surgery on Urology**

- Gynecology outcomes
  - Improvement in urinary incontinence and quality of life
- Oncology outcomes
  - After bariatric surgery, 71% reduced risk for uterine malignancy
The cost of obesity

- Overall economic impact is ~$200 billion/year
- ~10% of all health care costs
- Increased cost in obese population
  - Inpatient
  - Outpatient
  - Pharmaceutical
  - Disability/sick leave

Facilities and equipment

- Per hospital, accommodating the obese can cost $500,000/year
  - Specialized equipment (OR tables, instruments)
  - Remodeling facilities (doorways, furniture, etc.)
  - Increased storage space
  - Widened doorways and hallways
  - Operating room tables/motorized lifts

Impact of obesity on health care personnel
Impact of obesity on health care personnel
- Specialized lift equipment/minimal lift policies
  - Designated lift teams
  - Use of mechanical lifts
  - Decreased injury rate by over 41%
  - Improved patient satisfaction rates

Impact of obesity on surgeons
- Operating room/Surgeon impact
  - Prolonged standing/retraction
  - Fixed and awkward positioning
  - Longer cases
  - Moving patients
- Consider exercises breaks in the operating room
  - 60 second stretches every hour

Economic impact of obesity on the surgeon
- Obese patients = increased workload
- Less cases = less RVUs
- Reimbursement are based on complexity of procedures
  - With bundled payments
  - Obesity doubled during this timeframe
  - Bundled payments will reduce reimbursements even more
- We need to be involved in health care policy!
Summary

- Obesity contributes to preventable health sequelae and death
- Surgical intervention requires an understanding of potential risks and "best practices"
- Discuss alternative to surgery and the management of obesity (e.g., weight loss surgery)
- Increasing economic impact of management of obesity needs to be addressed

Thank you!

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