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The first case report of failed single-anastomosis-duodeno-ileal bypass converted to One anastomosis gastric bypass/Mini-gastric bypass



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ABSTRACT

INTRODUCTION: The established single-anastomosis-duodeno-ileal bypass with sleeve gastrectomy (SADI-S) is based on a sleeve gastrectomy (SG) as the restrictive part of the procedure. Due to preserved pylorus, SG has the disadvantage of a high-pressure system with de novo or worsening of existing gastroesophageal reflux disease (GERD).

CASE PRESENTATION: A female patient presented herself due to protracted GERD and weight regain after multiple bariatric surgeries. At an initial weight of 158 kg (BMI 62.5 kg/m²) the patient underwent adjustable gastric banding in 2009. After band removal in slippage, the patient underwent SG at a weight of 135 kg in 2012. Nine months after SG, SADI-S was performed as a malabsorptive second step procedure. After 32 months the patient suffered from severe GERD under proton pump inhibitor therapy. Actual weight was 107.9 kg (BMI 42.7 kg/m²). Upper endoscopy showed a hiatal hernia and esophagitis B and dorsal hiatoplasty was performed. After 6 months in still existing severe GERD and weight regain indication for laparoscopic conversion to One anastomosis gastric bypass/Mini-gastric bypass (OAGB/MGB) was given, aiming to reduce the high-pressure system of SG in a low-pressure system of OAGB/MGB. One year after revisional surgery reflux was reported to be only occasionally. Further weight loss was seen (91 kg, BMI 36 kg/m², EWL 67.7%).

CONCLUSION: SG as the restrictive part of SADI-S may lead to GERD and consequently to pathologic eating of “soft” calories, that defeats the operation and results in weight regain. OAGB/MGB might be a simple method to rescue such failed SADI-S patients.

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1. Introduction

Nowadays we talk about metabolic surgery, as obesity surgery goes beyond weight loss and includes improvement of metabolic syndrome [1,2]. Restrictive surgeries, such as the adjustable gastric banding (AGB) and laparoscopic sleeve gastrectomy (SG), are being questioned. Beyond Roux-en-Y gastric bypass (RYGB) metabolic operations, such as the single-anastomosis-duodeno-ileal bypass

Abbreviations: MGB, Mini-Gastric Bypass; OAGB, One anastomosis gastric bypass; RYGB, Roux-en-Y gastric bypass; SG, sleeve gastrectomy; AGB, adjustable gastric banding; SADI-S, single anastomosis duodeno-ileal bypass with sleeve gastrectomy; EWL, excess weight loss; BMI, body mass index; GERD, gastroesophageal reflux disease; BPD-DS, biliopancreatic diversion with duodenal switch; PPI, proton pump inhibitor.

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with sleeve gastrectomy (SADI-S) and the One anastomosis gastric bypass/Mini-gastric bypass (OAGB/MGB), are gaining additional recognition.

In accordance to the high amount of visceral fat and the increased intraabdominal pressure in obese [3] the incidence of hiatal hernia and esophagitis are elevated in obese individuals [4,5]. While weight loss after obesity surgery improves reflux symptoms, it often worsens after SG due to multifactorial nature [6]. Preservation of the pylorus in combination with the antrum leads this operation type creating a high pressure system and the increased intragastric pressure lead to de novo GERD or even worsens existing symptoms [7]. In the long-term outcome 32% of patients after SG require revisional surgery [8] and different second-step procedures after SG are described to treat weight regain and GERD [9]. In patients with weight regain biliopancreatic diversion with duodenal switch (BPD-DS) and OAGB/MGB are more efficient second stage procedures than re-sleeve or RYGB [9,10]. Cruroplasty [11,12] and conversion to RYGB or OAGB/MGB have been described in GERD after SG [10]. OAGB/MGB as a gastric bypass surgery offers a safe and effective revisional surgery for failed gastric restrictive

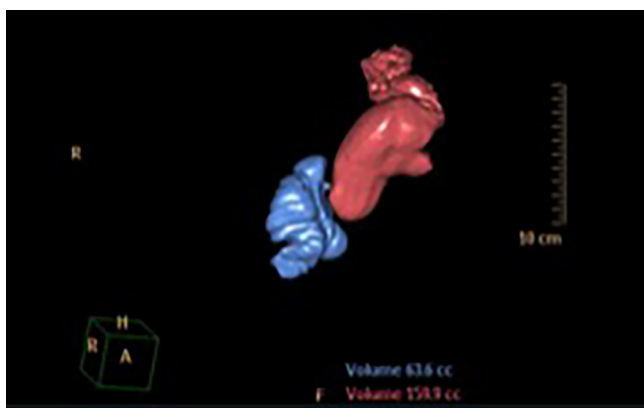


Fig. 1. CT Pouchography.

