

عنوان مقاله:

**Comparing patient selection and 30- day outcomes between  
single Anastomosis Gastric Bypass and Roux-en-Y Gastric  
Bypass**

عنوان کتاب:

**IFSO Consensus 2023**

موضوع:

**Choosing the most appropriate metabolic-bariatric procedure :  
an algorithm**

سخنران: دکتر کیوان صابونی فلوشیپ جراحی درون بین

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# *Choosing the most appropriate metabolic-bariatric procedure: an algorithm*

According to the IFSO registry, the vast majority of primary MBS procedures involve one of the following four procedures, in decreasing order of frequency: (SG), (RYGB), (OAGB), and biliopancreatic derivation with duodenal switch.

The procedure chosen mostly depends on the surgeon's and/or patient's preference, and this **unscientific basis** most likely explains the high frequency of SG worldwide. It is the aim of the current section to provide guidance for decision-making based on high-quality evidence in the literature, so the surgical procedure that is selected is best suited to the patient deemed suitable for MBS.

Note that the algorithm proposed here **does not address** patients with a BMI >50 kg/m<sup>2</sup> or above 60 years of age, both patient populations discussed at length in the next chapter.

The most important objective in all surgery is to **not harm the patient** (noli me tangere). Hence, bariatric surgeons must avoid procedures that endanger patients despite proven success achieving weight loss and/or improved metabolic outcomes.

Its pivotal to evaluate each patient's Helicobacter pylori status *Specially procedure involves exclusion of the gastric body*

UGD is considered an essential part of the MBS patient work-up

Conditions such as severe gastric disease and oesophagitis – which might otherwise remain asymptomatic and undetected, with the potential to induce severe disease at a later stage – can usually be assessed by EGD

H. pylori has been shown to facilitate the development of gastric carcinoma, atrophic gastritis, ulcers gastro-intestinal stromal tumours

as a rule – H. pylori eradication reduces the risk of carcinoma of the stomach

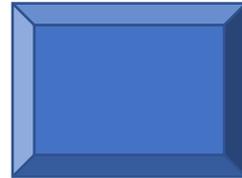
LSG



prevalence of Barrett's oesophagus

There is no evidence that this evolution happens **after a gastric bypass**

Performing hiatal hernia repair at the same time as LSG improves oesophagitis and GERD  
(Substantial evidence )



When a hiatal hernia is present in the absence of severe oesophagitis  
combining LSG and a hiatal hernia repair may still be recommended

RYGB can be chosen, since it is the procedure of choice in patients with a hiatal hernia

The main patient issue is **overweight, with or without T2DM**

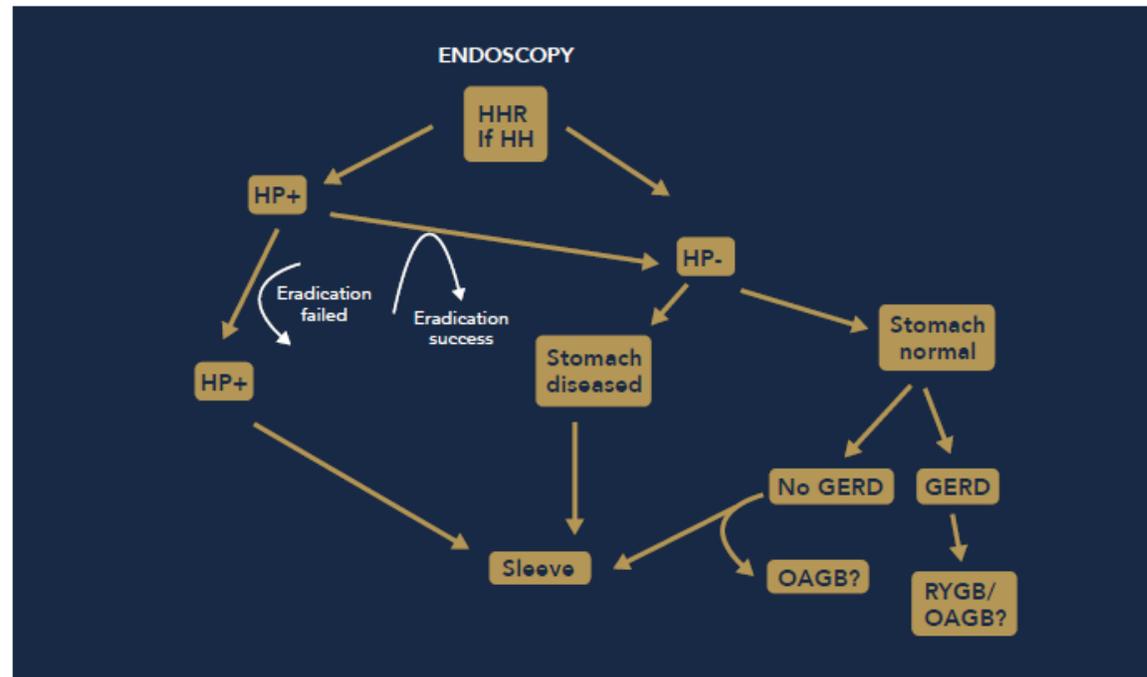
Indeed, while **BPD-DS** has been documented to yield excellent clinical results, the high rate of complications makes this procedure less attractive.

The **outcomes achieved with SG and RYGB are quite comparable**, in terms of weight loss and diabetes control **LSG, relative to RYGB**, is not the case for Barrett's oesophagus

In terms of weight loss and glucose control, OAGB is non-inferior to RYGB,

**OAGB** is easier to perform and associated with similar outcomes for up to five years post-operatively

Figure 5-3: Algorithm for MBS in patients with obesity.  
(Patients with a BMI  $\geq 50\text{kg/m}^2$  and/or age  $>65$  years excluded).



