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Results of Preoperative Investigations Before Sleeve Gastrectomy: The Basel Experience

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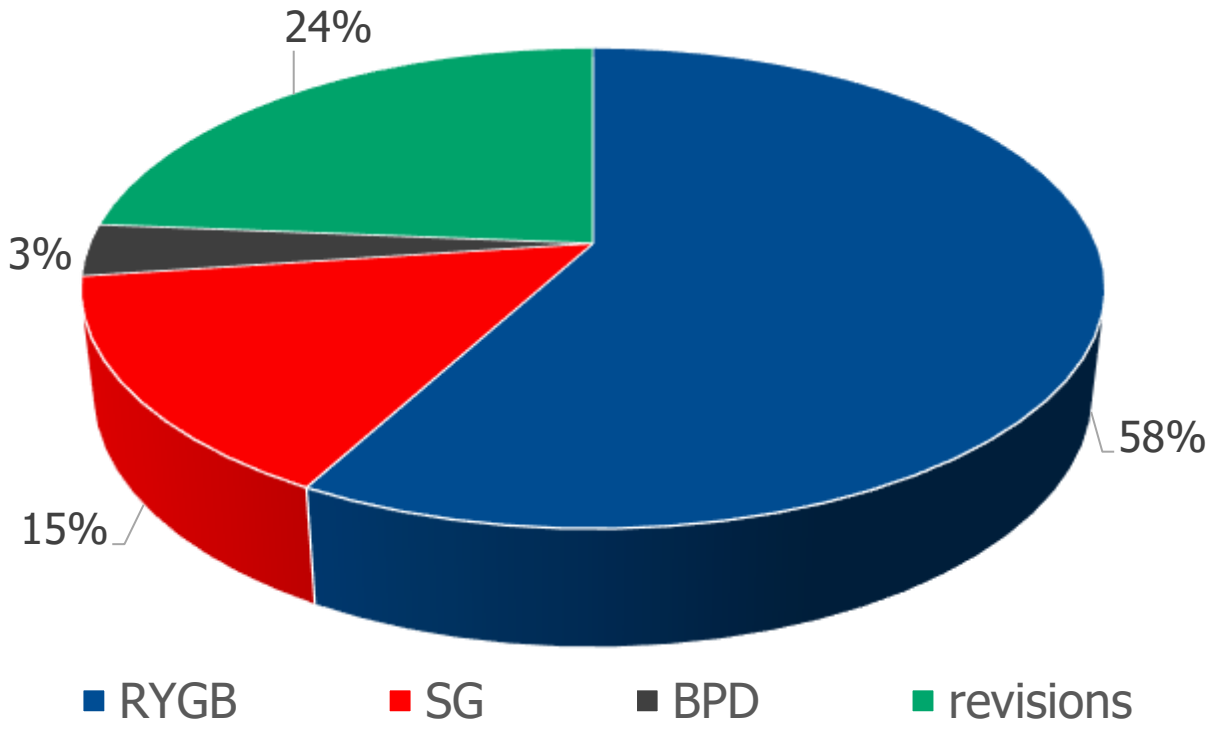
Outline

- Background
- Published data
- Current status
- Discussion

Disclosure

- No financial disclosures
- Case mix:



OAGB, SADI: 0%

Background

- Increasing use of bariatric surgery
- No or insufficient international consensus on preoperative examinations
- Gastrointestinal: No consensus
- Preoperative diagnostic workup differs from hospital and country
- High prevalence of overweight-associated gastrointestinal pathologies
  - gallstones, hiatal hernia, GERD, peptic ulcer, Barrett's esophagus, and cancer
- Pathologies affect therapeutic approach or can cause technical challenges

Setting

- Bariatric and metabolic surgery = covered by insurance

- Indications:
  - BMI > 35 kg/m^2
  - since January 1, 2021: **metabolic surgery**
    - BMI 30 – 35 kg/m^2
    - poorly controlled T2DM (HbA1c > 8%)

- Interdisciplinary team

- Preoperative examinations
  - endocrinological examination
  - cardiological & pneumological examination
  - psychiatric assesment
  - gastrointestinal investigations

- Aim: safety!

