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Follow-Up After Bariatric Surgery for Health Professionals

The following advice is intended for general practitioners, practice nurses, and other health professionals who might be caring for patients who have previously undergone bariatric surgery. It is intended for use with patients who have undergone either laparoscopic Roux-en-Y gastric bypass (LRYGB), laparoscopic one anastomosis gastric bypass (LOAGB) or laparoscopic sleeve gastrectomy (LSG) surgery, who are at least one year out from their surgery, and who have completed the standard follow-up of their bariatric surgery program. This advice may not be suitable for patients who have undergone different bariatric operations, or in every circumstance. Additionally while every effort is made to keep current follow-up recommendations available at www.aspiringbariatrics.co.nz, guidelines do change. If you have any questions, please don't hesitate to contact me via one of the methods above.

In general, people who are a year or more out from bariatric surgery should be relatively stable from a nutritional and vitamin perspective. Regular vitamin supplementation and nutritional monitoring is necessary however to prevent and micronutrient deficiency. These guidelines are based on those published by the American Society of Metabolic and Bariatric Surgery and the British Obesity and Metabolic Surgery Society, and adapted for patients who have had surgery either in the public or private sector in Otago or Southland.

Operations

Laparoscopic Roux-en-Y gastric bypass and Laparoscopic sleeve gastrectomy are the two most common weight loss operations in modern bariatric surgery.

Fig 1a – Laparoscopic Roux-en-Y gastric bypass

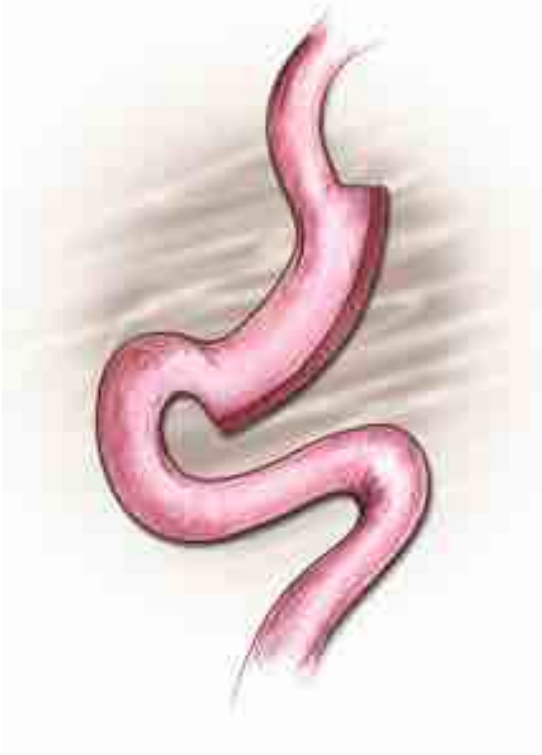

Fig 1b – Laparoscopic sleeve gastrectomy

Vitamins

All patients who have undergone bariatric surgery require life long vitamin supplementation with a multivitamin. There are a wide range of multivitamins available in New Zealand and unfortunately most are not sufficient for patients post bariatric surgery. Our current recommendations are either **BN Bariatric multivitamins** available as capsules or chews through bnmulti.co.nz or **Centrum multivitamins** at a dose of **one to two tablets daily** as advised by a bariatric dietitian (this is available from most supermarkets and pharmacies). The difference between these is that Centrum has a high dose of B6 that can accumulate in the long term, leading to neurological symptoms in rare cases. For this reason we recommend BN multivitamins as the best long term option for most people. *Please note that the subsidised multivitamin available on prescription is not suitable for patients after bariatric surgery.*

All LRYGB and LOAGB patients also require **calcium** at a dose of 500mg of elemental calcium two to three times daily. LSG patients only require calcium supplementation if they have an inadequate dietary calcium intake or an elevated PTH level despite a normal vitamin D and low normal serum calcium. Calcium carbonate is available on prescription, but is poorly absorbed in the absence of stomach acid, so is not recommended after gastric bypass operations or in people taking PPI's. We recommend instead **calcium citrate** which is available from on line bariatric vitamin suppliers such as Barilife (https://nz.barilife.com.au/) or Tric nutrition (tric.co.nz). Additional calcium is not needed for patients taking the My New Tum multivitamin, as this already contains calcium citrate.

Vitamin B12 is required for patients with low vitamin B12 on testing. It can be given as an intramuscular injection of 1mg every 3 months.

Iron is not given routinely, but will be required by many menstruating women. Iron should also be given to any patient with low or falling ferritin on testing. We favour **Maltofer Iron Polymaltose OTC** over prescription **Ferrograd** due to the lower incidence of gastroinetestinal side effects. The usual maintenance dose is one tablet alternating days (100mg elemental iron), but replacement doses are up to two to three tablets daily for people with low ferritin levels. Iron may be better tolerated if given three days per week (Monday, Wednesday, Friday) than if given daily. If iron stores cannot be maintained despite supplementation then a coeliac screen and causes of blood loss should be investigated (GI, menstruation) and the patient should be referred for an iron infusion.