HP: Helicobacter Pylori, HH: Hiatal Hernia, HHR: Hiatal Hernia Repair  
OAGB: One anastomosis gastric bypass; RYGB: Roux en Y Gastric Bypass  
T2DM: case by case SG vs RYGB (Aminian) vs OAGB (Robert)

## ***Revisional surgery after RYGB - Jacques Himpens, MD, PhD***

Roux-en-Y gastric bypass (RYGB) is currently the second most frequently performed metabolic-bariatric surgery (MBS) procedure.

The sheer volume of procedures alone renders it hardly surprising that **bariatric surgeons are sometimes called** to **perform revisional surgery** to deal with less-than-optimal outcomes (e.g., suboptimal weight loss, excessive weight loss, weight recurrence after initial satisfactory weight loss), or to adjust **aberrations that were caused** either at the time of surgery or that developed with time and interfere with the correct physiology of RYGB, resulting in marginal ulcers, dumping syndrome, GERD, persistent or recurrent pain, meteorism, flatulence, and diarrhoea.

Perhaps the **most difficult aspect of revisional surgery after RYGB** is determining **IF and WHEN** one should intervene surgically, since **most undesired outcomes can be adequately treated by non-surgical means** (e.g., dietary, genetic, psychiatric) .

When the primary goal is to correct weight issues **possible techniques include** distal Roux-en-Y gastric bypass (DRYGB), conversion to a duodenal switch with the one-anastomosis procedure SADI-s or the two-anastomosis procedure BPD-DS, and resizing the gastric pouch and/or gastro-jejunal anastomosis via either a laparoscopic or endoscopic approach.

However, **based on the findings in the above-noted systematic review**, it seems that malabsorption-enhancing procedures – like DRYGB or the duodenal switch with one (SADI-s) or two anastomosis (BPD-DS) – are the most effective procedures in the long-run.

Despite the **results of the above-noted meta-analysis**, Mahawar et al., in their systematic review, concluded that **interventions involving the gastric pouch and/or the size of the gastro-enterostomy** did not have a significant impact on weight loss.

While none of the studies analysed by these authors detected better outcomes with larger pouches or wider gastro-jejunostomies, nine of 14 and six of 10 did not identify any influence on weight loss by larger pouches or wider stomas, respectively.

According to another recent meta-analysis, inadequate weight loss after RYGB is best approached by lengthening the biliopancreatic limb at the expense of the common limb (i.e., **distalising the bypass**), while **preserving a safety margin** so the combined alimentary limb length and common limb length remain greater than 350 cm. Further shortening the limbs was not associated with greater %EWL (P = 0.9), but was significantly associated with severe protein malnutrition (p = 0.01) [119].

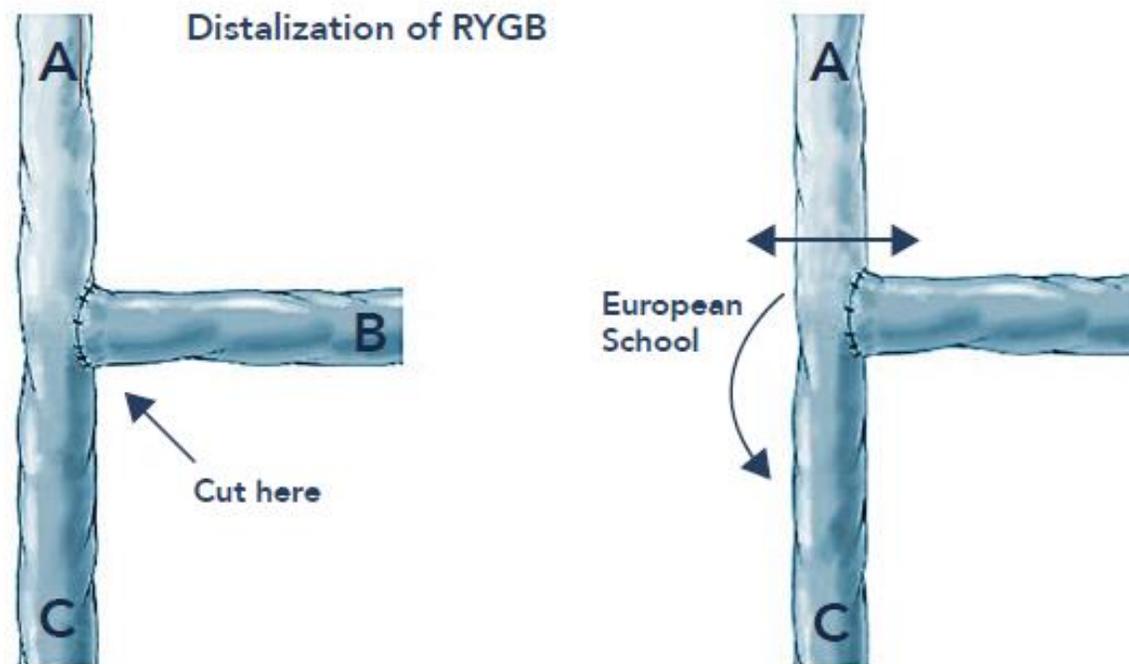


Figure 5-4: Schematic of distalisation by lengthening the biliary limb (transection of distal end of alimentary and reimplantation more distally on the common limb).

A = alimentary, 150cm, B = Biliary, C=common

*In a recent expert consensus survey  
when weight loss is deemed suboptimal  
after RYGB*



Using BPD-DS were considered limited  
(technical difficulty)

*When the multidisciplinary advisory team decides to select surgery as an option for non-weight related issues after RYGB*



***Ad hoc treatment must be chosen***

# *GERD after RYGB*



- *Using the ligamentum teres hepatis* to reinforce a hiatal hernia repair, ?
- *Radiofrequency ablation* of the distal oesophagus ?
- *Employing the upper part of the remnant* to create a sling at the gastro-oesophageal junction?

