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INTRODUCTION

One Anastomosis Gastric Bypass (OAGB) is a relatively novel, but already a frequently implemented bariatric procedure. As of now, no specific OAGB protocol for supplement advice has been consolidated to the level of official guidance. Nutrition specialists adopt the existing protocols relevant to Roux-en-Y Gastric Bypass (RYGB) or Biliopancreatic Diversion (BPD) [1,2], while the information on the malabsorptive nutritional complications after OAGB following this supplementation remains poor.

AIM

To add evidence on the nutritional outcomes and changes in biomarkers for OAGB surgery in nutritional-metabolic aspects, one year after the procedure, and to compare them with the nutritional risks of Sleeve Gastrectomy (SG), another widely implemented surgery, which does not involve a malabsorptive component.

METHOD

A retrospective study, based on a file analysis of patients who were admitted for surgery between the years 2017 and 2019 in the Surgical Department of Hadassah Mount Scopus Hospital.

- Patients with no previous bariatric history were included.
- Patients' files were selected randomly (N=60 for SG and 60 for OAGB).
- According to the Medical Center protocol, the patients were required to attend appointments at the following time points: before the surgery, during the hospitalization process, 10-14 days after the surgery, 5 weeks after the surgery, and every three months for follow-up thereafter, up to one year after the surgery.
- Demographic characteristics, anthropometric and blood indices before surgery and after one year were collected.
- Immediately after the surgery, the patients were advised to take supplements according to the clinical guidelines for RYGB (an accepted OAGB advice), and for SG (Table 1)

Table 1: A standard post-surgery advice for dietary supplements in Hadassah Medical Center

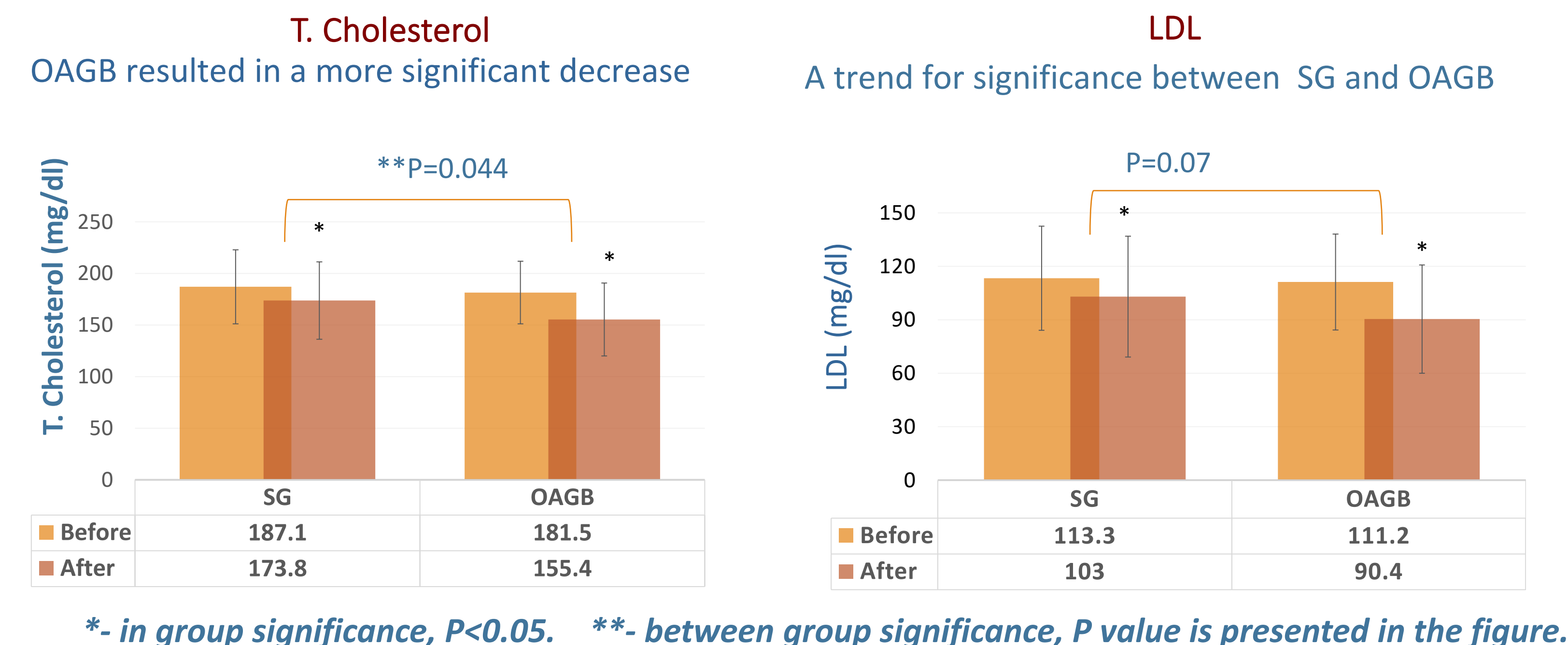
Type of Dietary Supplement	OAGB	SG
Calcium mg/day	500 × 2	500
Multivitamin for children (chewable) pills/day	4	4
Whitman D IU/day	According to blood test/3000	According to blood test/3000
Liquid iron mg/day	50	-
Complex B/B12	According to blood test	According to blood test

RESULTS

Table 2: Post-surgery SG and OAGB anthropometric outcomes

Variables	SG Mean (SD), N=55	OAGB Mean (SD) N=51	P value
Weight (kg)	78.2 (18.2)	79.2 (16.0)	0.051
BMI (kg/m ²)	28.3 (4.7)	28.2 (5.0)	0.091
TWL (kg)	39.0 (10.0)	44.1 (16.0)	0.051
TWL (%)	33.5 (7.0)	35.4 (8.0)	0.199
EWL (%)	84.9 (21.7)	87.6 (24.0)	0.545
BMI loss (kg/m ²)	14.2 (3.4)	15.5 (5.0)	0.091
BMI loss (%)	33.5 (7.1)	35.4 (8.0)	0.207

Figure 2. Lipid profile indices one year after SG and OAGB



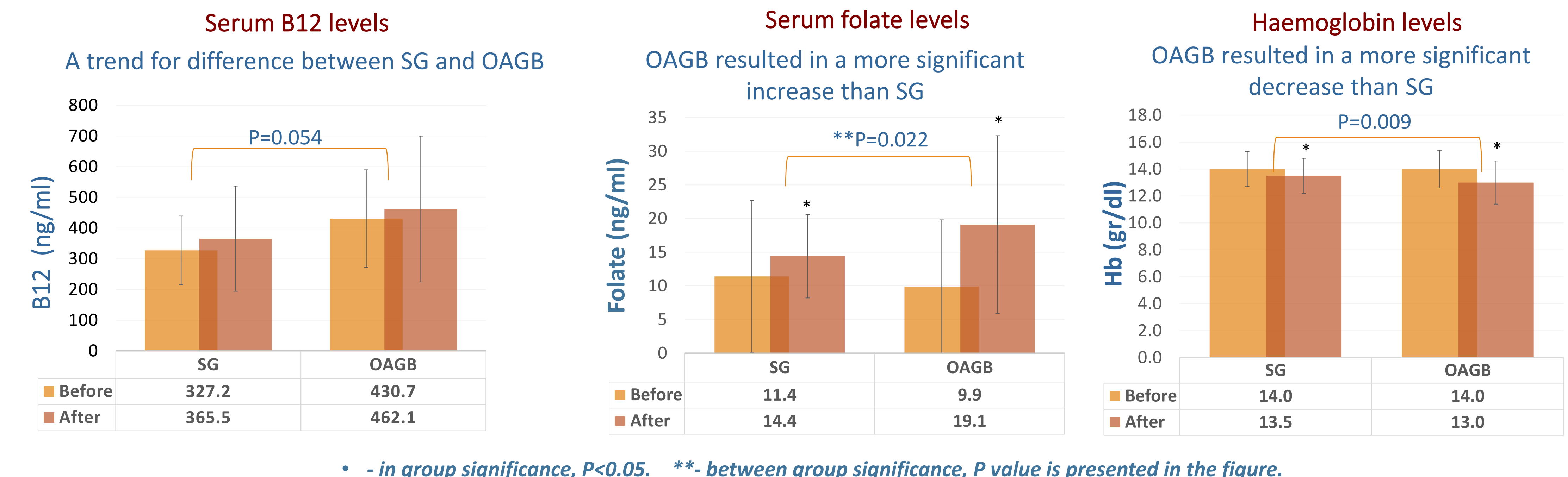
*- in group significance, $P < 0.05$. **- between group significance, P value is presented in the figure.

T. Cholesterol and LDL decreased after both surgeries; however, OAGB resulted in a more significant reduction. Despite a significant improvement from the baseline in HDL and TG in both groups, no between-group advantage was observed for SG or OAGB (Table 3).

CONCLUSIONS

- Despite the malabsorptive component in OAGB, no disadvantage (besides more intensive decrease in Hb) was observed for nutritional outcomes compared to SG one year after the surgery.
- Adhering to the existing RYGB protocol for dietary supplementation can be appropriate for prevention of nutrition deficiencies after OAGB, and even for improvement of several indices compared to the pre-surgery phase.
- Anthropometric and metabolic outcomes were similar for both surgeries (except some lipid profile outcomes), with some trend for a higher effectiveness of OAGB.
- To assure the conclusions on a lack of malabsorption-related deprivation and on anthropometric stability, a research with a longer follow-up is needed.

Figure 1. The one year post-surgery effects of SG and OAGB on anemia-related indices



While the existing supplemental protocol was successful for elevating serum levels of B12 and folate (a more significant effect for OAGB), a decrease in Hb was observed for both surgery groups, with a statistically significant disadvantage for OAGB. The changes in iron levels were not different between the surgery types (Table 3).

Table 3: Post-surgery outcomes similar for SG and OAGB

Variables	SG Mean (SD)	OAGB Mean (SD)	P value (between group effect)	In-group post-surgery effect compared to the baseline
Vitamin D (ng/ml)	44.5 (32.7)	38.2 (37.3)	0.648	↑
Iron (mg/dl)	88.9 (47.9)	76.5 (37.0)	0.246	ND
Ferritin (ng/ml)	76.4 (64.8)	80.2 (71.1)	0.304	Mixed trend
Albumin (gr/dl)	41.9 (3.3)	40.2 (3.3)	0.088	↓
HDL (mg/dl)	52.3 (8.9)	49.4 (12.7)	0.39	↑
TG (mg/dl)	88.3 (31.5)	90.3 (30.9)	0.95	↓
Hb A1C%	5.2 (0.5)	5.2 (0.7)	0.127	ND

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INTRODUCTION

Leak is one of the common complications of laparoscopic sleeve gastrectomy that result prolongation of hospital stay, morbidity and even mortality.

AIM

One step procedure for the treatment of sleeve leak.

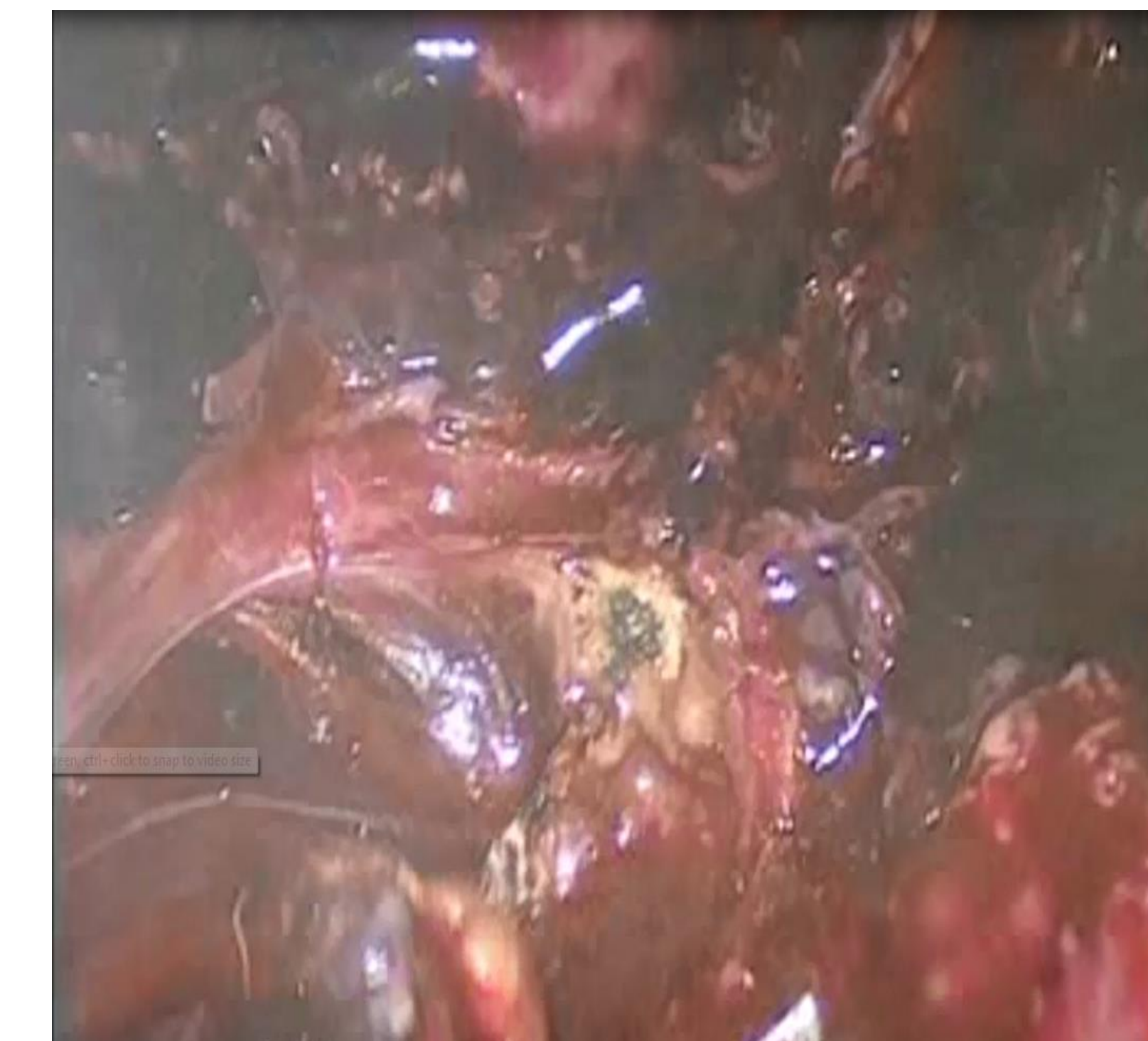
METHOD

I report new approach for the treatment of 51 leaks presented to me post laparoscopic sleeve gastrectomy with laparoscopic Roux En Y bypass to the leak site at the level of gastroesophageal area. Only 2 mortality , one was due to sepsis due to delayed surgery and one bleeding post removal of chest tube after surgery. This new approach is possible and feasible, and avoids stenting due to high failure rate, prolonged hospitalization and saves life of patients.

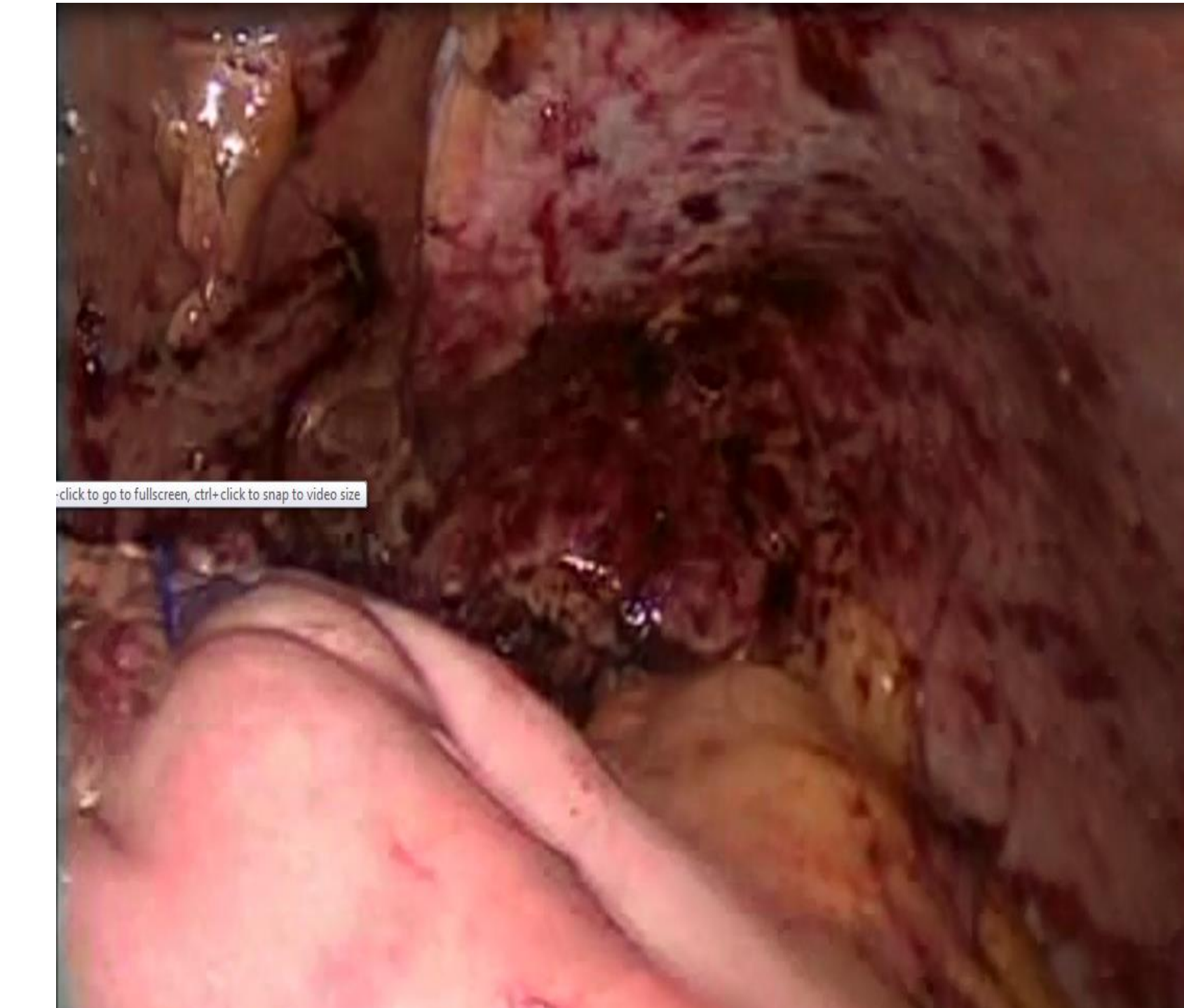
RESULTS

All leaks healed 7 days from surgery due to well vascularized small intestinal mucosa to mucosa anastomosis, except for 3 leaks that healed after 2 weeks of conservative treatment.

Side of perforation at the gastroesophageal junction.



Completion of side-to-side anastomosis before creation of Roux En Y.



CONCLUSIONS

This new approach is successful in 96% of patients with reducing hospital stay up to 7-10 days.

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A05- SASI Bypass as a Revision Surgery for Sleeve Gastrectomy Non-Responders: 2 Years Follow up

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INTRODUCTION

Single Anastomosis Sleeve Ileal Bypass(SASI)is a Novel Metabolic/Bariatric Surgery operation based on Santoro’s bipartition operation . It can be offered for patients with weight regain after Sleeve gastrectomy. Abstract : Sleeve gastrectomy (SG)is a commonly performed bariatric procedure . Weight regain following SG is a significant issue .Yet , the understanding of this phenomenon is still unclear . Rates of regain ranged from 5.7% at 2 years to 75.6% at 6 years. SASI bypass was an option for some candidates having SG done 2 years back and failed to achieve the required weight loss or having weight regain . In SASI bypass ,Re-sleeve gastrectomy of the dilated gastric pouch is done followed plication of the stapler line then creating a Bipartition channel doing a side to side gastro-ileal anastomosis.

AIM

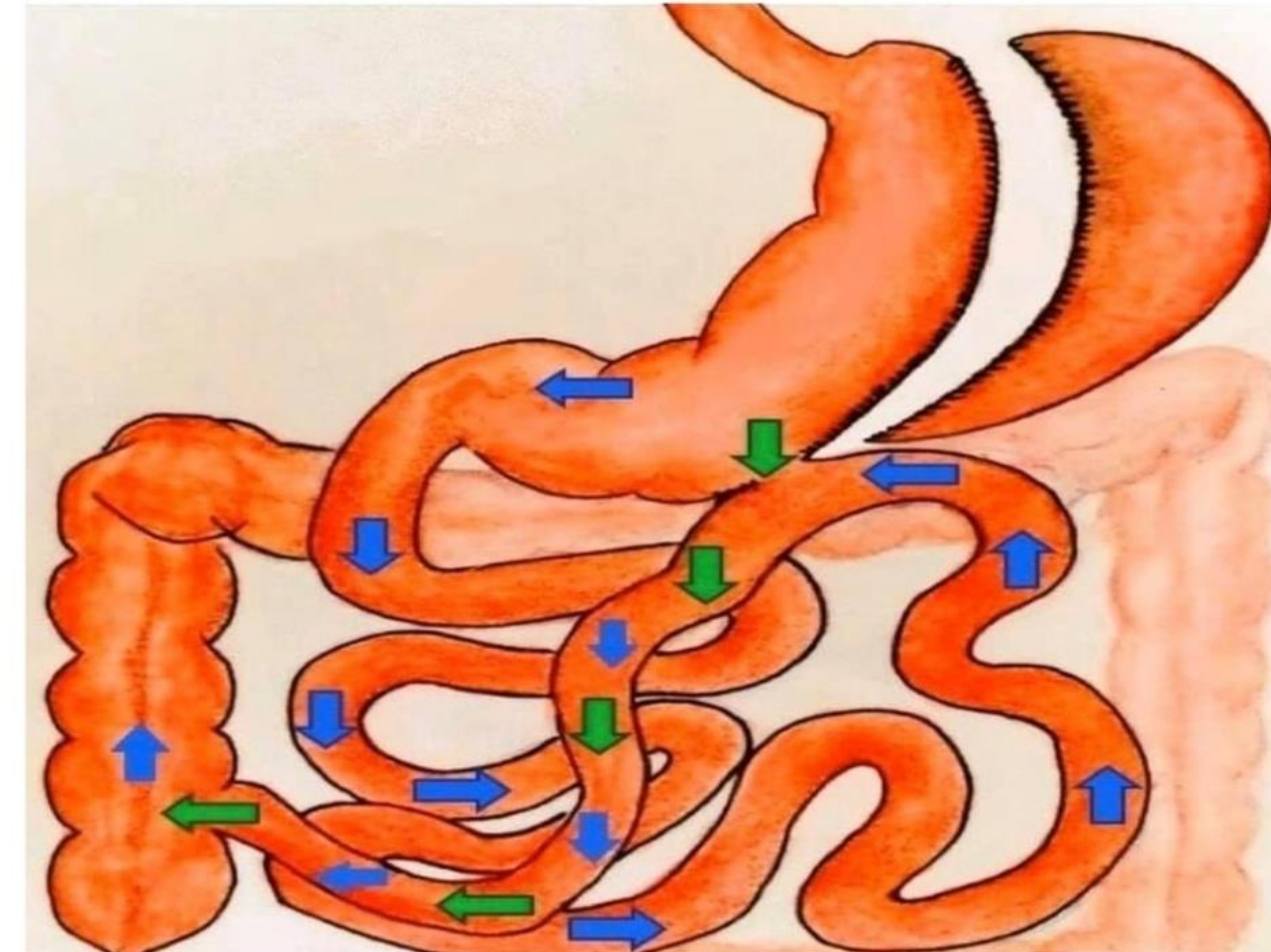
The aim of this study is to report the clinical results and the outcomes of SASI bypass as a therapeutic option for patients with weight regain after SG.

METHOD

We conducted a retrospective study for 75 morbidly obese patients having history of SG done more than 2 years back and failed to achieve and/or to maintain the required BMI. Exclusion criteria : Patients with history of Bypass Bariatric Surgery and patients with documented psychological instability or intolerance for regular follow up . Procedure was done at Sidra Hospital in Kuwait from February 2017 to November 2019. Using 5 ports, Re-sleeve Gastrectomy was performed over36 for bougie tube starting 6 cm above the pylorus then gastro-ileal anastomosis (side to side)was performed 6 cm above the pyloric ring to an ileal loop counted 300cm from the ileocaecal valve. Data was collected from the patients including: Weight loss progress, laboratory full results

RESULTS

During the study period:75 morbidly obese patients with a mean BMI of 44+/-6 Kg/m2 were evaluated .-%EWL(excess weight loss)reached 64% at two years-Diabetes was cured in the known diabetic patients (type2)within 6 months, .- Follow up laboratory results were normal in 88% of patients (all were kept on regular vitamins and proteins supplementation for 2 years) 3 patients had hiatal hernia that was repaired during the procedure and 2 patients had asymptomatic gall stones that was discovered during the routine preoperative work up for whom Laparoscopic cholecystectomy was done at same session before starting the SASI procedure.



CONCLUSIONS

SASI Bypass is a promising operation that offers a good weight loss for morbidly obese patients having weight regain after SG..

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A06-Laparoscopic Sleeve Gastrectomy In A Patient With Severe Haemophilia (A Case Report)

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INTRODUCTION

Hemophilia A is an X linked inherited bleeding disorder caused by deficiency in coagulation factor VIII(FV III) .To prevent spontaneous bleeding in muscles and joints, patients with severe Hemophilia A should receive prophylactic replacement therapy. Dosing shall be adjusted according to body weight.

AIM

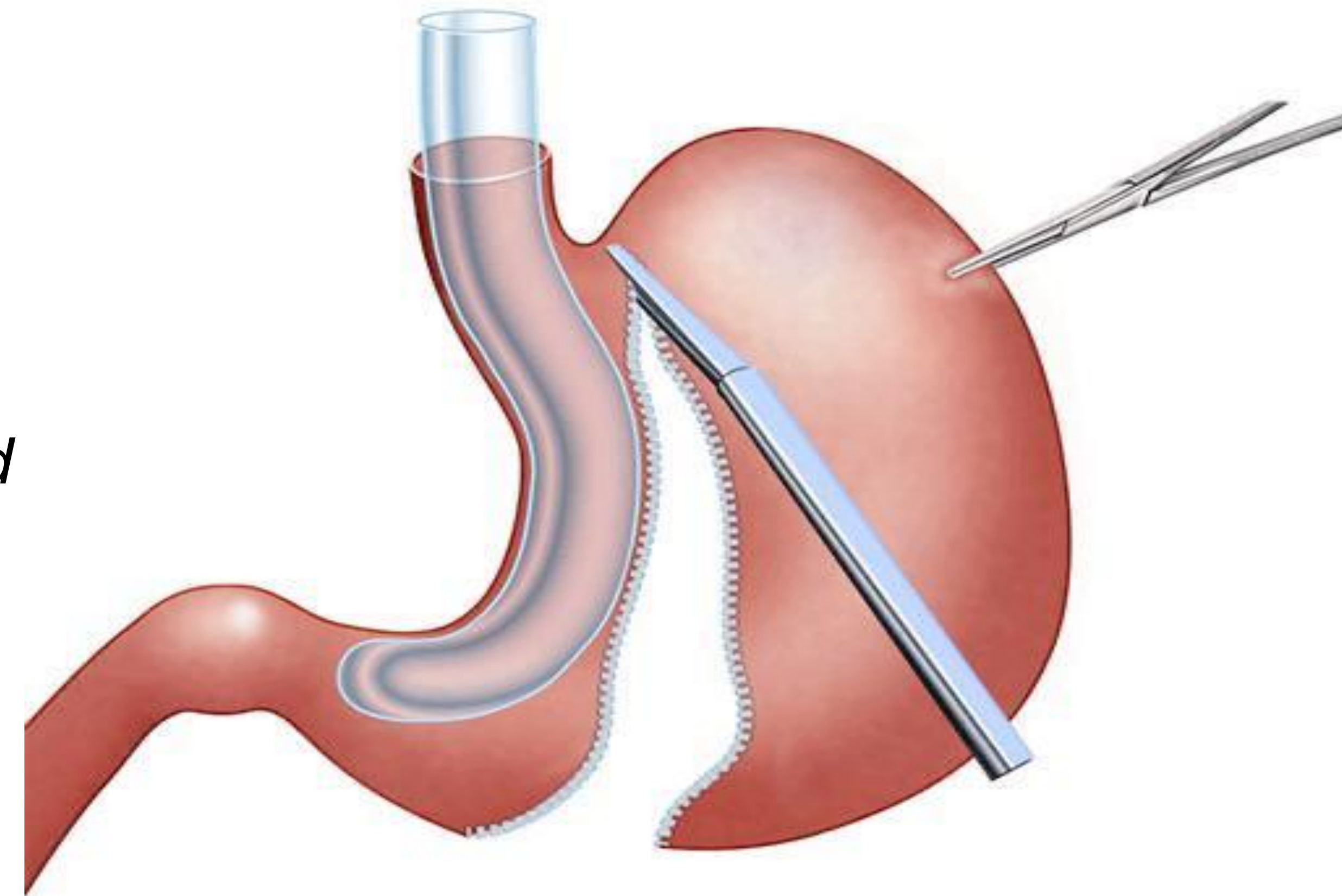
The aim of this case report is to represent the success of Sleeve gastrectomy as a bariatric surgery in Hemophilia A patient done by bariatric surgery team in sidra Kuwait Hospital.

