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One Anastomosis Gastric Bypass is an acceptable version of Gastric Bypass. Editorial article

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ORIGINAL

The Roux-en-Y gastric bypass (RYGB) has been considered a gold standard procedure in bariatric surgery for many years and yet there is no definite standardisation (1). RYGB has a small gastric pouch, different biliopancreatic limb lengths, Roux limb [alimentary limb] and the common channel. Standardization of the procedure is suggested in the 2019 Bhandari et al study (2). It suggested <30mls gastric pouch capacity, the total length of BPL and the Roux limb is 200cm with each limb could be 50-150cm. There was no mention of the common channel length. The proximal RYGB with short BPL is expected to be associated with an increasing risk of failure, weight regain and relapse of the comorbidities, while the distal type is associated with severe hypoproteinaemia, malnutrition, liver failure and increasing risk of mortality, but superior efficacy (3). The adjustment of the BPL and bypassed intestinal length is the safety and efficacy key factor for both OAGB and RYGB.

A recent By-band trial confirmed the superiority of RYGB over LSG and AGB (4). We do not have an ideal or perfect bariatric and metabolic procedure. There are certain 'common' problems associated with gold standard RYGB as internal hernia, reactive hypoglycaemia, chronic abdominal pain, relapse of diabetes and weight regain. Previous studies confirmed that RYGB is associated with a higher risk of complications and mortality compared to LSG or AGB. It is also true that experienced hands would produce better results (5; 6; 7).

The RYGB problems of chronic left-sided abdominal pain, internal hernia, JJ anastomosis complications and long-term failures of weight regain and relapse of diabetes are pushing for innovation to find a new procedure (8). Different intestinal bypasses were suggested such as single anastomosis duodenal ileal bypass(SADI), but none without associated complications (9). OAGB was born as an unplanned baby when Dr Rutledge reconstructed the upper gastrointestinal tract for an emergency patient and reported his first series of 1,274 in 2001 (10)

Technique : Contrary to the RYGB, the OAGB pouch provides early fullness and lasting satiety after having a meal. A long and narrow gastric pouch delays the emptiness and produces longer satiety compared to RYGB. It is less likely to dilate according to Laplace's law of physics and physiology. Different sizes of bougies are used to create the long and slender pouch. The longer the gastric pouch, the better the physiological effect and less bile reflux. The size of the gastrojejunostomy is debatable. The use of a 45 mm cartridge will produce a stoma diameter of 2.9 cm [the circle diameter = circumference divided by 3.14]. GJ firing parallel and close to the staple line reduces the incidence of ischemia, ulcers and perforations (6). A BPL of more than 200cm will lead to nutritional or diarrhoea problems in the future (11). The OAGB configuration makes it easy to adjust the BPL length according to age, dietary habits (vegetarian or not), and the different levels of body mass index (BMI). The OAGB provide greater flexibility for BPL length adjustment applied to future revisional surgery if required. **Absence of Roux limb:** we don't know the exact effect of the absence of an alimentary limb in OAGB surgery. We are sure, however, of metabolic

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consequences and it may play a role in decreasing dumping syndrome or abolishing additional neuroendocrine signals that affect GLP-1 and other hormones.

The reflux and biliary gastritis, both can contribute to dyspeptic symptoms. Acid reflux is different from bile reflux. This is a bit complex as there are cases of pure bile reflux, acid reflux or a combination of the two. Long slender pouch and wide anastomosis are helping to reduce the reflux symptoms (10). Repair of hiatus hernia and OGAB may reduce the acid and bile reflux (12).

Patients who have Billroth II resection for duodenal ulcer do not have a higher risk of gastric carcinoma than the general population (13). Also following 338 patients who had Billroth II gastrectomy for 25 years, the number of cancers detected was less than expected (12). So far, there have been 5 gastro-oesophageal cancers reported following OAGB1 (14), all of these patients did not have lower oesophageal/esophagogastric biopsies before the operation which raises the possibility of missing early pre bariatric surgery cancer, bearing in mind there are more cases of gastric adenocarcinoma following bariatric surgery including RYGB (15). In general , bariatric surgery compared with no surgery was associated with a significantly lower incidence of obesity-associated cancer and cancer-related mortality (16).

Caygill et al (13) reported no difference in the risk of death from gastric cancer in the first 20 years of follow-up after gastric surgery for ulcer disease but a 4.5-fold increase thereafter. After 20 years, patients treated with the Bilroth II operation were at higher risk than those treated with Bilroth I, consistent with a role for bile reflux in gastric carcinogenesis. This study included a heterogeneous group of patients and included vagotomy in the procedures. We don't know whether the difference is statistically significant. We also know that bile reflux is a common phenomenon and found during gastroscopy, maybe up to 10% of patients had it, yet they did not develop cancer. The removal of the residual stomach in OAGB surgery has been suggested and will eliminate the future risk of developing malignancy, however, this step is adding risk of complications (17).