## *Reducing dumping syndrome*



Endoscopic or laparoscopic trimming of the gastro-jejunal anastomosis or even placement of a loose non-adjustable band distally around the gastric pouch for slowing down gastric pouch emptying

## **Conclusions :**

**Pouch volume and gastro-jejunal anastomosis size are “probably” not all that important when revising RYGB**



**Limb lengths may be altered to improve weight loss, but should be wary of the risk of malnutrition**



**Total alimentary limb length is the most important determinant in terms of avoiding protein malnutrition**

**Dumping symptoms and GERD can both be problematic after RYGB, but treatment options remain missing**

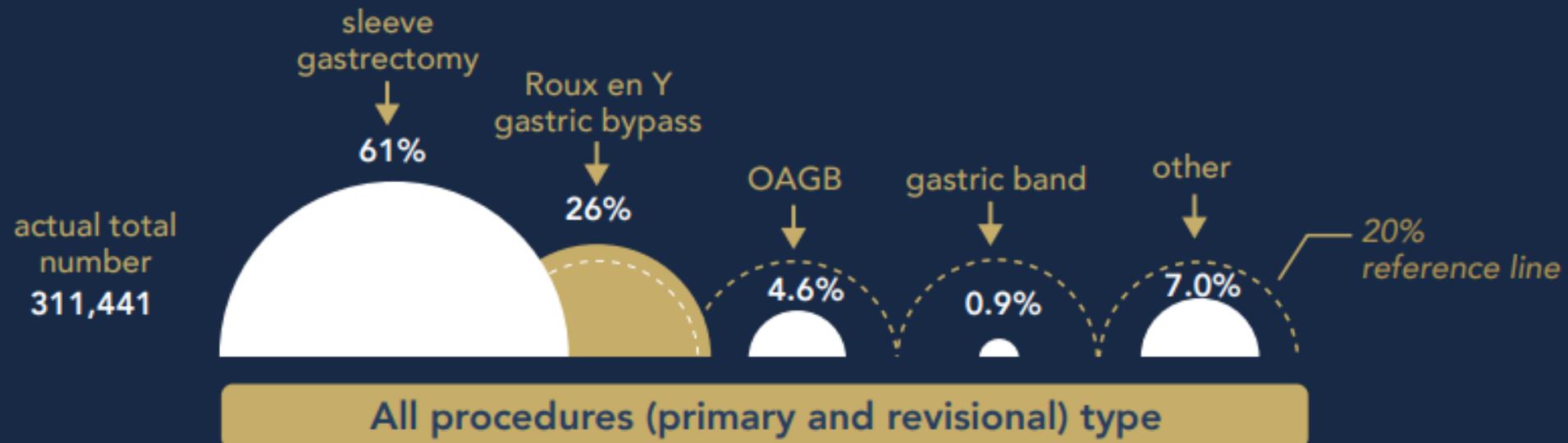


Figure 5-5: Frequency of use of various MBS procedures, as reported in the 7th IFSO Global Registry Report – 2022. (Borrowed with permission from Brown et al., 2022 [3])

# ***Conversion or revision surgery after a sleeve gastrectomy***

SG is the most frequently performed (67%) of the all primary MBS procedures worldwide, as reported in the IFSO Global Registry Report 2022

## ***The popularity of SG is being:***

- 1) More economical
- 2) Technically simpler to perform
- 3) Free of any surgical anastomoses
- 4) Free of the risk of internal hernias
- 5) Easier to learn, with a shorter learning curve
- 6) Faster to perform, with shorter operating times
- 7) Feasible and relatively safe in patients considered at higher surgical risk; and
- 8) Comparable to RYGB in terms of weight loss and metabolic outcomes

***Metabolic and bariatric surgery is the only treatment option that has been shown to cause sustainable weight loss and remission of the metabolic syndrome***

Despite its worldwide high acceptance, SG has post-operative issues that oblige MB surgeons to sometimes perform revisions or conversions

GERD, leaks, and either suboptimal weight loss or weight recurrence

# GERD

*Several meta-analyses considered level 1 evidence have examined the issue of GERD after SG*

*Pooled data in these **two meta-analyses** revealed GERD symptoms in 19% – 31.8% and de novo GERD in 23% - 31.6% of patients post SG*

*Barrett's oesophagus (BE) was also seen in 8-11% of patients spanning two meta analyses*



*there was no correlation with GERD symptoms and **most BE** was observed beyond three years of follow-up*

***After SG**, 3.1 – 4.0% of patients will need revisional surgery for GERD*

*Based on **mid- to long-term outcomes (≥3 years follow-up) after SG**,*

*Both bariatric surgeons and patients need to fully understand and deal with the **occasional need for revisions after SG***

***30% of the patients requiring revisional surgery after SG do so **because of GERD*****

*Pooled analysis revealed that GERD symptoms resolved in 79% of patients after conversion of SG to RYGB*

*GERD after SG is a strong indication for conversion to RYGB*



## **Leaks**

In 2017, in a multi-centre German trial, Benedix et al. identified a leak in **241 of 15,756** patients (**incidence = 1.53%**). The authors concluded that **postoperative staple line leaks after primary SG** significantly increases postoperative morbidity and mortality

### ***Risk factors associated with leaks***



longer operating time, conversion surgery, intraoperative complications, hypertension, and degenerative joint disease.