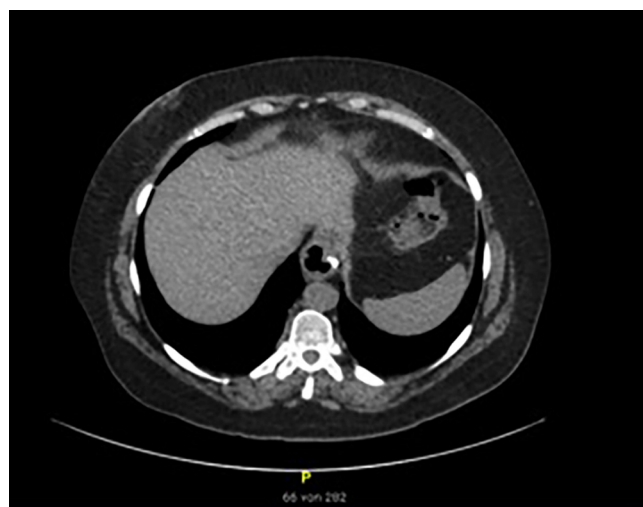


Fig. 2. Hiatal hernia.

procedures [13]. Safety and long-term effects of OAGB/MGB are proven [14] and OAGB/MGB gives the opportunity to convert the high-pressure system into a low-pressure system, improving GERD and additionally including the option on further weight loss, which is not always achieved by RYGB [9,15].

SADI-S has been presented as a simple version of a malabsorptive procedure after SG. It is described as a safe second-step operation that offers a satisfactory weight loss for patients subjected to a previous SG [16,17]. Due to preserved pylorus, SADI-S has the disadvantage of the high-pressure system with worsening of GERD.

In this clinical case report we describe the first case in the literature of conversion of SADI-S into OAGB/MGB due to prolonged GERD and weight regain.

2. Presentation of case

A 50-year old female patient with a BMI of 45.1 kg/m² (height 1.59m, weight 113.9kg) was transferred to our bariatric center (academic center of maximal care) due to protracted reflux and weight regain. The patient's bariatric history started in 2009, when she had undergone laparoscopic adjustable gastric banding (AGB) at an initial weight of 158 kg (BMI 62.5 kg/m²). The AGB was removed in 2012 due to slippage. Indication for SG was given and was performed laparoscopically one month after band removal with a weight of 146 kg. A planned second-step procedure in form of SADI-S (250 cm common channel) with simultaneous cholecystectomy and appendectomy was performed nine months after SG at a weight of 135 kg (BMI 53.4 kg/m²). The patient presented symptoms of important reflux with daily treatment of proton pump inhibitor (PPI) 32 months after SADI-S. Actual weight was 107.9 kg (BMI 42.7 kg/m²). Upper gastrointestinal endoscopy showed a hiatal hernia with esophagitis grade B according to the Los Angeles Classification. GERD – Health Related Quality of Life Questionnaire (GERD-HRQL) was 48. Indication for laparoscopic hiatal hernia repair with dorsal hiatoplasty was given. At this time the patient showed an EWL of 50.6%.

After six months the patient was readmitted, due to impaired recurrence of reflux even under high PPI therapy (Omeprazol 40 mg 1-0-1) and an aluminum complex (Sucralfate 1-1-1-1). Upper endoscopy showed a recurrence of a 5 cm large hiatal hernia and esophagitis grade A according to the Los Angeles Classification. GERD-HRQL was 52. The patient reported a weight regain up to a BMI of 45.1 kg/m² (height 1.59 m, weight 113.9 kg). Dietary protocol showed a shift to high calorie liquid food. The patient associated this change in diet with the impairment of reflux symptoms. CT Pouchography (Fig. 1) showed the hiatal hernia (Fig. 2) and a suspected functional stenosis at the angulus.

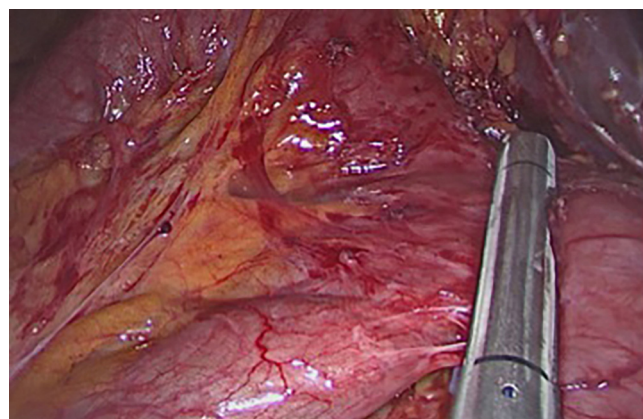


Fig. 3. Division of the duodenojejunosotomy.

