



Magnetic Small Bowel Elongation

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Clinical History

56-year-old female presents with malabsorptive syndrome after laparoscopic biliopancreatic diversion with duodenal switch 2 years prior.

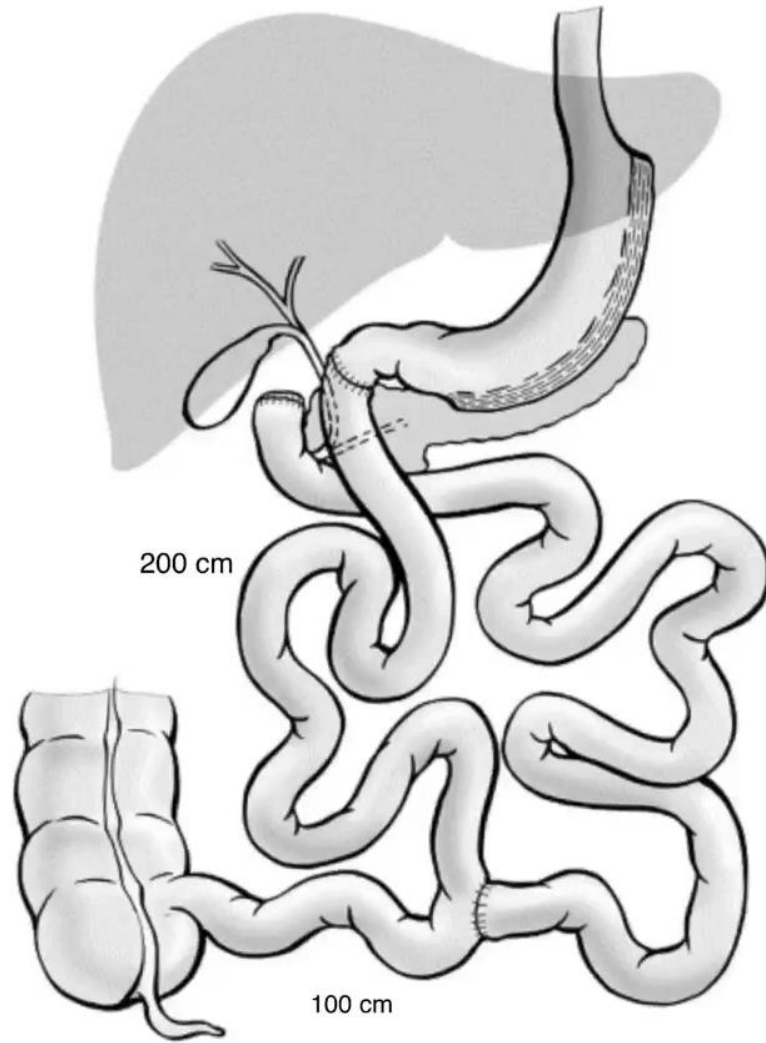
- Pre-op: 383 lbs. BMI 60.3 kg/m²
- Comorbidities: MAFLD
- Post-op: 169 lbs. BMI 26.34 kg/m² (-214 lbs/34 BMI drop)
- Post-operative course complicated by progressive protein calorie malnutrition, related fat-soluble vitamin deficiency, and moderate GI dysfunction.
- Nutritional counseling and clinical efforts unsuccessful
- Albumin 1.5 g/dL at nadir, responded to 6 weeks of TPN support to near normal (3.4 g/dL).

Traditional Limb Elongation Techniques

- Full Roux Reversal
- Convert Roux to Loop (SADI)
- Divided Limb Elongation: Divide distal roux limb and anastomose proximally on BP
- Braun (Kissing) Enteroenterotomy: anastomose mid roux limb to proximal BP limb

