Endoscopic Reversal of Roux-en-Y Gastric Bypass May Prevent Worsening of Nutritional Outcomes in Patients with Severe Malnutrition

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Introduction

- Roux-en-Y gastric bypass (RYGB) can precipitate protein-caloric malnutrition and micronutrient deficiencies. [1]
- Sonographically guided endoscopic reversal (ER) via deployment of a stent from the gastric pouch to the remnant stomach is emerging as a novel option for decreasing transit time and increasing absorptive surface area (Figure 1).
- In this investigation, short-term nutritional outcomes after endoscopic reversal for malnutrition were assessed.

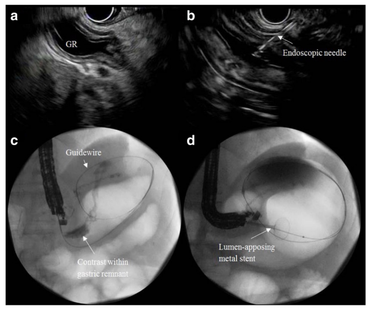

Figure 1: Gastrogastrostomy. Sonographic characteristics of gastric remnant (GR) (a). Gastric remnant punctured with a 19-gauge Flex endoscopic needle (b). Contrast injected into the remnant stomach and position confirmed on fluoroscopy (c). LAMS deployed under fluoroscopic guidance (d).[2]

Methods

- Patients (age ≥ 18) who underwent ER of RYGB for malnutrition from a single academic health center in Minneapolis over a seven-year period (2015-2021) were reviewed.
- Nutrition status (assessed by a registered dietitian or a gastroenterologist), mode of nutrition (per oral (PO), tube feed (TF), or total parenteral nutrition (TPN)), weight and body-mass index (BMI) were obtained at 12 and 6 month pre-procedurally, at six months, and at one year post-procedurally.

Results

- 17 patients underwent ER for severe protein caloric malnutrition or dependence on TF / TPN.

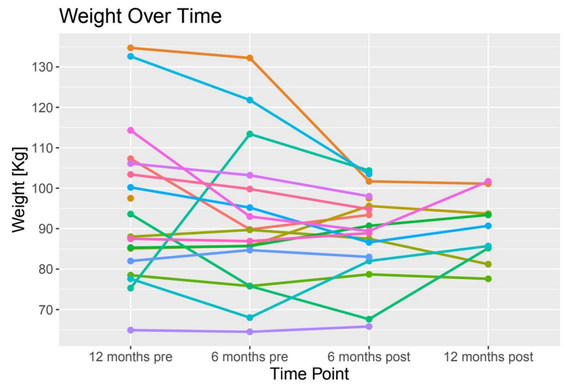

Figure 2: Individual weight trends

	Pre-procedure	Post-procedure at 6 months	Post-procedure at 1 year
Malnutritional Status	**N=17**	**N=17**	**N=9**
Severe Malnutrition or on TF/TPN (n, %)	17 (100%)	15 (88%)	8 (89%)
Moderate	0	0	0
Non-severe	0	0	0
Not malnourished	0	2 (12%)	1 (11%)
Nutrition Route	N=17	N=17	N=9
Oral intake (PO)	6	6	2
Tube feeding (TF)	3	6	3
Total parenteral nutrition (TPN)	8	5	4
Weight / BMI	**N=17**	**N=15**	**N=9**
Weight (Kg, median and IQR)	64.8 (54.3, 78.1)	68.4 (57.9, 83.6)	67.8 (63.0, 71.1)
BMI (median and IQR)	25.2 (21.2, 29.0)	25.1 (23.1, 30.3)	23.2 (20.5, 24.9)
Nutritional Laboratory Values	**N ***	**N ***	**
Albumin (g/dL)	2.6 (2.3, 3.1)	2.4 (1.92, 3.05)	x
Prealbumin (mg/dL)	14 (10, 15)	14 (8, 16)	x
Hemoglobin (g/dL)	9.4 (8.8, 11.5)	10.6 (8.8, 12.4)	x
Creatinine (mg/dL)	0.88 (0.62, 0.99)	0.72 (0.66, 1.06)	x
Glomerular filtration rate (ml/min)	86 (61, 90)	84 (52, 90)	x
Iron (ug/dL)	59 (29, 71)	34.5 (19, 49.3)	x
Ferritin (ng/ml)	113 (27.8, 409)	39 (28.5, 114)	x
Vitamin B12	893 (554, 1405)	1271 (731, 1422)	x
Folate	6.6 (5.4, 21.4)	10.6 (6.5, 11.8)	x
Vitamin D	14 (13, 39)	24.5 (14.5, 27.8)	x

* Various different sample size based on lab availabilities
** 1 Year nutritional laboratory values not assessed

Table 1: Pre and Post Procedure Nutritional Status

- A panel of laboratory values including markers of protein calorie malnutrition (albumin), renal function (creatinine and GFR) and micronutrients (Vitamin B12) were not significantly different at six-month or at one year follow-up (P>0.05; Table 1).
- Weight and BMI were not significantly different at six-month or at one year follow-up (P>0.05; Table 1).
- At 6 months post-ER, 2 out of 17 patients were no longer malnourished and taking PO nutrition (table 1).

Discussion/Conclusion

- ER is a nuanced, advanced technique useful for when remnant access is desired in RYGB patients and is safe in experienced hands.
- Malnutrition is a common complication before and after endoscopic intervention with patients often requiring supplemental nutrition.
- Despite small sample size, this investigation revealed that ER of RYGB may prevent worsening weight loss, and worsening macro and micro-nutrient deficiencies; though improvement in weight and nutritional parameters were not observed.
- As ER affords patients a potential alternative to revisional bariatric surgery, further studies are warranted to examine longer-term nutritional and medical outcomes.
- Without any adverse complications, endoscopic reversal presents itself as a safe and viable alternative to surgical interventions, where complications following surgical RYGB reversals are frequent in the setting of chronic malnutrition.[1]

Citations

1. Kerdsirichairat, T., Arain, M. A., Freeman, M. L., Leslie, D. B., Ikramuddin, S., & Amateau, S. K. (2016). Mo2017 endoscopic reversal of roux-en-Y gastric bypass using lumen apposing metallic stent: A series from a single-center experience. *Gastrointestinal Endoscopy*, *83*(5). https://doi.org/10.1016/j.gie.2016.03.709
2. Amateau, S. K., Lim, C. H., McDonald, N. M., Arain, M., Ikramuddin, S., & Leslie, D. B. (2018). EUS-guided endoscopic gastrointestinal anastomosis with lumen-apposing metal stent: Feasibility, safety, and efficacy. *Obesity Surgery*, *28*(5), 1445–1451. https://doi.org/10.1007/s11695-018-3171-6

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