See No Evil: Malignancy in the Excluded Gastrointestinal Tract after Gastric Bypass for Obesity

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Introduction

- The incidence of obesity is rising, with nearly 100 million obese adults in the United States.
  - Obesity is associated with increased risk for esophageal and gastric adenocarcinoma.
  - Bariatric surgery has been shown to reduce the risk for gastroesophageal malignancy.
- Bariatric surgery is being increasingly performed for obesity.
  - >60,000 gastric bypasses performed in 2022, increased from ~40,000 in 2016.
- Diagnosis of malignancy after gastric bypass can be challenging.
  - Presenting symptoms like weight loss, early satiety, abdominal pain, and iron-deficiency anemia can be difficult to differentiate from ordinary post-op complaints.
  - Altered anatomy makes the remnant stomach difficult to access endoscopically.

Methods

- PubMed and Google Scholar were queried to identify published cases of foregut malignancy after gastric bypass for morbid obesity.
  - Esophageal, gastric and duodenal malignancies were included.
  - Biliary and pancreatic malignancies were excluded.
  - References were reviewed for all papers to identify missed reports.
- Other exclusions included bypass for indication other than morbid obesity, prior foregut malignancy, malignancy identified at the time of obesity surgery and non-bypass bariatric operations.

Results

- A total of 83 reports were identified.
  - 31 reports in the esophagus/gastric pouch, 52 in the excluded GI tract.
- Reports were published from 1991 - 2024.
  - 35 were published before 2015, 48 in 2015 or later.

Table 1 - Patient Demographics. *[Continuous variables expressed as Mean (95% CI)].*

	Excluded GI Tract	Esophagus/Gastric Pouch	
Sex	M 7.7%, F 90.4%	M 77.4%, F 22.6%	*p<0.001*
Age (years)	57.5 (54.6-60.3)	56.2 (52.9-59.4)	p=0.277
Years since Gastric Bypass	11.8 (9.2-14.3)	7.1 (4.5-8.8)	*p=0.016*
Duration of Symptoms (months)	7.1 (0.8-13.5)	3.5 (1.8--5.1)	p=0.260

Figure 1 - Presenting Symptoms by Location of Malignancy. *(Error bars = 95% CI. Asterisk denotes p<0.05.)*

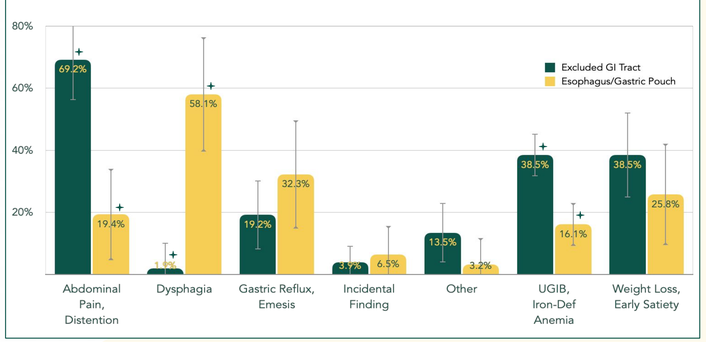
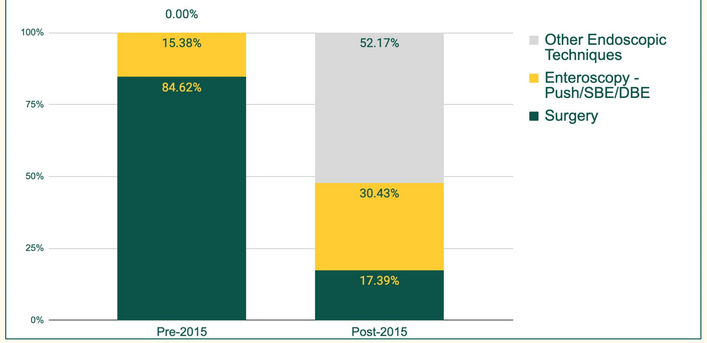


Table 2 - Malignancy Characteristics

		Excluded GI Tract	Esophagus/Gastric Pouch	
No. of Diagnostic Modalities *[Mean (95% CI)]*		3.86 (3.23 - 4.51)	1.48 (1.14 - 1.82)	*p<0.001*
Pathologic Diagnosis *[Count (Percent)]*	*Adenocarcinoma*	42 (80.8%)	30 (96.8%)	p=0.098
	GIST	5 (9.6%)	0 (0.0%)	
	Other	5 (9.6%)	1 (3.2%)	
Staging *[Count (Percent)]*	T_{3-4}	21 (75%)	13 (50%)	*p=0.048*
	N_{1-3}	10 (45.5%)	12 (46.2%)	p=0.334
	M_1	15 (48.3%)	2 (7.7%)	*p=0.001*
	Stage III - IV	25 (75.8%)	11 (42.3%)	*p=0.004*
Survival	*Months [Median (IQR)]*	10 (3.75 - 22.5)	13 (4.0 - 21.0)	p=0.364
	1-year Survival	72.7%	89.5%	p=0.177

- Described techniques for tissue diagnosis in the Excluded GI Tract
  - Surgical Exploration
  - Enteroscopy (Push, Single-balloon or Double-balloon)
  - Endoscopic Ultrasound with Biopsy
  - Laparoscopic or IR-assisted gastropexy with gastroscopy
  - Lumen-Apposing-Metal-Stents (LAMS)
    - Creation of gastrogastrostomy or jejunogastrostomy
- Diagnosis was primarily made by surgical resection in early reports (pre-2015)
  - Most recently, diagnosis predominantly made endoscopically

Figure 2 - Pathologic Diagnosis in Excluded GI Tract Before/After 2015. *(p=0.004)*



Conclusions

- Malignancy in the excluded GI tract is a rarely reported complication after gastric bypass
  - Due to the high prevalence of obesity and increasing performance of bariatric surgery, this should be expected to rise.
- The excluded GI tract is inaccessible via traditional endoscopy, complicating diagnosis.
  - Malignancy in the excluded tract required more diagnostic testing, were diagnosed at a higher stage and were more likely to be metastatic at the time of diagnosis.
- Suspicion for malignancy should be maintained, particularly in patients presenting with delayed symptoms or with no clear diagnosis.
  - Advanced endoscopic techniques should be considered to assess for pathology in the excluded GI tract.

Figure 3 - Proposed Diagnostic Algorithm for Gastric Cancer after Gastric Bypass

