Bariatric surgery: Impact on Co-morbidities and Weight Loss Expectations

ALIYAH KANJI, MD FRCSC

MIS AND BARIATRIC SURGERY

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Disclosures

- None

Objectives

- Review expected weight loss from various procedures
- Methods of calculating weight loss after surgery
- Sustainability of weight loss
- Resolution of co-morbidities

Rationale for surgery

- 1991 NIH Consensus Conference
  - “Dietary weight reduction with or without behavioral modification or drug therapy had an unacceptably high incidence of weight regain in the morbidly obese within two years of maximal weight loss.”

NIH consensus statement, 1991

- Indications for bariatric surgery
  - BMI>40
  - BMI 35-40 with significant obesity related co-morbidities (sleep apnea, HTN, DM)
  - Other possible indications for patients with BMI's between 35 and 40 include obesity-induced *physical* problems interfering with lifestyle
    - joint disease treatable but for the obesity,
    - body size problems precluding or severely interfering with employment, family function, and ambulation
  - Unsuccessful attempt at weight loss by non-operative means
  - Well-informed, highly motivated patients after evaluation by multi-disciplinary team including medical, surgical, psychiatric and nutritional expertise
  - No medical contraindications

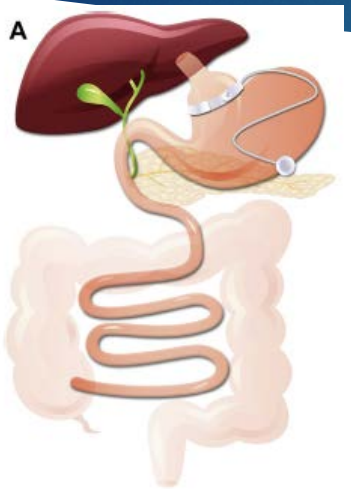
Medical Sequelae of Obesity

- Hypertension
- Lipid disorders
- Diabetes
- Ischemic heart disease
- Cardiomyopathy
- Pulmonary hypertension
- Asthma
- Hypoventilation syndromes
- Obstructive sleep apnea
- Gallstones
- NASH (Non-alcoholic steatohepatitis)
- Urinary incontinence
- Gastroesophageal reflux
- Arthritis – weight bearing
- Low back pain
- Infertility and menstrual problems
- Obstetric complications
- DVT and thromboembolism
- Depression
- Immobility
- Breast/bowel/prostate/ endometrial cancer
- Venous/stasis ulcers
- Accident prone

Obesity Epidemic: Facts for Alberta

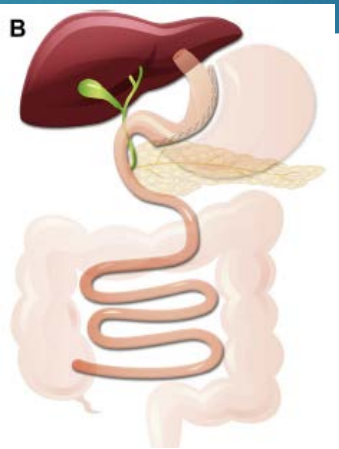
- 1 million overweight or obese (1/3 population)
- Obesity linked to 22 chronic diseases
  - 90% of type 2 diabetics
  - 30% of cancers
  - 80% of cardiovascular disease
- Direct and indirect costs $1.27 billion per annum
- 2500 Albertans candidates for bariatric surgery
- Approaching 700 procedures/yr

Expeced weight loss for various surgeries



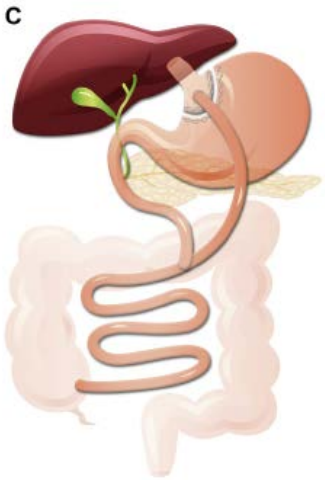
Adjustable gastric band (restrictive)
An inflatable band is used to create a small pouch, which limits food consumption

Weight loss: 15–20%



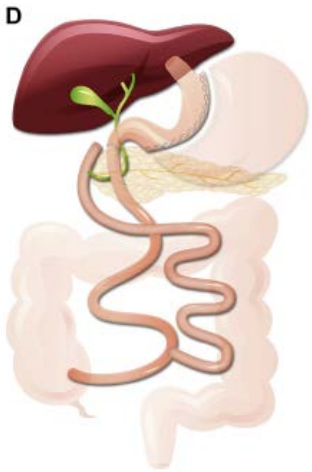
Vertical sleeve gastrectomy (restrictive)
Permanently removes most of the stomach, leaving a sleeve-shaped pouch; results in ↓ ghrelin (hunger hormone)

Weight loss: 25–30%



Roux-en-Y gastric bypass (restrictive & malabsorptive)
Creates a smaller stomach and bypasses part of the intestine; results in ↑ GLP-1 (satiety hormone)