Swiss Society for the Study of morbid Obesity and metabolic disorders

Published data

Radiologic and Endoscopic Evaluation for Laparoscopic Adjustable Gastric Banding: Preoperative and Follow-Up

Arno Frigg;[1] Ralph Peterli, MD;[1] Anatol Zynamon, MD;[2] Claudio Lang, MD;[3] Peter Tondelli, MD[1]

Obes Surg, 2001

- Upper endoscopy and upper GI series on 148 patients
- December 1996 to January 2000

Preoperative Findings Prior to Gastric Banding

- Upper endoscopy:

Table 1. Macroscopic and microscopic findings in gastroscopies prior to LASGB

Finding	Patients with symptoms	Patients without symptoms	Total
Macroscopic	n=62	n=42	n=104
- no abnormality detected	26	20	46
- gastroesophageal reflux	23	12	35
- hiatal hernia	13	3	16
- gastritis/ duodenitis	4	6	10
- ulcer	1	0	1
- erosion	1	1	2
- food retention	0	1	1
Microscopic	n=52	n=38	n=90
- no abnormality detected	15	16	31
- esophagitis	5	3	8
- gastritis	33	20	53
with Helicobacter pylori	15	8	23
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→ **56% with pathological findings!**

→ **34%**

→ **15%**

Frigg A, Obes Surg (2001)

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→ **66% with pathological findings!**

→ **34%**

Preoperative Findings Prior to Gastric Banding

- Upper GI series:
  - In 70/147 patients (48%) no pathologies were found
  - 74 showed hiatal hernias (50%)
  - 2 motility disorders of the esophagus (1%)
  - 1 an incomplete malrotation (1%)

Published data

Original article

The impact of preoperative investigations on the management of bariatric patients; results of a cohort of more than 1200 cases

Romano Schneider, M.D.[a,*], Ioannis Lazaridis, M.D.[a], Marko Kraljević, M.D.[a], Christoph Beglinger, M.D.[b], Bettina Wölnerhanssen, M.D.[b], Ralph Peterli, M.D.[a]

[a]*Department of Surgery, St. Claraspital AG, Basel, Switzerland*
[b]*Clinical Trial Unit, St. Claraspital AG, Basel, Switzerland*

Surg Obes Relat Dis, 2018

- Ultrasound, upper endoscopy, upper GI series and manometry on 1255 patients who underwent RYGB or SG
- January 2007 to January 2017

Preoperative Findings Prior to Bariatric Metabolic Surgery

- Upper endoscopy:

Table 2
Findings in upper endoscopy

	LRYGB	SG	*P*
Examinations, n; %	812; 97.4	378; 96.7	-
Normal examination, n; %	313; 38.6	157; 41.5	.3397
Type C gastritis, n; %	145; 17.9	79; 20.9	.2321
Helicobacter positive gastritis, n; %	106; 13.1	52; 13.8	.7832
Type A gastritis, n; %	0: 0	1; .3	.3176
Submucosal lipoma, n; %	0; 0	1; .3	.3176
Ventricular or duodenal ulcus, n; %	1; .1	2; .5	.2384
Duodenal adenoma, n; %	0; 0	1; .3	.3176
Hiatal hernia, n; %	41; 5.1	14; 3.7	.3739
Reflux associated esophagitis, n; %	165; 20.3	64; 16.9	.1798
Papilloma of the esophagus, n; %	1; .1	0; 0	.999
Diverticulosis of the esophagus, n; %	2; .3	0; 0	.999
Barrett's esophagus, n; %	4; .5	0; 0	.3136
Barrett's esophagus with high-grade dysplasia, n; %	1; .1	0; 0	.999
Achalasia, n; %	1; .1	0; 0	.999
Celiac disease, n; %	0; 0	1; .3	.3176
Others, n; %	31; 3.8	7; 1.9	.0781

LRYGB = laparoscopic Roux-en-Y gastric bypass; SG = sleeve gastrectomy.

Values are expressed as n, %.

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Schneider R, Surg Obes Relat Dis (2018)

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Preoperative Findings Prior to Bariatric Metabolic Surgery

- Upper GI series:

Table 3
Findings in upper GI series

	LRYGB	SG	*P*
Examinations, n; %	800; 95.9	378; 96.7	-
Normal examination, n; %	562; 70.3	262; 69.3	.7854
Hiatal hernias, n; %	218; 27.3	107; 28.3	.7272
Achalasia, n; %	1; .1	0; 0	.999
Others, n; %	26; 3.3	7; 1.9	.1914

GI = gastrointestinal; LRYGB = laparoscopic Roux-en-Y gastric bypass; SG= sleeve gastrectomy.

