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A REVIEW ON MANAGEMENT AND COMPLICATIONS AFTER BARIATRIC SURGERY

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ABSTRACT

Bariatric surgery is one of the main procedure which plays an important role in all medical procedures of weight loss. In current practice guidelines state that bariatric surgery may be considered in patient with a BMI of 40kg/m^2. Thus basic bariatric surgery procedures achieved weight loss and maintained principle mechanisms like.[1] Restriction and reduction of food intake by reducing the stomach volume and[2] Malabsorption by reducing the absorptive surface of the alimentary tract. All surgery carries some degree of risks since, Postoperative complications may also occurs i.e. common complications of fistula, hernia, micronutrient deficiencies, nephrolithiasis dumping syndrome, bone loss complications of adjustable gastric banding, band slippage, pouch enlargement, band erosion. In Sleeve gastrectomy complications are bleeding, gastric leaks, and reflux. After a sleeve gastrectomy or gastric bypass patients must follow a post operative dietary progression that begins with liquids and concludes with a transition of small amount of regular food.

KEYWORDS: Weight loss, Bariatric surgery, Conventional Roux-en-Y gastric bypass, Adjustable gastric band, Biliopancreatic diversion, Complications after bariatric surgery, Management.

INTRODUCTION

Bariatric surgery or weight loss surgery is one of the fastest growing segments of the surgical discipline. As with all the medical procedures, postoperative complications will occur.[1] Consistent with the growing obesity epidemic. Current practice guidelines state that bariatric surgery may be considered in patient with a BMI of 40kg/m^2.[2] All surgery carries some

degree of risks.[3] A Present challenge with an increased number of patients with problems after bariatric surgery. It is important to be familiar with symptoms following bariatric surgery such as nausea/vomiting, abdominal pain ,dysphasia etc.[4] Possible complications after surgery include anastomatic leak, internal hernia, ulcers, dumping syndrome, gall stone formation.[5] Indications or Guidelines for bariatric surgery: By National Institutes of Health in 1991 as a consensus guideline statement.[6]

Metric Formula:

$$BMI = Weight\ (kg) / [Height\ (m)]^2$$

Imperial formula:

$$BMI = 703 \times weight\ (lbs) / [height\ (Inc)]^2$$

Eligibility for bariatric surgery based on the BMI range:

BMI RANGE	ELIGIBILITY FOR SURGERY
$<30 kg/m^2$	NO
$30\text{-}35 kg/m^2$	Yes conditional
$35\text{-}40 kg/m^2$	Yes
$>40 kg/m^2$	Yes

Management of after bariatric surgery complications are reduced or prevented by the dietary, portion control, physical fitness, exercises.[7]

BASIC PRINCIPLES OF BARIATRIC SURGERY PROCEDURES

Based on French National Health Authority by H.A.S.[8] All bariatric surgery procedures achieved weight loss and maintains through principle mechanisms: 1. Restriction or reduction of food intake by reducing the stomach volume or 2. Malabsorption by reducing the absorptive surface of the alimentary tract.[2]

TYPES OF BARIATRIC SURGERIES

- Adjustable gastric banding.
- Vertical banded gastroplasty.
- Bilio pancreatic diversion with duodenal switch.
- Conventional Roux-en-Y gastric bypass.[2]

Roux-en-Y gastric bypass

It was developed Mason in the 1970's. In this procedure, the stomach is transacted creating a gastric pouch of approximately one ounce capacity.[16]

Sleeve gastrectomy

This involves removing a large portion of the stomach and leaving a tube or banana shaped sleeve that is closed with staples. This reduces the amount of food needed to feel full, but it can also disrupt metabolism.it is not reversible.[13]

