



**IN THE SUPER-OBESE, BILIOPANCREATIC  
DIVERSION/DUODENAL SWITCH ELIMINATES VARIATION BY  
SEX OF CO-MORBIDITY RESOLUTION BUT NOT WEIGHT AND  
BMI: ANALYSIS OF 1,673 PATIENTS**

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# Disclosure Statement

- No financial Interest to disclose

# Introduction

- Previous investigations identified differences in weight and clinical characteristics between obese women and men
- We have reported significant variation by sex in weight, BMI, and weight-related medical problems among super-obese women and men pre-operative for BPD/DS
  - BATTLE OF THE SUPER OBESE SEXES: FEMALE VERSUS MALE VARIATION IN PRE-OPERATIVE CLINICAL CHARACTERISTICS AMONG 1,673 SURGICAL PATIENTS UNDERGOING BILIO-PANCREATIC BYPASS/DUODENAL SWITCH (BPD/DS)
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- In the medically fragile super-obese, whether or not post-operative responses to BPD/DS also vary by sex is unknown

# Objective

- To identify variations in outcomes between women and men who underwent BPD/DS

# Methods

- **Setting:** Participating Surgical Review Corporation Centers of Excellence in Bariatric Surgery, June 2007 through December 2010
- **Exposure:** De-identified patients were evaluated before and after undergoing BPD/DS
- **Main Outcomes and Measures:** Super-obese men and women differ at baseline in body mass and obesity co-morbidities, but these variations may be altered by BPD/DS.

# Methods

- Pre-operative and follow-up data at 2, 6, 12, 18 and 24 months after surgery on 1,673 BPD/DS patients
  - From the Surgical Review Corporation's BOLD database
- Retrospective analysis in two groups:
  - Women (n=1,217) and Men (n=456)
- Data included the following:
  - Weight, BMI, and 29 weight-related medical conditions
- Continuous variables were analyzed using ANOVA with baseline and treatment in the model
- Dichotomous variables were examined by a general linear model with baseline and treatment in the model
  - Modified for binomial distribution

# Weight Loss

- Males weighed more both pre- and post-operatively as well as had higher BMI
- Total weight loss was higher for males vs. females at 2, 4, 6, 12, 18, and 24 months
  - Weight and BMI remained higher

# Cardiovascular

- At pre-operative baseline, congestive heart failure, hypertension, ischemic heart disease, and dyslipidemia were increased in men
- These variations by sex disappeared by 12 months
- Women were not higher in any cardiovascular parameter

# Pulmonary

- Pulmonary variation:
  - Men increase in OSA through 12 months
  - Female increased asthma through 18 months
- No cardiopulmonary variation persisted to 24 months

# Endocrine and Metabolic

- Increased male diabetes and gout compared with women at baseline
  - resolved by 12 months

# Abdominal and Hepatobiliary

- Female:
  - Baseline abdominal panniculitis, cholelithiasis, GERD, and stress urinary incontinence ( $p < 0.01$ ) were higher than were those characteristics among men
  - Abdominal panniculitis was higher through 12 months
  - GERD remained dominant through 18 months
  - Stress urinary incontinence persisted increased through 24 months
- Male:
  - Higher baseline liver disease
  - Resolved by 12 months

# Somatic

- Back pain, impaired functional status, lower extremity edema, and musculoskeletal pain did not vary by sex
- Increased female fibromyalgia
  - Resolved by 12 months

# Psychological and Behavioral

- Women:
  - Increased depression
    - Resolved after 12 months
  - Mental health diagnosis and psychological impairment higher through 18 months
- Support group attendance was high in women only at 6 months
- Alcohol consumption was higher for men through 18 months

# No variation by sex

- Race
- Abdominal hernia
- Angina
- Back pain
- DVT/PE
- Impaired functional status
- Lower extremity edema
- Musculoskeletal pain
- Obesity hypoventilation syndrome
- Peripheral vascular disease
- Pseudotumor cerebri
- Psychomotor impairment
- Pulmonary hypertension
- Substance/tobacco abuse

# Results

- Female:
  - Baseline abdominal panniculitis, asthma, cholelithiasis, GERD, stress urinary incontinence, depression, fibromyalgia ( $p < 0.01$ ) and mental health diagnosis ( $p < 0.05$ ) ( $n=8$ ) were higher than were those characteristics among men
- Male:
  - Alcohol use, congestive heart failure, hypertension, ischemic heart disease, dyslipidemia, obstructive sleep apnea, diabetes, gout ( $p < 0.01$ ), liver disease and unemployment ( $p < 0.05$ ) ( $n=10$ ) were higher than female

# Results

- At baseline, 12 months ( $p < 0.0001$ ), and 24 months ( $p < 0.01$ ):
  - Male weight and BMI were higher than female
- At 12 months:
  - Male sleep apnea, alcohol use, and gout remained significantly higher than females
  - Female panniculitis, asthma, mental health diagnosis, depression, psychologic impairment, and stress incontinence remained higher than males
- At 24 months, only stress urinary incontinence varied by sex

# Conclusion

- Pre-operative female versus male variations in weight and BMI remain significant after BPD/DS
- Eighteen obesity co-morbidities varied by sex pre-operatively
  - At twelve month following BPD/DS 18 were reduced to 9
  - At twenty-four months all variations by sex were eliminated, except for 1
- Among the super-obese, in long-term outcomes men and women benefit equally from BPD/DS

# Any Questions?

