

# Safety of Laparoscopic Vs Open Bariatric Surgery

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# Surgical Treatment of Obesity

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Bariatrics is the branch of medicine that deals with the causes, prevention and treatment of obesity.

Bariatric surgery (weight-loss surgery) includes a variety of procedures performed on obese.

# What is Bariatric Surgery

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Bariatric surgeries are medical procedures done to help lose weight. The surgery is usually done in **extremely obese** people where exercise and diet have failed. It reduces complications of excess weight, such as hypertension, diabetes, GERD, apnea and infertility., Bariatric surgery lowers the mortality rate of severely obese patients, especially when used in combination with healthy eating and lifestyle changes after surgery.

# Morbid Obesity

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- Occurs only when all other methods of wt reduction like diet, exercise & life style modification fail.
- Bariatric surgery is then the only option.



OBESITY IS NOT BECAUSE IT  
RUNS IN THE FAMILY

IT IS BECAUSE NO BODY RUNS  
IN THE FAMILY

# Surgical Treatment of Obesity

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According to National  
Institute of Health (NIH)



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Bariatric Surgery is the permanent  
treatment of choice and the only  
treatment that has been proven to be  
successful in the long term (more than  
10 years).

# NIH/Mayo Guidelines

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- Recommends bariatric surgery for obese people :
  - BMI > 40 without co morbidities.
  - BMI > 35 with 1 or more co morbidities.
- Or
- BMI of 30 to 35 with significant or serious co morbidities.
- Or
- When less invasive methods of weight loss have failed and the patient is at high risk for Obesity-associated morbidity and mortality.

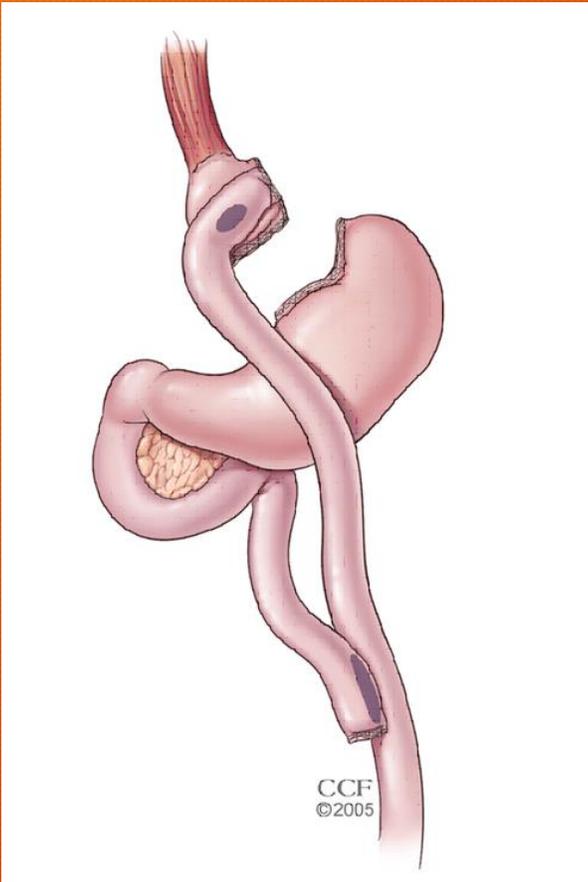
- The idea behind bariatric surgery is to reduce food intake and decrease its absorption.
- Body mass index, or BMI, measurement is important before surgery to determine the level of obesity in order to qualify for the surgery.
- In moribund obesity the BMI is  $> 60$ .

- Bariatric surgery is an invasive procedure that is either restrictive, malabsorptive or both.
- There are two types of restrictive surgery. In gastric binding a band is placed at the top of the stomach. In vertical sleeve gastrectomy 75 percent of the stomach is removed.

- There are also two types of malabsorptive surgery. In a gastric bypass a pouch emptying directly into the small intestines is created.
- In a biliopancreatic bypass a part of the stomach is removed with a duodenal switch. Gastric bypass surgery is preferable due to its lower risk of complication, according to Mayo Clinic.
- The most common bariatric surgery procedures are gastric bypass, sleeve gastrectomy, adjustable gastric band, and biliopancreatic diversion with duodenal switch. Each surgery has its own advantages and disadvantages.

# Gastric Bypass

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- The Roux-en-Y Gastric Bypass - often called gastric bypass - is considered the 'gold standard' of weight loss surgery.

# The Procedure

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- There are two components to the procedure. First, a small stomach pouch, approximately one ounce or 30 milliliters in volume, is created by dividing the top of the stomach from the rest of the stomach. Next, the first portion of the small intestine is divided, and the bottom end of the divided small intestine is brought up and connected to the newly created small stomach pouch. The procedure is completed by connecting the top portion of the divided small intestine to the small intestine further down so that the stomach acids and digestive enzymes from the bypassed stomach and first portion of small intestine will eventually mix with the food.