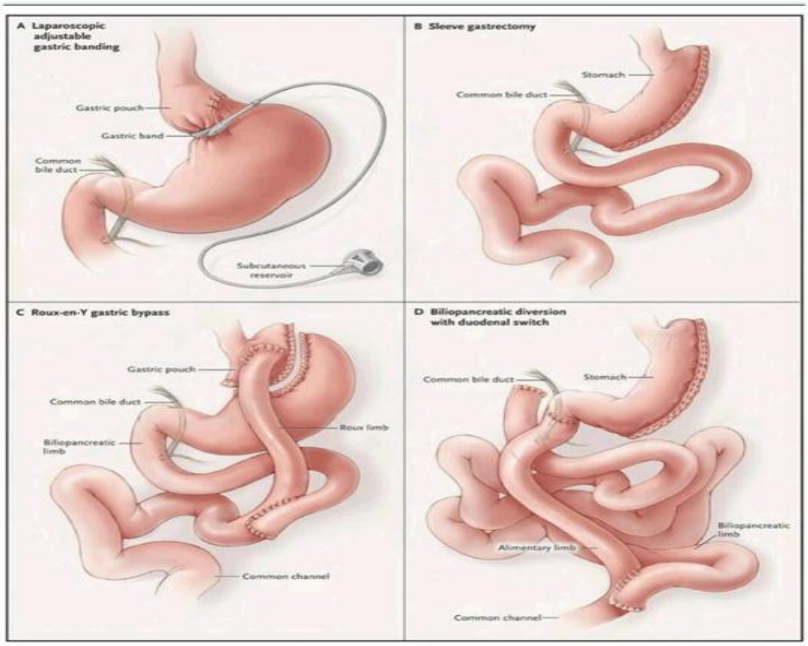
Adjustable gastric band (AGB)

The AGB is a small bracelet – like device placed high in the stomach to produce a pouch of about 30cm. The band is lined by an inflatable cuff that is joined to a sc abdominal port to allow adjustment of the pouch outflow.[17]

Vertical band gastroplasty: The VBG was first successful restrictive procedure. In the procedure 30cc proximal gastric pouch with vertical Staple line from the Angel of his to a circular opening about 1cm, punched out with a circular stapler. It is far easier to perform, safer, and less to fail due to staple line breakdown.[17]

Biliopancreatic diversion

BPD technique combined a horizontal gastric resection with closure of the duodenal stump, a gastro-ileostomy and an ileo-ileostomy create a 50 cm common and 250 cm alimentary channel. It was modified to duodenal switch.[18]



COMPLICATIONS OF ADJUSTABLE GASTRIC BANDING

- LAGB involves wrapping an adjustable silicon band around the upper part of the stomach.[12] Band complications are related to mechanical problems with the band itself.
- Band slippage: Anterior slippage (Type-I prolapsed), Posterior slippage (Type-II prolapsed).[10]
- Pouch enlargement (Type-III prolapsed), Type-IV prolapse.
- Band erosion: Intra abdominal infection, Port site infection, Port breakage.[11]

COMPLICATIONS OF ROUXY-en-Y GASTRIC BYPASS

- Gastric remnant distension.
- Stomal stenosis.
- Marginal ulcers.
- Cholilithiasis.
- Dumping syndrome.
- Short bowel obstruction.[14

COMPLICATIONS OF SLEEVE GASTRECTOMY

- Bleeding.
- Stenosis.
- Gastric leaks.
- Reflux.

COMPLICATIONS OF VERTICAL BANDED GASTRO PLASTY

- Staple line disruption.
- Obstruction.
- Erosion of mesh band.
- Reflux.
- Vomiting.

COMPLICATIONS OF BILIOPANCREATIC DIVERTISION AND DUEDONAL SWITCH

- Cirrhosis.
- Renal failure.
- Electrolyte imbalance.[14]

COMMON COMPLICATIPONS AFTER BARIATRIC SURGERY

Surgical complications

1. Fistula.
2. Bleeding.
3. Hernia.
4. Anastomatic stenosis.
5. Gastric erosion.
6. Intestinal small bowel obstruction.

Pulmonary complications

- Deep vein thrombosis and pulmonary embolism.