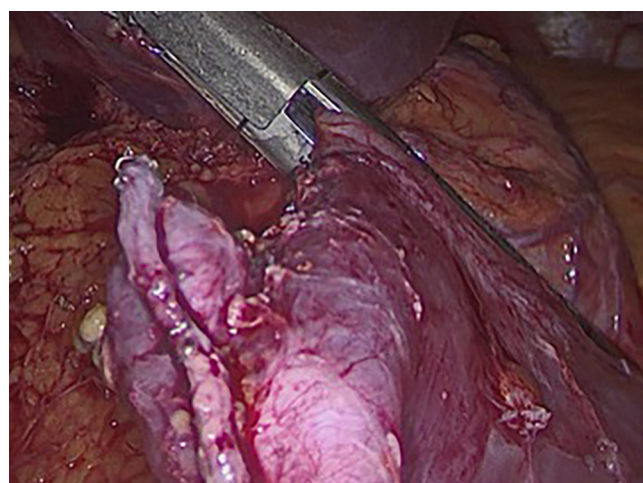


Fig. 4. Resection of the distal part of sleeve.

With the aim of converting the high-pressure system of SG into a low-pressure system of OAGB/MGB, indication for revisional surgery was given.

Surgery was performed laparoscopically. First, important adhesions had to be reduced, then duodenojejunosotomy was divided (Fig. 3). Gastric pouch was created as a long tubular pouch against a 42 Fr bougie and distal part of the sleeve was resected (Fig. 4). Anas-

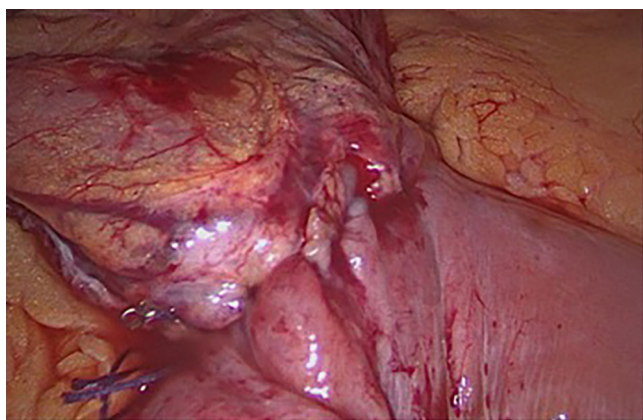


Fig. 5. Creation of the gastroenterostomy.

Table 1
Timetable.

2009	Laparoscopic adjustable gastric banding	158 kg, 1.59 m, BMI 62.5 kg/m ²
2012	Laparoscopic band removal due to slippage	
2012	Laparoscopic sleeve gastrectomy	146 kg, BMI 57.8 kg/m ²
2013	Laparoscopic single-anastomosis-duodeno-ileal bypass with simultaneous cholecystectomy and appendectomy	135 kg, BMI 53.4 kg/m ²
2015	Laparoscopic hiatal hernia repair with dorsal hiatoplasty	107.9 kg, BMI 42.7 kg/m ² GERD-HRQL: 48
2016	Laparoscopic conversion of single-anastomosis-duodeno-ileal to One anastomosis gastric bypass/Mini-gastric bypass	113.9 kg, BMI 45.1 kg/m ² GERD-HRQL: 52
2017	1 year follow-up	91 kg, BMI 36 kg/m ² GERD-HRQL: 2

tomosis was performed 200 cm after Treitz as a gastroenterostomy with a linear stapler (45 mm) and a 24 Fr tube for calibration (Fig. 5). Surgery was performed without any complication. After one hour of adhesiolysis, conversion was performed in less than 60 min. Hiatal hernia repair was not repeated due to important adhesions on the lower esophageal junction and due to the low-pressure system of OAGB/MGB.

Postoperative course was uneventful and the patient was discharged on the 5th postoperative day without reflux symptoms. Table 1 demonstrates the timetable of the different surgical procedures.

In the first follow-up (FU) one month after surgery the patient was still under PPI therapy for 6 weeks postoperatively. She had no important reflux symptoms. In the 6 month FU the patient showed a weight of 102 kg (BMI 40.3 kg/m², EWL 56.6%) and with a PPI therapy of 40 mg 1-0-0 the patient had acceptable sporadic reflux 2–3 times/week. GERD-HRQL was 5. In the 12 month FU the patient showed a weight of 91 kg (BMI 36 kg/m², EWL 67.7%) and with a PPI therapy of 40 mg 1-0-0 the patient had reflux only occasionally. GERD-HRQL was 2. The patient referred a good quality of life.

Written informed consent was obtained from the patient for publication of this case report and accompanying images. The work has been reported in line with the SCARE criteria [16].