METHOD

19 years old male patient who is well known to have Hemophilia A, that has been diagnosed shortly after birth during routine circumcision.
 The Patient had presented to our clinic with Body Mass Index of 53.9 kg\m2. He was counselled for laparoscopic sleeve gastrectomy after failure of many trials to loose weight.
 He and his father were counselled for procedure pros and cons. Routine preoperative work up had been performed (Full labs, Abdomen Ultrasound, Dietician consultation, Anesthesia consultation, Cardiology consultation).
 Hematological consultation had been done and consultant opinion was to give prophylactic factor VIII 7500 IU:
 • 2 hours prior to surgery, 24 hours after surgery and 72 hours after surgery
 Extra precaution had been taken in the perioperative period in the form of: Careful cannulation, IM injections had been avoided completely, No Anticoagulants, 1:1 Nursing care, careful Handling and positioning, Continuous monitoring (planned ICU admission for first 24 hours then HDU admission for 48 hours). Senior anesthetist, Senior anesthesia technician, On table gastroscopy (same cession), Smooth bouji tube (size 36 fr.), Careful haemostasias: slow Harmonic sealing, Clipping of short gastric, 1minute stapler compression (All green), Full stapler line plication and omental patching. Maintenance of blood pressure to average range during surgery.. Patient had uneventful postoperative recovery, a part from mild sub conjunctival hemorrhages (Bilateral) that had subsided spontaneously.

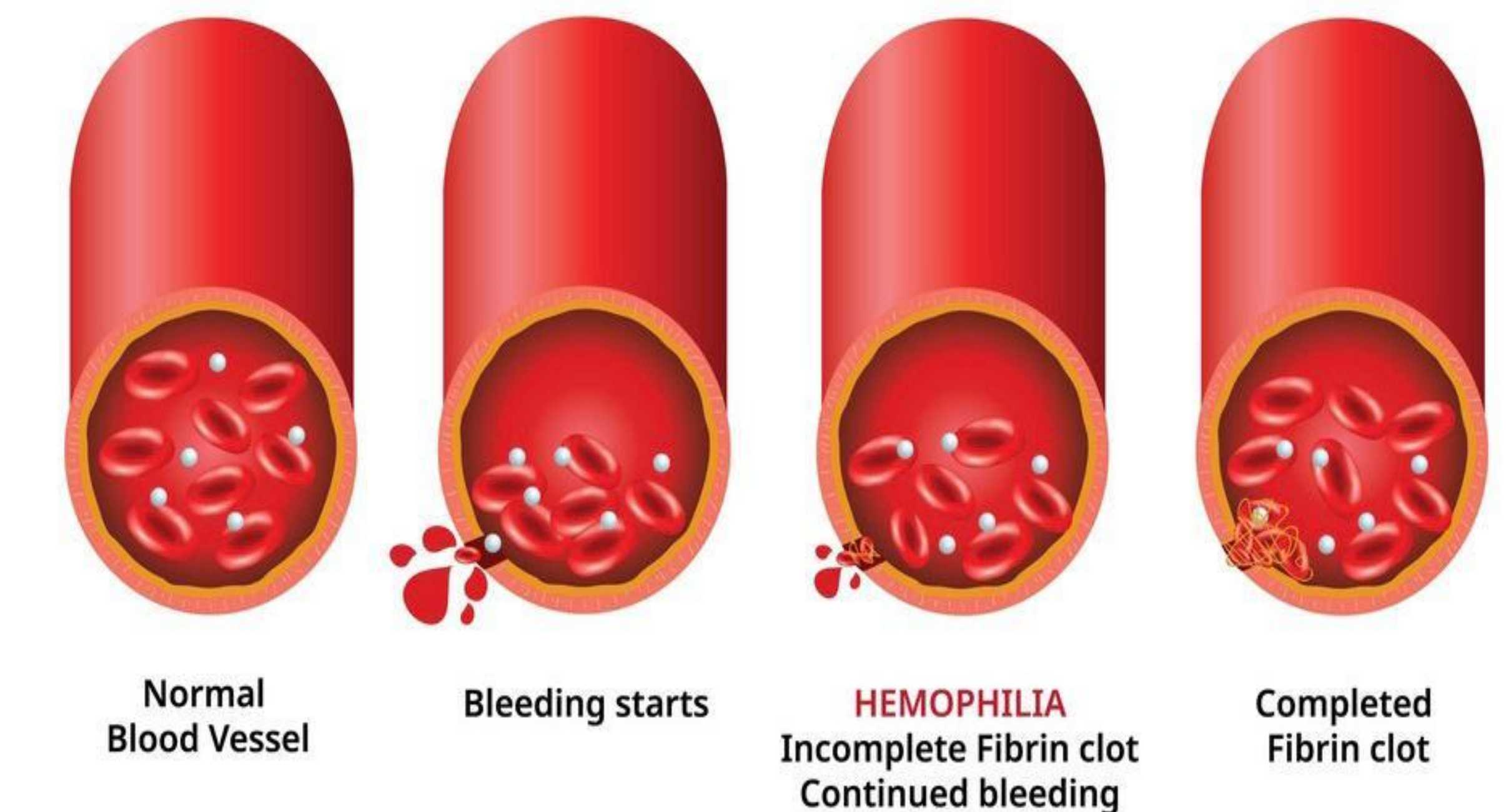
RESULTS

With meticulous perioperative multidisciplinary care, A case of severe Hemophilia A with Morbid obesity could have a successful uneventful laparoscopic sleeve gastrectomy



Laparoscopic Sleeve Gastrectomy).

HEMOPHILIA



Hemophilia : A rare Dangerous bleeding disorder

CONCLUSIONS

Laparoscopic sleeve gastrectomy can be performed smoothly in patients with Hemophilia A with proper perioperative multidisciplinary care management.

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A09-Simultaneous Occlusion Of Afferent & Efferent Limb Due To Slippage Of Mini-Mizer Band Following Revisional Banded OAGB; A Video Case Report

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INTRODUCTION

- Banded Bypass procedures are debated upon regarding their complication rate
- The reported band related complication rate in literature ranges from 5-6%

AIM

- We present a rare case of a lady who presented with obstruction due to simultaneous occlusion of afferent and efferent limb by a slipped band following banded OAGB

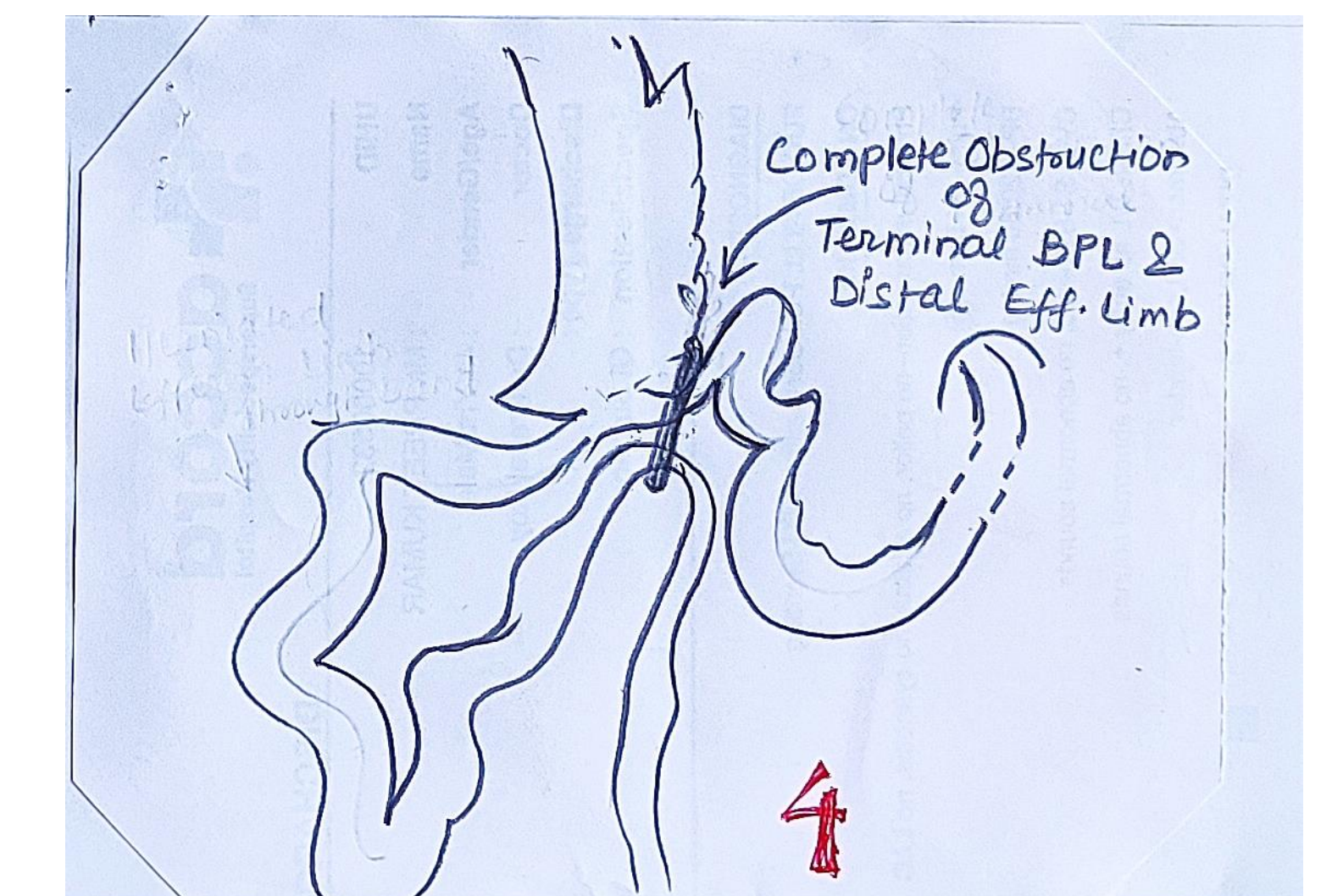
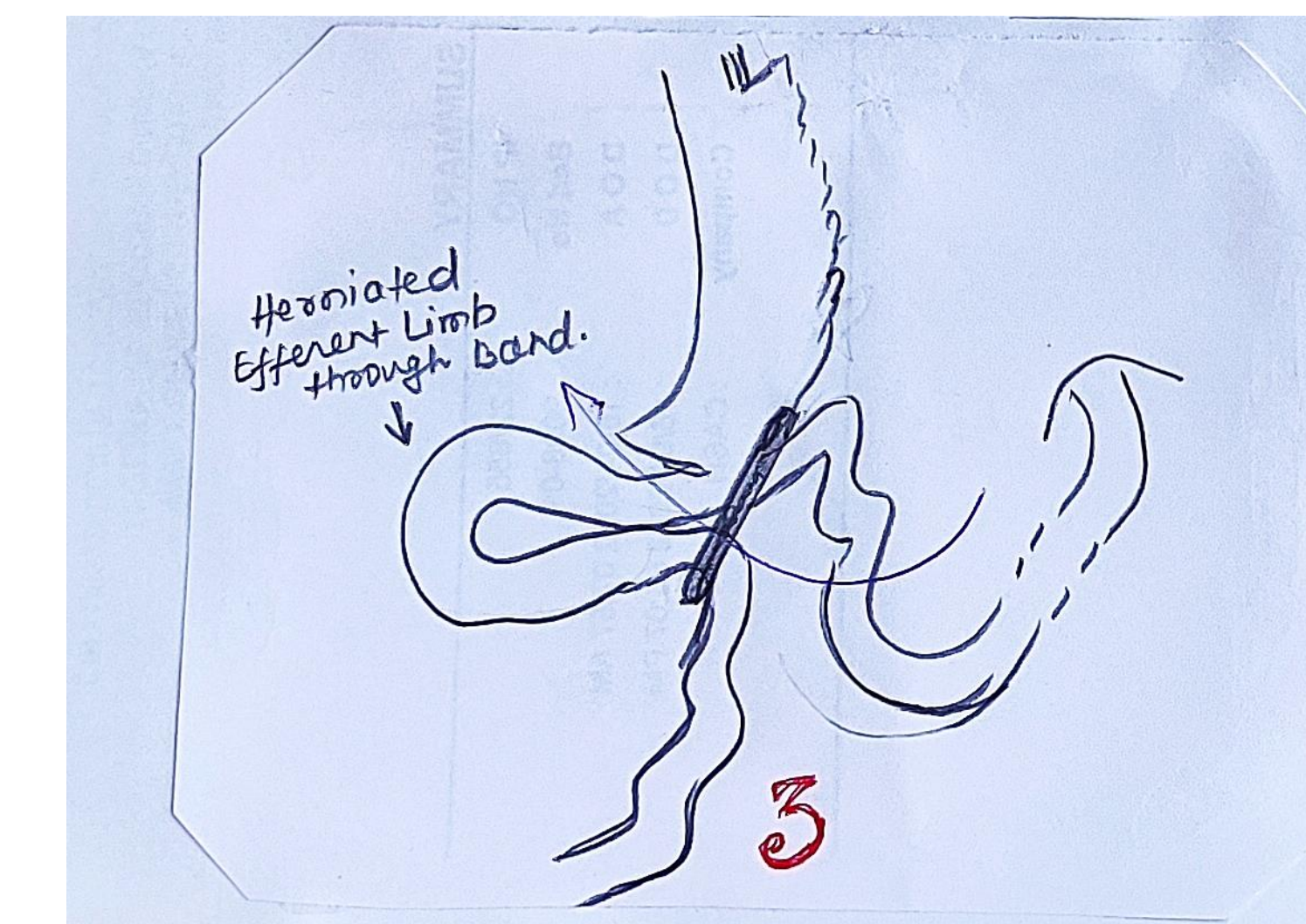
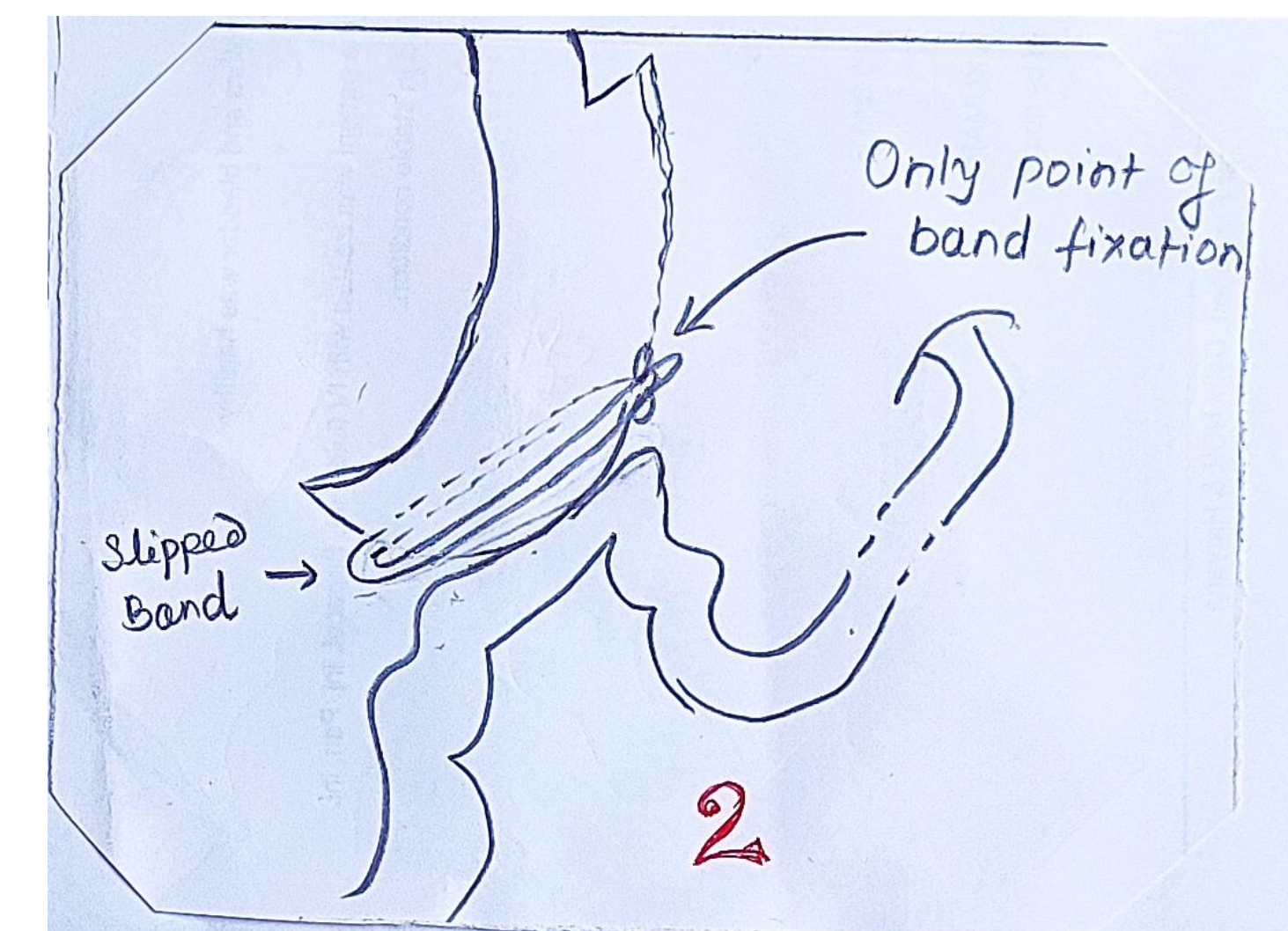
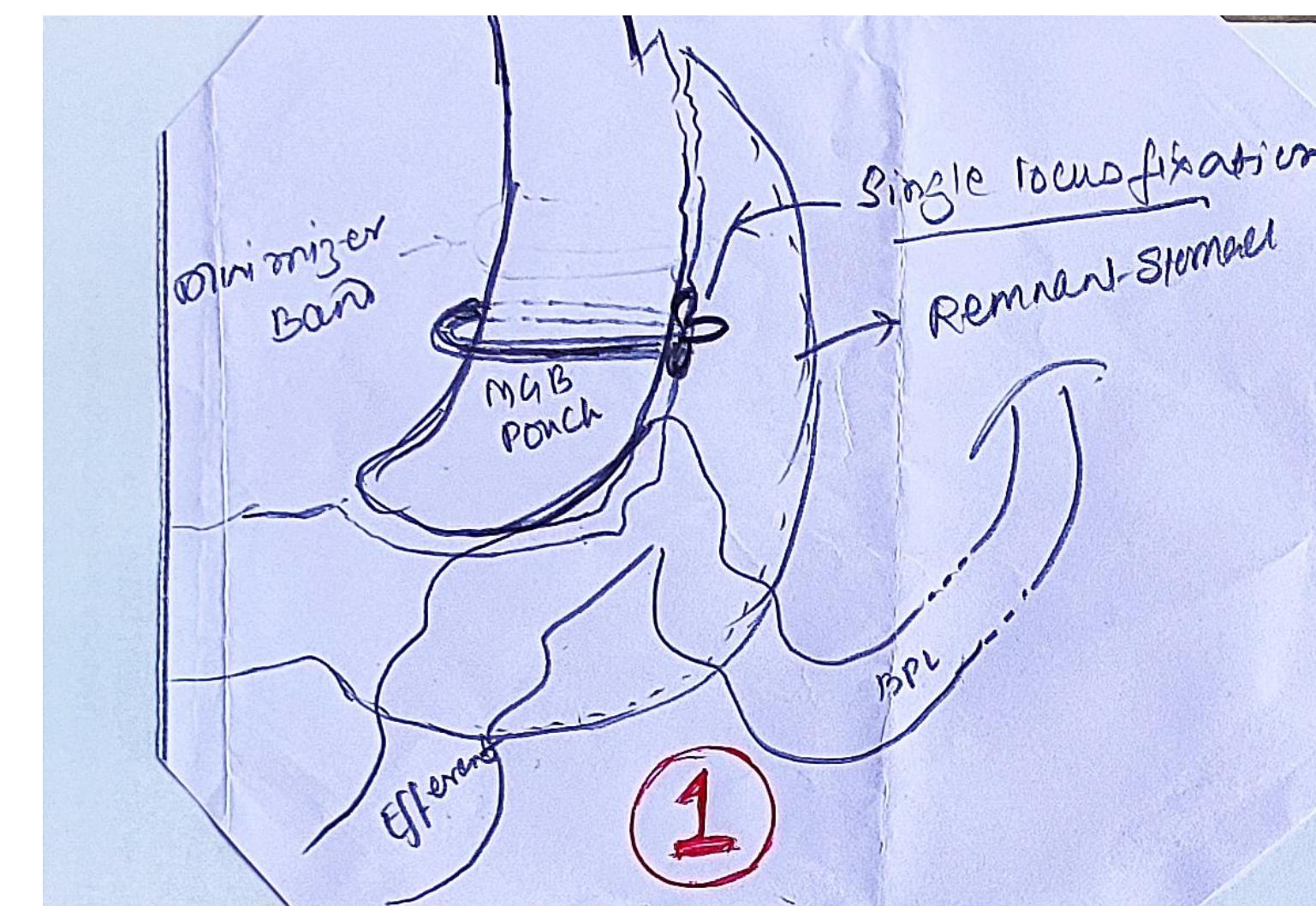
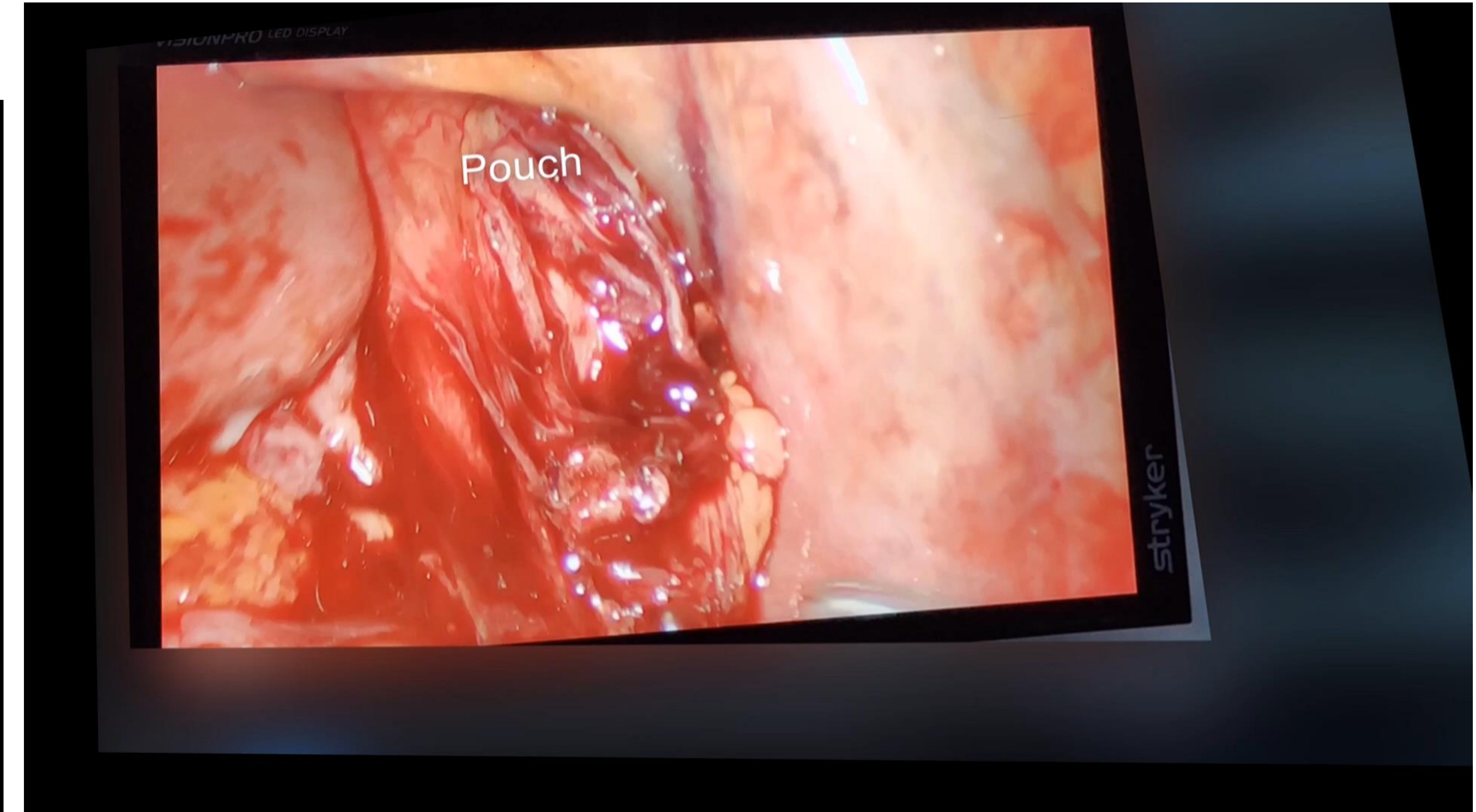
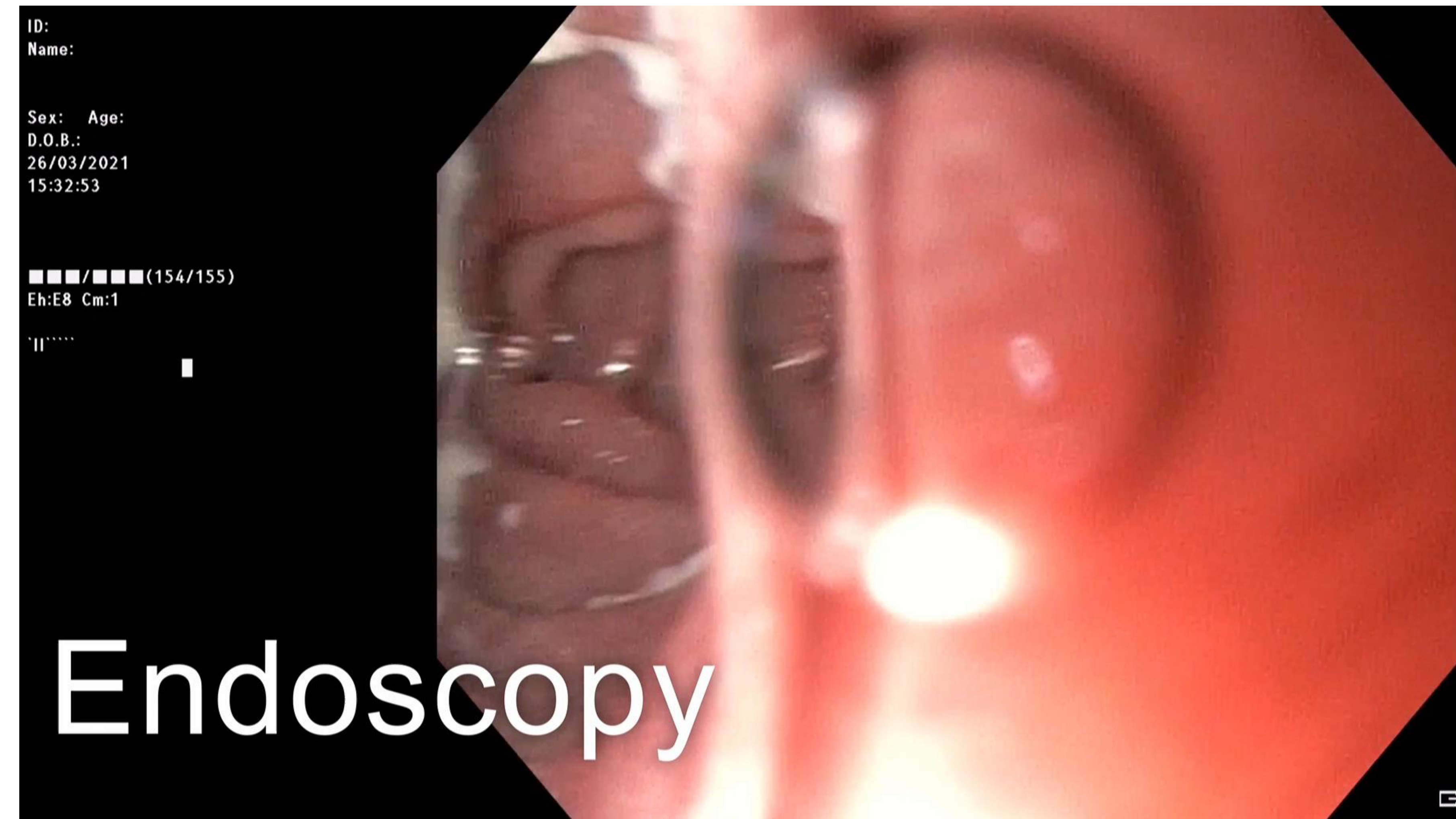
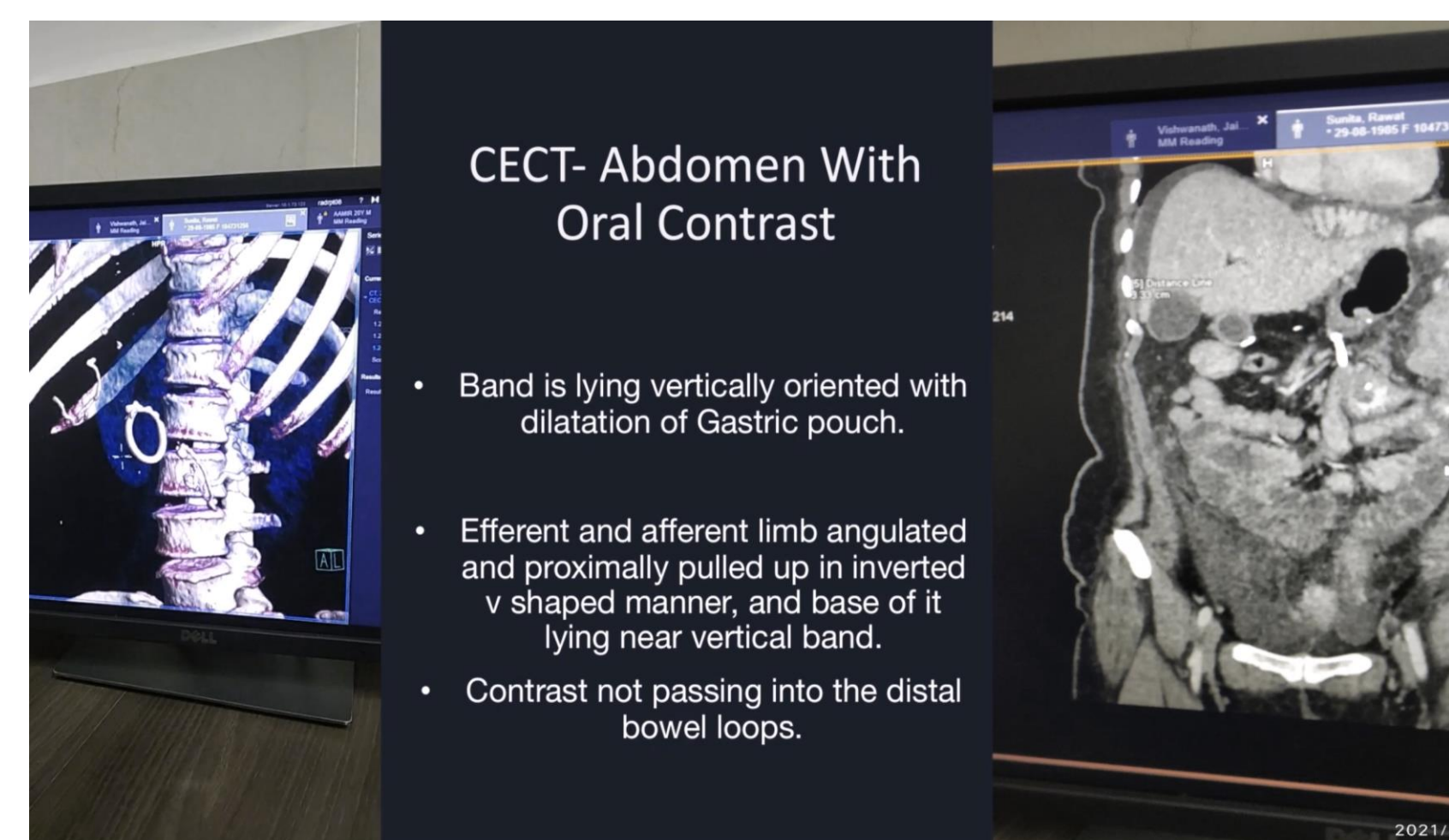
CASE REPORT

