Bariatric Surgery in the Obstetrical Patient

Nicholas M. Brown, M.D.
Wichita Surgical Specialists – General & Bariatric Surgery
Clinical Assistant Professor – KUMC-W Dept of Surgery
Background Info

- Medical School – University of Kansas School of Medicine – 2002-2006
- General Surgery Residency – University of Kansas School of Medicine - Wichita – 2006-2011
- Fellowship in Minimally Invasive, Robotic & Bariatric Surgery – University of Texas Health Science Center at Houston
- Proud son of Dr. Michael Brown
Goals of This Presentation

- Provide an Overview of Bariatric Surgery
  - History & Current Practice
  - Anatomy & Physiology of Post-Bariatric Patients
- Bariatric Surgery in the Obstetrical Patient Population
  - Impact on Fertility & Pregnancy Outcomes
  - Prenatal & Postpartum Care of Post-Bariatric Patients
- Criteria for Bariatric Surgery
  - Which patients are most likely to benefit from bariatric surgery
  - Work-up prior to bariatric surgery
Bariatric Surgery

- **Restrictive Procedures**
  - Laparoscopic Adjustable Gastric Band
  - Sleeve Gastrectomy
  - Molina Band (Fixed Gastric band)
  - Vertical Banded Gastroplasty

- **Malabsorptive Procedures**
  - Biliopancreatic Diversion w/ Duodenal Switch
  - Jujunoileal Bypass
  - Jejnuocolic Shunt

- **Combination Procedures**
  - Roux-en-Y Gastric Bypass
Bariatric Surgery - History

- 1954 First Bariatric Procedure (Kremen & associates) - involved anastomosis of the upper & lower intestine
- 1963 Jejuno-colic Shunt (Payne & Dewind) and the Jejunointestinal bypass
  - Severe diarrhea, dehydration & electrolyte imbalances
- 1967 Gastric Bypass (Mason)
  - 1993 Laparoscopic Roux-en-Y Gastric Bypass Performed (RYGB)
- 1970-80s Molina Band & Vertical Banded Gastroplasty
  - Restrictive Procedures – now a lot of revisions
- 1988 (Hess) Biliopancreatic Diversion w/ Duodenal Switch
  - Still performed today – more morbidity than RYGB
Vertical Banded Gastroplasty (VBG)

Molina Band
What is Overweight and Obesity?