***Other risk factors that were identified were SG stenosis and SG torsion***

***The mortality rate from leaks after SG was estimated to be from 0 -1.4%***

***The most frequent time when a leak is diagnosed is three weeks after surgery (88.9%) and the most frequent site is the upper third of the staple line***

## ***Suboptimal weight loss and weight recurrence***

***The most common indication for revisional surgery after SG (52% of revisions)***

**Conversion of SG to RYGB** is a conversion option that yields good weight loss and potential ***resolution of the symptoms of both metabolic syndrome and GERD*** (Level 1 evidence)

Fortunately, when converting from an SG, almost any procedure is an option, from a technical standpoint

***The choice of procedure selected is determined based upon***

The indication for revision or conversion, the patient, and the surgeon's experience and expertise with different procedures

***Re-operative surgery following a primary MBS procedure is increasing***

looking at such factors like suboptimal weight loss, weight recurrence, GERD, and staple-line leaks, but also ***behavioural factors***

***Poor adjustment to lifestyle changes***, the postoperative re-emergence of ***maladaptive eating***, difficulty embracing the required lifestyle changes, and the ***reappearance of depressive and anxiety symptoms***

***It has also been found that increased gastric volume is one of the factors that predicts weight recurrence after SG.***

***Risk factors related to weight recurrence***

**Anatomical, genetic, dietary, psychiatric, and temporal**

Not hormonal changes

***patients with weight recurrence have***

*lower levels of physical activity*

One psychiatric risk is **anxiety**

## **Conclusions**

The use of sleeve gastrectomy is continuing to grow worldwide, but **surgeons and patients** **must communicate** to decide what type of surgery is best in each case



**Preoperative endoscopy** must be performed in all cases when severe GERD is identified, the best option for patients is almost inevitably RYGB  
At a **centre of excellence for MBS**, it also is recommended that **routine preoperative video-cineradiography and manometry are performed**



**When revision or conversion are required after an SG**  
The choice of surgery depends on the indication for revision, though **RYGB** is by far the most commonly selected **revision procedure**  
Whatever procedure is selected, all patients must be followed long-term

## ***Suitability for MBS***

Preoperative decision making and care,  
indications and contra-indications for MBS,  
specifics on and comparisons between various MBS procedures  
(SG, RYGB, OAGB, SADI, LAGB), and follow-up and outcomes

***Thirty-eight statements*** pertained either to the ***specific primary MBS procedures or re-operations,*** with consensus reached on 31 (81.6% of the statements)

There was consensus that **MBS should be offered to individuals with the following:**

- ***BMI 30-35 kg/m<sup>2</sup> and T2DM*** who do not achieve substantial, durable weight loss and diabetes improvement with reasonable nonsurgical methods
- ***BMI 30-35 kg/m<sup>2</sup> and obesity-related complications,*** but no T2DM, who do not achieve substantial, durable weight loss and improvement in their complications with reasonable nonsurgical methods
- ***BMI 30-35 kg/m<sup>2</sup> and no obesity-related complications*** who do not achieve substantial, durable weight loss with reasonable nonsurgical methods.

## ***Choice of procedure***

Recent trends have led to SG being the most commonly chosen procedure, followed by the RYGB, OAGB, and biliopancreatic diversion with duodenal switch.

*Our experts reached consensus that, for individuals with evidence of In A large hiatal hernia and/or severe gastro-oesophageal disease or Barrett's oesophagus, **RYGB** is preferable to SG to control reflux symptoms and decrease the risks of worsening Barrett's oesophagus.*

In adult patients with T2DM and obesity, *gastric bypass (including RYGB & OAGB)* is generally preferable to SG.

*Our experts reach almost unanimous consensus* that OAGB should NOT be considered a carcinogenic procedure.

However, for *patients undergoing OAGB*, there was consensus that a biliopancreatic limb of 200 cm or longer may increase the risk of protein deficiency.

Whilst there was consensus that the indications for a **primary SADI-S** could include poorly-controlled T2DM, consensus was not reached as to whether a primary SADI-S should be offered to individuals with a BMI  $\leq$  45kg/m<sup>2</sup> or that it provides a better quality of life than the classic Roux-en-Y Duodenal Switch.

## ***Preoperative preparation***

In addition to lower extremity compression, there was consensus ***that all MBS patients*** must have perioperative chemoprophylaxis against venous thromboembolism (VTE)

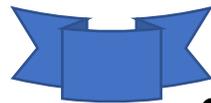


There was consensus that, for the ***preoperative workup of patients being considered for MBS, improved patient selection for GERD risk*** will significantly reduce the rate of SG conversions to bypass;

That ***preoperative gastroscopy*** should be ***performed routinely for*** individuals considering sleeve gastrectomy; and that a ***hiatal hernia assessment requires laparoscopic evaluation*** at the start of MBS

## ***For long-term follow-up***

The main concern pertaining to the risk of sleeve gastrectomy-associated reflux was the ***endoscopic findings of esophagitis or Barrett's oesophagus, rather than GERD symptoms***, like heartburn or regurgitation



Since ***most post-MBS VTE events occur after hospital discharge***, there was consensus that ***patients with known risk factors for VTE*** would likely benefit from ***extended pharmaco-prophylaxis*** after discharge.

***Individuals who undergo SADI-S must be under surveillance and supplemented for life***



***For RYGB patients*** who develop ***persistent hypoglycaemia syndrome*** despite adequate nutritional counselling, there ***was consensus*** that ***treatment with medications like*** diazoxide, acarbose, octreotide, and a GLP1-mimetic is preferred over reducing the pace of gastric pouch emptying either ***endo- or laparoscopically*** and preferred over ***performing surgical reversal to normal anatomy.***

### ***Outcomes***

***There was consensus*** that ***patients experiencing weight recurrence after weight loss*** require a ***thorough, multidisciplinary workup*** before any decision on revisional MBS surgery is made



In the absence of GERD symptoms or Barrett's oesophagus, patients with *suboptimal weight loss after a sleeve gastrectomy* can be treated by either adding (*AOM*) or *converting the SG to some other MBS procedure*, or both

For patients with *suboptimal weight loss after RYGB*, there was consensus that revisional surgery may include *pouch trimming* (with or without band placement), *gastro-jejunal anastomosis size reduction*, or *limb length modification*.