Age/ sex #5y/ female

- Chief complaints:** pain abdomen X 2 days
- Colicky** in nature and aggravating on oral intake
- Vomiting** since morning
- Projectile, Non Bilious** with food particles. No hematemesis

Underwent LSG in 2010

- LSCS** in 2014
- Para umbilical hernia repair** in 2016
- Revision OAGB** in September 2019 for weight regain
- Presented** with these symptoms 18 months after revision surgery



CONCLUSIONS

- With Increasing Popularity of Bands, Two or Three points fixation technique need to be devised to avoid Complications.
- Need for very high degree of suspicion and Low threshold for CECT and Diagnostic Laparoscopy to diagnose such complications

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Effects of LSG and LMGB-OAGB on lipid profile of patients post bariatric surgery

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INTRODUCTION

Laparoscopic mini gastric bypass (LMGB) and laparoscopic Sleeve gastric (LSG) are the two commonly performed surgical procedures used to reduce weight in morbidly obese patients. These patients tend to have many other comorbid conditions. Dyslipidemia is one of those major conditions which may subsequently lead to other serious health problems.

AIM

Assess the effect of LMGB and LSG on the lipid profile, besides the weight loss.

METHOD

- **Study Design:** Retrospective Cohort Study
- **Population & Inclusion Criteria:**
 - All patients who underwent primary LMGB or LSG at Rashid Hospital Dubai, UAE, between 2016 and 2018.
 - Only patients with complete and documented baseline and postoperative lipid profile values and follow-up of at least 1 year were included.
 - Patients age, gender, BMI (initial, 3-6 months and at 12 months) and total cholesterol, Triglyceride, HDL and LDL cholesterol at baseline, 3-6 months and at 12 months were recorded.
 - A total of 240 patients were included in this study.
- **Exclusion:**
 - Patients who had re-operative bariatric surgery (e.g., Redo - conversion of LSG to LMGB or RYGB).
 - Patients on lipid-lowering drugs.

RESULTS

- There were 240 cases and 82 (34.2%) were males.
- Among these 124 had LMGB and 116 had LSG.
 - The average age for these patients was 36±10 years.
 - The total cholesterol, Triglyceride, HDL and LDL were all insignificantly different at baseline between two groups with p-values 0.803, 0.205, 0.915 and 0.752 respectively.
 - After 12 month period the LMGB group had significantly low TC and LDL as compared to LSG group with p-values <0.001.
 - No significant difference was recorded between the two groups for triglyceride and HDL and the p-values were 0.059 and 0.583 respectively, but HDL levels were slightly higher in LSG group especially after 6 months.
 - The mean change in BMI, as percent of excess weight loss, was not significantly different at 3-6 months in both procedures with p-value 0.253 but the change in BMI/weight loss was significantly more in LMGB as compared to LSG with p-value 0.038 at 12 months.

CONCLUSIONS

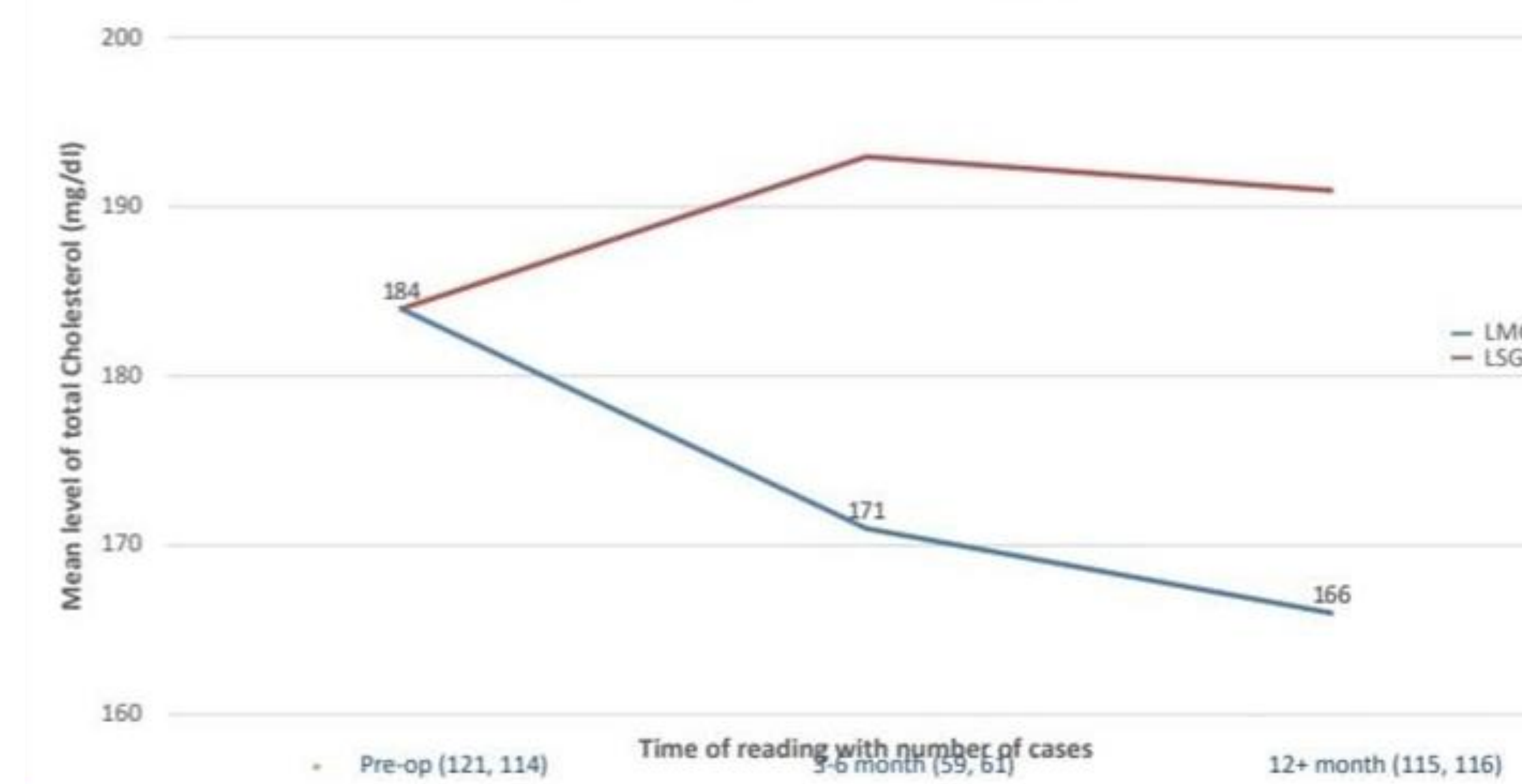
- Retrospective cohort study with 12 month follow up period after LSG and LMGB.
- The two surgical procedures can be considered equivalent for weight reduction in initial 3-6 months but at 12 months LMGB leads to more loss of excess body weight.
- LMGB produces an overall improvement in lipid profile, with a clear benefit in Total Cholesterol and LDL fractions. Although LSG does not alter LDL cholesterol levels, its effect on HDL cholesterol is comparable to or greater than that obtained with malabsorptive technique (LMGB).
- Interestingly, we found that although little differences were reported during the first 3-6 months post-op, the overall effect on lipid profile improvement was greater in LMGB as compared to LSG in 12 months time.

Statistical Analysis

The data were arranged and analyzed by using IBM Statistics SPSS version 20.0. Data were presented as mean and standard deviations for all measures.

- Comparison of lipid levels at each follow-up time, between two surgical groups was made by using Mann Whitney U test.
- The comparison among three follow-up readings within each group was made by using Friedman ANOVA.
- Line graphs were used to present the changes in lipids between baseline and 12 months.
- The change in BMI was measured at baseline, 3-6 months and at 12 months. The comparison between the two groups was made by using Mann Whitney U test.
- P-value ≤ 0.05 was considered statistically significant.

Trend for Total Cholesterol



	Time (n ₁ , n ₂)	TYPE OF SURGERY				P-value (Mann Whitney U)
		LMGB n ₁ = 121		LSG n ₂ = 116		
		Mean	SD	Mean	SD	
Total cholesterol	Pre-op (121, 114)	184	34	184	38	0.803
	3-6 month (59, 61)	171	32	193	37	0.003
	12+ month (115, 116)	166	34	191	45	<0.001
P-value	(Friedman ANOVA) (51, 60)	0.001		0.784		
P-value	(Wilcoxon pre vs 12 m) (113, 114)	<0.001		0.223		
Triglycerides	Pre-op (121, 114)	123	64	114	57	0.205
	3-6 month (60, 61)	106	38	107	36	0.680
	12+ month (114, 116)	81	35	88	35	0.059
P-value	(Friedman ANOVA) (51, 60)	<0.001		0.001		
P-value	(Wilcoxon pre vs 12 m) (112, 114)	<0.001		<0.001		
HDL	Pre-op (111,110)	49	15	50	15	0.915
	3-6 month (55, 60)	49	17	51	16	0.189
	12+ month (113, 112)	59	15	62	17	0.583
P-value	(Friedman ANOVA) (66, 58)	<0.001		<0.001		
P-value	(Wilcoxon pre vs 12 m) (102, 107)	<0.001		<0.001		
LDL	Pre-op (111, 110)	119	31	118	34	0.752
	3-6 month (53, 60)	107	32	127	33	0.008
	12+ month (112, 112)	96	31	117	41	<0.001
P-value	(Friedman ANOVA) (64, 58)	<0.001		0.690		
P-value	(Wilcoxon pre vs 12 m) (101, 107)	<0.001		0.304		



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A15 -Evaluating the effect of a Very-Low Calorie Ketogenic Diet versus a Very-Low Calorie Diet prior to bariatric surgery

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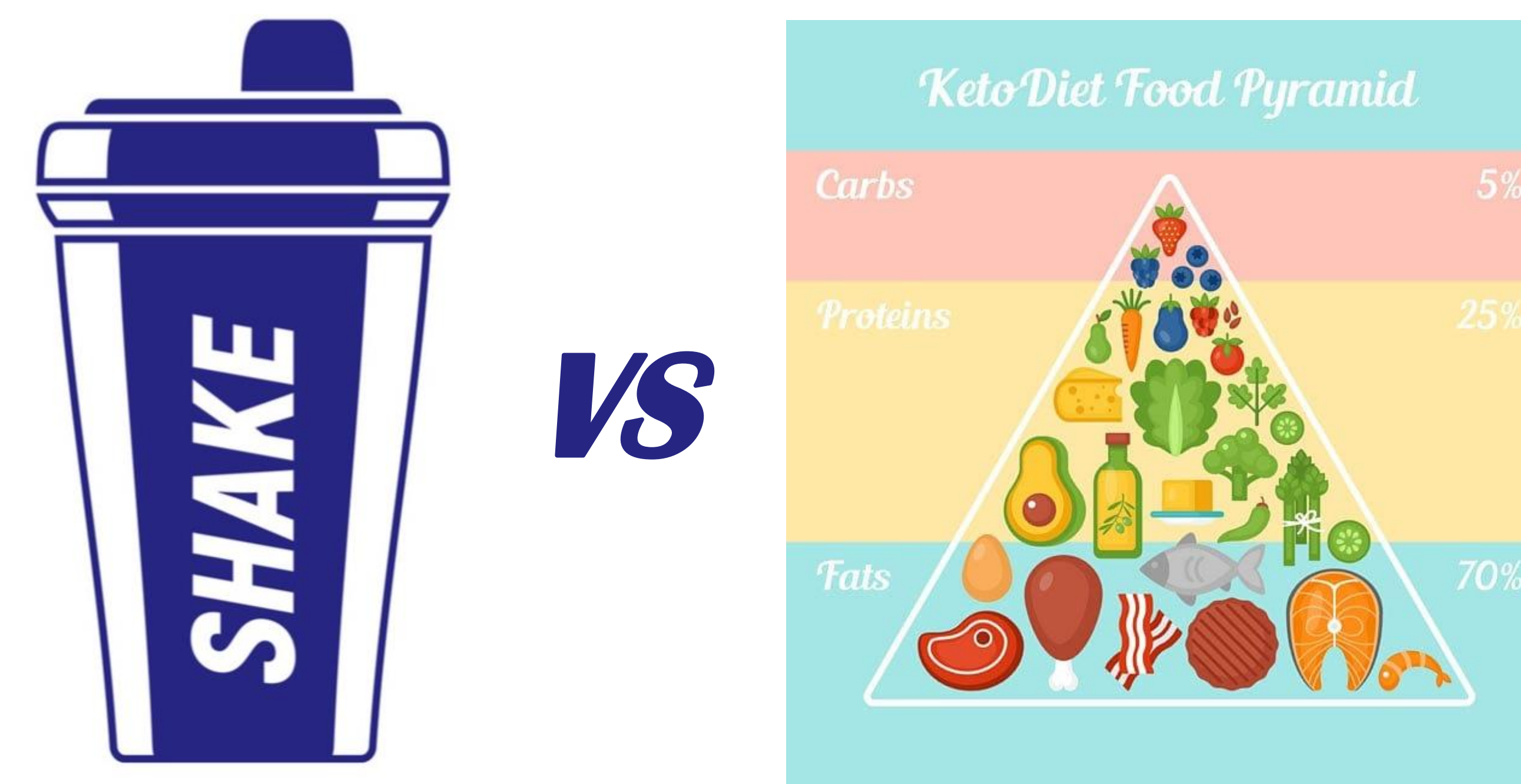
INTRODUCTION

Very-Low Calorie Diet (VLCD) <800 kcal/day

- Two weeks prior to surgery
- To reduce liver volume and kick start weight loss
- ‘Gold’ standard prior to bariatric surgery
- But: Loss of fat free mass (FFM), poor compliance and side effects

Alternative?

- **Very-Low Calorie Ketogenic Diet (VLCKD)?**



METHOD

Randomised controlled trial

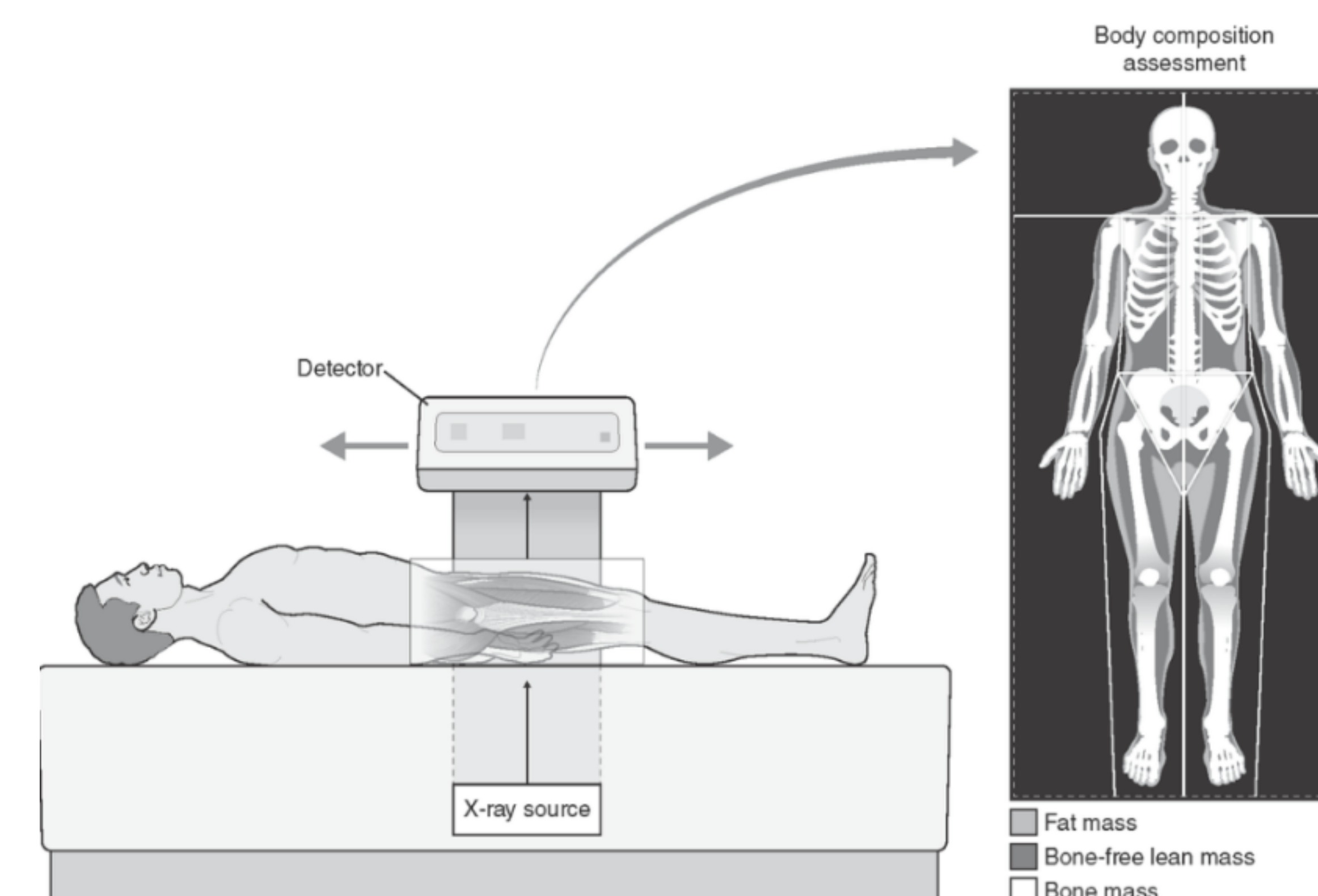
- 50 patients with BMI >35
- Bariatric surgery (Roux-en Y Gastric bypass)
- VLCD vs VLCKD

Primary outcomes

- Reduction in FFM (%) in proportion to total body weight loss
- Measured with DXA-scan and multi-frequency bioelectrical impedance (MF-BIA)

Secondary outcomes

- Muscle strength
- Difference in physical activity
- Compliance, side effects and patient satisfaction
- Biochemical analysis
- Surgical outcomes



Time point	T0	T1	T2	T3	T4
Patient demographics: Gender, age, BMI, comorbidities	X				
Patient demographics: weight (using a scale)	X	X	X	X	X
Body composition: Fat free mass, Lean body mass, Fat mass, Resting metabolic rate, total body weight (DXA and BIA)	X		X		X
Muscle strength (hand dynamometer)	X		X		X
Compliance, side effects and food intake (self-report questionnaire and interview)		X	X		
Level of ketonemia (blood analysis)			X		
Electrolytes, kidney, liver function, metabolic profile, glucose (blood analysis)	X		X		
Physical activity (IPAQ-questionnaire)	X	X	X		X
Surgical outcomes: surgical time, hospital stay, complications and readmissions			X	X	
Patient satisfaction (5-point likert scale)		X	X		X

T0 = baseline, prior to diet; T1 = after 7 days of dieting; T2 = after 14 days of dieting, day of surgery; T3 = 30 days after surgery; T4 = 90 days after surgery.

CONCLUSIONS

This study will help establish the clinical utility of VLCKD prior to bariatric surgery in comparison to VLCD

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INTRODUCTION

There is a significant association between obesity and nocturia which can have a negative impact on quality of life. Nocturia aetiology and pathophysiology is multifactorial and the correlation between obesity and nocturia remains unclear.

- Obesity results in increased nocturia symptoms in both men and women
- Nocturia results in poor sleep and impaired cognitive performance
- Bariatric surgery improves in both BMI and nocturia symptoms

AIM

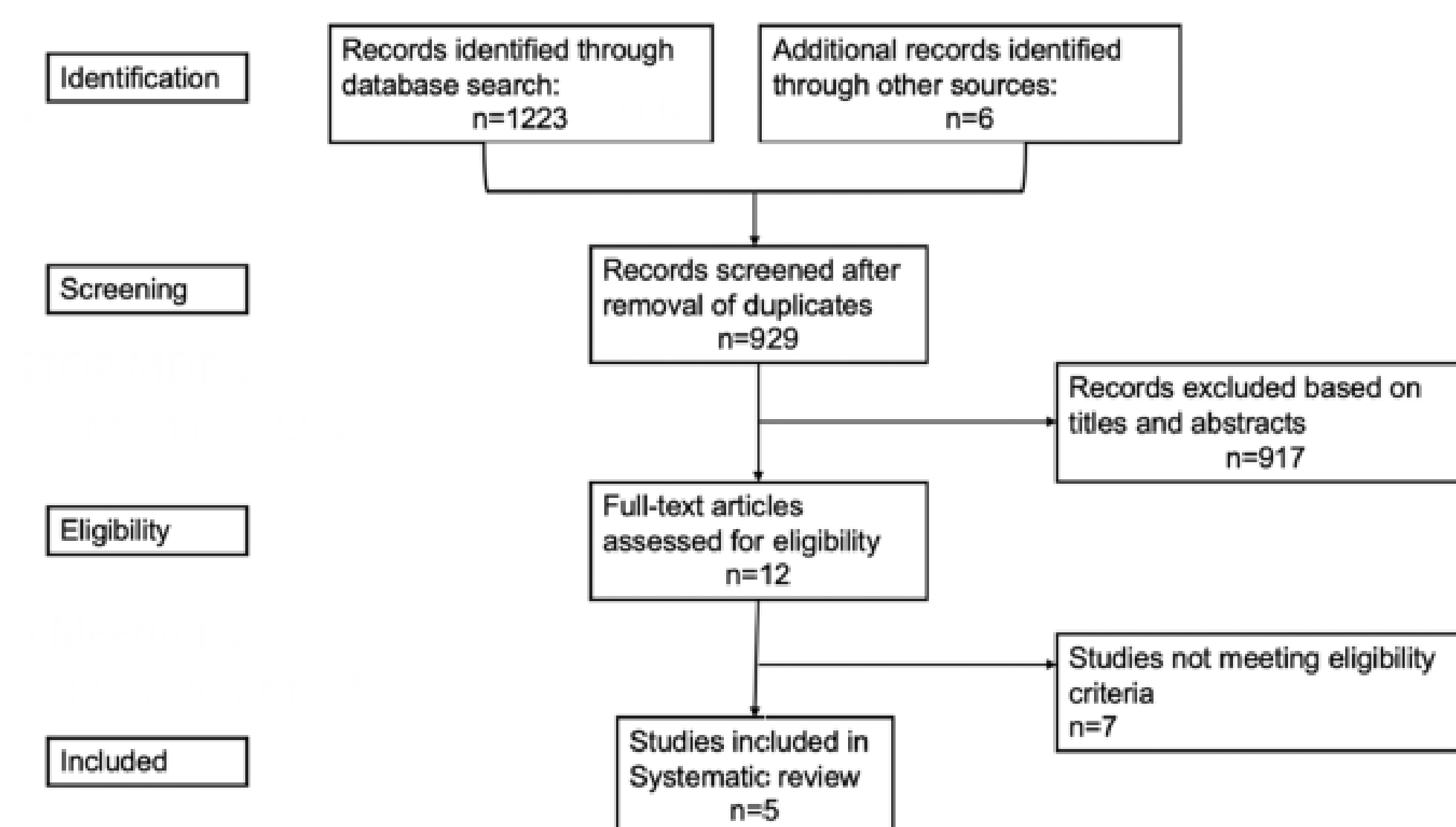
This systematic review and meta-analysis aims to determine the effects of bariatric surgery on nocturia in both men and women.