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Preoperative Findings Prior to Bariatric Metabolic Surgery

- Esophageal manometry:

Table 4
Details of esophageal manometry examination results

	LRYGB	SG	*P*
Examinations, n; %	300; 36.0	310; 79.3	-
Normal examination, n; %	252; 84.0	254; 81.9	.5196
Pathologic peristaltics, n; %	9; 3.0	8; 2.6	.8093
Lower sphincter pathologic, n; %	34; 11.33	45; 14.52	.2780
Lower sphincter and peristaltics pathologic, n; %	5; 1.7	3; 1.0	.4984
Achalasia, n; %	0; 0	1; .3	.999
Tertiary contractions, n; %	1: .3	0; 0	.4918

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Schneider R, Surg Obes Relat Dis (2018)

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Preoperative Findings Prior to Bariatric Metabolic Surgery

Table 5
Initially planned bariatric procedure compared with finally performed bariatric procedure

	LRYGB	SG	Total
Initially planned bariatric procedure, n; %	812; 66.1	416; 33.9	1228; 100
Finally performed bariatric procedure, n; %	834; 68.1	391; 31.9	1225; 99.8
Finally performed other procedures (oncologic resection)	-	-	3; .2%

LRYGB = laparoscopic Roux-en-Y gastric bypass, SG = sleeve gastrectomy.

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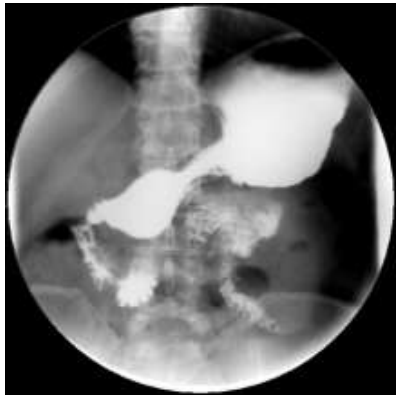
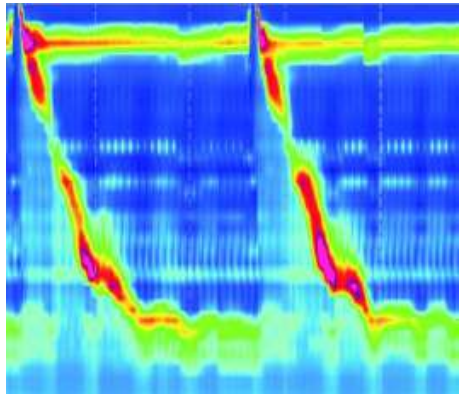
Schneider R, Surg Obes Relat Dis (2018)

Current Data on Preoperative Investigations

- January 2017 – December 2022
- Primary bariatric surgeries
- Ultrasound, upper endoscopy, upper GI series & manometry


Patient Characteristics

	RYGB	SG	total
n (%)	741 (82.6)	156 (17.4)	897
age (y)	41.4 ± 12.4	43.4 ± 12.5	41.8 ± 12.4
females (%)	73.0	57.7	70.3
BMI (kg/m^2)	41.7 ± 5.8	44.6 ± 7.7	43.0 ± 6.2

Ultrasound - Findings

	RYGB	SG	total
Preoperative ultrasound, n	667	138	805
Gallstones, n (%)	120 (18.0)	28 (20.3)	148 (18.4)
Common bile duct stones, n (%)	0	0	0
History of cholecystectomy, n (%)	74 (10.0)	18 (11.5)	92 (16.5)

Ultrasound – Consequences

	RYGB	SG	total
Gallstones, n	120	28	148
Concomitant cholecystectomy, n (%)	114 (95.0)	24 (85.7)	138 (93.2)
Later cholecystectomy, n (%)	6 (5.0)	2 (7.1)	8 (5.4)
Time to cholecystectomy, m	23.6 ± 17.1	25.4 ± 22.3	23.9 ± 17.8

Ultrasound – Change of Therapy

- Gallstones:
  - → MRCP to detect common bile duct stones
  - Simultaneous cholecystectomy
  - Change of the therapeutic approach in 138/897 patients (15.4%)

- No complication linked to the cholecystectomy [1]
- Postoperative symptomatic gallstones in 9.3% of patients [1]
  - 19.8% of those patients initially presenting with a complication
- Number needed to screen sonography = **5.4**