3. Discussion

There are only a few descriptions of SADI-S as a primary- or second-step operation after SG in the literature [17–20]. The procedure constitutes a simplification of the conventional duodenal switch. It is easier and quicker to perform and associated with less morbidity and mortality. Being a malabsorptive operation it has a weight loss about 70% and a high rate of metabolic improvement. Due to the malabsorption the described complications and secondary effects, are predominantly diarrhea and hypoalbuminemia. However surgery is described to be safe and effective [17,18], the side effects of preserving pylorus and creating a high pressure system remain a challenging disadvantage: GERD can worsen or occur de-novo.

No case report with persistent reflux is described in the literature. Due to increasing GERD problems after SG, the same problems are expected after SADI-S or BPD-DS. RYGB remains an important second-stage procedure in hiatal hernia and GERD [10,21]. Further weight loss in RYGB is questionable, while mean EWL after SG is reported with 50–60% [22,23] in the literature and conversion to RYGB with an EWL of 66.9% [20] and 65.5% [24]. OAGB/MGB could replace RYGB due to additional weight loss [25] but keeping the same effect for GERD while having a low-pressure system. In a study by Tolone et al. manometric features and patterns did not vary significantly after OAGB/MGB, whereas intragastric pressures and gastroesophageal pressure gradient statistically diminished. In contrast, sleeve induced a significant elevation in both parameters [26].

The OAGB/MGB is believed to be more malabsorptive than the standard RYGB due to its longer biliopancreatic limb [27], but will not reach the malabsorptive power of a biliopancreatic diversion with its disadvantageous side effects [28,29]. OAGB/MGB is a safe and effective gastric bypass alternative. It has reliable weight loss and complications similar to other forms of gastric bypass. Due to the low pressure system gastric bypass such as RYGB and OAGB/MGB present an important therapy option in GERD. Malabsorption is lesser than in biliopancreatic diversion and the risk of diarrhea and fat malabsorption are low, if the biliopancreatic limb will not extend 150 cm and 1% when biliopancreatic limb is 200 cm [30]. OAGB/MGB can be a valid option in GERD and failed weight loss and should be performed as a “rescue operation” after failed SADI-S.

The systematic identification and intervention of individuals, who maintain or develop eating disorders and other problematic eating-related psychopathology post-operatively, may improve long-term outcomes [31].

Changing in eating behavior after AGB and RYGB is known to be an important issue for postoperative success in weight loss. Mitchell et al. found in a group of 2022 patients (1513 RYGB, 509 AGB) a greater weight loss of about 14% compared with participants, who made no positive changes in eating behavior [32].

Due to postgastrectomy syndrome, which includes dumping syndrome, diarrhea, nausea, afferent and efferent loop syndrome, patients with OAGB/MGB are forced to eat small portions to prevent symptoms and change indeed eating behavior. Nevertheless GERD can cause changing in eating behavior [33]. The resolution of the high-pressure system with GERD indeed changed eating behavior of the patient and further weight loss was achieved. SADI-S is a relative new operation with many obvious advantages. Nevertheless the combination of SG with retained pylorus and the massive gut bypass by biliopancreatic diversion type operations may lead to GERD, diarrhea and malabsorption syndromes. The resulting pathologic shift of eating behavior leads to avoid fat in favor of carbohydrates and the intake of large quantity of ‘soft’ calories. Finally

those changes can include the risk of operation failure, GERD or malabsorptive syndromes.

4. Conclusion

Long-term complications after obesity surgery may arise from restrictive and malabsorptive procedures and bariatric surgeons have to be aware and have to be able to manage them.

In this case report we describe the first conversion of SADI-S to OAGB/MGB to improve patients symptoms and quality of life. OAGB/MGB might be a simple method to rescue such failed SADI-S patients in the short term. Long-term data is necessary.

Bariatric surgeons may face similar scenarios as described in this case report and experiences in re-do and revisional surgery are mandatory for the future. Due to general interest data from revisional surgery should always be collected and should be assessed initially as a series and later as a cohort study.

Conflicts of interest

Nothing to declare.

Funding

Nothing to declare.

Ethical approval

No ethical approval was necessary as this is a retrospective presentation of a case report.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request”.

Author contribution

Authorship: S.C, O.S. and C.S. performed substantial contributions to conception and design of the article and to acquisition, analysis and interpretation of data. S.T. operated the patient. All authors reviewed the manuscript for important intellectual content and approved the final version for publication.

Registration of research studies

As this is a retrospective case report no registration is necessary.

Guarantor

Sonja Chiappetta, Rudolf Weiner.

Disclosure

Dr. Sonja Chiappetta, Dr. Christine Stier, Dr. Oliver Scheffel, Sophia Theodoridou and Prof. Rudolf Weiner have no conflicts of interest or financial ties to disclose.

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