## ***More specifically***

***Consensus was not reached for patients with suboptimal weight loss after RYGB on whether revising pouch size or the GJ anastomosis should be performed during the same operation as limb length modification***

***No consensus was reached on the most appropriate surgical option for patient with suboptimal weight loss after SG in the absence of GERD symptoms or Barrett's oesophagus, when experts were offered the options of RYGB, OAGB, or SADI-DS***

***\*\*\* There was consensus that patients can be considered for \*\*\*  
modification of a prior MBS procedure based on weight issues alone (e.g., BMI>35 kg/m<sup>2</sup> ),  
even when pre-existing obesity-related complications have resolved or are in remission***

***No consensus was reached on whether SADI-S outcomes are superior to, inferior to, or roughly the same as those achieved with Roux-en-Y DS***

***Voting on the treatment of recurrent anastomotic (marginal) ulcers after a RYGB was considered invalid, because open discussion between consensus attendees resulted in too many options to consider (e.g., accurate vagotomy or reducing pouch size; resecting the anastomosis and creating a new one (preferably by hand); resecting the remnant; none of the above).***

Table 5-3: Results of a 2023 IFSO Delphi survey on metabolic and bariatric surgery

Statements	N	Rounds required	Most common selection	Percentage consensus
<b>ROUX-EN-Y GASTRIC BYPASS (RYGB)</b>				
In individuals with evidence of a large hiatal hernia and/or severe gastro-oesophageal disease or Barrett's oesophagus, RYGB IS/IS NOT preferable to SG.	40	1	Is	97.5%
The best option to treat medically-uncontrolled GERD after a SG is conversion into a RYGB.	38	1	Agree	97.4%
In individuals with class 1 obesity and early-stage diabetic kidney disease, with poor control despite medical treatment, RYGB SHOULD/SHOULD NOT BE recommended.	36	1	Should	91.7%
Revision of RYGB to address suboptimal weight loss would include pouch trimming (with or without band placement), GJ anastomosis size reduction, or limb length modification.	37	1	Agree	78.4%
Unless contraindicated, gastric bypass (including RYGB & one-anastomosis procedures) is generally preferable to SG for adults with T2DM and obesity.	41	1	Agree	78.0%
Preferred treatment for hypoglycaemia syndrome after RYGB, persisting despite adequate nutritional counselling, consists of: Medication (e.g., diazoxide, acarbose, octreotide, GLP1-mimetic)/Reducing the pace of gastric pouch emptying endo- or laparoscopically/Reversal to normal anatomy/None of the above	37	1	Medication	75.7%
Recurrent anastomotic (marginal) ulcers after a RYGB should be treated surgically by: Accurate vagotomy/Reducing pouch size, resecting anastomosis & creating a new anastomosis (preferably by hand)/Resecting the remnant/None of the above.	27	1	Reducing pouch...	74.1%
For a revisional surgery to address suboptimal weight loss after RYGB, given the risk of nutritional adverse events, revising the size of pouch and GJ anastomosis should NOT be done during the same operation as limb length modification.	32	2	Disagree	67.7% (NC)
In the absence of GERD symptoms or Barrett's oesophagus, the most appropriate surgical option for suboptimal weight loss after a sleeve gastrectomy would be conversion to: RYGB/OAGB/DS-SADI.	36	2	RYGB	60.5% (NC)

N = number of voters in deciding round; AOM = anti-obesity medication; BMI = body mass index; DS = duodenal switch; GERD = gastro-oesophageal reflux disease; GJ = gastro-jejunal; MBS = metabolic and bariatric surgery; OAGB = one-anastomosis gastric bypass; RYGB = Roux-en-Y gastric bypass; RY-DS = Roux-en-Y duodenal switch; SADI = single-anastomosis duodenal-ileal bypass; SADI-S = SADI with sleeve gastrectomy; LGB = laparoscopic gastric banding; T2DM = type 2 diabetes mellitus; VTE = venous thromboembolism. NC = no consensus.

Table 5-3: Results of a 2023 IFSO Delphi survey on metabolic and bariatric surgery

Statements	N	Rounds required	Most common selection	Percentage consensus
<b>SLEEVE GASTRECTOMY (SG)</b>				
Gastroesophageal reflux disease, suboptimal weight loss, and recurrent weight gain are the main reasons for revisions after SG.	37	1	Agree	100.0%
Sleeve gastrectomy is a suitable procedure for high-risk individuals as the first step of a staged surgical approach.	42	1	Agree	95.2%
Sleeve gastrectomy is a suitable procedure for high-risk individuals as a stand-alone procedure.	41	1	Agree	92.7%
Individuals experiencing T2DM recurrence without suboptimal weight loss or recurrent weight gain after a SG are candidates for optimized adjuvant medical treatment.	35	1	Agree	91.4%
In the absence of GERD symptoms or Barrett's oesophagus, suboptimal weight loss after sleeve gastrectomy can be treated by... Adding an AOM/converting the SG to some other MBS procedure/BOTH/NEITHER.	40	1	Both	87.5%
Improved patient selection preoperatively for GERD risk WILL/WILL NOT significantly reduce the rate of sleeve gastrectomy conversions to bypass.	37	1	Will	83.8%
Sleeve gastrectomy is not the ideal procedure for individuals with severe T2DM on insulin.	35	1	Agree	80.0%
At long-term follow-up, the main concern, pertaining to the risk of sleeve gastrectomy-associated reflux is... GERD symptoms, like heartburn or regurgitation/endoscopic findings, like esophagitis or Barrett's oesophagus.	38	1	Endoscopic findings	76.3%
A preoperative gastroscopy SHOULD/SHOULD NOT be performed routinely for individuals considering sleeve gastrectomy.	40	1	Should	75.0%
Generally, sleeve gastrectomy is the preferred procedure for elderly individuals (>65 years old) because of its excellent safety profile.	40	1	Agree	75.0%