Vitamin D should be given if testing reveals a deficiency. The recommend regimen is 50 000 units once per month. In the south, vitamin D deficiency is common during the winter months and it is reasonable to supplement this over winter.

Blood Testing

Patients who are a year or more out from bariatric surgery should only need laboratory blood testing once per year if they are nutritionally stable. Blood tests should be done more frequently for those with symptoms suggestive of a vitamin deficiency, pregnancy, or following supplementation of a deficiency.

Recommend blood tests are full blood count, electrolytes, creatinine, liver function tests, parathyroid hormone, thyroid stimulating hormone, ferritin, vitamin B12, folate, 25 OH vitamin D, lipids and glycated haemoglobin. People who have had a gastric bypass should also have copper, zinc and vitamin A measured on an annual basis.

Copper, selenium and zinc should also be measured if there are unexplained anaemias, neurological symptoms, taste changes, hair loss or poor wound healing.

Pregnancy

Risks of most pregnancy complications are reduced following bariatric surgery. Bariatric surgery does represent a risk for low birth weight babies however and there are small risks of fetal malformations related to vitamin deficiencies (e.g. folate deficiency, vitamin A toxicity). Furthermore it can be difficult for bariatric patients who are pregnant to meet their increased nutritional needs and appropriate weight gain throughout pregnancy needs to be addressed. For this reason all women should be referred to a bariatric surgeon AND bariatric dietitian prior to conception, and should have their pregnancy managed in conjunction with a high risk obstetrician.

If this is not possible, recommended daily vitamin intake should be:

- BN bariatric multivitamin throughout pre-conception and pregnancy
- Folic acid 800 mcg/day (5mg/day if BMI > 30 kg/m2) pre-conception to the end of the first trimester
- Iodine 150 mcg/day from pregnancy to the end of breastfeeding

Blood tests should be checked for vitamin A, copper and zinc pre-conception and vitamin A, zinc, vitamin B12, and folate each trimester

Other Issues

Rapid weight loss is a risk factor for the development of **gallstones**. Suspicious symptoms should be investigated by ultrasound, and surgical referral indicated if diagnosed. Cholecystectomy should ideally be performed by a bariatric surgeon who can check the anatomy of the bariatric procedure at the time of cholecystectomy.

Bowel obstruction can occur after LRYGB or LOAGB, caused by internal hernia, adhesions or intussception. Because of the surgical rearrangements, this may have very atypical symptoms such as left upper post-prandial abdominal pain. It will also not show up on plain abdominal radiology. **It is important that any unexplained abdominal pain is investigated by a bariatric surgeon.**

Anastomotic ulcer can occur late after gastric bypass and present as GI bleeding, dysphagia or perforation. These are more common in smokers and those taking NSAID's. This should be investigated by endoscopy, preferably by a surgeon familiar with bariatric surgery.

Counselling regarding **smoking cessation**, and **avoidance of NSAID's** is important to prevent anastomotic ulcers, which can occur at any point after surgery.

Thiamine deficiency should be considered in any patient with intractable vomiting or poor oral intake. Urgent referral for IV thiamine replacement should be made in these circumstances.

Gastro-oesophageal reflux symptoms are common after LSG. These can usually be managed with OTC medications or proton pump inhibitors. Persistent or severe symptoms should be investigated by a bariatric surgeon.

Excessive weight loss or significant weight regain can have surgical causes. Please re-refer to a bariatric surgeon for further investigation.

Vomiting after meals is often the result of overeating or eating too fast, however can have a surgical cause. Please consider referral to a bariatric surgeon or dietitian.

Excess skin is common after significant weight loss. Patients should delay any body contouring surgery until their weight is stable, preferably two years after their bariatric surgery. After this time, referral to a plastic surgeon should be considered.

Who to Refer

Please consider referral to a specialist bariatric surgeon in the following circumstances:

- Unexplained abdominal pain
- Excessive weight loss
- Significant weight regain
- Significant or difficult to treat vitamin deficiencies
- Intractable reflux symptoms
- Pregnancy or pre-pregnancy planning
- Symptomatic gallstones
- Unexplained anaemia or neurological symptoms.
- Any other concerns

We also recommend a referral to a bariatric Dietitian in the following circumstances:

- Significant weight regain
- Pregnancy or pre-pregnancy planning
- Fatigue
- Increased energy requirements eg nutrition for increased activity/bariatric-specific sports nutrition

If you have any other questions about these guidelines or management of patients after bariatric surgery please contact me via one of the above methods.

Yours sincerely,

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