Weight loss: 27–33%



Bileopancreatic diversion (restrictive & malabsorptive)
Similar to Roux-en-Y.
A variant called a duodenal switch retains the pyloric valve

Weight loss: 34%

1. Piche et al. Can J Cardio. 2015;31:153-166; 2. ASMBS Bariatric Surgery Procedures 2014. Available at: http://asmbs.org/patients/bariatric-surgery-procedures

Estimated weight loss

- RYGB > sleeve gastrectomy > gastric band

(Trastulli et al, 2013)

%EWL:

- LAGB ~ 28.7% - 48%
- LSG ~ 49% - 81%
- LRYGB ~ 62.1% - 94.4%

In initial surgical assessment we say the estimated weight loss in first year for LAGB is around 30-40lbs, LSG 40-60lbs, and bypass 60-80lbs.

Most weight loss occurs in first two years after surgery.

Calculating weight loss

- Ideal body weight
  - Many calculators
  - Factor: age, gender, height
- Excess weight
  - Current weight – IBW = excess weight
- Expected weight loss
  - Excess weight x 0.7 (RNY)

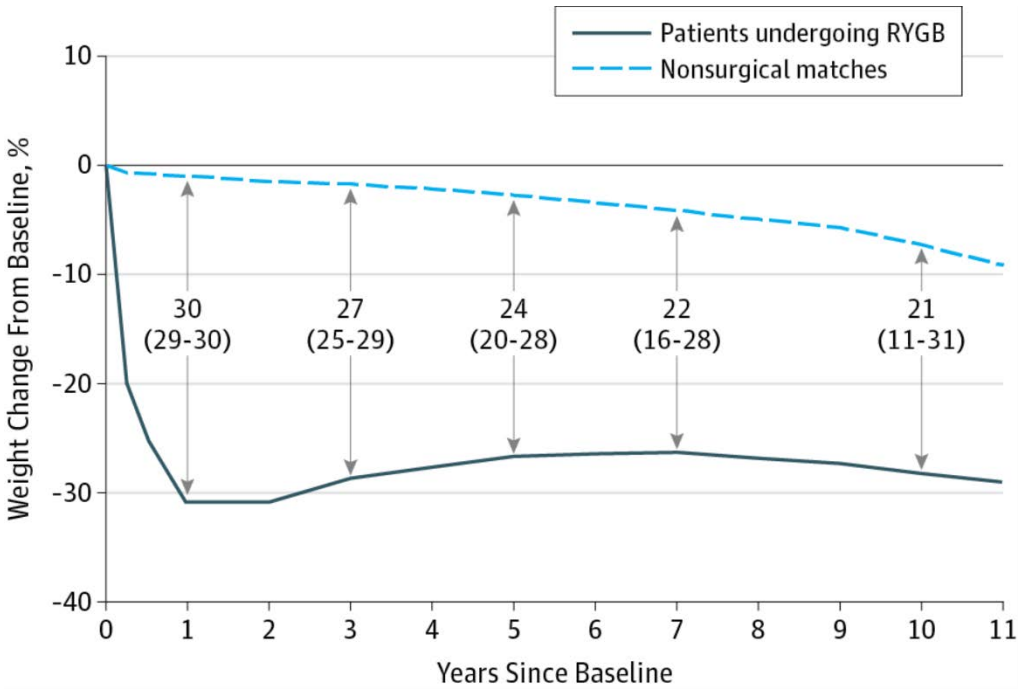
Other methods – calculating weight loss

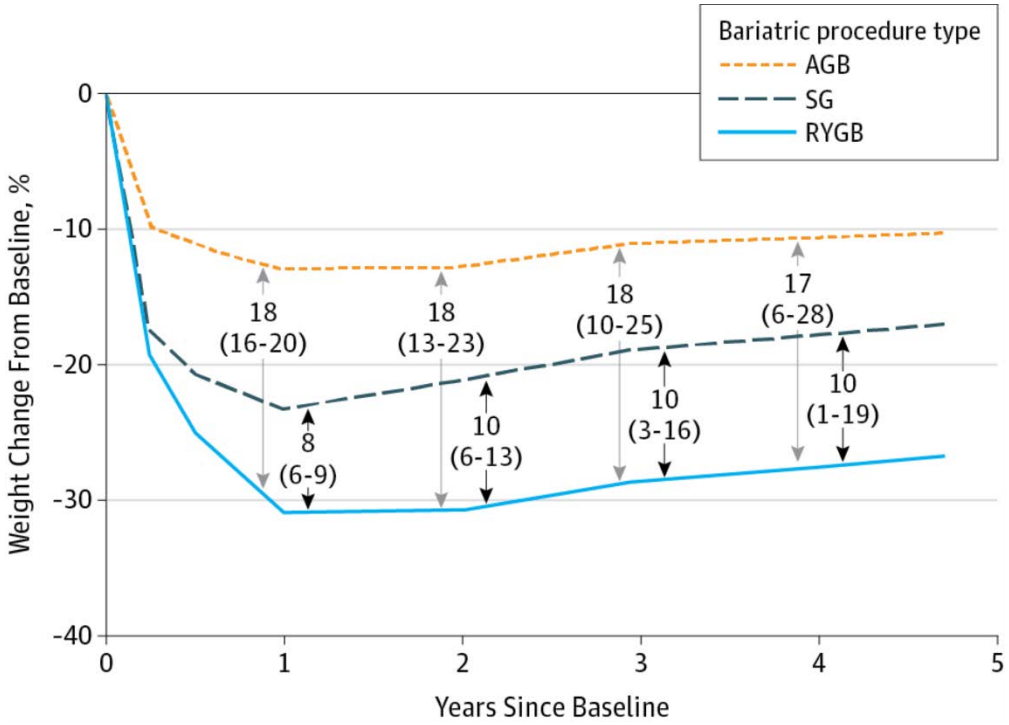
- Weight and height at the time of surgery
- What the patient's weight would be if they were at a BMI of 24.9 (Upper end of "Ideal weight range")
- calculate what losing 50% of that "extra weight" (30-80%)