Nutritional complications

- Micronutrient deficiencies.
- Post gastric bypass hypoglycaemia.
- Cholelithiasis.
- Nephrolithiasis.

Gastric intestinal complications

- Gastric ulcers.
- Dumping syndrome.
- Food blockade by ring.
- Bone loss and fracture.[8]

Neurological complication

- Vitamin B_1 deficiency.

Other nutritional and metabolic disorders

Miscellaneous disorders.[16]

Complications[9]

Complications	Early complications	Late complications
Bleeding and wound infection eaks eep venous thrombosis	cision hernia I haemorrhage neumonia ntracartable vomiting	 ERD eripheral neuropathy ernicke's encephalopathy

MANAGEMENT FOR COMPLICATIONS OF BARIATRIC SURGERY

After a sleeve gastrectomy or gastric by pass patients must follow a post operative dietary progression that begins with liquids and concludes with a transition of small amount of regular food.[6]

NON – PHARMACOLOGICAL TREATMENT

- Mind full eating.
- Portion control.
- Physical fitne.

- Resistance training.
- For non exercisers -10000 steps/day.
- For exercisers – 5hr of vigorous exercise per week.

DUMPING TREATMENT

- Should take six meals/day.
- Avoid fluids during meals.
- Avoid alcohol consumption and smoking.
- Avoid simple sugars.
- Avoid milk products.
- To Increase protein intake to fulfil energy needs.
- Lie flat for 30minutes after meals.
- Should take fibre supplements for diet purpose.
- Avoid NSAIDS.

POST OPERATIVE MANAGEMENT

Post operative supplementation of vitamins and minerals for micronutrient complications.[15]

S NO	DRUG	DOSE
1	Thiamine	12 mg /day
2	Vitamin B_{12}	Oral or sublingual 350-500 mcg /day Intranasal 1000mcg/ week IM 1000 mcg/month
3	Folate	400 -800 mcg /day Women of child bearing age 800-1000 mcg/day
4	Iron	18 mg /day Elemental iron RYGB,SG,BDD/DS or menstruating women 45-60 mg/day take separately from calcium supplements
5	Vitamin D	D_3 3000IU/ day
6	Vitamin A	LAGB:VIT A 5000 IU/day RYGB or SG: VIT A 5000-10000 IU/day BPD/DS: Vitamin A 10000 IU.
7	Vitamin E	15mg/day
8	Vitamin k	LAGP, SG or RYGB 90-120 mcg/day BPD/DS : 300mcg/day
9	Zinc	SG or LAGB 8-11mg /day RYGB 8-22mg/day BPD /DS : 16-22mg/day
10	Copper	SG or LAGB 1mg/day RYGB or BPD/DS: 2mg /day

SEPARATE SUPPLIMENTATION[15]

S.no	DRUG	DOSE
1	Calcium	LAGB, SG, RYGB-calcium -1200-1500mg/day. (Diet + Supplement). BDS/DS: Calcium1800-2400mg/day. (Diet + Supplements). Calcium citrate in divided doses.

FLATULENCE/BLOATING

Anti gas agents – Simethicone - 60-125mg/day Beano.

Protein intake: 60-80g/day.

BPD/DS- 90g/day.

CONCLUSION

The knowledge about the management and complications after bariatric surgery Consists mostly data derived from a few review articles Bariatric surgery or weight loss surgery is one of the fastest growing segments of the surgical discipline. As with all the medical procedures, postoperative complications will occur. Bariatric surgery is most intensely developing areas in surgical practice today. Complications related to weight loss procedure can be safe for bariatric patients after surgery. Nutritional supplements are recommended, because of lack of several nutrients, developing complications like surgical, pulmonary, gastric, neurological and others. So focusing to fill these remaining gaps in knowledge. Based on the data collected in this review further more studies needs to be conducted.

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