N = number of voters in deciding round; AOM = anti-obesity medication; BMI = body mass index; DS = duodenal switch; GERD = gastro-oesophageal reflux disease; GJ = gastro-jejunal; MBS = metabolic and bariatric surgery; OAGB = one-anastomosis gastric bypass; RYGB = Roux-en-Y gastric bypass; RY-DS = Roux-en-Y duodenal switch; SADI = single-anastomosis duodenal-ileal bypass; SADI-S = SADI with sleeve gastrectomy; LGB = laparoscopic gastric banding; T2DM = type 2 diabetes mellitus; VTE = venous thromboembolism. NC = no consensus.

Table 5-3: Results of a 2023 IFSO Delphi survey on metabolic and bariatric surgery

Statements	N	Rounds required	Most common selection	Percentage consensus
<b>SINGLE-ANASTOMOSIS DUODENO-ILIAL BYPASS (SADI) + DUODENAL SWITCH = SADI-S</b>				
Individuals who undergo SADI-S must be under surveillance and supplemented for life.	36	1	Agree	100.0%
In a metabolically-challenged patient, hypo-absorptive procedures – especially those involving a duodeno-ileostomy – should only be performed by experienced surgeons at high-volume centres ( $\geq 25$ cases per year)	34	1	Agree	88.2%
Suitable candidates for classic Duodenal Switch or SADI-S would be individuals with a BMI $>50$ kg/m <sup>2</sup> and previous SG / severe or uncontrolled T2DM / Both / Neither.	35	2	Both BMI $>50$ & severe DM	77.1%
Indications for a primary SADI-S include poorly-controlled T2DM.	35	1	Agree	71.4%
Indications for a primary SADI-S include a BMI $\leq 45$ kg/m <sup>2</sup> .	36	2	Agree	66.7% (NC)
Considering that hypo-absorptive MBS procedures are associated with a higher risk of malnutrition, they SHOULD NOT BE/CAN STILL BE undertaken in adolescents (< 18 years old).	42	2	Should not be	66.7% (NC)
Comparing weight loss outcomes between SADI-S (with a common limb length of 250 - 300 cm) and classic Roux-en-Y DS... SADI-S is superior/Classic DS is superior/Weight loss is comparable	36	2	SADI-S & RYDS comparable	63.0% (NC)
Compared with classic Roux-en-Y Duodenal Switch, SADI-S provides a better quality of life.	33	2	Agree	51.5% (NC)
<b>ONE-ANASTOMOSIS GASTRIC BYPASS (OAGB)</b>				
With OAGB, a biliopancreatic limb of 200 cm or longer may increase the risk of protein deficiency.	39	1	Agree	100.0%
OAGB SHOULD/SHOULD NOT be considered a carcinogenic procedure.	37	1	Should NOT	83.8%
OAGB IS/IS NOT better than RYGB for individuals with a BMI $>50$ kg/m <sup>2</sup> .	31	1	Is NOT	80.6%
Unless contraindicated, gastric bypass (including RYGB & one-anastomosis procedures) is generally preferable to SG for adults with T2DM and obesity.	41	1	Agree	78.0%

N = number of voters in deciding round; AOM = anti-obesity medication; BMI = body mass index; DS = duodenal switch; GERD = gastro-oesophageal reflux disease; GJ = gastro-jejunal; MBS = metabolic and bariatric surgery; OAGB = one-anastomosis gastric bypass; RYGB = Roux-en-Y gastric bypass; RY-DS = Roux-en-Y duodenal switch; SADI = single-anastomosis duodenal-ileal bypass; SADI-S = SADI with sleeve gastrectomy; LGB = laparoscopic gastric banding; T2DM = type 2 diabetes mellitus; VTE = venous thromboembolism. NC = no consensus.

Table 5-3: Results of a 2023 IFSO Delphi survey on metabolic and bariatric surgery

Statements	N	Rounds required	Most common selection	Percentage consensus
<b>LAPAROSCOPIC GASTRIC BANDING (LGB)</b>				
Long-term follow-up (>10 years) after LGB reveals a high-rate of band-related reoperations and device explants.	38	1	Agree	94.7%
Laparoscopic gastric banding (LGB) is an effective treatment option for suitable individuals with obesity.	40	2	Disagree	60.0% (NC)
<b>OTHER</b>				
Weight gain recurrence requires a thorough evaluation before even considering a patient a candidate for modifying a prior MBS procedure.	37	1	Agree	100.0%
Suboptimal weight loss has different implications than recurrent weight gain when considering which type of intervention to consider next.	35	1	Agree	85.7%
A hiatal hernia assessment REQUIRES/DOES NOT REQUIRE laparoscopic evaluation at the start of MBS.	32	1	Requires	81.3%
Modification of a prior MBS procedure can be considered for weight issues alone (e.g., when BMI>35 kg/m <sup>2</sup> ), even when preexisting obesity-related complications are cured or are in remission.	40	1	Agree	80.0%
OVERALL MEAN LEVEL OF CONSENSUS = 80.2%				
RYGB = 80.1%; SG = 82.4%; SADI-S = 71.7%; OAGB = 85.6%; LGB = 77.4%; OTHER = 86.8%				

N = number of voters in deciding round; AOM = anti-obesity medication; BMI = body mass index; DS = duodenal switch; GERD = gastro-oesophageal reflux disease; GJ = gastro-jejunal; MBS = metabolic and bariatric surgery; OAGB = one-anastomosis gastric bypass; RYGB = Roux-en-Y gastric bypass; RY-DS = Roux-en-Y duodenal switch; SADI = single-anastomosis duodenal-ileal bypass; SADI-S = SADI with sleeve gastrectomy; LGB = laparoscopic gastric banding; T2DM = type 2 diabetes mellitus; VTE = venous thromboembolism. NC = no consensus.