# Mechanism-How it Works

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- The newly created stomach pouch is considerably smaller and facilitates significantly smaller meals, which translates into less calories consumed.
- Additionally, because there is less digestion of food by the smaller stomach pouch, and there is a segment of small intestine that would normally absorb calories as well as nutrients that no longer has food going through it, there is probably to some degree less absorption of calories and nutrients.

- Most importantly, the rerouting of the food stream produces changes in gut hormones that promote satiety, suppress hunger, and reverse one of the primary mechanisms by which obesity induces type 2 diabetes.

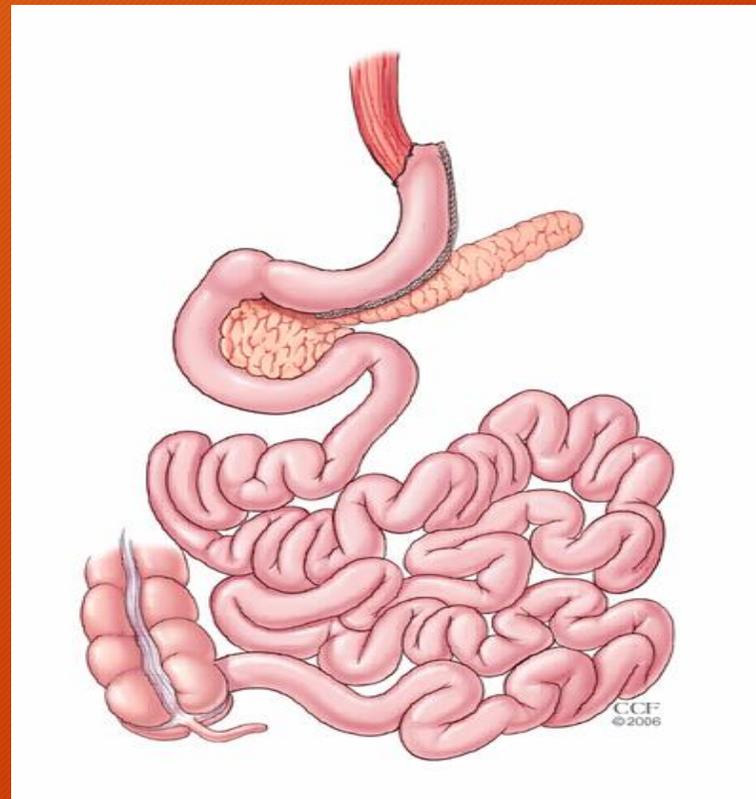
# Advantages

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- Produces significant long-term weight loss (60 to 80 percent excess weight loss).
- Restricts the amount of food that can be consumed.
- May lead to conditions that increase energy expenditure.
- Produces favorable changes in gut hormones that reduce appetite and enhance satiety.
- Typical maintenance of >50% excess weight loss.