METHOD

- Studies evaluating the effect of bariatric surgery on nocturia were identified using MEDLINE and Embase databases
- Search terms used were: 'bariatric surgery', 'obesity surgery', 'bariatrics', 'nocturia', 'lower urinary tract symptoms', 'LUTS'
- The search was updated in April 2022
- Inclusion criteria – studies reporting pre and post op nocturia scores, age >18, BMI >35
- Data extraction was performed by one reviewer and independently checked by a second reviewer
- Primary outcomes: mean nocturia score before and after surgery
- Secondary outcomes: BMI, IPSS (International Prostate Symptoms Score)
- Statistical analysis was performed using R statistical software
- A random-effects model was used to assess study heterogeneity pre- and post-operatively

RESULTS

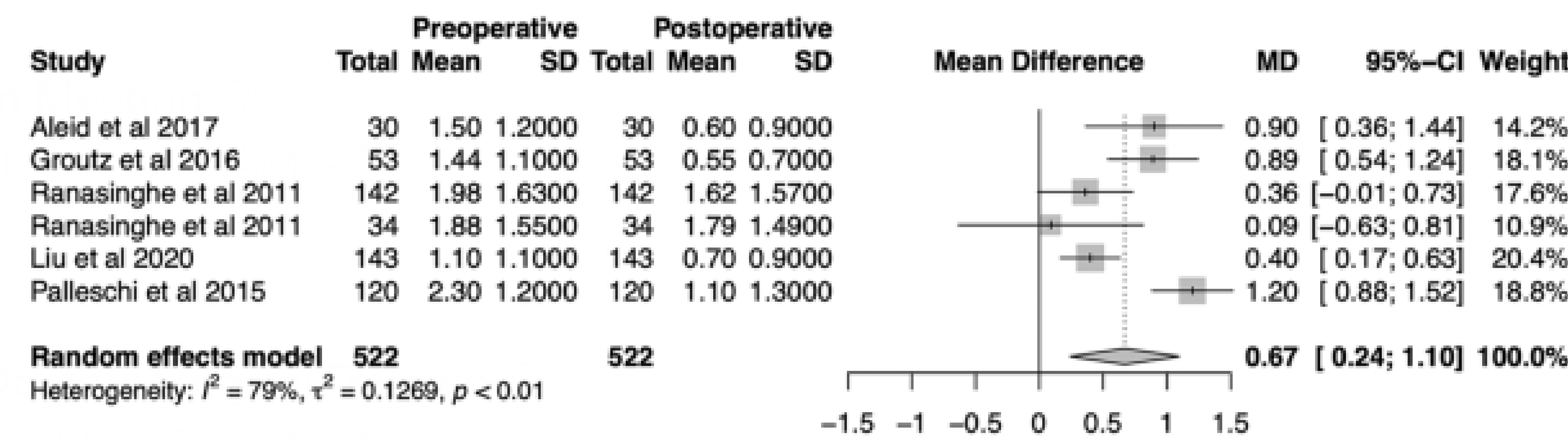
- Screening for inclusion and exclusion criteria resulted in a final total of 5 studies
- Articles were published between 2011 and 2020
- 522 patients were included from these studies for analysis
- 4 of the 5 studies used the IPSS (International Prostate Symptoms Scale) to assess nocturia symptoms
- **Statistically significant decreases in nocturia scores were observed following bariatric surgery**
 - Decrease of 0.67 points (95% CI 0.24 to 1.10; p=0.01)



PRISMA guided flow diagram of study selection for inclusion

Characteristics of included studies

Author	Year	type of study	Number of patients	Age (mean ± SD)	BMI pre-op (mean ± SD)	BMI post-op (mean ± SD)	Nocturia pre-op (mean ± SD)	Nocturia post-op (mean ± SD)	Longest Follow up (months)
Liu et al	2020	prospective cohort	143	43 ± 10.4	39.1 ± 5.2	31.5 ± 4.9	1.1 ± 1.1	0.7 ± 0.9	36
Aleid et al	2017	prospective cohort	30	47.5 ± 8.4	46.4 ± 9	36.9 ± 8	1.5 ± 1.2	0.6 ± 0.9	6
Groutz et al	2016	prospective cohort	53	39 ± 12.5	42.8 ± 5.3	31.3 ± 5.4	1.44 ± 1.1	0.55 ± 0.7	3
Palleschi et al	2015	prospective cohort	120	53.4 ± 13	40.6 ± 3.4	31.5 ± 1.5	2.3 ± 1.2	1.1 ± 1.3	6
Ranasinghe et al	2011	retrospective cohort	142	47.8 ± 10.98	43.5 ± 6.65	35.5 ± 6.8	2.0 ± 1.6	1.6 ± 1.6	31
Ranasinghe et al	2011	retrospective cohort	34	52.8 ± 9.3	47.3 ± 12.67	38.4 ± 6.18	1.9 ± 1.6	1.8 ± 1.5	31



CONCLUSIONS

This study provides a comprehensive review of the current published literature and confirms that bariatric surgery can have significant improvements on nocturia symptoms in men and women with obesity.

Improving these symptoms has a consequential improvement of quality of life for individuals having bariatric surgery.

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DISCLOSURE

There was no declared conflicts of interest. NHS Research Ethics Committee tool determined that ethical approval was not required for this study as it is a review of published research

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INTRODUCTION

The rising incidence of obesity is a global threat that is being only partially met by bariatric surgery. Use of minimal invasive access to metabolic/bariatric operations remains the most frequent bariatric procedure, but limited dexterity, poor ergonomics and increased fatigue on surgeons due to the increased abdominal wall thickness, increased fat deposits and hepatomegaly contributes to a limited and challenging working space for surgeons. Artificial intelligence (AI) is the tool for decision making, it includes a wide range of sub categories that includes machine learning (ML), natural language processing (NLP), computer vision (CV), deep learning (DL) and Robots. Despite the development of robotics and its evolution in abdominal surgery, the role of the complete robotic surgical system in

AIM

This article aims to provide a better understanding of artificial intelligence involvement in the treatment of morbid obesity.

METHOD

A current systematic review of the available literature on artificial intelligence and metabolic/bariatric operations from 2011 till 2022.



(google source)

RESULTS

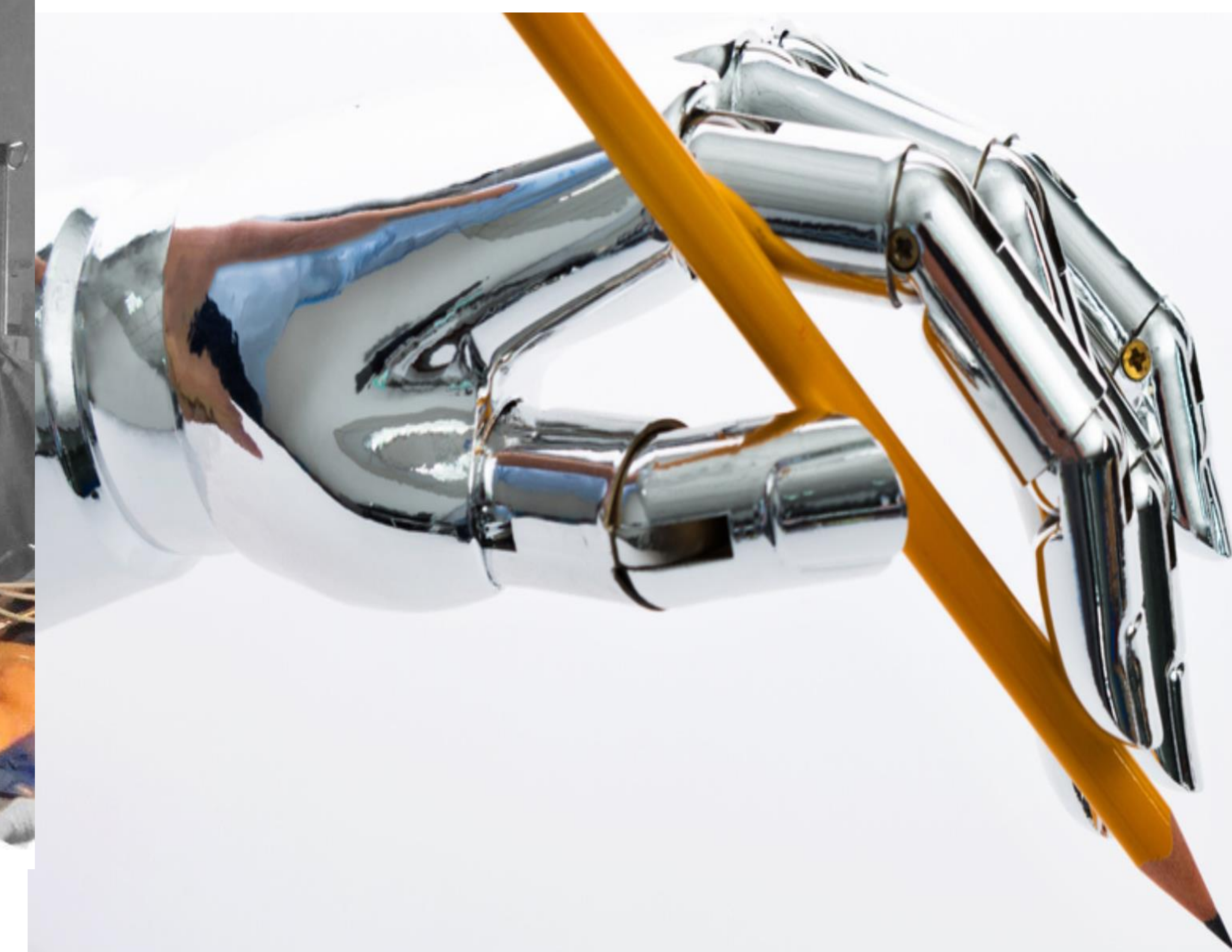
articles that emphasize the relevance and importance of Artificial intelligence in metabolic/bariatric

The list includes surgery. Results include preoperative and postoperative outcomes, the extent of the learning curve and the differences in cost. The literature notes advantages due to the facilitation of the procedure with use of artificial intelligence, as robotic-assistance, similar operating times; however costs are significantly higher with robotics. Notably, the length of stay and the learning curve are non-significantly higher for laparoscopy.

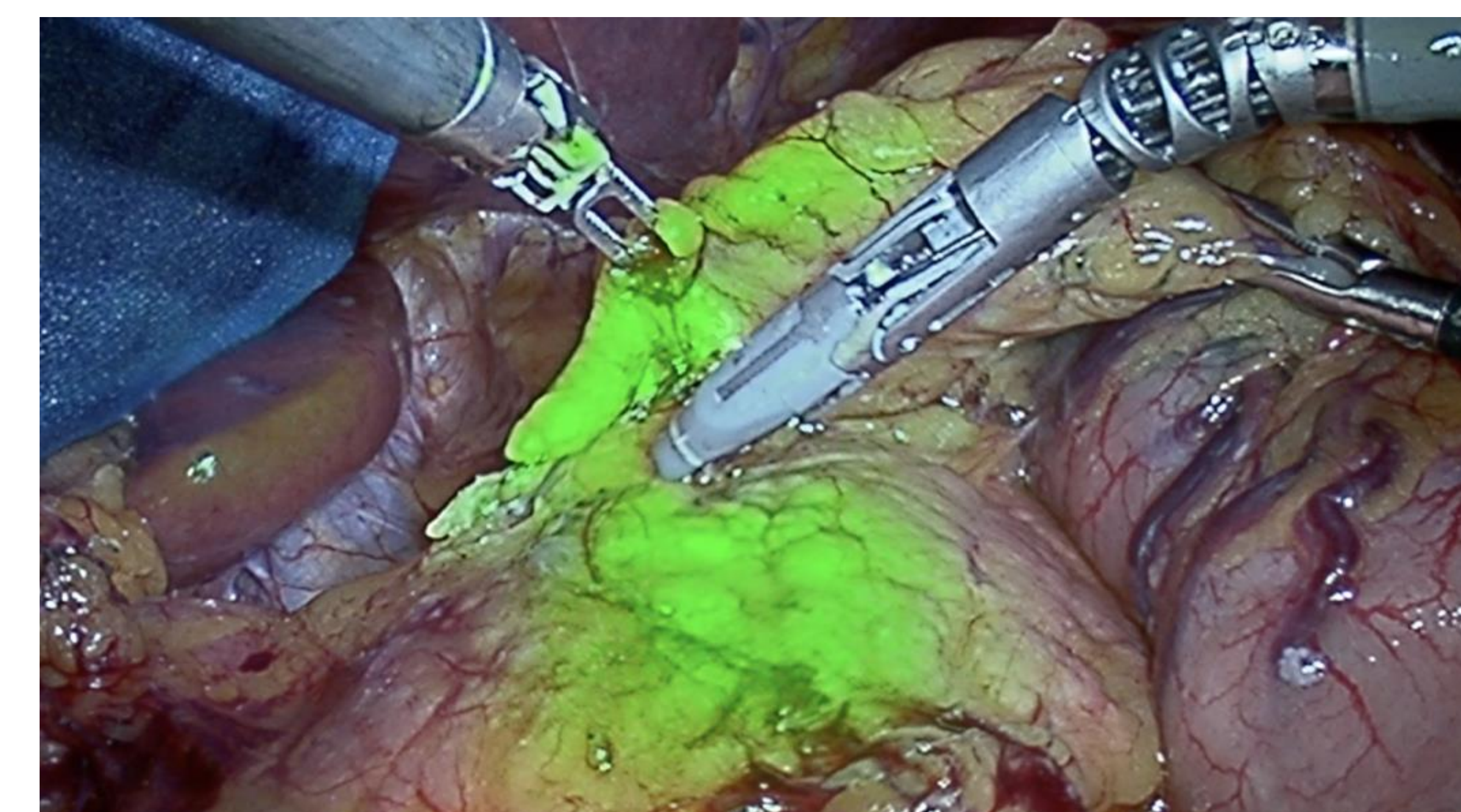


CONCLUSIONS

Randomized-controlled trials with longer follow up specifically looking at sustained rates of weight loss with artificial intelligence involvement (robots and etc) in Metabolic/Bariatric operation are still required to see if there are any significant benefits for better outcome.



(google source)



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ACKNOWLEDGEMENTS

I would like to express my deep gratitude to Professor Mamuka Tavkhelidze , Professor Andrew A. Gumbs, Professor Khatuna Kaladze, Professor Nina Inauri, Yameen Khan and Professor Konrad W.Karcz for inspiration, collaboration and support!

Especially gratitude to GRUNI for making this participation possible.

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A21- Routine Pre-operative Testing for Helicobacter Pylori Infection Prior to Laparoscopic Sleeve Gastrectomy

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INTRODUCTION

The association of Helicobacter Pylori (H.pylori) infection and outcomes following laparoscopic sleeve gastrectomy (LSG) is debatable. Early literature raised the suspicion of possible adverse outcomes but subsequent studies have not demonstrated any statistically significant correlation. However, due to the overall complication rate being low, small studies may not be powered to investigate this. The literature around relationship of H.pylori gastritis and symptoms of gastro-oesophageal reflux disease(GORD) is obscure.

AIM

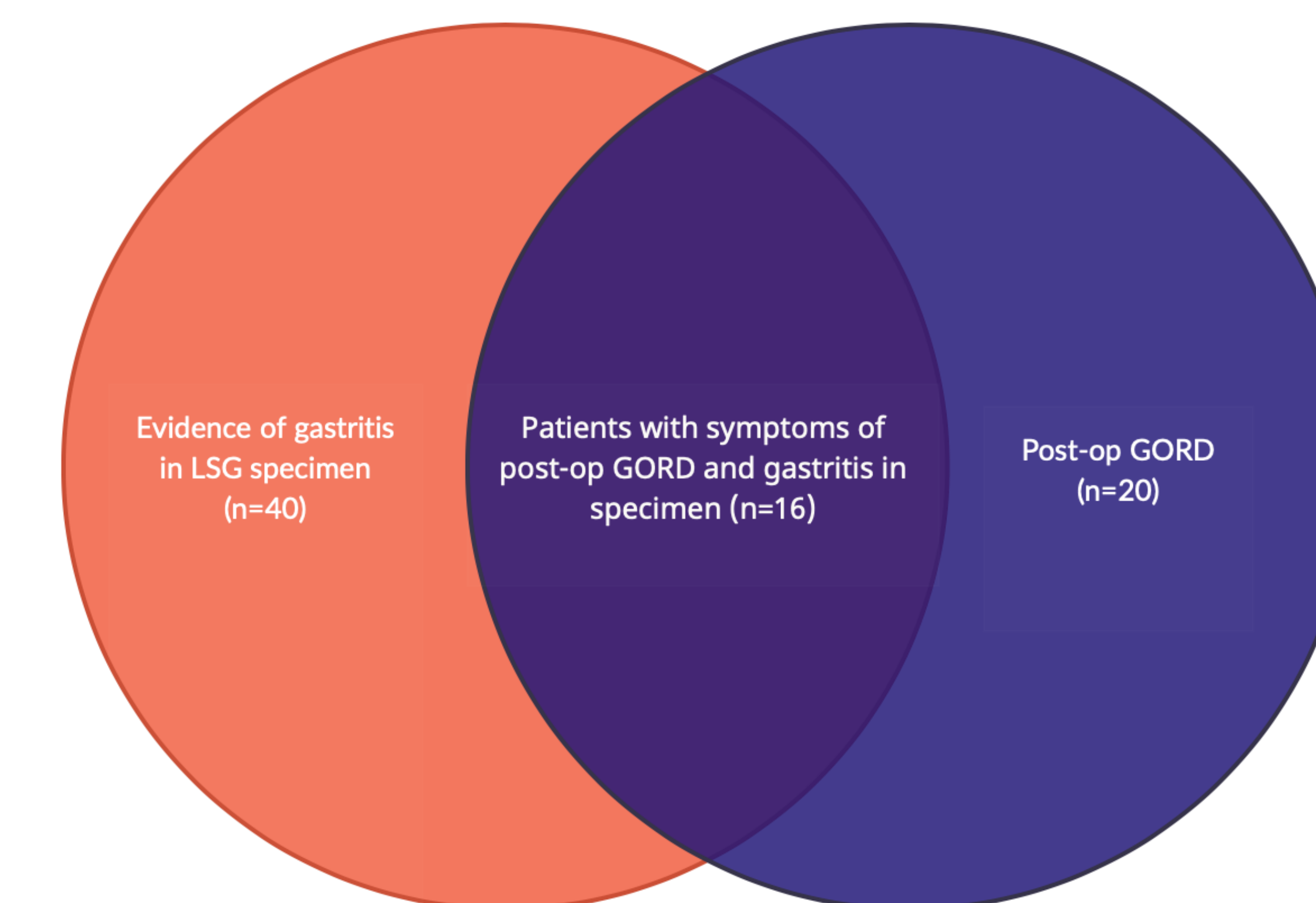
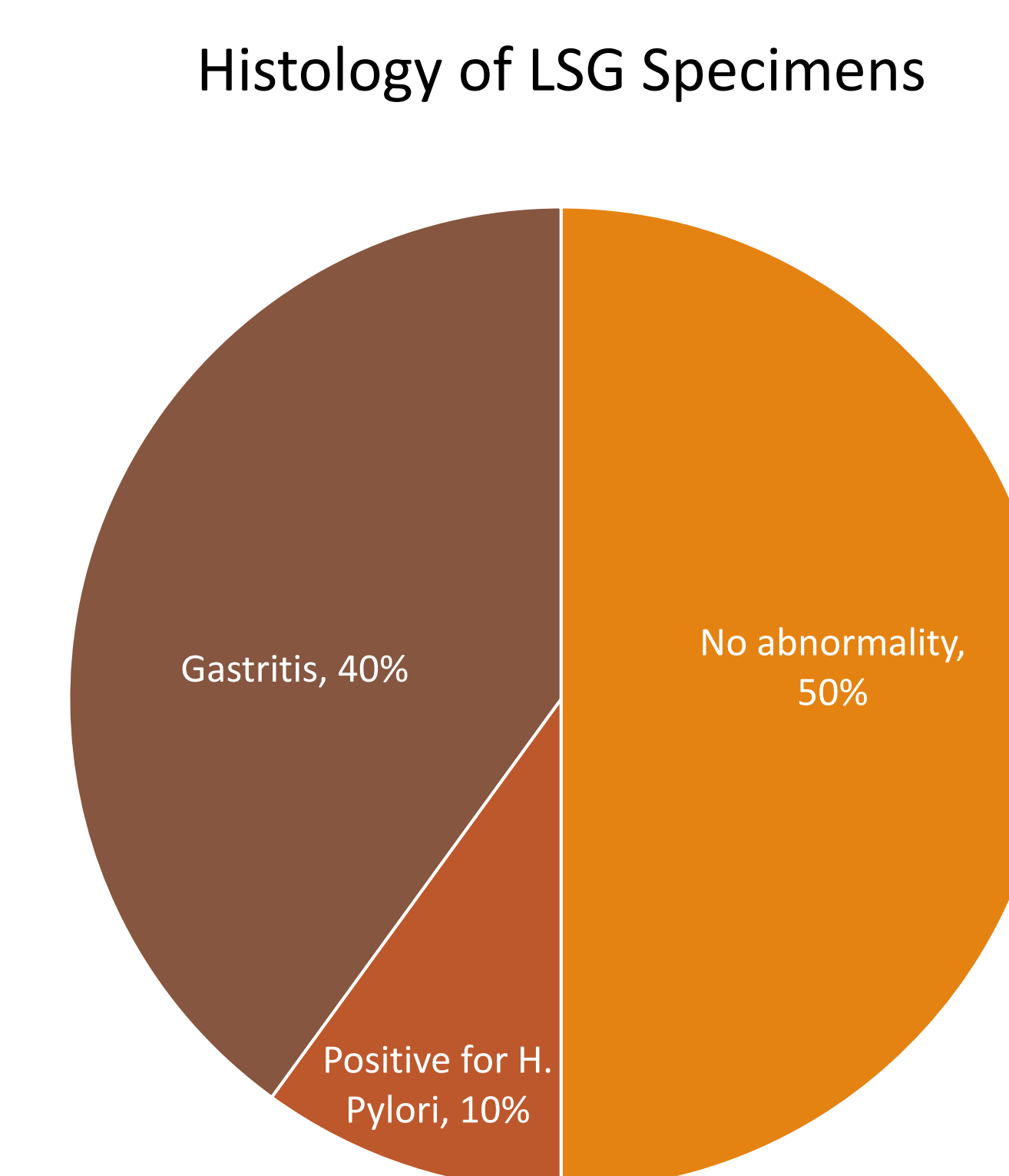
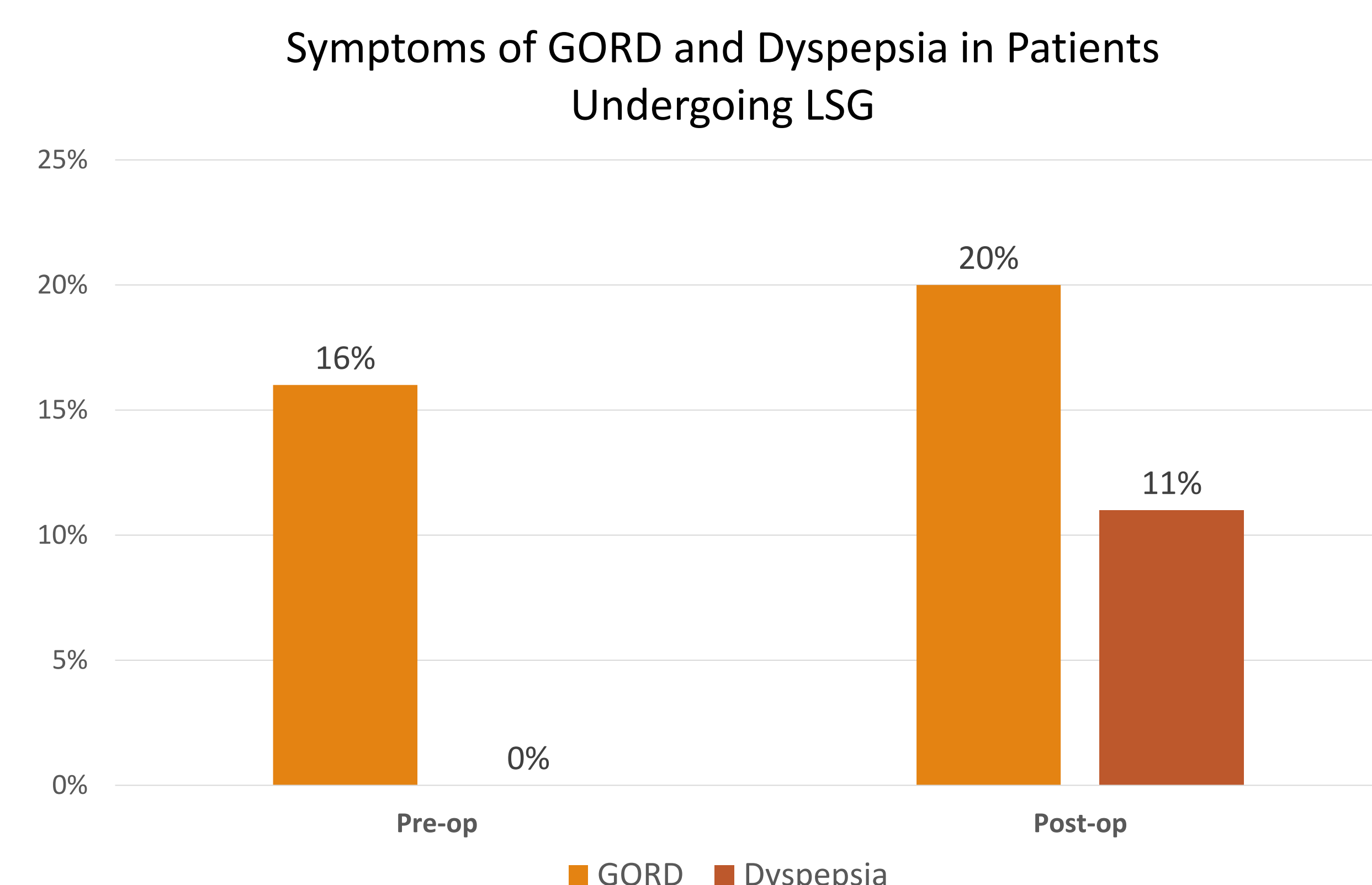
To investigate the relationship between H. Pylori infection and outcomes following LSG, specifically looking at signs and symptoms of gastro-oesophageal reflux disease.