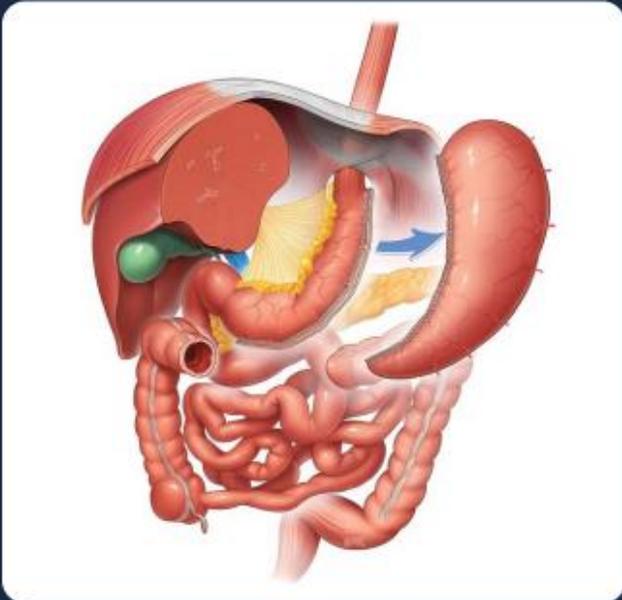


Figure 5-7: Sleeve Gastrectomy



Figure 5-8: RYGB



Figure 5-9: OAGB



Figure 5-10: SADI-S

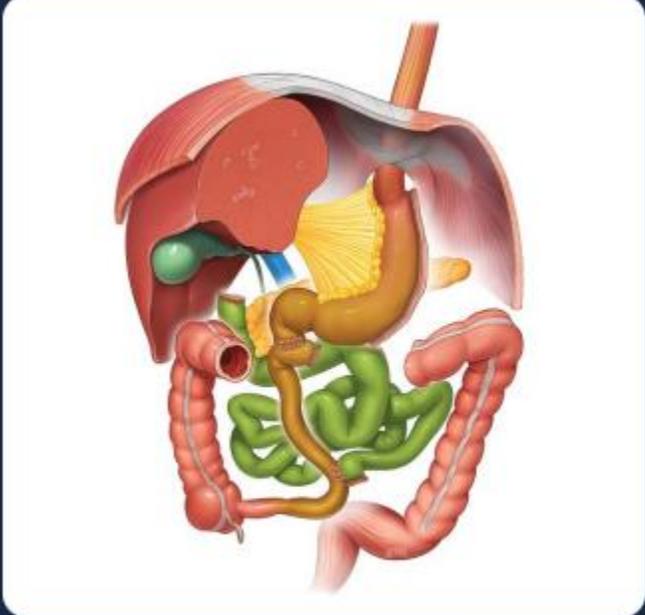


Figure 5-11: Duodenal Switch

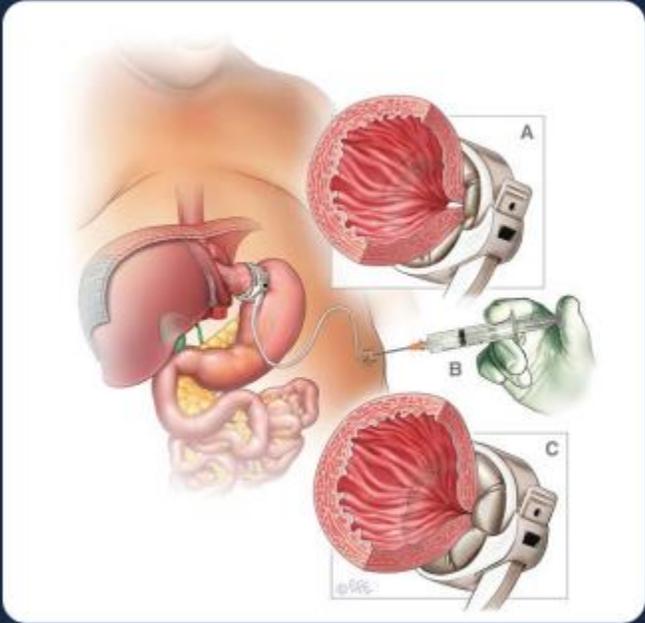


Figure 5-12: Adjustable Gastric Banding



Figure 5-13: Biliopancreatic Diversion



## Comparing Patient Selection and 30-day Outcomes Between Single Anastomosis Gastric Bypass and Roux-en-Y Gastric Bypass: a Retrospective Cohort Study of 47,384 Patients

Valentin Mocanu<sup>1</sup> · Kevin Verhoeff<sup>1</sup>  · Hayley Forbes<sup>1</sup> · Daniel W. Birch<sup>2</sup> · Shahzeer Karmali<sup>2</sup> · Noah J. Switzer<sup>1</sup>

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## Abstract

**Purpose** Single anastomosis gastric bypass (SAGB) offers a novel bariatric procedure with increasing popularity. However, its adoption, patient selection, and short-term safety remain poorly characterized.