- Most useful measure is BMI (body mass index) which is calculated from height and weight
| HEIGHT IN INCHES | 80  | 90  | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 |
|-----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 48              | 24.4| 27.5| 30.5| 33.6| 36.6| 39.7| 42.7| 45.8| 48.8| 51.9| 54.9| 58  | 61  | 64.1| 67.1| 70.2| 73.2| 76.3|
| 50              | 22.5| 25.3| 28.1| 30.9| 33.7| 36.6| 39.4| 42.2| 45   | 47.8| 50.6| 53.4| 56.2| 59.1| 61.9| 64.7| 67.5| 70.3|
| 52              | 20.8| 23.4| 26   | 28.6| 31.2| 33.8| 36.4| 39   | 41.6| 44.2| 46.8| 49.4| 52  | 54.6| 57.2| 59.8| 62.4| 65   |
| 54              | 19.3| 21.7| 24.1| 26.5| 28.9| 31.3| 33.8| 36.2| 38.6| 41   | 43.4| 45.8| 48.2| 50.6| 53   | 55.4| 57.9| 60.3|
| 56              | 17.9| 20.2| 22.4| 24.7| 26.9| 29.1| 31.4| 33.6| 35.9| 38.1| 40.4| 42.6| 44.8| 47.1| 49.3| 51.6| 53.8| 56   |
| 58              | 16.7| 18.8| 20.9| 23   | 25.1| 27.2| 29.3| 31.3| 33.4| 35.5| 37.6| 39.7| 41.8| 43.9| 46   | 48.1| 50.2| 52.2|
| 60              | 15.6| 17.6| 19.5| 21.5| 23.4| 25.4| 27.3| 29.3| 31.2| 33.2| 35.2| 37.1| 39.1| 41   | 43   | 44.9| 46.9| 48.8|
| 62              | 14.6| 16.5| 18.3| 20.1| 21.9| 23.8| 25.6| 27.4| 29.3| 31.1| 32.9| 34.7| 36.6| 38.4| 40.2| 42.1| 43.9| 45.7|
| 64              | 13.7| 15.4| 17.2| 18.9| 20.6| 22.3| 24   | 25.7| 27.5| 29.2| 30.9| 32.6| 34.3| 36   | 37.8| 39.5| 41.2| 42.9|
| 66              | 12.9| 14.5| 16.1| 17.8| 19.4| 21   | 22.6| 24.2| 25.8| 27.4| 29   | 30.7| 32.3| 33.9| 35.5| 37.1| 38.7| 40.3|
| 68              | 12.2| 13.7| 15.2| 16.7| 18.2| 19.8| 21.3| 22.8| 24.3| 25.8| 27.4| 28.9| 30.4| 31.9| 33.4| 35   | 36.5| 38   |
| 70              | 11.5| 12.9| 14.3| 15.8| 17.2| 18.7| 20.1| 21.5| 23   | 24.4| 25.8| 27.3| 28.7| 30.1| 31.6| 33   | 34.4| 35.9|
| 72              | 10.8| 12.2| 13.6| 14.9| 16.3| 17.6| 19   | 20.3| 21.7| 23.1| 24.4| 25.8| 27.1| 28.5| 29.8| 31.2| 32.5| 33.9|
| 74              | 10.3| 11.6| 12.8| 14.1| 15.4| 16.7| 18   | 19.3| 20.5| 21.8| 23.1| 24.4| 25.7| 27   | 28.2| 29.5| 30.8| 32.1|
| 76              | 9.74| 11   | 12.2| 13.4| 14.6| 15.8| 17   | 18.3| 19.5| 20.7| 21.9| 23.1| 24.3| 25.6| 26.8| 28   | 29.2| 30.4|
| 78              | 9.24| 10.4| 11.6| 12.7| 13.9| 15   | 16.2| 17.3| 18.5| 19.6| 20.8| 22   | 23.1| 24.3| 25.4| 26.6| 27.7| 28.9|
| 80              | 8.79| 9.89| 11   | 12.1| 13.2| 14.3| 15.4| 16.5| 17.6| 18.7| 19.8| 20.9| 22   | 23.1| 24.2| 25.3| 26.4| 27.5|
| 82              | 8.36| 9.41| 10.5| 11.5| 12.5| 13.6| 14.6| 15.7| 16.7| 17.8| 18.8| 19.9| 20.9| 22   | 23   | 24   | 25.1| 26.1|
| 84              | 7.97| 8.97| 9.96| 11   | 12   | 13   | 13.9| 14.9| 15.9| 16.9| 17.9| 18.9| 19.9| 20.9| 21.9| 22.9| 23.9| 24.9|
| 86              | 7.6  | 8.55| 9.51| 10.5| 11.4| 12.4| 13.3| 14.3| 15.2| 16.2| 17.1| 18.1| 19   | 20   | 20.9| 21.9| 22.8| 23.8|

http://www.bmicharts.net

Underweight: 17.5 - 18.4 Severely Underweight < 17.5
How is obesity diagnosed?

BMI:
- 18.5-24.9: Normal Weight
- 25-29.9: Overweight
- 30-39.9: Obese
- 40 and above: Extreme Obese
Factors Causing Obesity

- Family History and Genetics
- Environment
- Metabolism (the way your body digests food)
- Behavior and Habits
Other Causes

- Inactive Lifestyle
- Environment
- Health Conditions
- Medication (steroids, antidepressants)
- Emotional Factors
- Lack of Sleep (prefer eating more calories) Ghrelin goes up and Leptin goes down)
What are the risks of overweight and obesity?

- Coronary Heart Disease
- High Blood Pressure
- Diabetes Type 2
- Sleep Apnea
- Hyperlipidemia
- Asthma
- Stress Urinary Incontinence
Other Risks

- Menstrual Irregularities
- Infertility
- Arthritis
- Cancer
- Gallstones
- Hypoventilation Syndrome
Morbid Obesity Treatment

- Lifestyle and Behavioral Changes (record keeping, environmental control)
- Calorie and Portion Reduction (meal Replacements)
- Physical Activity
- Medication (Meridia, Alli, Xenical, Belviq/Qsymia, Metformin)
- Over the counter Products (Ephedra, Chromium, Diuretics, Hoodia)
- Weight Loss Surgery
Gastric Bypass Weight Loss
January 2013

• 1 Year     72.1% EBWL
             101.1 Lbs.