METHOD

We conducted a retrospective analysis of one hundred patients undergoing sleeve gastrectomy between August 2019 and April 2022. Data was collected on pre-operative symptoms, endoscopy findings, rapid urease test and/or biopsy results and postoperative histology. All patients listed for LSG in our unit undergo a preoperative endoscopy.

RESULTS

100 patients who underwent LSG between August 2019 and April 2022 were included. Eighty of the patients were female and the mean age was 44 years. Of these, 16 patients (16%) reported pre-operative symptoms of GORD but none reported dyspepsia. Eleven patients were positive preoperatively for Helicobacter pylori infection and had eradication therapy. All resected stomachs were sent for histology. Ten of these were positive for presence of H.pylori and 40 specimens had a positive finding of chronic active gastritis. Eleven patients developed symptoms of dyspepsia postoperatively, but none of these had previous diagnosis or treatment for H.pylori. Interestingly, 20% of the patients developed symptoms of gastro-oesophageal reflux after LSG and of these 16 patients (80%) were found to have gastritis in the specimens.



CONCLUSIONS

H.pylori prevalence in patients undergoing LSG is significant. More importantly, the findings of chronic gastritis in resected specimens is higher. There is currently no strong evidence to suggest this has a bearing on poor outcomes such as bleeding or leak. More studies are needed to investigate the association of H.pylori/gastritis with post-operative dyspepsia and GORD.

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INTRODUCTION

Laparoscopic Gastric Bypass complications are well-known including leak, early postoperative bleeding, jejeunojejunal hernia, jejeunojejunal stenosis, and hernia defects.

AIM

Combined approach of laparoscopy and endoscopy facilitates treatment of complicated gastric bypass.

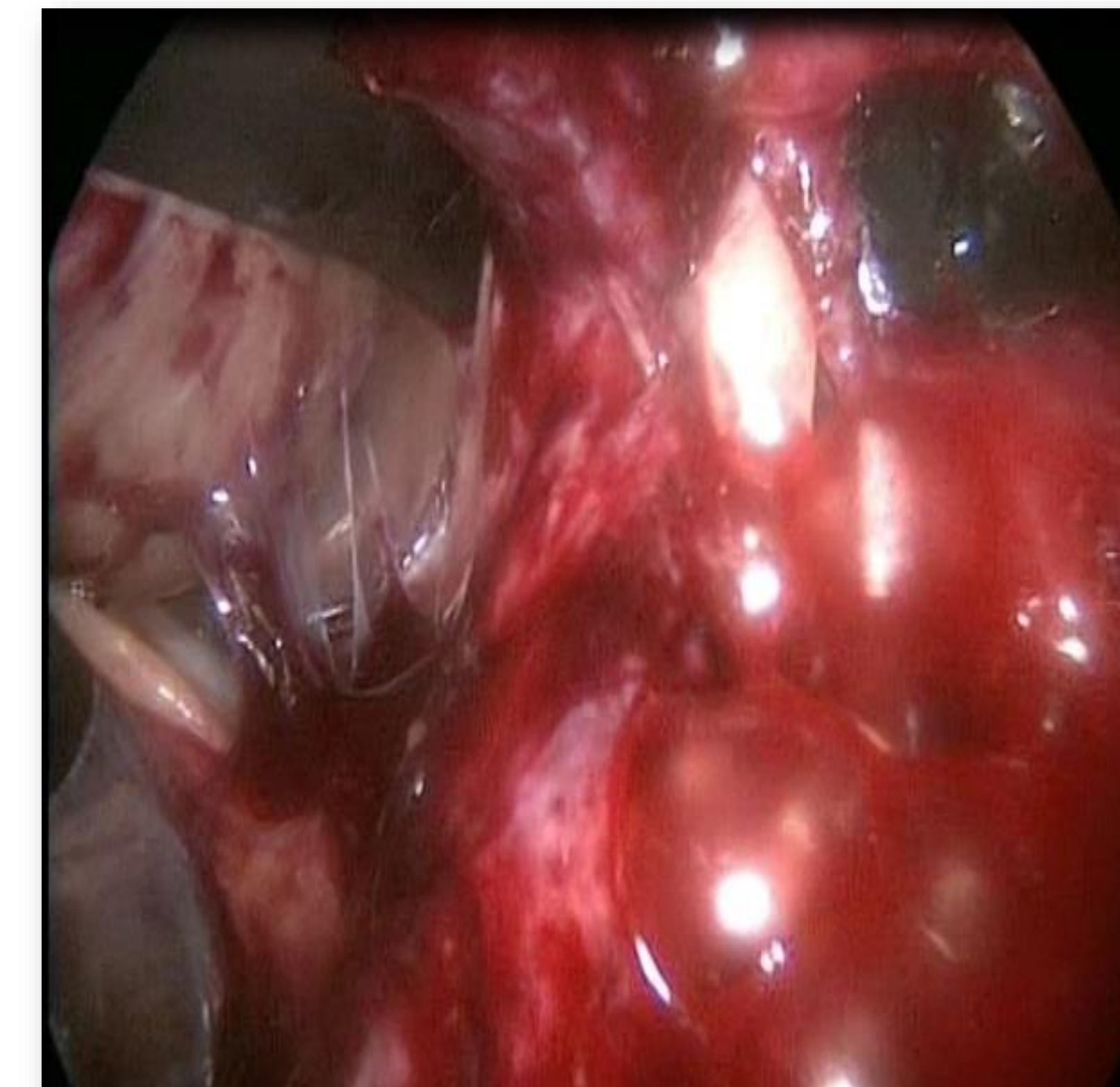
METHOD

We will present delayed Gastric bleeding 6 weeks post surgery referred from other hospital after transfusion with 6 units of PC due to erosion of left Gastric artery into the suture line.

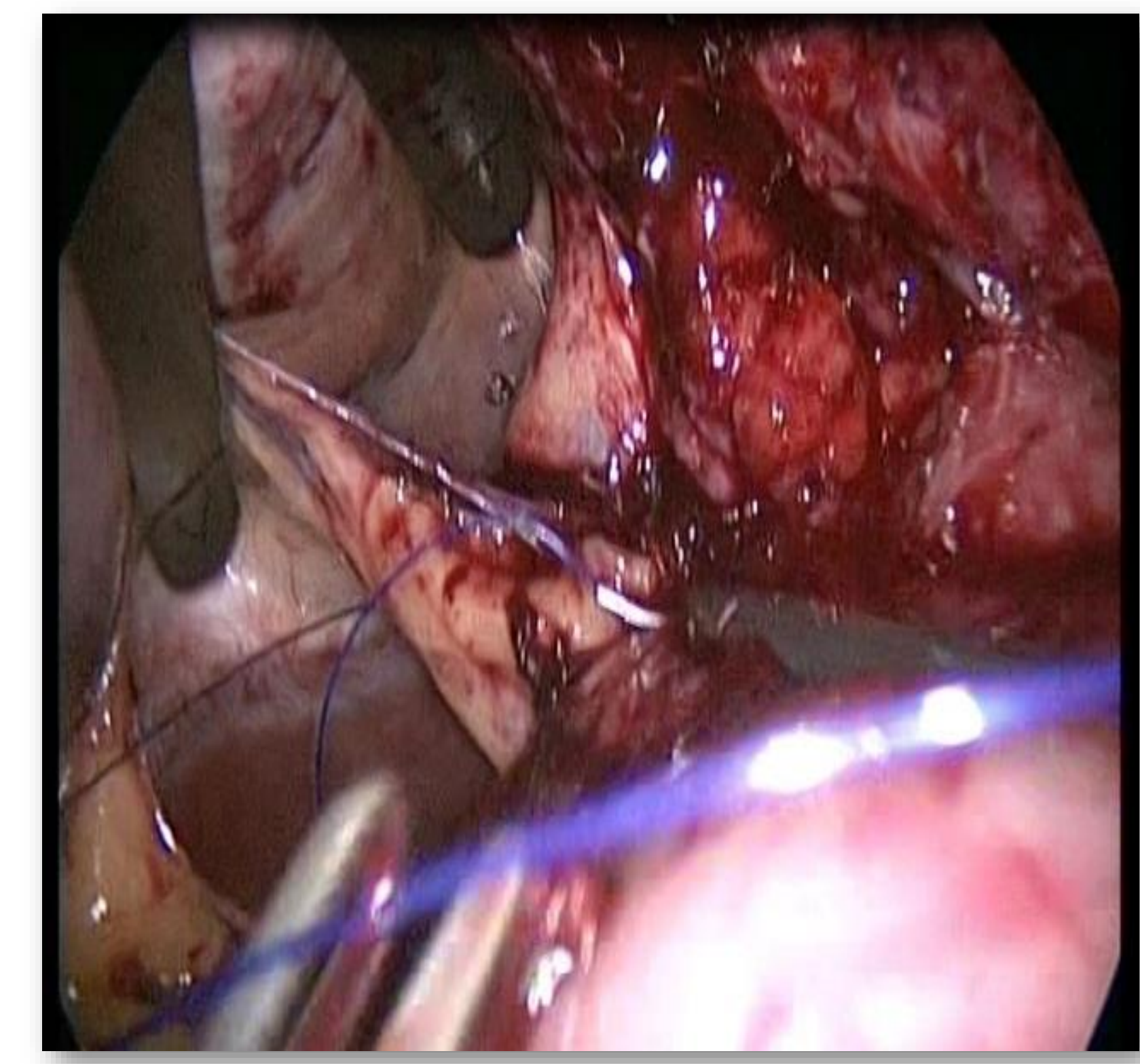
RESULTS

The images will show the steps used by endoscopy to localize the bleeding site and laparoscopic approach to control the bleeding, and redo the anastomosis site.

Diagnostic combined approach for gastro Jejunostomy bleeding.



Control of bleeding with intra corporeal suturing.



CONCLUSIONS

Treatment of Gastric Bypass complication is feasible by minimal invasive surgery in advanced center in Bariatric Procedures.

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INTRODUCTION

Balloon treatment of obesity is associated with multiple complications including small bowel obstruction.

AIM

Laparoscopic removal of intra-gastric balloon from distal jejunum.

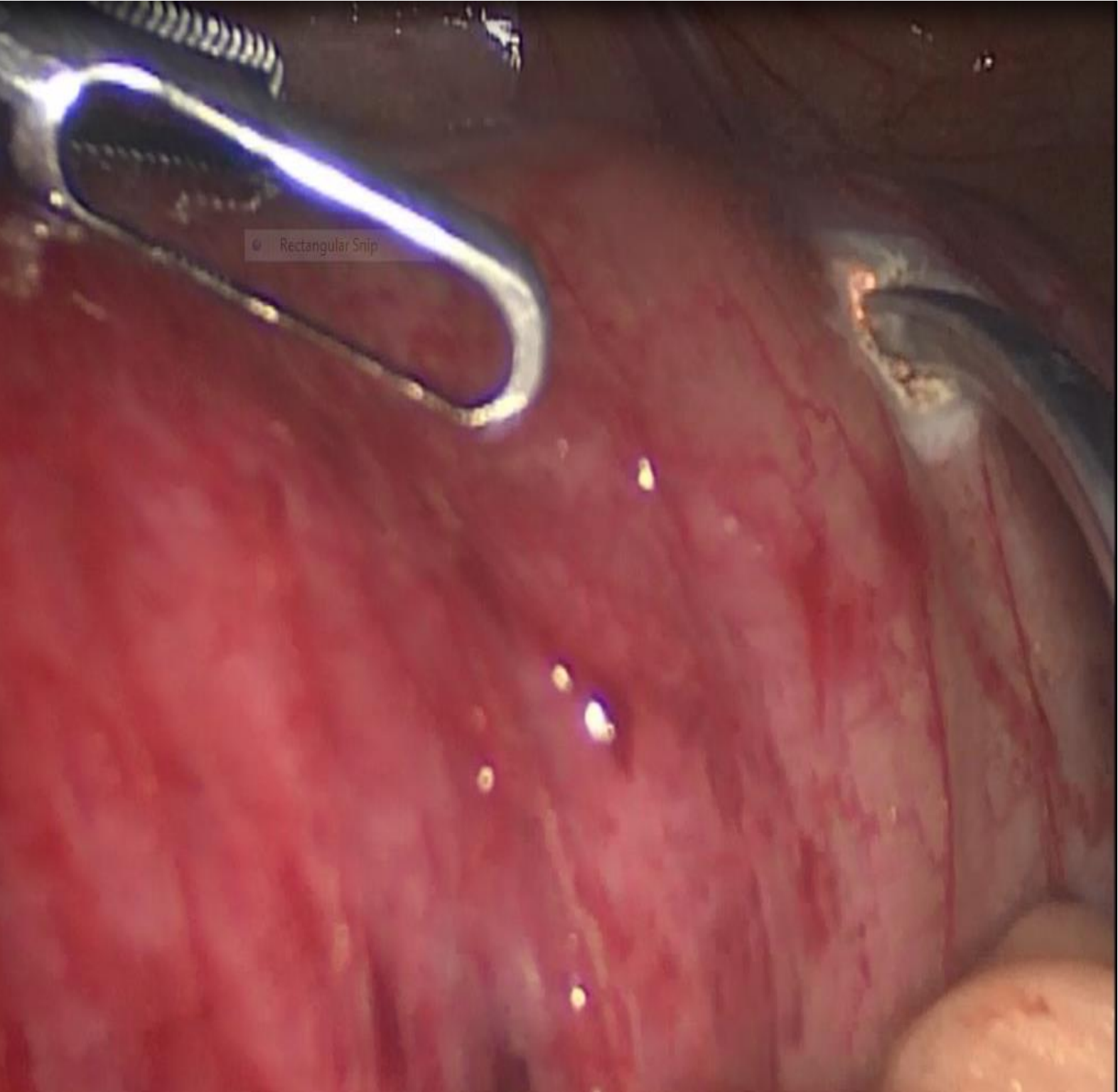
METHOD

The pictures in this poster show the steps used for the treatment of obstructive intra-gastric balloon in the distal jejunum diagnosed by CT Scan of the patient presenting to Emergency Department with evidence of obstruction and abdominal pain.

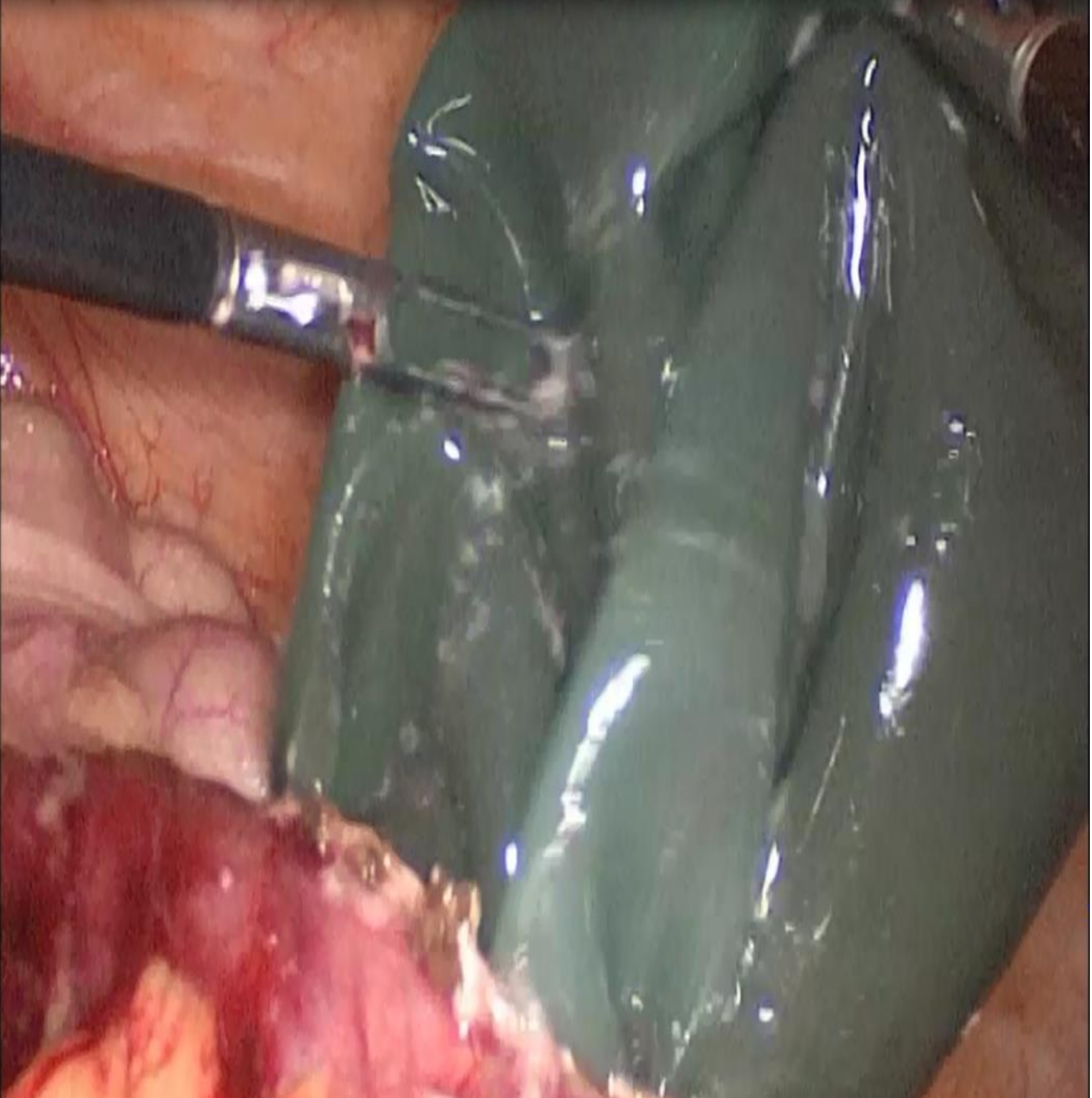
RESULTS

The balloon was removed by enterotomy and suturing it with Endo GIA 60mm with white cartilage Escheron.

Site of the obstruction at the distal jejunum.



Laparoscopic balloon extraction from the distal jejunum.



CONCLUSIONS

Patient had smooth post-operative course discharge 4 days after surgery.

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INTRODUCTION

The advantages of Robotic surgery in comparison to standard laparoscopic surgery is the ability to do surgery in sitting position and 3D view and the ergonomic of movement and third hand assistance but the disadvantages is one field surgery, the presence of a second surgeon in the field, extra expenses, the elongated time and absence of tactile sensation and the disadvantages of standard laparoscopic surgery is increased musculoskeletal complaint.

AIM

Laparoscopy is still the Gold Standard treatment in comparison to Robotic surgery.

METHOD

I report my experience in the field of Laparoscopic surgery at the American University of Beirut Medical Center and affiliated hospitals where I shifted all laparoscopic procedures including Bariatric procedures to sitting position with 100% completion of the procedures in the first 1000 bariatric cases.

RESULTS

Laparoscopic sitting position will allow you to do long list surgery with decreased muscle fatigue, back and knee pain.

This demonstrates the position of the surgeon in laparoscopic sleeve gastrectomy in sitting position.



The intra corporeal suturing in sitting position.



CONCLUSIONS

Therefore, laparoscopic surgery is feasible in the sitting position and can maintain all the advantages of standard laparoscopies and avoid the disadvantages of Robotic surgery.

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A25- Preoperative Predictors of Type 2 Diabetes Remission after Bilio-Pancreatic Diversion with Duodenal Switch

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INTRODUCTION

Many patients achieve short-term type 2 diabetes (T2D) remission after bariatric surgery, but relapses are common. Diabetes outcomes after bariatric surgery vary across procedures and populations. T2D remission scores are simple clinical tools developed to predict remission after bariatric surgery. However, they have never been tested after BPD-DS.

AIM

The aim of this study was to compare the predictive value of validated T2D remission scores and preoperative diabetes characteristics for prediction of durable T2D remission after BPD-DS.

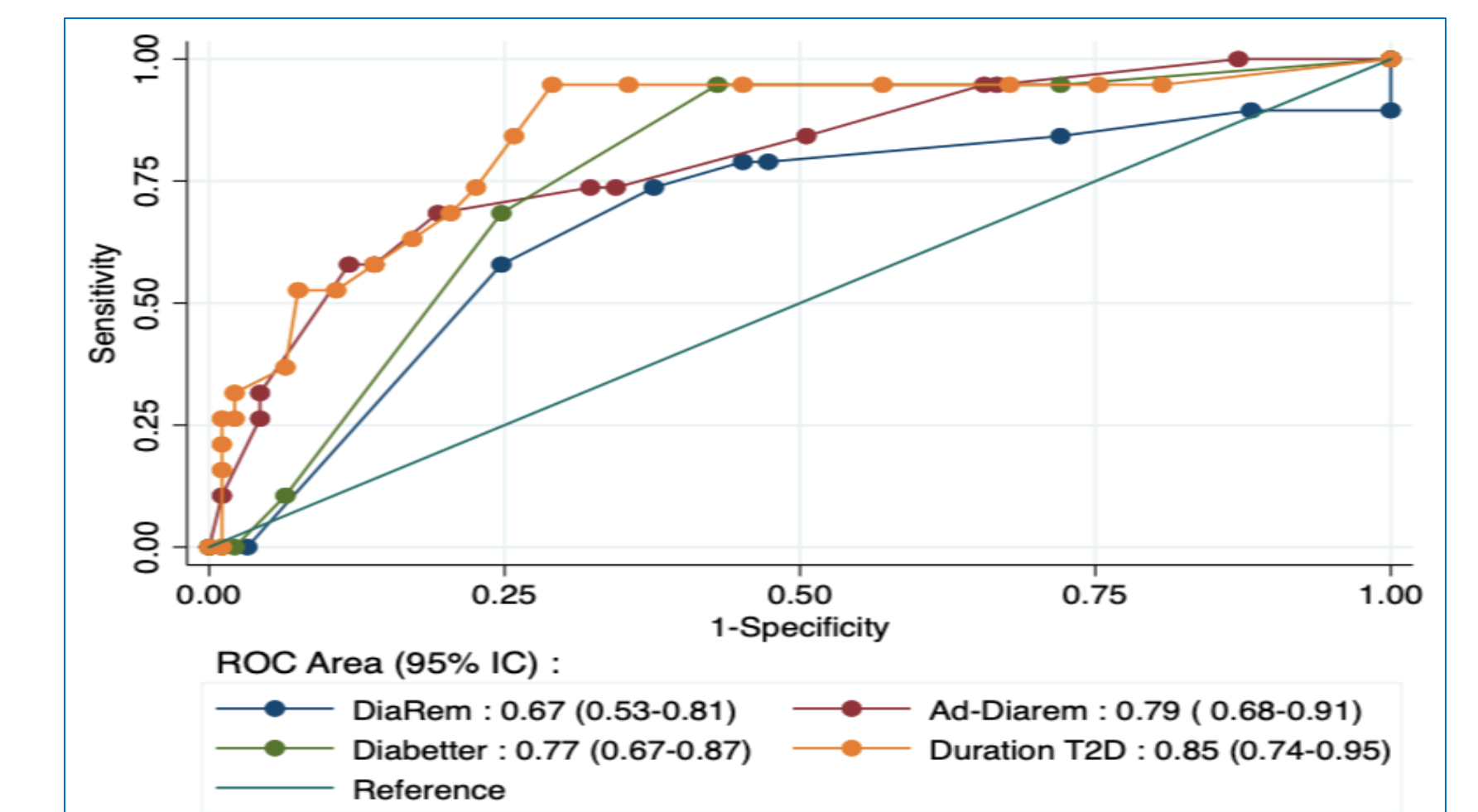
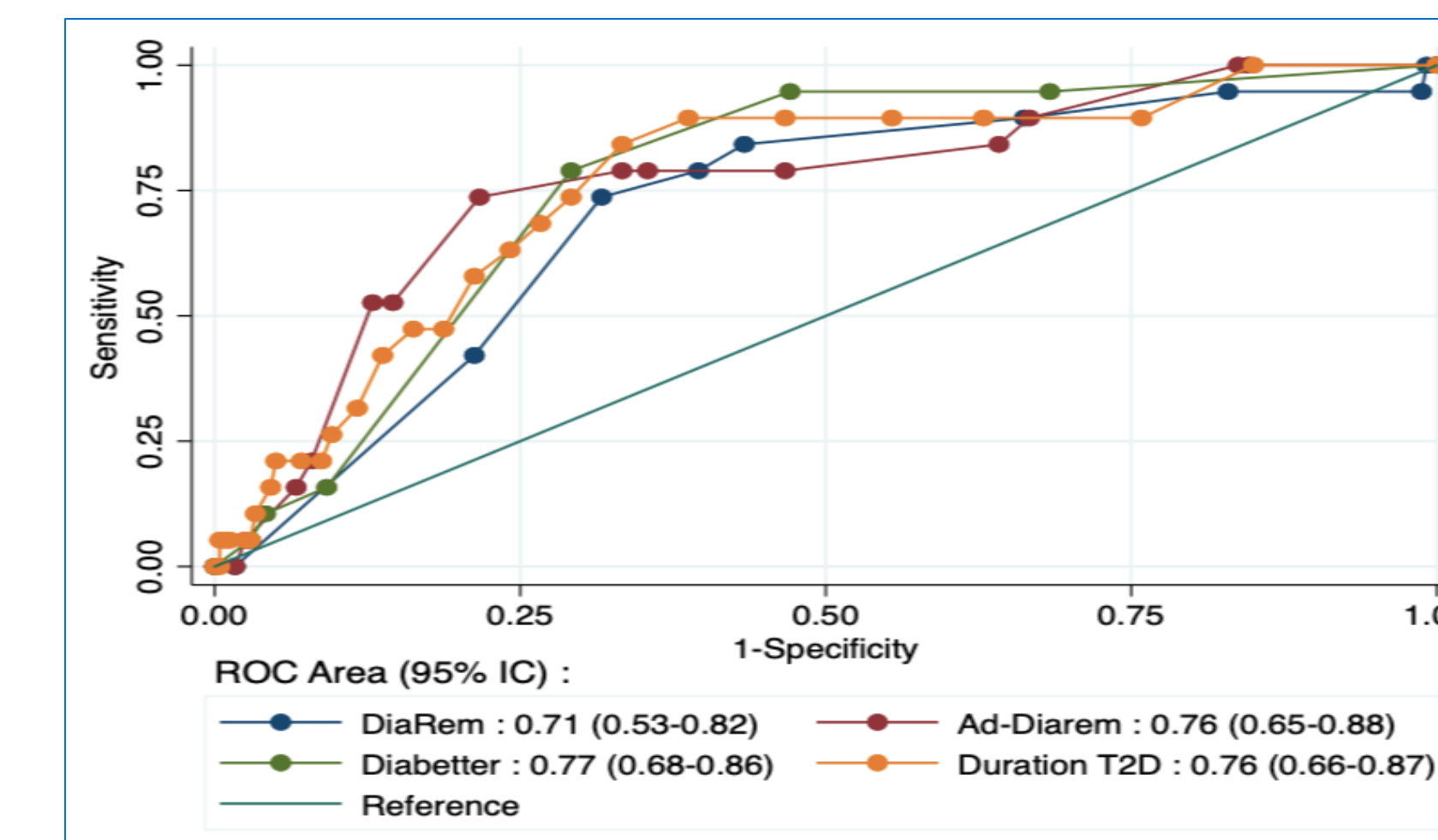
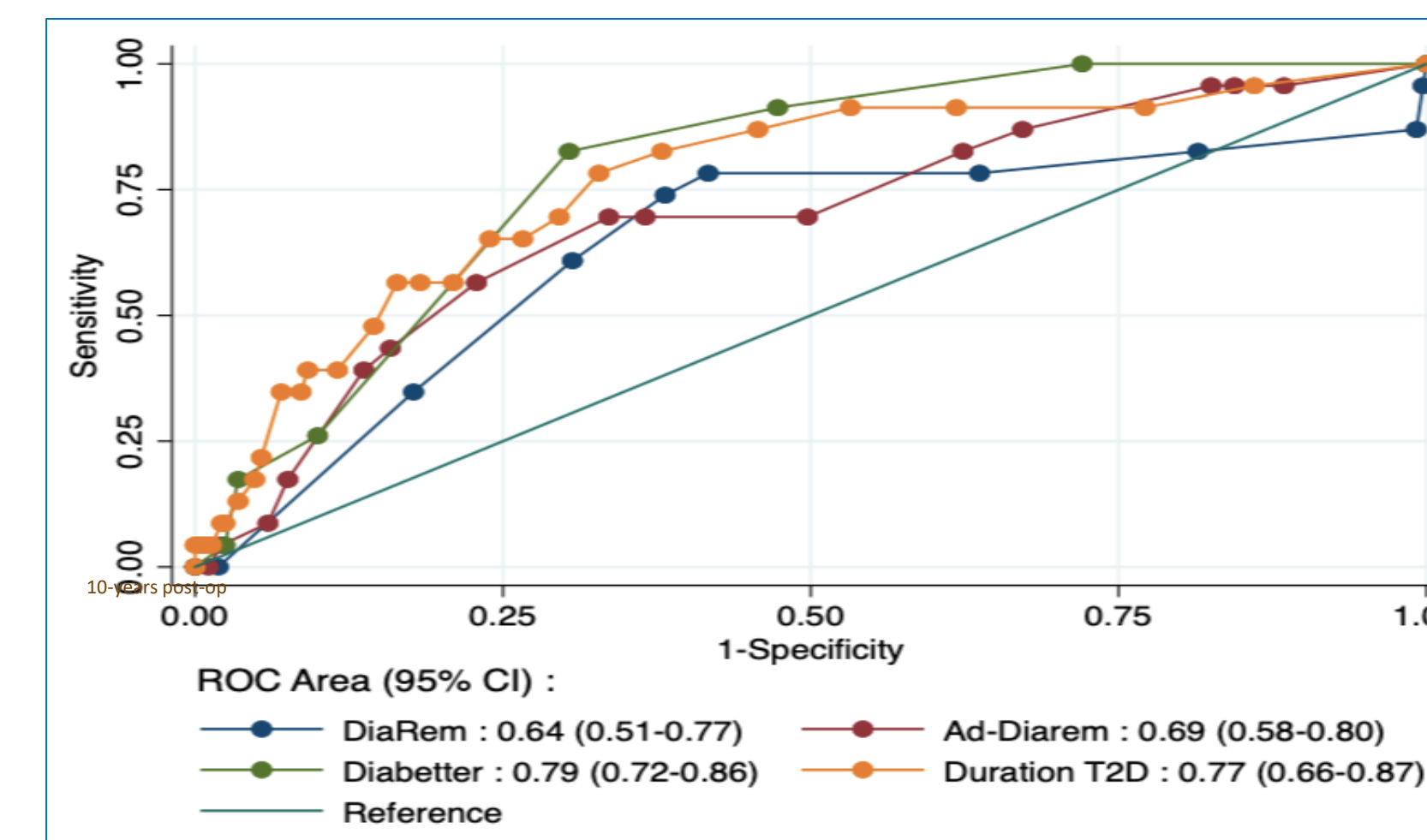
METHOD

We retrospectively identified **918 patients** with preoperative T2D who had undergone **BPD-DS** and for whom data (preoperative age, Body-Mass Index (BMI), C-peptide, HbA1C, oral diabetes medications, insulin use, and diabetes duration) were available for calculation of T2D remission scores. T2D status was assessed annually for up to 10 years post-op. Predictive values for each score (DiaRem, Ad Diarem and Diabetter) and preoperative diabetes characteristics (diabetes duration, insulin use duration and HbA1C) were evaluated by area under receiver operating characteristic curves (AUC).