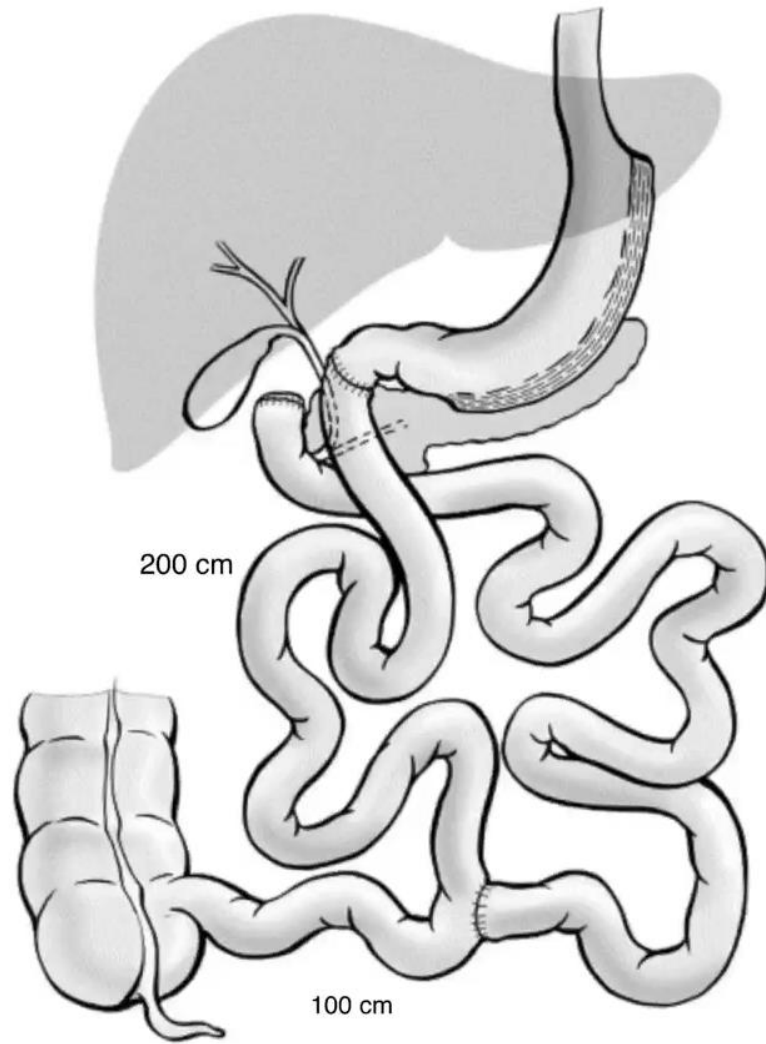
Divided

- Measure proximally on BP limb
- Divide above the ileoileostomy
- Close mesentery



Kissing

- Measure proximally on BP limb
- Anastomose mid roux limb to BP +100 cm
- Close mesentery



Magnet Technology

- FDA approved implantable device for magnetic compression anastomosis
- Parylene-C coated neodymium magnet
- Magnet size 5 cm