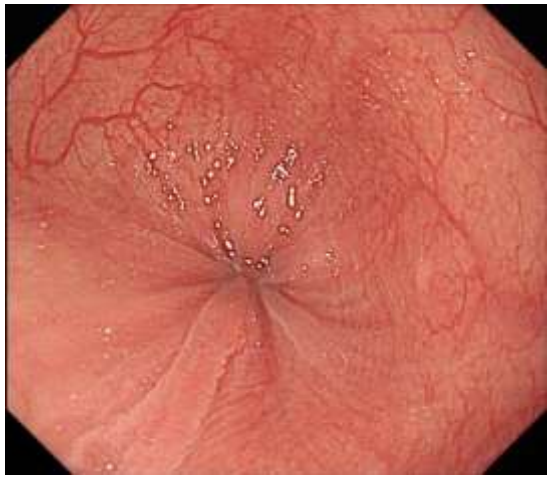
[1] *Dirnberger A, Surg Obes Relat Dis (2022)*

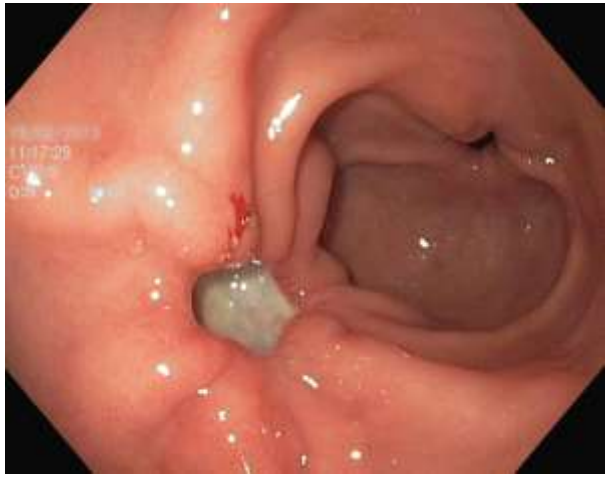
Upper Endoscopy - Findings

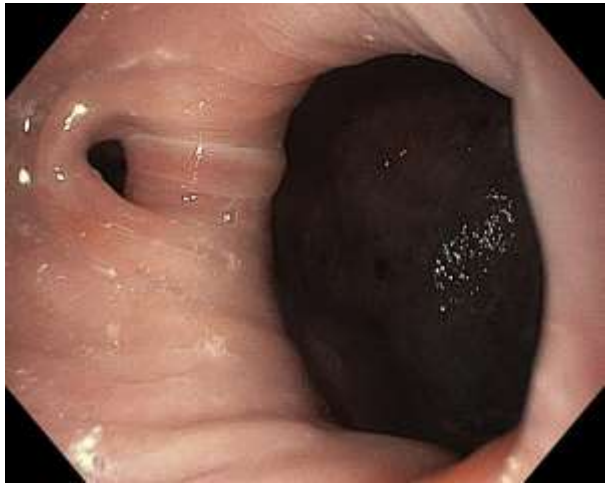
	RYGB	SG	total
n	741	156	897
Gastritis, n (%)	227 (30.6)	91 (58.3)	318 (35.5)
Autoimmune gastritis, n (%)	1 (0.1)	2 (1.3)	3 (0.3)
H. pylori-associated gastritis, n (%)	117 (15.8)	28 (17.9)	145 (16.2)
Hiatal hernia, n (%)	44 (5.9)	19 (12.2)	113 (12.6)
Reflux-associated esophagitis, n (%)	134 (18.1)	47 (30.1)	181 (20.2)
Barrett's esophagus, n (%)	13 (1.8)	3 (1.9)	16 (1.8)
Incompetent LES, n (%)	9 (1.2)	3 (1.9)	12 (1.3)

Upper Endoscopy – Rare Findings

- 6 ulcers
- 4 eosinophilic esophagitis
- 3 cealiac disease
- 2 achalasia
- 1 soor esophagitis
- 1 intestinal metaplasia
- 1 esophageal diverticulum
- 1 ampullary adenoma
- 1 varices







Upper Endoscopy - Consequences

- Helicobacter pylori infection
  → preoperative antibiotic eradication

- Esophagitis (C or D):
  → RYGB instead of SG

- Change of therapy in 216/897 patients (24.1%)