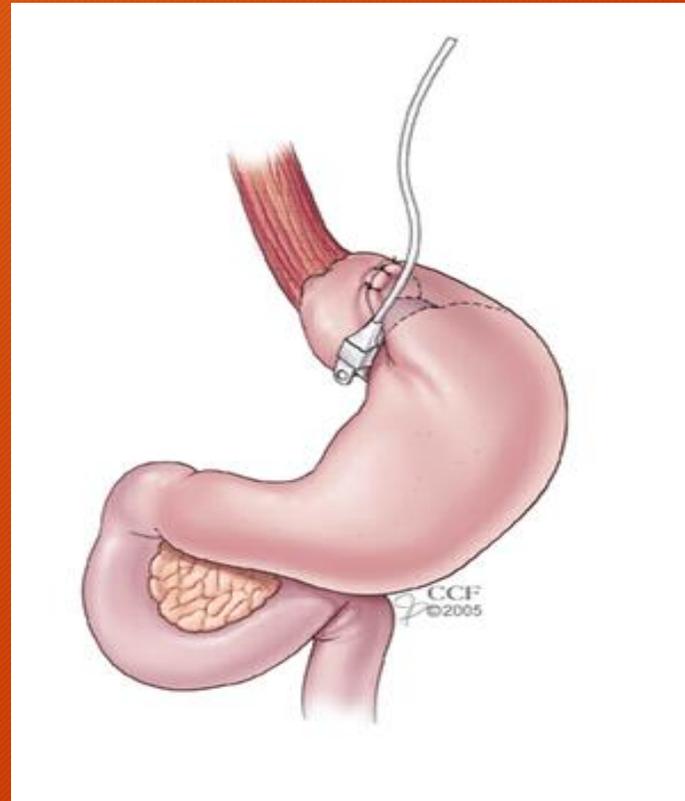
# Sleeve Gastrectomy

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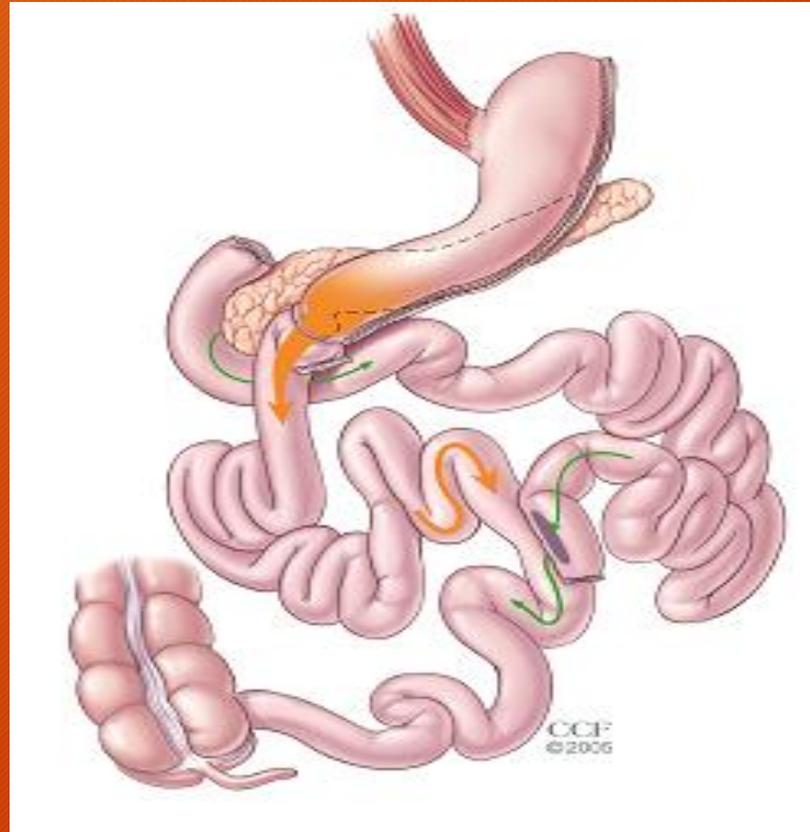
# Adjustable Gastric Band

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# Biliopancreatic Diversion with Duodenal Switch (BPD/DS) Gastric Bypass

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# Open Surgery Vs Lap Surgery

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- Easy to perform
- Easy to train
- Many can learn
- Can be offered to many
- Lap surgery - learning curve more
- Instrument cost & maintenance cost
- Not all are good at learning lap surgery
- Anesthesia risk is more in lap surgery

# Anesthesia Risk Slightly Greater In Lap Surgery

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- Patient is extremely Obese and has a compromised air way & lungs.
- Putting CO<sub>2</sub> in the peritoneal cavity raises both the domes of diaphragm and makes ventilation difficult.
- Prolonged CO<sub>2</sub> can cause CO<sub>2</sub> narcosis.
- Hypotensive anesthesia may be difficult in obese patients.
- Patient will almost always need a ventilator.
- Prolonged anesthesia has its own problems.





# Cost

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- More in LRYGB than in ORYGB.
- & has to be done in an advanced lap surgery set up.

- Mortality 0.2% in open surgery Vs 0.1% in Lap surgery.
- Hospital stay - 3.5 days in open Vs 2.2 days in lap.
- Complication & morbidity rate ratio of open vs lap is 1: 0.66
- ( $P < 0.001$ ).
- The above data is not statistically significant. However there is no doubt that in all recent published data, Lap surgery scores over open surgery in terms of safety, mortality , complication rate, hospital stay.

# Complications

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- Peri-operative : Complications of anesthesia, bleeding, positioning or pressure and those of a technical nature. Injury to Liver or Spleen.
- Early Post-operative Complications (30 days) : Bleeding : Anastomosis leak, infection secondary to leak, wound or tother infection, strictures and deep venous thrombosis/pulmonary embolism.
- Pulmonary Complication : Atelectatsis, preumonia, pulmonary embolism, respiratory arrest secondary to sleep apnea and acute respiratory distress syndrome (ARDS).
- Gastrointestinal (GI) Complication : Ulcer, stricture, anastomonic onstruction and small bowel obstuctiuon.
- Late Complications (greater the 30 yedays) GI ulcer (stricture, obstruction), nutrition deficiency (one or more nutrients, protein, vitamin or mineral), internal/incisional hernia, redundant skin, failure of weight loss or regain of lost weight and psychological.