RESULTS

Diabetter showed the greater performance for prediction of durable diabetes remission with acceptable discriminative capacities (AUC between 0.69 and 0.79), but was not superior to T2D duration as a single predictor (p=0.24 and p=0.18). At 10 years, T2D duration had a better discriminative capacity for prediction of T2D remission than all three predictive models (AUC = 0.85, p <0.05).

Pre-operative prediction of T2D relapse or T2D persistence at 1, 5 and 10 years after BPD-DS comparing DiaRem, Ad-Diarem and Diabetter scores with T2D duration as a single predictor



Pre-operative prediction of T2D relapse or T2D persistence at 1, 5 and 10 years after BDS-DS surgery comparing T2D characteristics

Predictive models	1 year post-op			5 years post-op			10 years post-op		
	Predictive capacity	Area under the curve (95% IC)		Predictive capacity	Area under the curve (95% IC)		Predictive capacity	Area under the curve (95% IC)	
Single predictors									
Duration of diabetes	Acceptable	0.77	(0.66-0.87)	Acceptable	0.76	(0.66-0.87)	Excellent	0.85	(0.74-0.95)
Duration of insulin use	Acceptable	0.78	(0.68-0.89)	Poor	0.60	(0.42-0.77)	Acceptable	0.79	(0.63-0.94)
Baseline HbA1c level	Poor	0.57	(0.44-0.70)	Poor	0.60	(0.40-0.80)	Poor	0.58	(0.38-0.78)

CONCLUSIONS

Conclusions: Diabetes duration alone offers an excellent predictive capacity and is a convenient alternative to diabetes remission scores for long-term diabetes remission after BPD-DS.

ACKNOWLEDGEMENTS



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A-29 - Perceptions and Understanding of Obesity and Bariatric Surgery Amongst Foundation Year Doctors

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Lewisham and Greenwich NHS Trust, London, United Kingdom

INTRODUCTION

The COVID-19 pandemic highlighted to healthcare professionals and patients the increased morbidity associated with obesity. As the prevalence of obesity continues to rise, healthcare professionals across all specialties are being exposed to the sequelae of obesity and metabolic syndrome. A good understanding, therefore, of obesity and bariatric surgery (BS) can significantly improve the diagnosis and management of these patients.

AIM

To gain an insight into the perceptions and understanding of obesity and bariatric surgery amongst foundation year doctors.

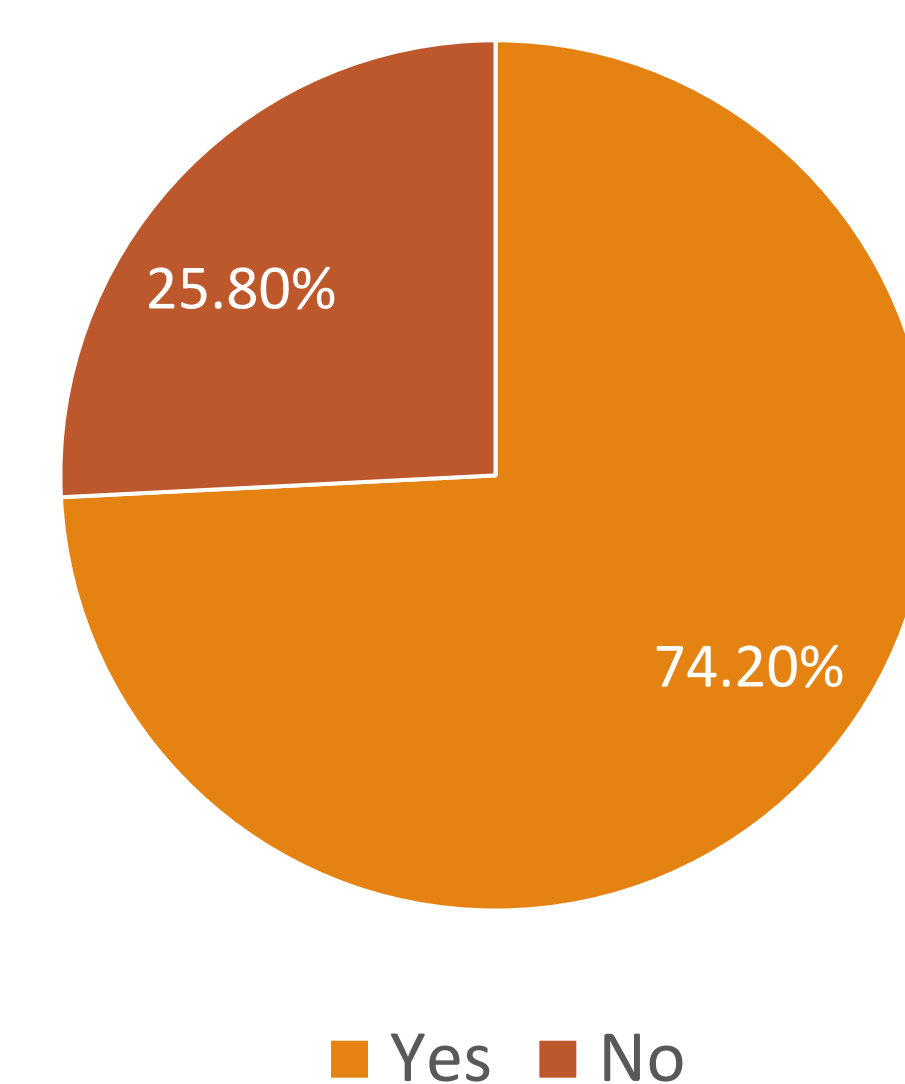
METHOD

An online questionnaire was distributed to all Foundation Year 1 (FY1) and 2 (FY2) doctors at Lewisham and Greenwich NHS Trust. The questionnaire comprised a mixture of questions around trainees' knowledge and perceptions on BS. All responses were anonymous.

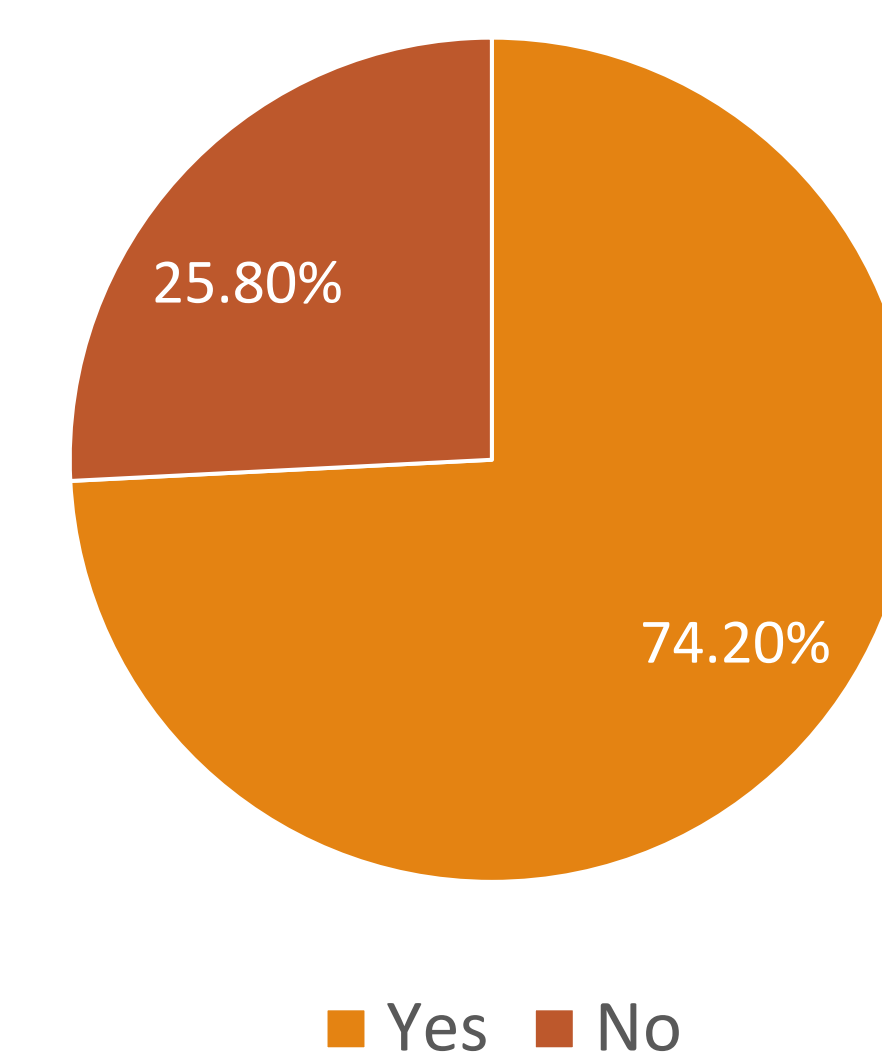
RESULTS

31 trainees completed the questionnaire; 12 (38.7%) were FY1 and 19 (61.3%) were FY2 doctors. 26 (84%) of respondents believed obesity was a burden on society and 6.5% of them felt that BS was a cosmetic procedure. 1 in 4 doctors felt that BS should not be funded on the NHS using taxpayers' money. Almost all respondents recognised sleeve gastrectomy and adjustable gastric band as bariatric procedures (100% and 96.8% respectively). However, Roux-en-Y gastric bypass and gastric balloon were less recognised [23 (74.2%) and 21 (67.7%) respectively]. 2 in 3 doctors did not think BS had any effect on Polycystic Ovarian Syndrome. 3 out of 4 doctors felt that BS should only be offered to patients who had tried weight loss through dieting and exercise. Although 18 (58%) of the respondents had not had any previous teaching or training about BS, 84% felt they would benefit from this.

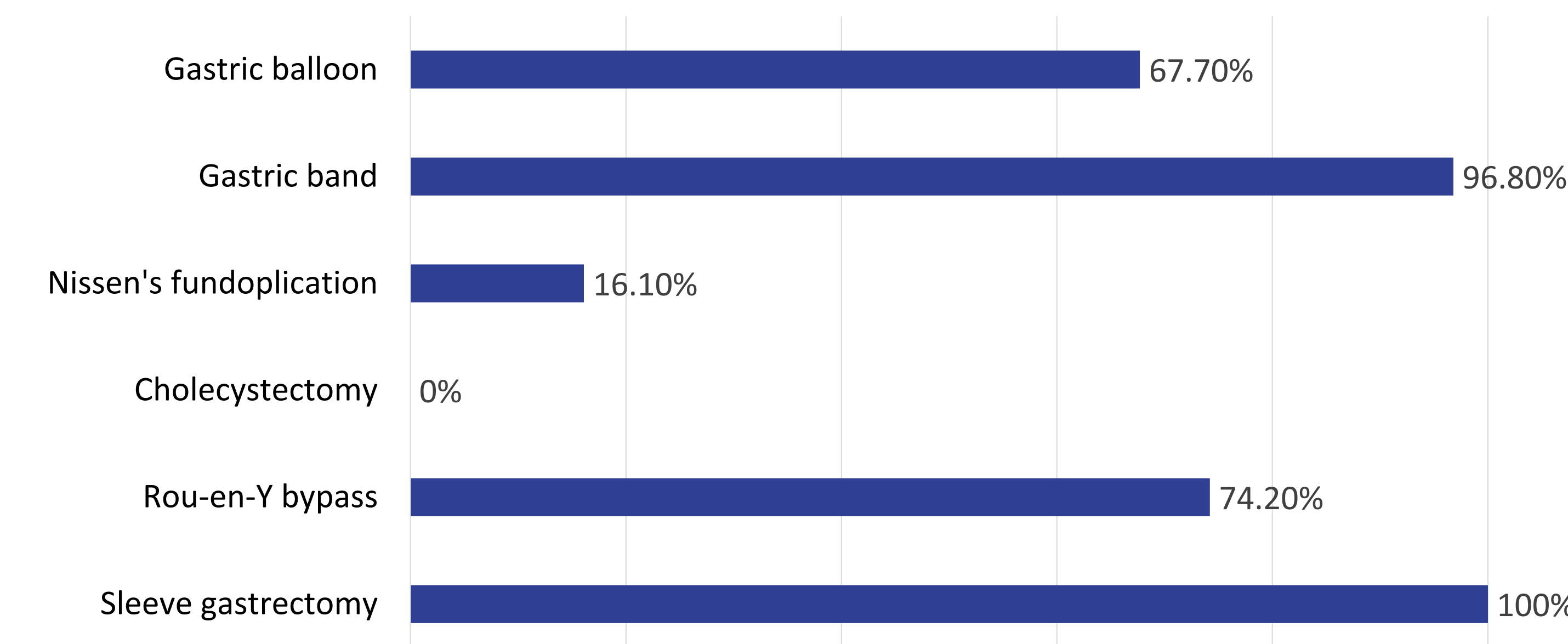
Do you consider obesity to be a burden on society?



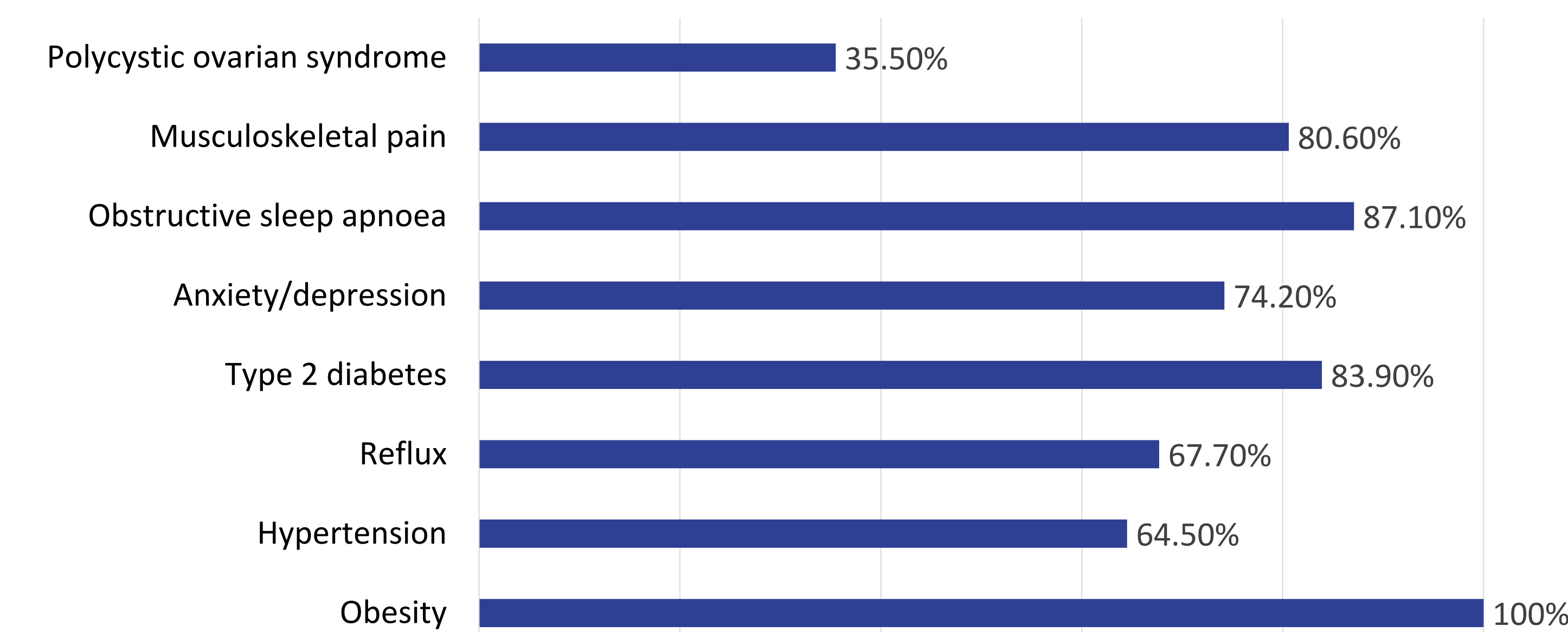
Should taxpayers' money be used to provide bariatric surgery on the NHS?



Which of the following are examples of bariatric surgery?



Which of the following conditions can bariatric surgery potentially treat?



CONCLUSIONS

Our questionnaire has revealed some insightful attitudes towards BS amongst foundation trainees. Although the vast majority felt BS had an important role to play in treating obesity, there is still some stigma associated with obesity as a disease. Incorporating teaching on obesity and metabolic syndrome in the medical curriculum and early years of training will improve junior doctors' perceptions and knowledge on this worldwide epidemic.

Complications and interventions post bariatric surgery: The East Anglia Experience

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BACKGROUND

Bariatric surgery has relatively low rates of complications, however, a small sub-set of patients will require admission, medical management and sometimes endoscopic or surgical intervention to manage^{1,2}.

AIM

To determine the type of interventions undertaken to manage post-operative complications and report outcomes following intervention.

METHOD

All patients who attended our centre between Sep 2018 and Sep 2021 having had recent bariatric surgery (whether in the UK or abroad) were included. Data on patient demographics, modes of intervention and outcomes were examined. The primary outcomes were location (local, other institutions within the UK, or abroad) and type of index bariatric procedure.



39%
(n=34)



41%
(n=36)



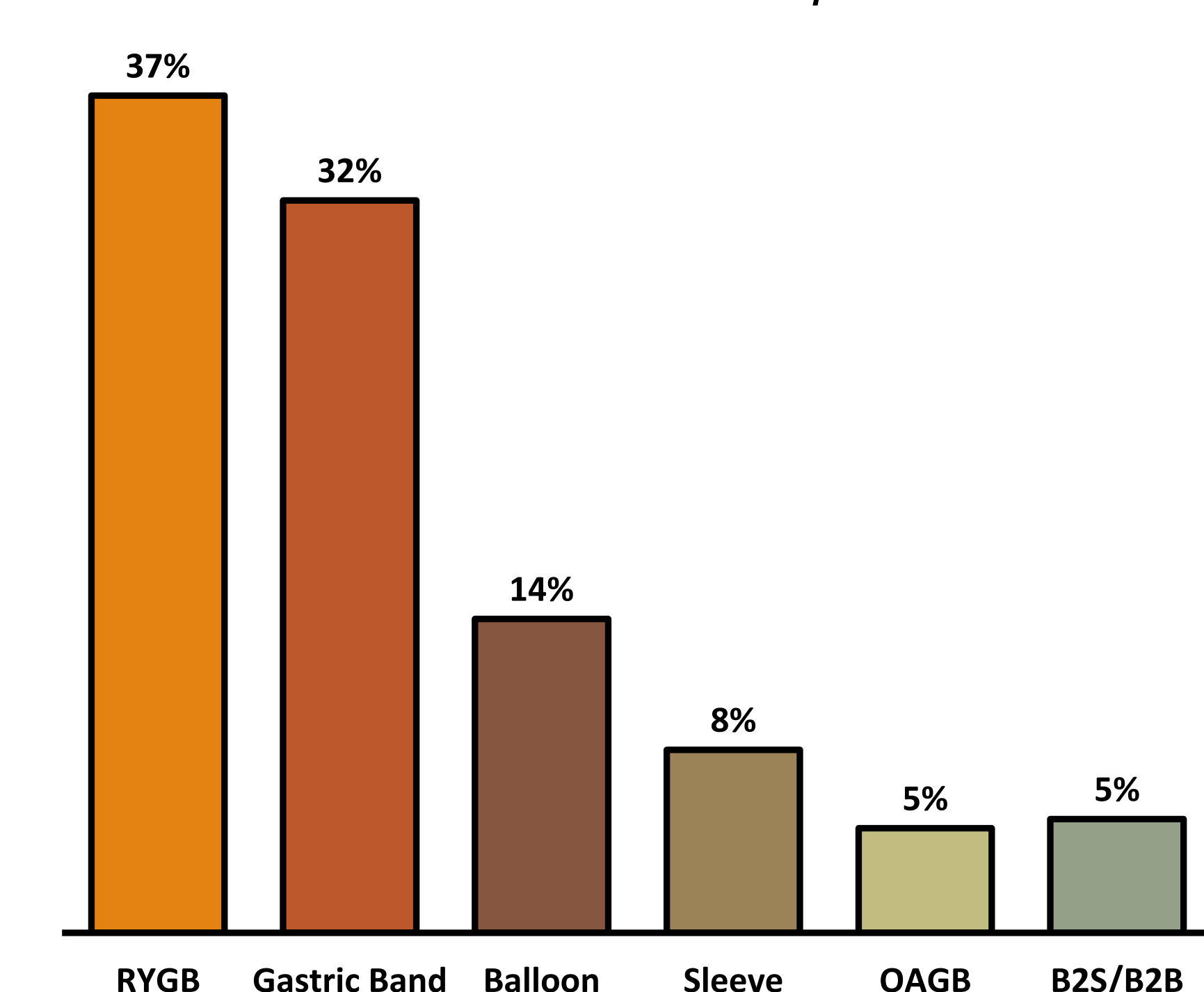
20%
(n=17)

RESULTS

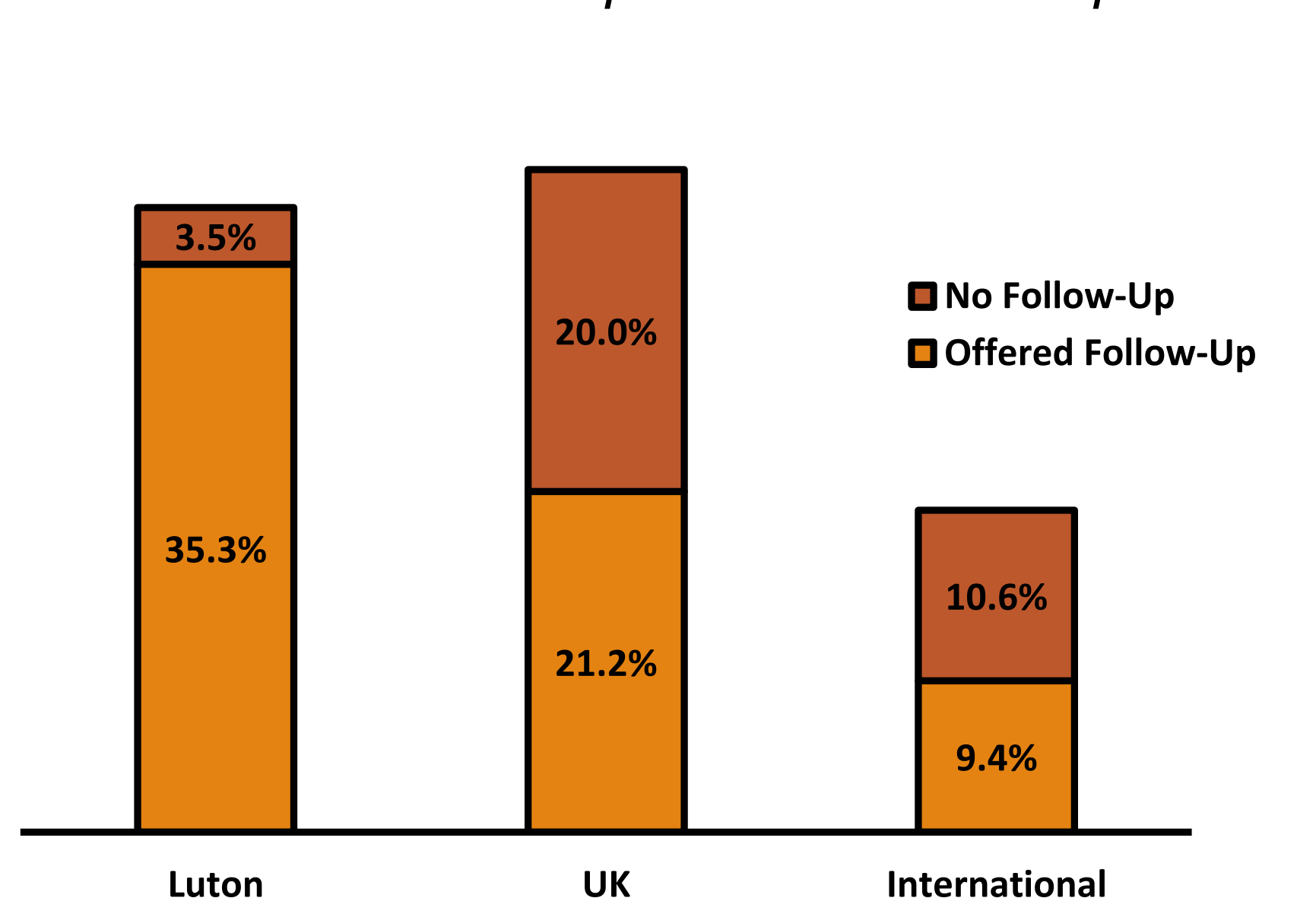
A total of 87 patients underwent 102 procedures, of which 79% were female. The median length of stay post intervention was 4 days (IQR 4 – 13). Most patients attended in (2020), followed by (2021). The most common index procedure was Roux-En-Y Gastric Bypass (37%), gastric banding (32%), balloon insertion (14%), sleeve gastrectomy (8%) and one-anastomosis gastric bypass.