- Number needed to screen gastroscopy = **4.1**

Upper GI series – Findings & Consequences

	RYGB	SG	total
n	82	106	188
Hiatal hernia, n (%)	33 (40.2)	34 (32.1)	67 (35.6)
Esophageal dysmotility, n (%)	4 (4.9)	7 (6.6)	11 (5.9)
Esophageal diverticulum, n (%)	1 (1.2)	0	1 (0.5)
Duodenal diverticulum, n (%)	1 (1.2)	0	0 (0.5)

→ Change of therapy in 52/188 patients (27.7%)

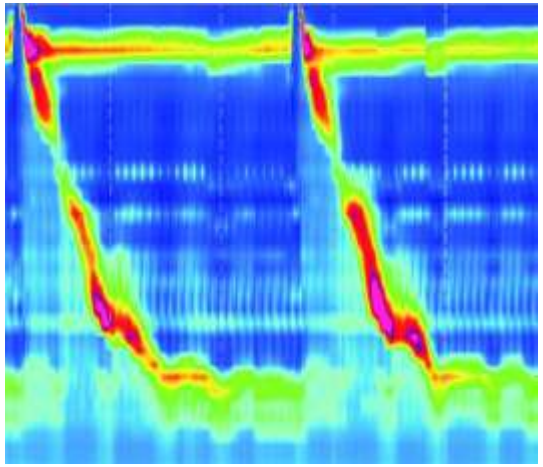
→ Number needed to screen upper GI series = **3.6**

Manometry – Findings & Consequences

	RYGB	SG	total
n	29	120	149
Hypertensive LES, n (%)	2 (6.9)	5 (4.2)	7 (4.7)
Nutcracker esophagus, n (%)	1 (3.4)	0	1 (0.7)
Incompetent LES, n (%)	3 (10.3)	7 (5.8)	10 (6.7)
Achalasia, n (%)	1 (3.4)	0	1 (0.7)
Nonspecific motility disorder, n (%)	1 (3.4)	6 (0.05)	7 (4.7)

→ Change of therapy in 10/149 patients (6.7%)

→ Number needed to screen manometry = **14.9**



Summary of Findings

- In 60.8% of patients the preoperative investigations did not have any conseqences
- Concomitant cholecystecomy was performed in 138/805 patients (17.1%)
- Helicobacter pylori eradication was necessary in 145/897 patients (16.2%)
- Hiatal hernia repair in 126/897 patients (14.0%)
- Five patients received a sleeve gastrectomy instead of gastric bypass due to preoperative findings
  - Autoimmune gastritis, premalignant conditions, varices
- Gastric bypass instead of initially planned sleeve gastrectomy in 7 patients
  - Severe reflux-associated esophagitis, motility disorders, giant hiatal hernia

Discussion - Abdominal Sonography

- Significant high percentage of gallstones (18.5%)
- Management of cholelithiasis controversial
- High morbidity and technical difficulty of the surgical or endoscopic intervention in biliary tree stones (especially after RYGB)
- No complication linked to the cholecystectomy in our own series [1]

[1] *Dirnberger A, Surg Obes Relat Dis (2022)*

Discussion - Upper Endoscopy

- Change of therapy in 24.1% of our patients
- Cost-benefit ratio of routine upper GI endoscopy → majority of the findings are **clinically insignificant**
- Alternative Helicobacter pylori testing?
- Presence of hiatal hernia with esophagitis → primarily suggest RYGB
- Cases of malignant and highly premalignant conditions in our setting in asymptomatic patients [1]

[1] *Schneider R, Surg Obes Relat Dis (2018)*

Discussion – Upper GI Series & Manometry

- SG in presence of hiatal hernia and GERD is under debate
  - high prevalence of Barrett's esophagus after SG
  - newer studies report lower prevalance comparable to RYGB [1,2]

- No routine upper GI series and manometry before RYGB

- Use upper GI series and manometry in combination to rule out SG

- Simultaneous hiatal hernia repair when SG is the patient's choice

[1] *Salminen P, JAMA Surg (2022)*
[2] *Wölnerhanssen BK, Surg Obes Relat Dis (2023)*

Conclusion

- Abdominal sonography and upper endoscopy are **mandatory** before bariatric surgery
- Upper GI series and esophageal manometry help to define patients **not suitable** for sleeve gastrectomy

Thank you!