# Possible Complications

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- May lead to short or long-term hospitalization and/or re-operation
- Infection, bleeding or leaking at suture/staple lines
- Blockage of the intestines or pouch
- Dehydration
- Blood clots in legs or lungs
- Vitamin and mineral deficiency
- Protein malnutrition
- Incisional hernia
- Death

# Possible Side Effects

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- Nausea and vomiting
- Gas and bloating
- Dumping syndrome
- Lactose intolerance
- Temporary hair thinning
- Depression and psychological distress
- Changes in bowel habit such as diarrhea, constipation, gas and/or foul smelling stool.

- Most of the reported data is from developed countries like USA & UK , in established centers of excellence.
- However if you scan publications from developing country since 1993, when Bariatric surgery was still evolving, there seems to be a higher complication rate for Lap surgery necessitating conversion & re operation in several cases including higher mortality.
- This clearly indicates that the safety of lap surgery is directly related to the surgical skills of the operating team & the complication rate is higher during the learning curve.

# Original Article June 2012

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- Laparoscopic vs Open Gastric Bypass Surgery Differences in Patient Demographics, Safety, and Outcomes
- Gaurav Banka, MD; Gavitt Woodard, MD; Tina Hernandez-Boussard, PhD, MPH; et al John M. Morton, MD, MPH
- Author Affiliations Article Information
- *Arch Surg.* 2012;147(6):550-556. doi:10.1001/archsurg.2012.195

- This was a large cohort study of 1,60,000 cases in a large national center in USA.
- The LRYGB vs ORYGB cases was 72% Vs 28%
- More pts in ORYGB group were insurance beneficiaries (Medicare N Medicaid) 18.7% vs 12.3 % indicating cost concerns.
- Conclusion was : LRYGB had lesser complication rate, shorter hospital stay as compared to open method, but definitely incurred higher total charges.

- In a large cohort study concluded that complications associated with lap methods must be studied in detail & comparisons must be done with different methods & different levels of surgical skills.

# Tice, Karliner, Walsh, Peterson et al (2013)

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- Analyzed several studies comparing different methods & their complication rates,
- studied the short & long term effectiveness in reducing wt
- Studied the advantages & disadvantages of each method (LSG, LAGB, BPD/DS, ORYGB, LRYGB)
- & concluded that Roux en Y gastric Bypass was the gold standard weight loss surgery.

# Lap Vs Open Surgery For Obesity

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- In the last two decades Lap surgery has taken center stage due to several advantages that it offers.
- More & more people prefer laparoscopic surgery in order to reduce hospital stay & lower morbidity.
- However lap surgery requires an advanced set up , high cost of instrumentation & over all extremely high cost of establishment .
- The lap surgery learning curve is extremely long & it takes long time to develop a skilled lap surgeon.

- Complications occurring out of poor lap surgical skills lead to conversion of these procedures to open surgeries.
- Many pure lap surgeons are not equipped to perform open surgeries.
- On the other hand a skilled & experienced open surgery expert has less complication rate as compared to a poorly skilled lap surgeon.

- As more & more patients opt for Lap Bariatric surgery, more skilled advanced centers, particularly in semi urban & Rural areas will be needed.
- When huge investments are not possible in such areas, keeping in mind the overall cost of surgery & affordability of the patients, these semi urban & rural centers will also need to perform open surgeries.
- Hence a healthy balance needs to be maintained between laparoscopic & open surgery & modern lap surgeons should be equally skilled to handle open surgery when a conversion is indicated.

- Obesity today is a global pandemic & India has a high incidence of childhood obesity, the demand for Bariatric surgery is likely to rise geometrically in years to come.
- Lap surgery training is still not imparted in our medical colleges.
- Most lap surgeons acquire these skills in private institutes after their PG. Which private institutes will allow hands on training to them?
- So if we believe that laparoscopy is the future, we must invest in creating training institutes of excellence especially in Govt hospitals.
- Institutes such as Meril training academy impart such training on animal models & endotainers & more such institutes will be needed.

# Conclusion

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- Lap surgery & technological advances for Bariatric procedures requires a huge investment & establishment cost.
- This entails a high cost of surgery to patients, not all of whom can afford it.
- Safe lap surgery for bariatric procedure requires extensive training of the surgeon
- There aren't enough hands on lap training institutes in our country.
- Anesthesia complications can be more in Lap Surgery.

On the other hand

- Open surgery is more time tested, bleeding and stapler complications can be tackled on the spot faster in open surgery. Requires less investment, hence can be cheaper to the patients. Particularly in developing country.

# Disclaimer

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- Although I am an old generation surgeon , in our own 6 hospitals , lap surgery is the procedure of choice, which we offer first to our patients.
- However when conversion is needed I am still called upon to use my open surgery skills.

**T H A N K**

**Y O U**