• 2 Years    76.2% EBWL
             109.3 lbs
Co-Morbid Condition Improvement or Resolution:
2 Years after Gastric Bypass

- Diabetes 96.6% improved or resolved
- High Blood Pressure 97.1%
- High Cholesterol 97.1%
- Sleep Apnea 85.6%
Gastric Banding Weight Loss

- 1 Year 26.5% EBWL
  33 lbs. lost

- 2 Year 32.7% EBWL
  41.7 Lbs. lost
Co-Morbid Condition Improvement and Resolution:
2 Years after Gastric Banding

- Diabetes 91.7% improved or resolved
- High Blood Pressure 83.3%
- High Cholesterol 86.4%
- Sleep Apnea 69.2%
Sleeve Gastrectomy Weight Loss

- Literature quotes 65-75% EBWL & some studies show near equivalent weight loss to RYGB
Bariatric Surgery

- 3 Most Common Procedures Done Today

Laparoscopic Adjustable Gastric Band (LAGB)

Laparoscopic Vertical Sleeve Gastrectomy (VSG)

Laparoscopic Roux-en-Y Gastric Bypass (RYGB)
Laparoscopic Adjustable Gastric Band

- Silicone band placed around the upper part of the stomach
- Creates a small pouch to limit food intake
- Diameter of the band outlet is adjustable
- Inner lining (balloon) filled with fluid by injection through a port under skin.
LAGB - Benefits

- Relatively safe
- Short recovery period
- Major complication rate is low
- No opening or removal of any part of the stomach or intestines
- No altering of the natural anatomy
- Same-day surgery
LAGB - Risks

- Balloon leakage
- Band erosion/migration
- Port Infection
- Multiple Adjustments
- Slower weight loss
- Pouch and esophageal dilation
- 20-40% revisional rate at 5 years
Sleeve Gastrectomy

- Restrictive procedure that limits the amount of food you can eat by reducing the size of the stomach
- During this procedure a thin verticle sleeve of stomach is created using a stapling device
- Hold about 50-150 ml and is about the size of a banana
- The excised portion of the stomach is removed
Sleeve Gastrectomy - Risks

- Hemorrhage
- Staple line leak
- Ulcers
- GERD
- Nonreversible since part of the stomach is removed
Roux-en-Y Gastric Bypass

- Most common bariatric procedure: restrictive and malabsorbtive
- Small portion of the stomach divided off
- 15-30ml pouch reduces food intake
- Feeling of fullness occurs after a few bites
- Feeling of satisfaction, less Ghrelin
- Hormone alterations – GLP-1 impact on blood sugar
RYGB - Benefits

- Restrictive and malabsorbtive: greatly controls food intake by several mechanisms
- Can improve diabetes
- Dumping syndrome---conditions person to control intake of sweets and fats
- “Gold Standard” in obesity operations
- Satisfaction as well as fullness, less Ghrelin
- Done laparoscopically
RYGB - Risks

- Staple line failure and leaks
- Ulcers in the stomach pouch
- Narrowing/blockage of the openings (stoma)- strictures
- Bowel Obstructions
- Vitamin and Mineral Deficiencies
Fertility & Pregnancy after Bariatric Surgery

- 80% of Bariatric Procedures Performed in Women
  - ½ of these women are reproductive age
- Clinical implications largely based on type of procedure (restrictive vs. malabsorptive)
  - LAGB – can be adjusted to help manage pregnancy related N/V & prevent excessive gestational weight loss
  - Restrictive procedures at increased risk for gastric ulceration from NSAIDs
  - Restrictive-malabsorptive procedures reduce absorption
    - Closely monitor antibiotic & anticoagulant levels.
Subfertility in women commonly related to ovulatory dysfunction

- In obese women this is related to PCOS.
- Even among ovulatory women, increasing obesity is associated with decreasing spontaneous pregnancy rates and increased time to pregnancy.
- Mechanism may be related to adverse effects of elevated insulin levels on ovarian function.
  - There is data that metformin treatment of obese women with infertility due to PCOS induces ovulation.
- Obesity is also associated with a reduced response to fertility treatment.

**Obesity & Impact on Fertility**
Both nonsurgical and surgical weight loss can improve fertility.

Return to fertility can be rapid
- One series showed return to normal menstrual cycles after a mean of $3.4 \pm 2.1$ months postoperatively

Post-surgical weight loss improves the multiple hormonal changes related to PCOS
- 2006 University of Pennsylvania – 70/98 anovulatory women regained normal menstrual cycles after surgery

Bariatric surgery is not primary treatment of infertility in severely obese women.
Bariatric Surgery & Fertility

- **Timing of Conception**
  - Delay Pregnancy for 12 to 18 months following surgery
    - Optimizes weight loss during rapid phase
    - Reduce adverse effect of nutritional deficiencies
  - Women who conceive earlier than this should be reassured of a likely favorable pregnancy outcome

- **Contraception**
  - RYGB can reduce absorption of oral contraceptives
  - ACOG recommends using non-oral forms of hormonal contraception in women who have undergone malabsorptive bariatric surgery and desire hormonal contraception
Candidates for Bariatric Surgery