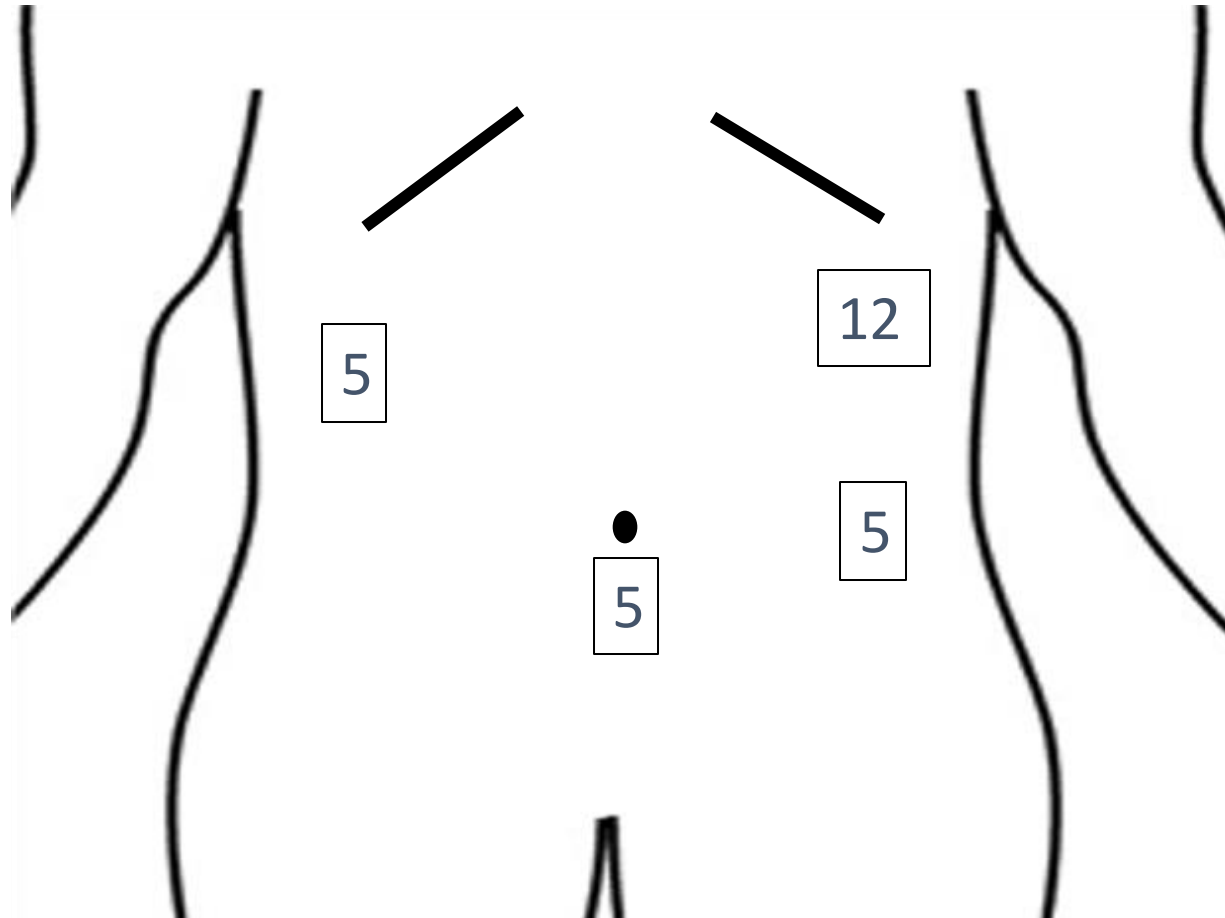
Pre-operative Considerations

- Nutritional support and protein repletion critical
- Goal albumin 3.2 g/dL or better
- Rule out other GI drivers for malnutrition (sleeve stenosis, hiatal hernia/slipped sleeve, proximal stricture, pyloric dysfunction)
- Limb lengths determine efficacy: recapture and functionalize both roux and BP limbs (typically 100 cm roux and 100 BP)
- Discuss potential for weight gain

Technical Considerations

- Mineral Oil (10 ml intraluminal dosing)
 - No saponification as roux limb diverts bile
 - Lubrication helps with with magnet surfing
 - Can cloud endoscopy lens
- Glucagon 1 mg IV at case start
- Hiatal Hernia (passing magnet)
- Sleeve, DI, and small bowel adhesions
- Avoid small bowel injury with handling

Trocar Position



Post-operative course

- Outpatient Surgery
- Operative time 65 minutes
- Follow-up at 2 weeks
- Plain abdominal films at 1-3 weeks to track magnet position

Limb Lengthening Outcome Data

N	LOS	Readmission	Retain magnet	Complications	Clavien-Dindo
19 patients	0.62 days * 16 patients LOS 0 days	3	0	3	Grade
	1. Adhesiolysis/Ileus (8 days) 2. Hiatal Hernia Repair (1 day) 3. Hiatal Hernia Repair (1 day)	1. GI bleed (prior GJ ulcer) 2. Abdominal Pain (LFT elevation) 3. Acute Abdomen		1. Readmission GI Bleed (marginal ulcer/NSAID use) 2. Readmission Abd Pain 3. Ischemic Bowel (Acute embolic event POD 8/embolizing (shaggy) aorta)	1. II 2. II 3. IV (small bowel resection/magnet removal)

AXR 1-week



AXR 3-weeks



Questions to Answer:

Magnetic compression anastomoses

- Benefits:

- Simplifying anastomotic technique
- Is it safer? Reduced bleeding and leak risks? More bowel manipulation? Less inflammation/scar?
- Outpatient surgery potential with reduction in LOS

- Questions:

- Larger magnet?
- Cost-benefit analysis and reimbursement?
- Magnetics in surgery introduce unique technical challenge
- Limited clinical applicability (non-fenestrated)