- Faster method that is sometimes easier to explain to patients is calculating a 20-30% loss from their highest weight (first clinic visit)

- Rapid in first few months, plateaus at **12-18 months**

Is weight loss sustainable?





JAMA Surg 2016

Sleeve vs bypass?

- SM-BOSS – RCT
- 217 patients, BMI 35-61
- No significant weight loss at 1, 2 and 5 years between SG and RNY
- At 5 years:
  - 61.1 % maintained excess BMI loss with SG compared to 68.3% with RNY
- No significant difference in DM remission, dyslipidemia, HTN
- GERD – worse in SG group

Bueter et al, JAMA 2018

Weight loss improves obesity-related comorbidities

Benefits of 5–10% weight loss

- Reduction in risk of type 2 diabetes[1]

- Reduction in CV risk factors[2]

- Improvements in blood lipid profile[3]

- Improvements in blood pressure[4]

- Improvements in severity of obstructive sleep apnea[5,6]

- Improvements in disability (pain & physical function) and health-related quality of life[7,8,9]

1 kg ↓ body weight → **16% RRR in diabetes**[10]

RRR = relative risk diabetes

1. Knowler *et al. N Engl J Med* 2002;346:393–403; 2. Li *et al. Lancet Diabetes Endocrinol* 2014;2:474–80; 3. Datillo *et al. Am J Clin Nutr* 1992;56:320–8; 4. Wing *et al. Diabetes Care* 2011;34:1481–6; 5. Foster *et al. Arch Intern Med* 2009;169:1619–26; 6. Kuna *et al. Sleep* 2013;36:641–9; 7. Warkentin *et al. Obes Rev* 2014;15:169–82; 8. Wright *et al. J Health Psychol* 2013;18:574–86; 9. Christensen *et* al. *Ann Rheum* Dis. 2007;66:433-9; 10. Diabetes Prevention Program Research Group. Lancet. 2009;374:1677-86.

Bariatric surgery and impact on diabetes

- **In 90% of patients**
  - lower blood sugar
  - reducing the dosage and type of medication required
  - Improvement in diabetes-related health problems
- **Remission in 78% of patients**
  - reducing blood sugar levels to normal levels
  - eliminating the need for diabetes medications

- Benefits are sustainable over a number of years

- International Diabetes Foundation (IDF) released a Position Statement (2011) calling for bariatric surgery to be considered early in the treatment of T2DM.

ASMBS

Other co-morbidities

	LAGB	SG	RNY
Diabetes	44%	55%	83%
HTN	44%	68%	79%
Dyslipidemia	33%	35%	66%
Sleep apnea	38%	62%	66%
GERD	64%	50%	70%

Nguyen et al., Ann Surg 2011

Obesity surgery and decreased cancer risk

- Decrease in hormone related cancers (OR 0.23)
  - breast (OR 0·25, 0·19 to 0·33)
  - endometrium (OR 0·21, 0·13 to 0·35)
  - prostate (OR 0·37, 0·17 to 0·76) cancer.
- Largest reduction with gastric bypass
- Possible association increased risk of CRC (OR 2·63, 1·17 to 5·95) with gastric bypass

Markar SR et al, Br J Surg, 2018

Impact on fertility

- PCOS
  - Restored menstrual cycle, lessened hirsutism and hyperandrogenemia, increased ability to conceive at 2 years
- Infertility
  - Menstrual regularity and increased ovulation
  - Delay pregnancy 12-18 months after surgery

Impact on life expectancy

Patients with BMI ≥30kg/m^2 have 50-100% increased risk of premature death

- Bariatric surgery increases lifespan:
  - bypass can increase life expectancy by 89%
  - Risk of premature death reduced by 30-40%
    - 60% ↓mortality from Ca
    - 56% ↓mortality from CAD
    - 92% ↓mortality from DM2