Overall, 39% of the patients had their initial procedure at our unit, 41% at another UK centre and 20% abroad. The most common emergency intervention was OGD (11% - 4% were therapeutic). Patients from other UK centres required removal of gastric bands (25%). Patients who underwent surgery abroad required OGD (5%), removal of gastric balloons (5%) or removal of gastric bands (4%).

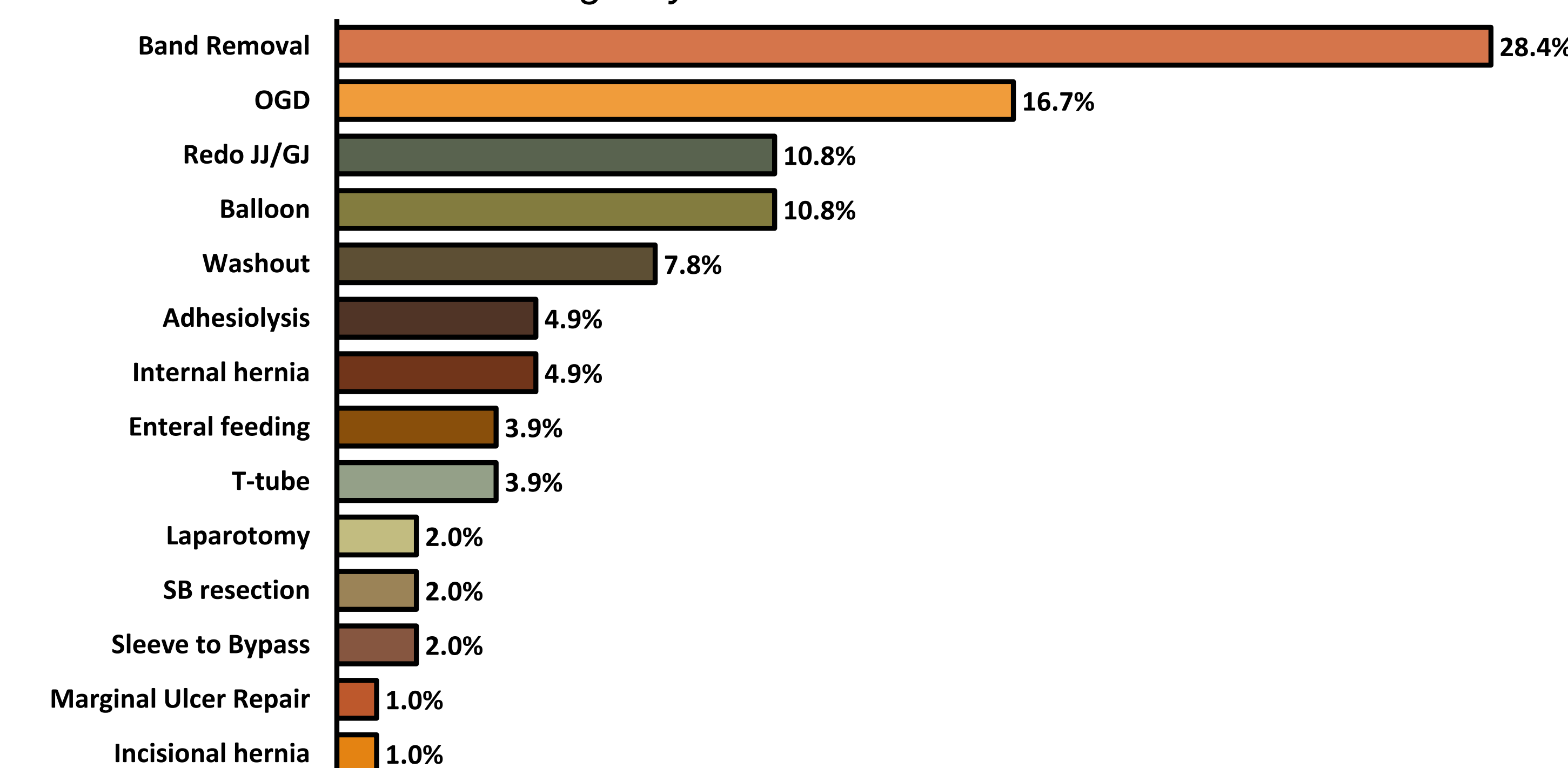
Overall Index Procedures To Require Intervention



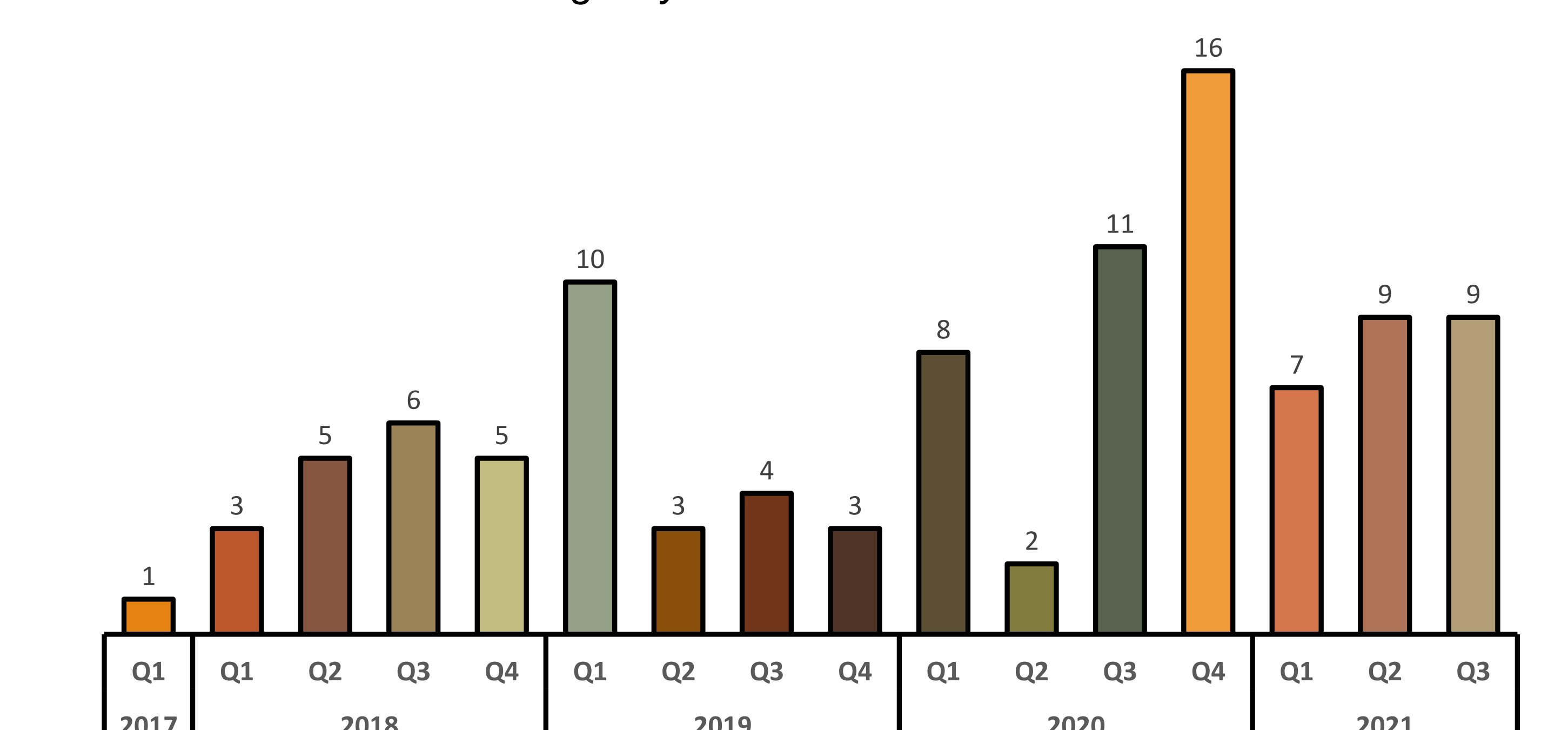
Post-procedural Followup



Emergency Bariatric Procedures Performed



Emergency Bariatric Procedures Performed



CONCLUSIONS

An increasing volume of patients who have bariatric surgery abroad are attending as an emergency and often require urgent intervention. Regional networks between hospitals and Bariatric centres are important in providing timely and specialist treatment. Further work is required to determine which patients are at high risk of requiring intervention post elective bariatric surgery as well as exploring the various drivers leading to patients seeking bariatric surgery abroad.

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A32 - To Study The Outcomes Of Laparoscopic Proximal Jejunal Bypass With Sleeve Gastrectomy



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INTRODUCTION

Obesity is a direct result of technological advances and represents a major challenge for technological society. The foremost physical consequence of obesity is atherosclerotic cardiovascular disease (ASCVD). The majority of obese persons who develop ASCVD typically have a clustering of major and emerging risk factors (metabolic syndrome). Bariatric surgery offers a treatment that can reduce weight, induce remission of obesity-related diseases and improve the quality of life.

AIM

To study the Outcomes of Laparoscopic Proximal Jejunal Bypass with Sleeve Gastrectomy (LPJB-SG) in terms of

- Weight loss
- Nutritional status
- Remission of type II diabetes

METHOD

- The study was conducted in the **Department of Surgery, Dayanand Medical College and Hospital, Ludhiana** on **40 obese patients** who underwent LPJ-SG from 1st September 2020 to 31st August 2022
- It is both a **retrospective and prospective study**.
- The study will be conducted on patients by taking initial measurements of height, weight, BMI, body fat composition analysis, subcutaneous fat, skeletal muscle, fat%, visceral fat, resting metabolism, baseline blood studies, lipid profile, fasting blood sugar, glycosylated hemoglobin, continuous glucose monitoring with sensor at the **time of admission**
- These values will be compared to the post-op values at **4 months**.

INCLUSION CRITERIA

- Patients with obesity (BMI > 32.5) and failure of medical therapy.
- Morbid obesity as defined as those with BMI >32 with / without diabetes.

EXCLUSION CRITERIA

- Patients with
 - Age < 18 years
 - Pregnancy
 - Psychiatric illness
 - Peptic ulcer disease
 - Advanced cases of malignancy

RESULTS

Sex	Frequency	Percent
F	21	52.5
M	19	47.5
Total	40	100.0

	Pre-Op Mean	Post-op Mean	p-value
Weight (kg)	116.8	92.7	0.001
Height (m2)	1.6	1.6	0.003
BMI(kg/m2)	44.1	35.2	0.001

	Pre – op Mean	Post -op Mean	Pre-op SD	Pre-op SD	p-value
Sub-cutaneous fat	45.6	38.8	6.0	2.7	0.001
Skeletal muscle mass	25.6	21.5	4.2	2.1	0.002
Body fat %	45.2	42.0	4.5	1.5	0.001
Visceral fat %	24.1	17.5	5.2	4.3	0.003
Resting metabolism (kcal)	2126.2	1547.7	491.1	228.6	0.045
Body age	75.9	66.0	6.5	4.1	0.058
Time in Range(CGMS)	50	80	5.6	8.9	0.010

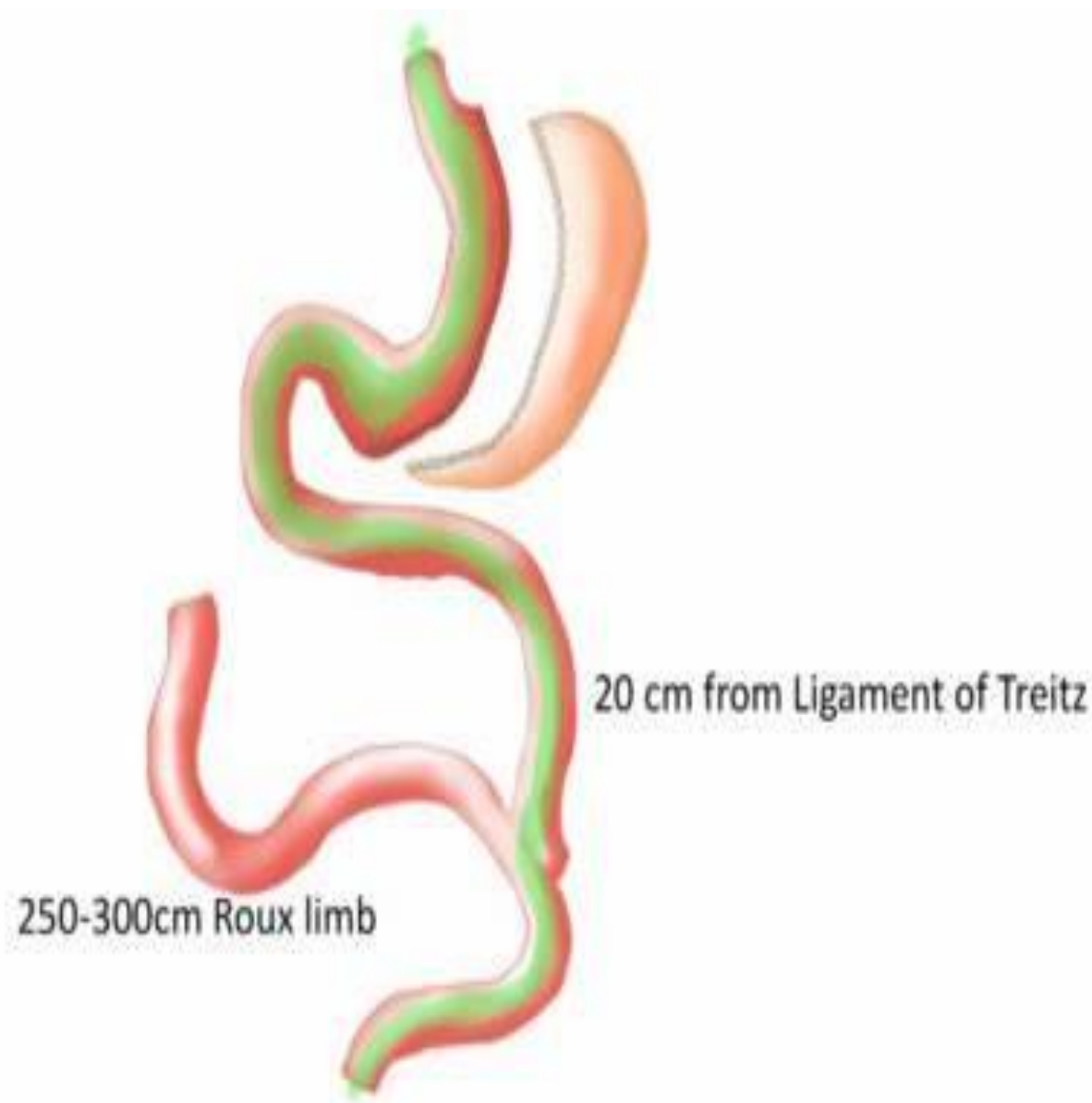
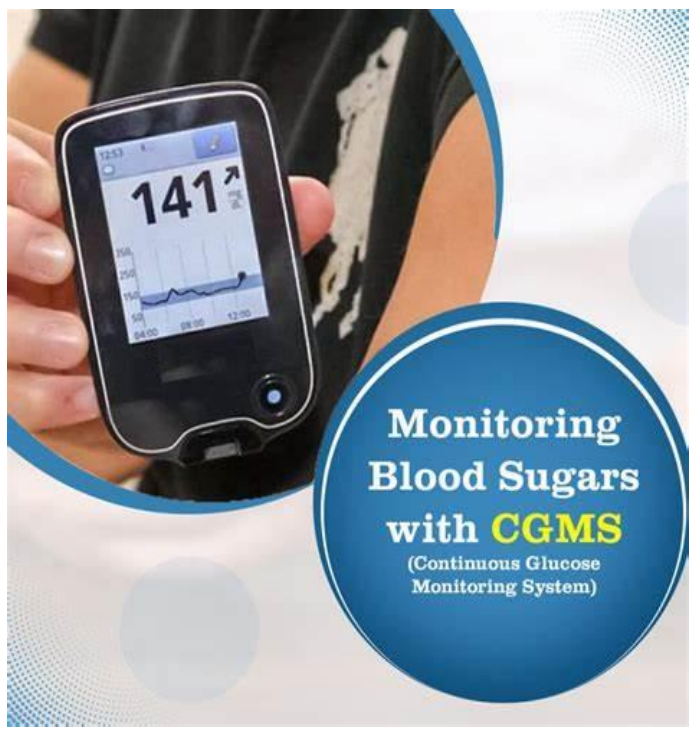
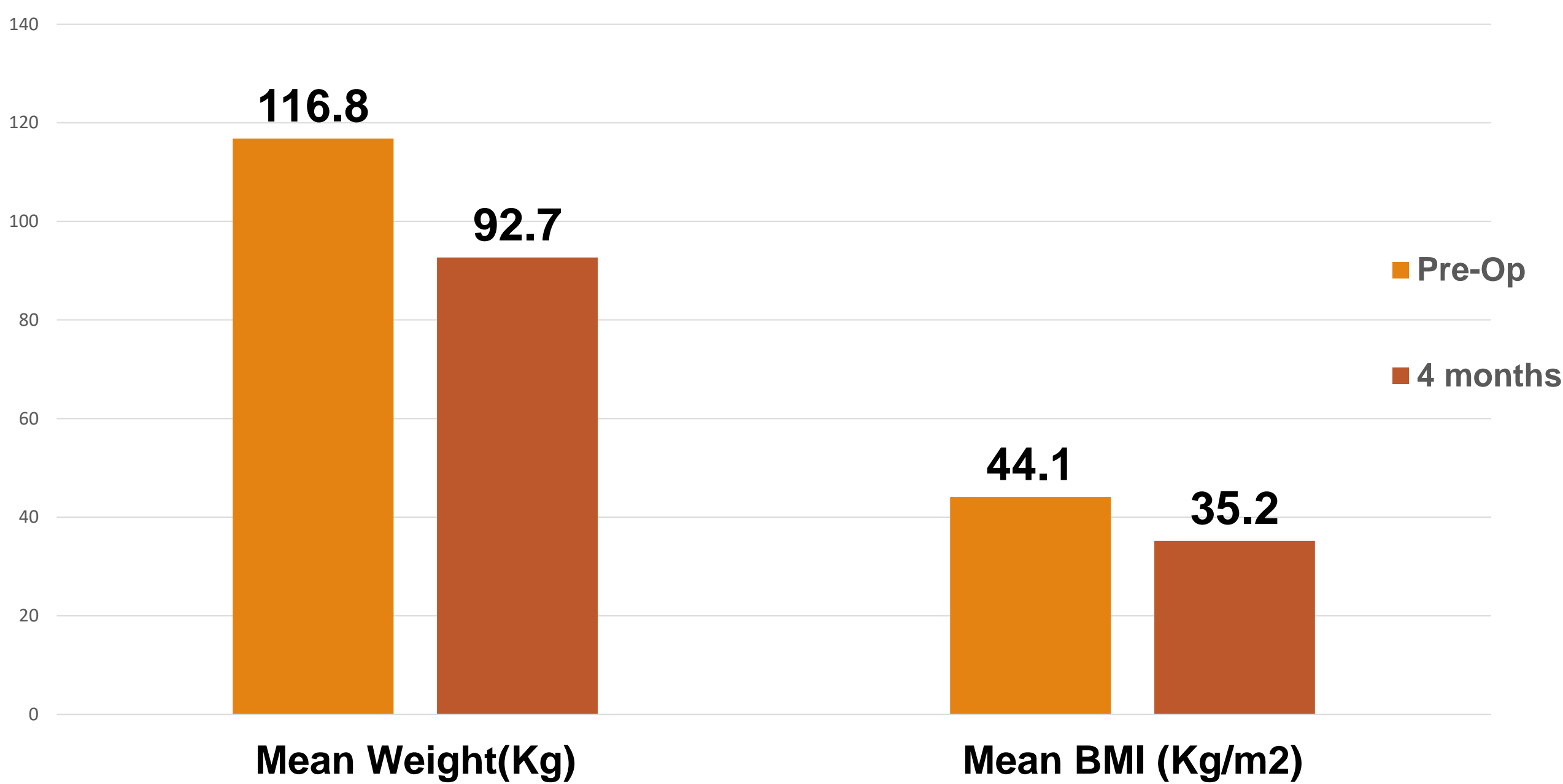


Fig 1. Laparoscopic Proximal jejunal Bypass with Sleeve Gastrectomy.

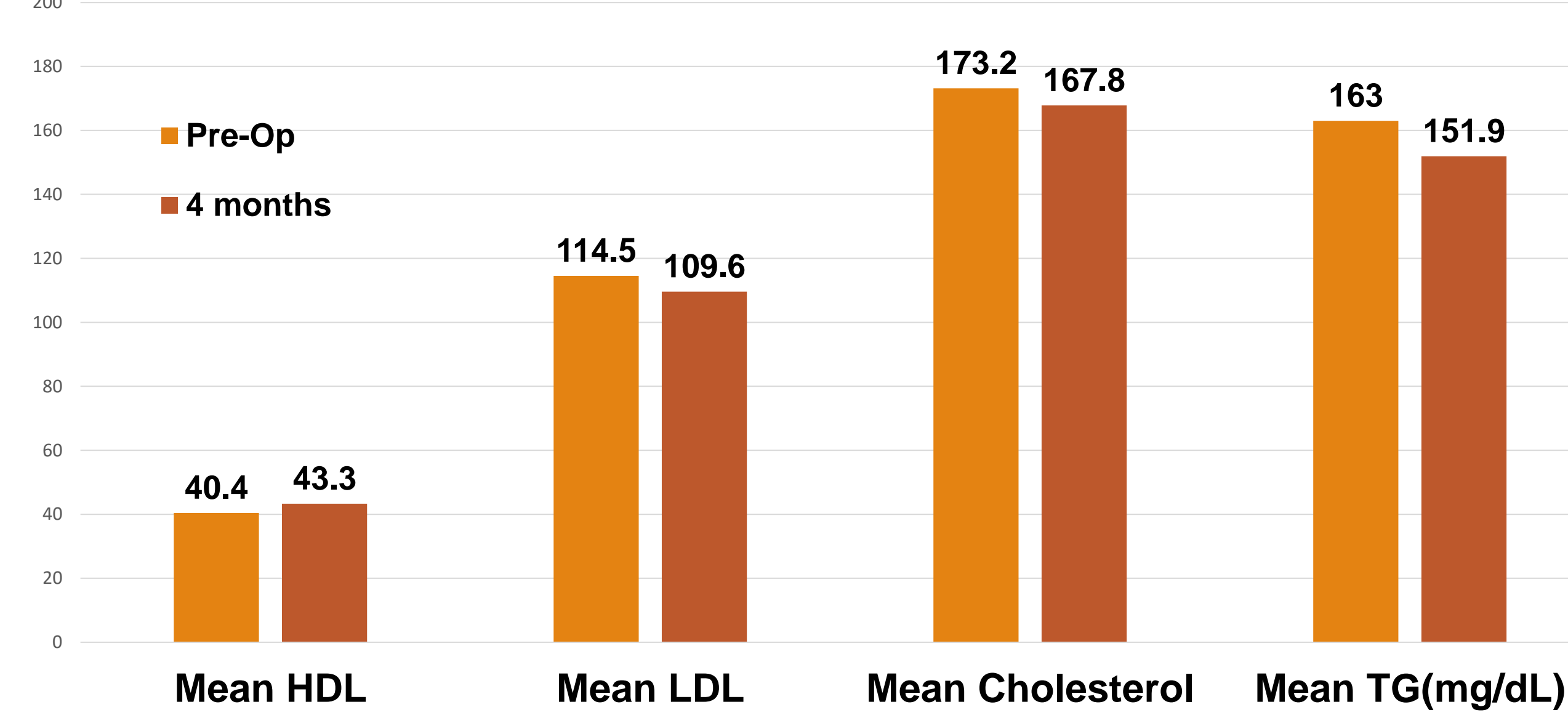


Diabetic Indices	Pre-Op	4Months	p-value
Mean FBS (mg/dL)	188.2	137.3	0.002
Mean HbA1c	8.13	7.02	0.003

Effect on Weight & BMI Pre-op and 4 Months



Effect on Lipid Profile at 3 Months and 6 Months



CONCLUSIONS

- Laparoscopic Proximal Jejunal Bypass – Sleeve Gastrectomy (LPJB-SG), is a feasible and effective surgery for treatment of **obesity**, long term remission of **type II diabetes mellitus** and to improve **cardiovascular health**.
- It produces sustainable weight loss with lesser complications, shorter hospital stay and improvement in quality of life.
- It is effective in the **cure of metabolic syndrome** producing resolution or improvement of glycemic status.
- It offers **significant improvement in hypercholesterolemia**.