• NIH Guidelines
  • BMI greater than 40
  • BMI greater than 35 with comorbidities (diabetes, high blood pressure, etc.).
• 18 years of age or older.
• Patient unable to lose weight and keep it off through traditional methods like diet and exercise.
• Patient does not have medical conditions that could cause serious complications during or after surgery.
• Patient ready to commit to a healthy, active lifestyle.
Bariatric Surgery & Pregnancy Outcomes

- Bariatric Surgery & obesity associated adverse outcomes:
  - Miscarriage: may reduce risk
  - Gestational Diabetes (GDM): lower prevalence than obese women who have not had bariatric surgery
    - 2008 retrospective study showed lower prevalence of GDM (17.3 vs 11.0 percent)
    - Women with a hx of T2DM may become euglycemic following surgery and remain so during pregnancy
  - Preeclampsia: following surgery risk may fall to that of the general obstetrical population
Bariatric Surgery & Pregnancy Outcomes

- Bariatric Surgery & obesity associated adverse outcomes:
  - Preterm Delivery: May lower the frequency of medically indicated preterm birth
  - Birthweight: Reduction in birthweight resulting in larger % of AGA infants than obese women who have not undergone surgery & decreasing LGA infants
    - Observational studies have shown increased rates if IUGR & SGA infants (inconsistent data)
  - Neural Tube Defects: no difference between general population
Bariatric Surgery & Prenatal Care

- Micronutrient Supplementation:
  - Metabolic & Nutritional Deficiencies – particularly after malabsorptive procedures (iron, folate, vitamin B12, calcium & vitamin D)
  - Risk reduced by tailoring supplementation to type of surgery – specifically for RYGB
    - Vitamin B1 (Thiamine) – 1.4 mg QD
    - Vitamin D 400 IU QD
    - Vitamin K 120 mcg
    - Zinc 11 mg
    - Biotin 30 mcg
Bariatric Surgery & Prenatal Care

- Micronutrient Supplementation:
  - Risk reduced by tailoring supplementation to type of surgery – specifically for RYGB (continued)
    - Iron 65 mg
    - Folate 800 mcg
    - Calcium citrate 1200 mg
    - Vitamin B12: oral or sublingual: 350 to 500 mcg/day, intramuscular: 1000 mcg/week, intranasal: 500 mcg/week
  - Can typically be met with PNV in addition to calcium & vitamin B12 supplementation
Bariatric Surgery & Prenatal Care

• Micronutrient Supplementation:
  • Lab before conception or at 1st prenatal appt:
    • CBC
    • Ferritin
    • Iron
    • Vitamin B12
    • Thiamine
    • Folate
    • Calcium
    • Vitamin D
  • Deficiencies should be corrected and monitored with monthly assessments.
Gestational Diabetes

- Screening at 24-28 weeks of gestation (sooner if high degree of suspicion)
- Typical glucose challenge test not well tolerated in RYGB pts due to dumping syndrome
  - Alternative is fasting and post-breakfast blood sugars for 1 week
  - Another option is measuring Hgb A1C & assume diabetes is present if >6.5
- Treatment – if using oral anti-hyperglycemic agents they may not be completely absorbed
Monitoring for Complications

- **Bowel Obstruction**
  - Most cases involved women who had RYGB and internal herniation
  - Band slippage has also been reported

- **Cholelithiasis**
  - Increased in pregnancy and following rapid weight loss
Monitoring for Complications

- **Gestational Weight Gain**
  - Should adhere to Institute of Medicine guidelines
  - Caloric restriction during pregnancy is not recommended as it might impair fetal growth
  - Women who are not achieving the minimum weight gain standards suggested by the IOM (0.5 pound [0.23 kg]/week for obese women in the second and third trimester) should undergo US evaluation of fetal growth and dietary consultation
  - In LAGB pts, band can be loosened to increase oral intake
Monitoring for Complications

- Postpartum
  - Micronutrient supplementation and screening should continue in women who breastfeed
  - Breastfed infants also run the risk of nutritional deficiencies
Surgery: A Major Addition to Morbid Obesity Treatment

- Surgery: a “Tool” to use and not a “Cure”
Preoperative Work-up Process

- **Via Christi Surgical Weight Loss Program**
  - Kate Jantz, ARNP – Program Coordinator
  - Shelly Ewertz – Patient Advocate
  - [www.viachristiweightmanagement.com](http://www.viachristiweightmanagement.com)
  - Have bimonthly seminars

- **Wesley Surgical Weight Loss Program**
  - Amanda Page, RN, BSN – Bariatric Coordinator
  - [www.wesleyweightloss.com](http://www.wesleyweightloss.com)
Following the intake with either program, the patient’s are referred to either Dr. Howes, Dr. Lancaster or myself for an office H&P

- EGD
- Baseline Lab
- Educational Classes
- Psychiatry Consultation
- Nutrition Consultation
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Questions?