Management of biliary gastritis: Sucralfate and PPI medications can help; however, resistant cases would warrant a revision to RYGB. The new-onset reflux rate after OAGB was significantly higher than gastric bypass but not different with sleeve gastrectomy (18). Braun anastomosis is not common and needed in only 0.7% of OAGB patients in large OAGB series (19; 20). Braun anastomosis does not completely abolish the reflux and it is potentially dangerous if sited distally making shorter common channels and increasing the risk of protein malnutrition and diarrhoea. The conversion of OAGB to normal anatomy is easier than RYGB. two steps are needed; dismantling the GJ and performing G-G anastomosis.

Few cases of internal hernia were reported after OAGB thus avoiding the larger risk compared to RYGB (1-3%) that could lead to mortality, massive bowel resection and life-long total parental nutrition and invalidism. The antecolic procedure, with closure of both the mesenteric and Petersen defects, has the lowest IH incidence following RYGB.Recent study showed 2.8% of IH following more than 3000 OAGB procedures (21). In the OAGB closure of the Peterson defect is not routine but in decreases the incidence of IH. The important predisposing factors were long BPL.

The majority of death after bariatric surgery was after RYGB according to the British Obesity and Metabolic Surgery Society Audit 2013-2019 (www.bomss.org.uk). In a randomised trial setting OAGB achieves better short- and long-term weight loss and resolution rates of DM, HT, and DL than RYGB YOMEGA RCT demonstrates a comparative weight loss between OAGB and RYGB and a substantially higher incidence of serious adverse events after OAGB ((24 in the RYGB group vs 42 in the OAGB group; p=0·042), of which nine (21·4%) in the OAGB group were nutritional complications versus none in the RYGB group (p=0·0034) (22).

YOMEGA trial group tried to prove the non-inferiority of the OAGB compared to RYGB and not the safety. There are several important points. The trial proved that OAGB is not inferior to the RYGB in terms of BMI/excess weight changes OAGB was better. However, it took 2 years to recruit patients from a multicentre in one of the European countries with a high volume of bariatric operations/year. The loss to follow-up was high, the BPL limb length was taken as 200

cm. The most important point was some surgeons involved in the trial had no prior extensive experience with the OAGB technique. This is definitely a detrimental factor in the outcomes.

Studies showed that BPL > 200 resulted in severe malnutrition, liver failure and even mortality (11; 23). The extent of the excess weight loss and the BMI changes after OAGB are indicative of longer BPL use possibly>200 in some patients that developed severe complications. It is clear that the sword of the OAGB is the BPL, and would remain a choice whether we want acceptable effects with negligible risks or aggressive effects with higher risks.

Current knowledge is that functional bariatric & metabolic surgery works through a complex altering of physiological signals affecting appetite (gut hormones, bile salts, gut microbiota etc). While both OAGB and RYGB share comparable mechanisms of action, the impact of these mechanisms is controlled by the nature and the magnitude of the anatomical changes, thus long BPL is producing much greater effect and increasing risks and complications. The other difference that impacts on outcomes of both procedures is the complexity of the anatomical reconstruction. The OAGB have one anastomosis, while there are two anastomoses in RYGB. We don't know the full spectrum of the cellular and neuroendocrine signalling and changes that were imposed by both bariatric and metabolic surgery.

OAGB has been presented to the bariatric community as an easy quick procedure. OAGB is not an easy procedure when it is performed well and certainly, there is a learning curve for this procedure. OAGB needs meticulous surgical technique to perform the gastric pouch, which is long, homogeneously narrow, without twists with a transverse wide dependent flat gastrojejunostomy in addition to careful measurement of limb lengths.

The other problem was that the recommendation initially was to increase the BPL to over 200 cm. This may be suggested for patients with a BMI above 50 kgs/m2 and diabetic patients. More than 200 cm BPL led to malnutritional changes, micronutrient deficiencies, liver failure and even mortality11. However, there are some reports of minimal malnutrition problems with BPL of 200 cm or more (24). It is not clear why, but factors of diet types, genetic makeup and geographical location may play a role.

Conclusion

OAGB can be considered an acceptable version of gastric bypass that provides safety, efficacy, and more flexibility for tailoring the BPL according to the clinical scenario without adding risks of serious complications.

Conflict Of Interest

Author declare no conflict of interest and no funding for this study.

Keywords : One anastomosis gastric bypass, Roux en-Y gastric bypass, Body mass index, Biliopancreatic limb, Gastric cancer

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