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INTRODUCTION

- The proportion of over 60-year-olds in the population is increasing
- Obesity is increasing in the general population
- Bariatric surgery is currently less readily offered to over 60s
 - Due to more advanced obesity-related disease
 - More comorbidities
 - Less time to benefit from the effect of weight loss
- Safety has already been demonstrated in this cohort
- A non-surgical approach has poorly predictable outcomes and high relapse rates
- There is a paucity of studies showing the long-term effects of bariatric surgery in this population

AIM

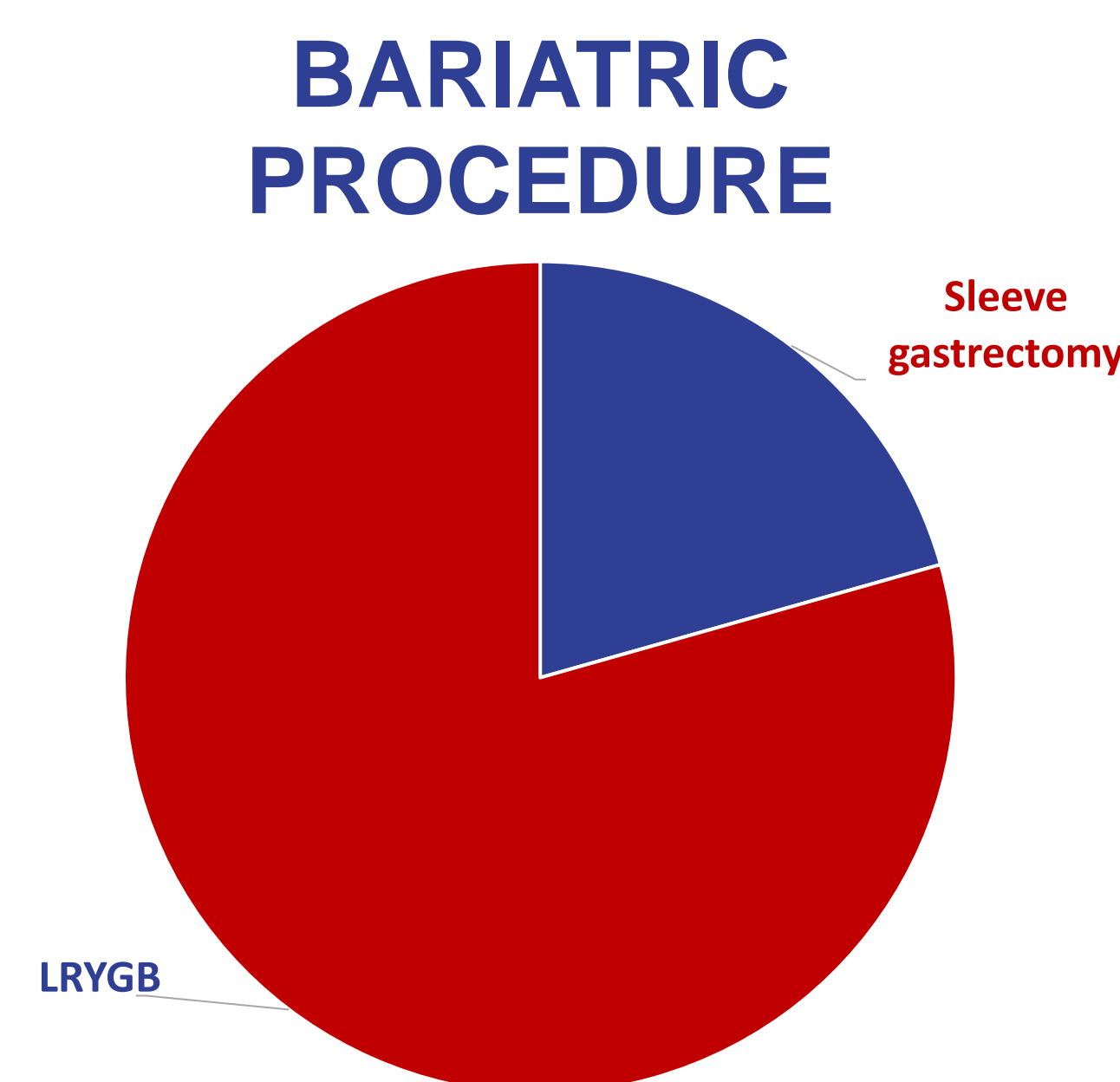
This study aims to evaluate the long-term effect on quality of life and obesity-related outcomes in the over-sixties cohort

METHOD

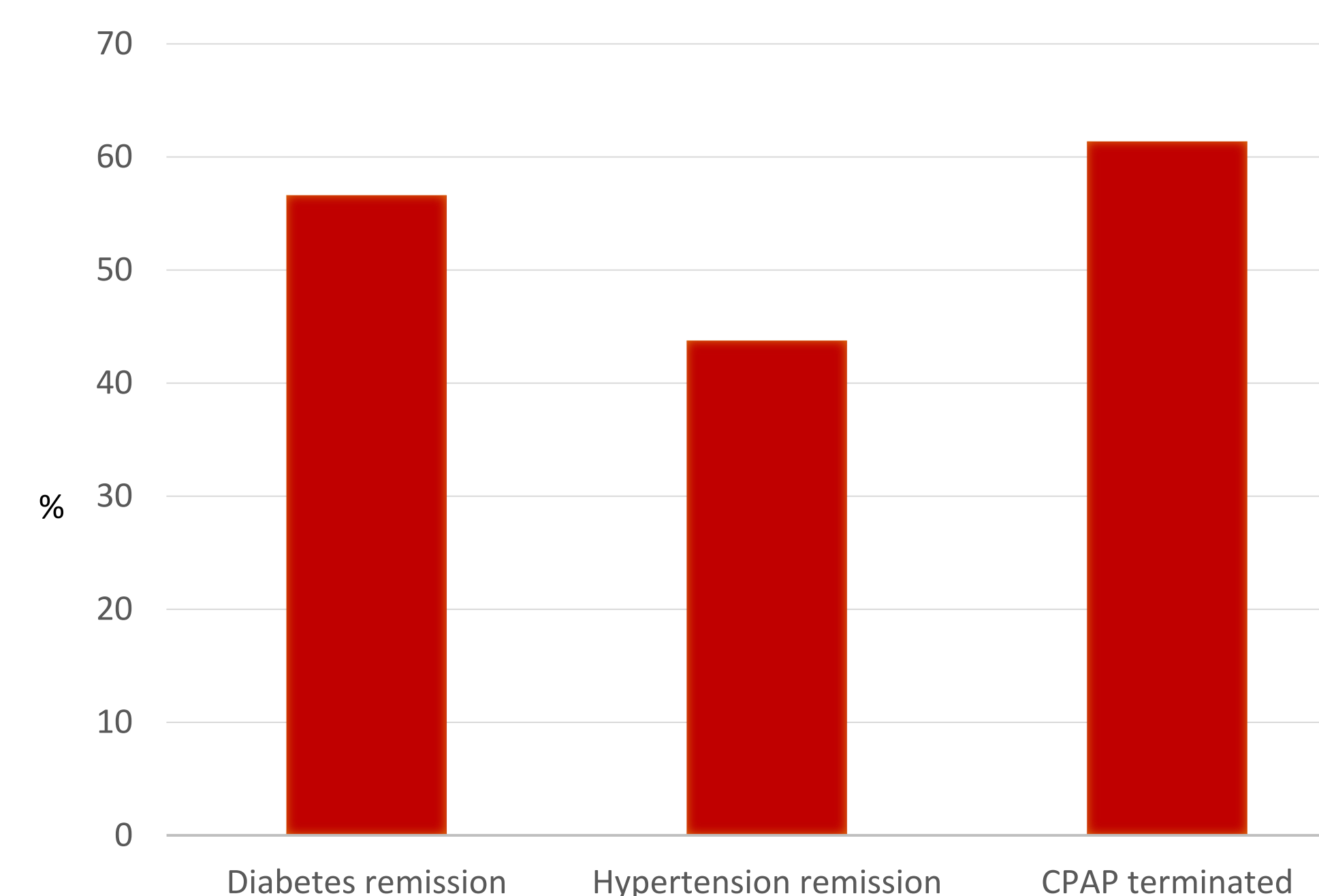
- Retrospective identification of all patients over 60 years that underwent bariatric surgery
- January 2015 – January 2020
- Single UK centre – St Richard's Hospital Chichester
- All patients were contacted by telephone using a standardised proforma
 - Current weight (BMI calculated)
 - Comorbidities
 - Hypertension, diabetes, obstructive sleep apnoea
 - Quality of life questionnaire
 - Euro QoL – 5D
- **Primary end point: percentage excess weight loss**
- Secondary end points
 - Remission of comorbidities
 - Quality of life and mobility
 - Length of hospital stay
 - Significant surgery-related morbidity

RESULTS

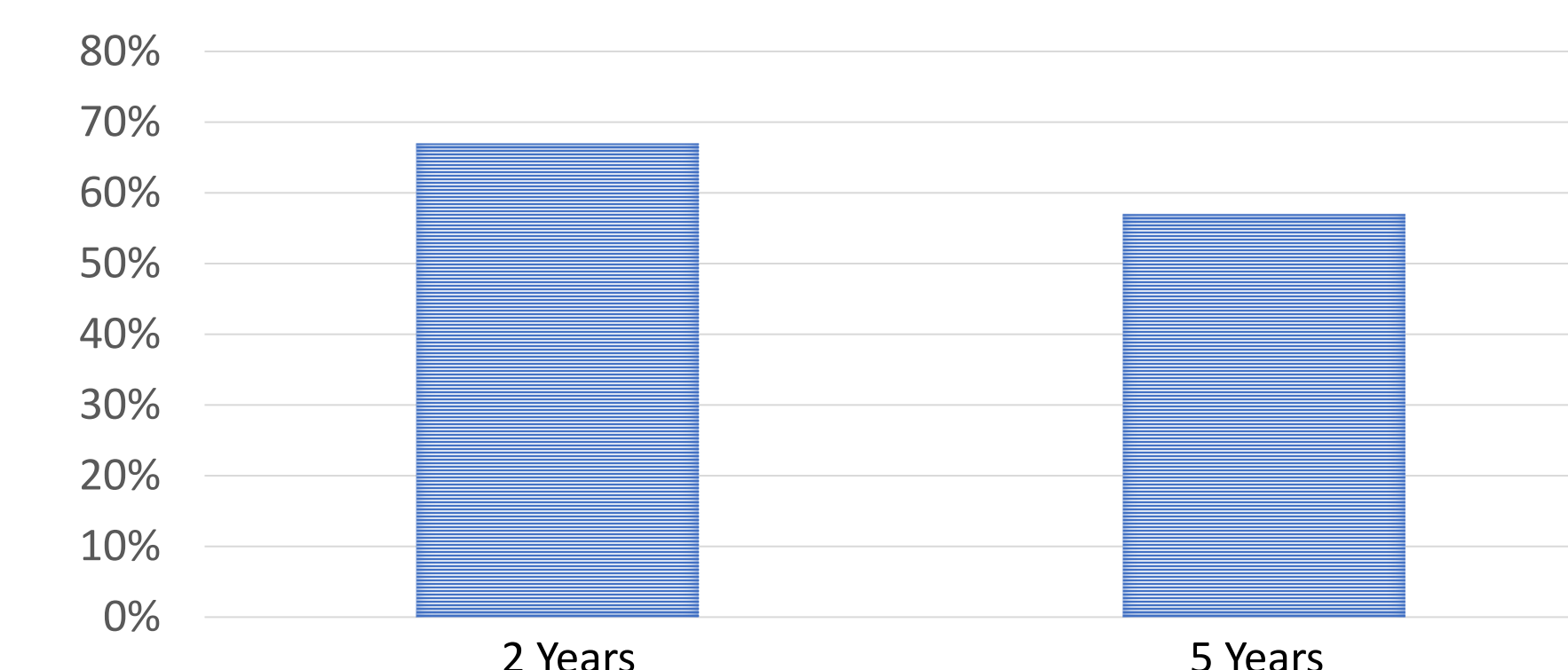
- 97 patients were identified
 - 20 sleeve gastrectomy
 - 77 laparoscopic Roux-en-Y gastric bypass.
- Median age 63 years (range 60-73)
- Median weight 129 kg (93-183kg)
- Median BMI 47 kg/m² (35-71)



REMISSION OF OBESITY-RELATED COMORBIDITIES



PERCENTAGE EXCESS WEIGHT LOSS



- Mean hospital stay was 2 days
- Significant complication rate 5% (5/97)
- 30 day mortality 1 (1/97)
- Median follow up 2 years (1-5)

Quality of life

- There was a significant improvement in overall quality of life at 2-5 years
 - Mobility (p<0.001)
 - Self-care (p=0.01)
 - Activity (p=0.03)
- Median overall satisfaction rate of 10
 - 1 = poor – 10 = excellent

Median excess weight loss

- 67% at 2 years
- 57% at 5 years

CONCLUSIONS

- **In the over 60s population, bariatric surgery leads to a sustained improvement in obesity-related comorbidities and quality of life**
- **Patient satisfaction in this cohort is high**
- **Age alone should not be a barrier to receiving bariatric surgery**

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There is no declared conflict of interest, This project was registered locally with the trust audit department but did not require formal ethics approval

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INTRODUCTION

Severe gastro-oesophageal reflux after Sleeve Gastrectomy has traditionally been treated by conversion to Roux-en-y Gastric Bypass, but this procedure is associated with other problems. An effectful antireflux-operation that does not include rerouting of the small bowel is needed.

AIM

TO EXPLORE HILL'S OPERATION AS AN ANTIREFLUX OPERATION FOR SEVERE REFLUX AFTER SLEEVE GASTRECTOMY

METHOD

THE HIATAL HERNIA WAS REDUCED AND THE CRURA APPROXIMATED TO THE DISTAL OESOPHAGUS

3 OR 4 HILL SUTURES WERE USED

THE FIRST 6 PROCEDURES WERE DONE WITH PEROPERATIVE MANOMETRY, THE NEXT 3 WITHOUT PEROPERATIVE MANOMETRY

RESULTS (N = 9)

ALL WOMEN, MEDIAN AGE 52 YRS (RANGE 29-66). 7 AFTER LAP SLEEVE GASTRECTOMY, 2 AFTER OPEN BPDDS.

OPERATING TIME MEDIAN 186 MIN, RANGE 143 – 248 (INCLUDING PEROPERATIVE MANOMETRY). NO COMPLICATIONS.

1/9 CONVERTED TO RYGBP AFTER ONE YEAR DUE TO REFLUX. RESULTS FOR THE 8 OTHERS (AFTER MEDIAN 24 MTHS, RANGE 5 - 41):

Variable	Preop (n=8)	Postop (n=8)
Hiatal hernia length, cm. Median (range)	5 (2-6)	0 (0-1) (n=7)
Oesophagitis LA gr III or IV (n)	0	0 (n=7)
PPI ≥ 40 mg daily (n)	8	3
GerdQ score. Median (range)	12 (10-13)	6 (3-11)
BMI	27,5 (22 - 37)	25 (22 - 32)
Smoking	3	3

«Success» for the whole cohort defined as:	(n = 9)	Percent:
No RYGBP and no PPI	4/9	44 %
No RYGBP and GerdQ score < 9	7/9	78 %
Doing well with sleeve with or without PPI	6/9	67 %

CONCLUSIONS

Hill's operation used as an antireflux procedure after Sleeve Gastrectomy shows promising results.

The procedure should only be performed at dedicated centers.

REFERENCES

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A37 - Bariatric surgery in renal failure patients improves access to transplantation without increased risk



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INTRODUCTION

Renal transplantation is not recommended in patients with BMI >40 as obesity is associated with delayed graft function, primary non-function and wound complications. Bariatric surgery (BS) results in sustained long-term weight-loss and improvement in comorbidities. However, renal failure patients are theoretically higher risk surgical candidates, and it is unclear whether they would benefit from obesity surgery.

AIM

We aim to investigate whether renal failure patients who have undergone BS: 1) have better access to transplantation by achieving eligibility through weight loss, compared to renal failure patients who do not proceed to surgery, and 2) have acceptable outcomes in terms of weight loss, complications, mortality and morbidity, compared to matched controls.

METHOD

- Three groups of patients were included:
 - Patients with renal failure (CKD3+, under nephrologist) who underwent bariatric surgery (BS; **RF operated**)
 - Patients with renal failure who were referred for consideration of BS, but did not proceed to an operation (**RF unoperated**)
 - Patients without renal failure with otherwise similar characteristics who underwent BS (**matched controls**)
- We assessed whether patients in each of the RF groups had achieved their target: transplantation or addition to the transplant waiting list
- Using data from follow-up appointments (6, 12, 18 and 24 months) we measured weight loss, early and late complications, mortality and quantifiable changes in comorbidities.

RESULTS

1. Patient characteristics

Characteristics		RF operated (n = 19)	Matched controls (n = 19)	RF unoperated (n = 12)
Female gender		13 (68%)	14 (74%)	7 (58%)
Median age		52	54	58
Mean BMI		46.2 ± 1.1	45.9 ± 1.4	41.5 ± 1.3
Sleeve gastrectomy		18 (95%)	18 (95%)	n/a
Comorbidities	Type 2 diabetes	9 (47%)	10 (53%)	9 (75%)
	Hypertension	19 (100%)	14 (74%)	7 (58%)
	OSA	9 (47%)	11 (58%)	2 (17%)

Table 1. Characteristics of patients included in the study. OSA = obstructive sleep apnoea. Data are shown as n (%) or mean ± standard error of the mean

- 34 patients were referred between 2013 and 2021. Three are undergoing work-up and have therefore been excluded. The remaining patients are summarised in Table 1.
- At the time of surgery, 11/19 (58%) of the RF operated group were on dialysis.

2. Renal failure patients who have undergone bariatric surgery have greater access to transplantation

- Follow-up data show that 58% (11/19) of RF operated patients have achieved their target outcome (6 transplanted, 5 activated on the waiting list).
- The remaining 8/19 (62%) RF operated patients have not yet been listed for the following reasons: cardiac comorbidity (n=2), death (n=2), eGFR still above threshold (n=2) and lost to follow-up (n=2).
- Among those with renal failure who did not proceed with BS, only 2/12 (17%) achieved the target outcome of access to transplantation.

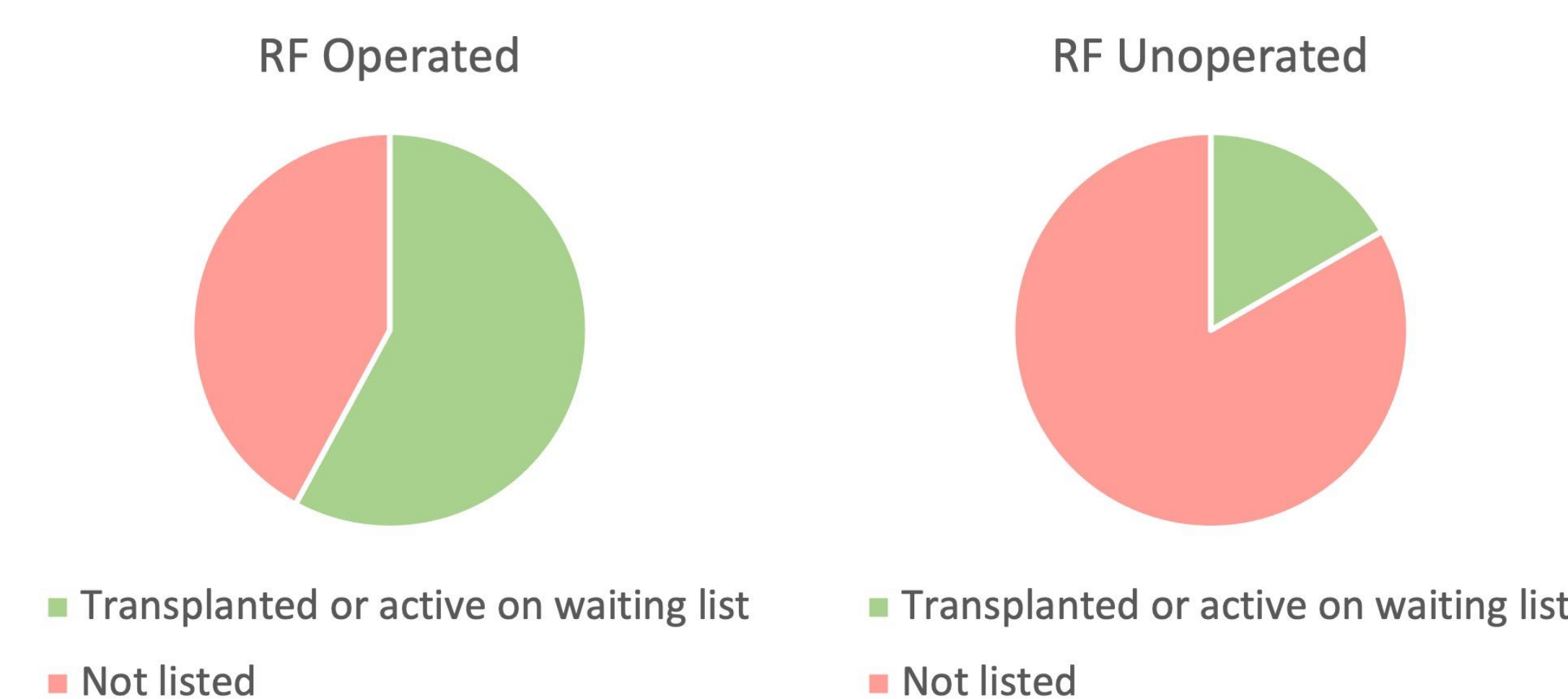


Figure 1. Rates of target achievement in the RF operated and RF unoperated groups. RF = renal failure.

3. Patients with renal failure have equivalent outcomes after bariatric surgery compared to matched controls without renal failure

- Weight loss was similar between patients with and without renal failure in the 2 years following bariatric surgery.
- Within 30 days of surgery there was no mortality, or major comorbidity (Clavien Dindo >2) in RF operated or the MC group.
- Both groups reduced the mean number of antihypertensive and diabetic medications per patient (Fig.3). In addition, HbA1c reduced in both operated groups (-23% for RF operated, -17% for controls).
- Long-term mortality was significantly greater in RF patients who did not undergo BS (42% vs. 11% RF operated). The 2 deaths in the RF operated group occurred at 1 and 2 years postoperatively and were unrelated to BS.

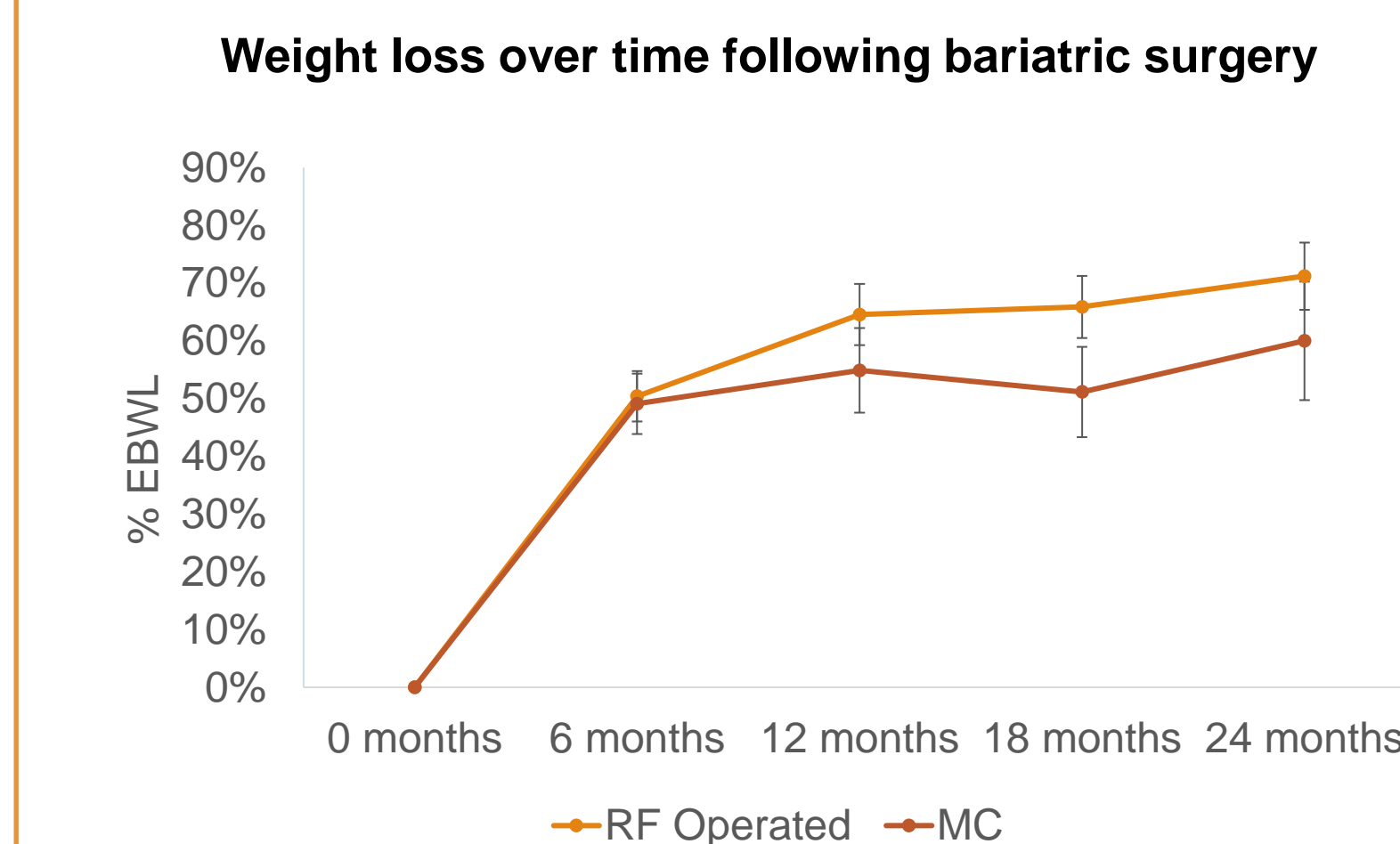


Figure 2. Change in %EBWL following bariatric surgery. Data are shown as mean ± SEM. %EBWL = percentage of estimated body weight loss; RF = renal failure; SEM = standard error of the mean.

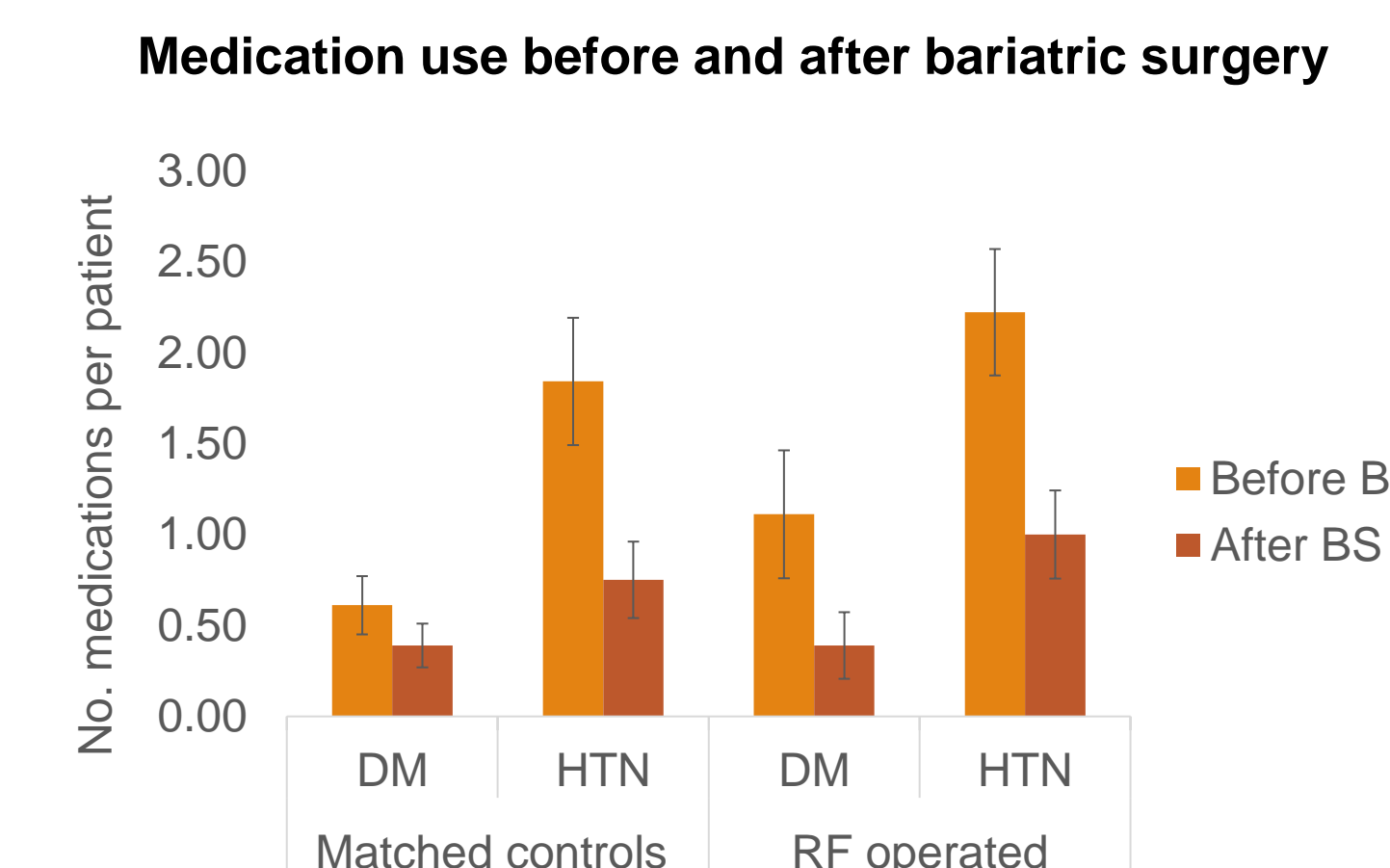


Figure 3. Change in no. medications per patient. BS = bariatric surgery; DM = diabetes mellitus; HTN = hypertension

CONCLUSIONS

- Offering bariatric surgery to renal failure patients **increases access to transplantation** as patients reach eligibility criteria through reduced BMI.
- Like matched controls, renal failure patients achieve sustained weight loss of a desirable magnitude, **without an increased complication rate**.
- Evidence of **improved control of comorbidities** such as diabetes and hypertension is seen through reduced medication use and reduction in HbA1c.

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