**Materials and Methods** The 2020 Metabolic and Bariatric Accreditation and Quality Improvement Program (MBSAQIP) was analyzed comparing SAGB to Roux-en-Y gastric bypass (RYGB). Bivariate analysis and multivariable logistic regression models compared difference between groups and factors associated with 30-day serious complications and mortality.

**Results** Overall, 47,384 patients were evaluated, with 1344 (2.8%) undergoing SAGB. SAGB patients had a higher BMI ( $45.2 \pm 7.6$  kg/m<sup>2</sup> vs  $44.6 \pm 7.9$  kg/m<sup>2</sup>,  $p=0.006$ ) and younger age ( $44.3 \pm 12.1$  years vs.  $45.4 \pm 11.5$  years,  $p=0.0008$ ) than RYGB patients respectively. SAGB patients were less likely to have GERD (42.6% SAGB vs. 45.7% RYGB,  $p=0.02$ ), sleep apnea (37.8% SAGB vs. 41.1% RYGB,  $p=0.02$ ), and chronic steroid use (1.3% SAGB vs. 2.2% RYGB,  $p=0.04$ ). There were no significant difference in diabetes, hypertension, or dyslipidemia rates. Operative length for SAGB was significantly less than for RYGB ( $101 \pm 53.7$  min SAGB vs.  $131.5 \pm 63.3$  min RYGB,  $p < 0.0001$ ). SAGB was independently associated with decreased serious complications (4.7% vs. 8.4%,  $p < 0.0001$ ) within 30 days compared to RYGB. Additionally, SAGB patients were less likely to experience reoperation (1.6% vs. 2.6%,  $p=0.03$ ), and readmission (2.2 vs. 5.8%,  $p < 0.0001$ ) compared to RYGB respectively.

**Conclusions** Compared to RYGB, patients undergoing SAGB were younger with marginally higher BMI. After adjusting for comorbidities, SAGB was associated with decreased odds of serious complications. Ongoing prospective studies analyzing long-term outcomes following SAGB remain needed.

**Keywords** SAGB · Single anastomosis gastric bypass · Bariatric surgery · RYGB

The *retrospective cohort study analyzed 47,384 bariatric surgery patients* from the 2020 MBSAQIP database, including 1,344 who underwent single anastomosis gastric bypass (SAGB) and 46,040 who underwent Roux-en-Y gastric bypass (RYGB).

SAGB patients had marginally higher BMI and were slightly younger than RYGB patients, with less gastroesophageal reflux disease, sleep apnea, and steroid use. Operative time was shorter for SAGB than RYGB.

After adjusting for comorbidities, SAGB had significantly lower 30-day serious complication rates but no mortality difference versus RYGB.

While SAGB appears to have some perioperative benefits, long-term data on nutritional complications, bile reflux, and other outcomes remain needed.

# ***Introduction***

***Bariatric surgery is effective for obesity*** and associated ***metabolic dysfunction***, with Roux-en-Y gastric bypass (RYGB) as **gold standard**, but **technically demanding**.

***The International Federation for the Surgery of Obesity and Metabolic disorders (IFSO)*** stated in their 2021 position statement that **SAGB** outcomes are “promising in terms of shorter operative time, low perioperative complication rate, good weight loss and good comorbidity remission and appear equivalent to other bariatric procedures”but **adoption is limited by** lack of data on patient selection and short term outcomes compared to RYGB .

## ***Material and Methods:***

This retrospective cohort study used the 2020 Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) database to identify 47,384 patients undergoing primary bariatric surgery, including 1,344 SAGB and 46,040 RYGB procedures.

***Preoperative characteristics, comorbidities, and 30-day outcomes were compared between SAGB and RYGB using bivariate analysis. Multivariable logistic regression models evaluated independent predictors of serious complications and mortality, adjusting for confounders.***

***The study aimed to assess SAGB patient selection, compare perioperative outcomes to RYGB, and determine independent effects of SAGB on 30-day complications and mortality.***

## ***key results:***

**SAGB patients** had marginally higher BMI and younger age than RYGB

**SAGB patients** had less gastroesophageal reflux disease, sleep apnea, and steroid use preoperatively. **Operative time** was shorter for SAGB.

**SAGB** had lower rates of 30-day reoperation, readmission, and serious complications versus RYGB.

After adjusting for comorbidities, SAGB was associated with **reduced odds of serious complications** but no mortality difference compared to RYGB.

Other complications like **leaks and infections** were similar between groups.

Overall, **SAGB** demonstrated improved short-term safety over RYGB.

## ***Discussion:***

The findings support previous evidence of ***favorable short-term outcomes for SAGB*** compared to RYGB.

***The study builds on*** prior research by using a larger sample size, adjusting analyses for comorbidities, and ***demonstrating*** reduced 30-day reoperations, readmissions, and serious complications for SAGB specifically.

However, ***limitations*** include retrospective design, limited generalizability outside study centers, and lack of long-term data.

Long-term prospective studies are still needed to ***evaluate nutritional, bile reflux, metabolic, and other critical outcomes*** for SAGB before it sees broader adoption.

***Conclusion: SAGB appears safer short-term but long-term data remains lacking***

## ***Limitations:***

The ***retrospective study design*** and ***MBSAQIP database limitations*** constrain data quality and generalizability. Lack of surgeon and center specifics prohibits evaluating learning curve effects.

Heterogeneity in SAGB techniques is not captured. Data was collected during COVID-19, which may impact outcomes. Residual confounding is possible.

### ***Most importantly***

MBSAQIP lacks long-term follow-up, so critical nutritional, metabolic, bile reflux and ***other long-term SAGB outcomes could not be evaluated*** to fully compare to RYGB standards.