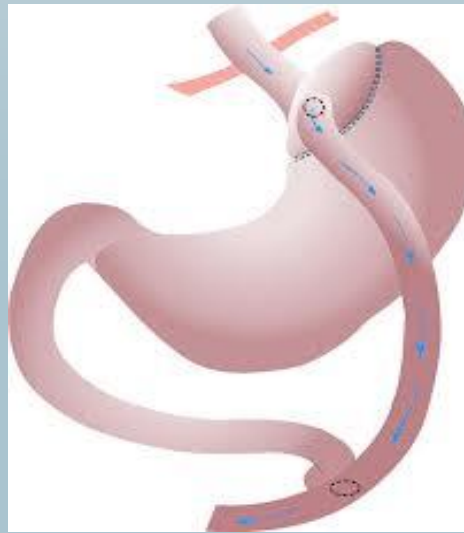


Nutritional Complications following a Roux-en-Y and Reversal Procedure










A Case Study Presentation

By

Lubna Qureshi, Dietetic Intern, UTHSCSA









Objectives

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- Describe unique characteristics of Roux-en-Y and reversal
 - Demonstrate a clear understanding of pathophysiology, etiology and treatment related to nutritional complications after Roux-en-Y and reversal
 - Gain perspective of appropriate nutrition interventions for patients s/p gastric bypass








Background

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- Bariatric surgery: a surgical treatment for morbid obesity
 - 1954-the first bariatric surgery^[1]
 - 220,000 bariatric surgeries performed annually in the U.S in 2008 and 2009^[2]
 - Overall 30 day mortality is <1% ^[3]
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Treatment Criteria for Bariatric Surgery

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- BMI >40 kg/m² or BMI 35-40 kg/m² with significant comorbidities
 - Documented failure of non-surgical weight loss programs
 - **Psychologically stable patient with realistic expectations**
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Treatment Criteria for Bariatric Surgery

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- Well informed and motivated patient
 - Supportive family and social environment
 - **Absence of uncontrolled psychotic or depressive disorder**
 - No active alcohol or substance abuse



(National Institutes of Health Consensus 1991, National Heart, Lung and Blood Institute Guidelines 1998)



Psychiatric Disorders of Patients Seeking Obesity Treatment ^[4]

- **Aim:** Understand the prevalence of psychiatric disorders among patients seeking obesity treatment
- **Subjects:** 841 patients
- **Results:** 42% with at least one psychiatric disorder
- **Conclusion:** A high prevalence of psychiatric disorders

Lin HY, Huang CK, Tai CM, Lin HY, Kao YH, Tsai CC, Hsuan CF, Lee SL, Chi SC, Yen YC. Psychiatric disorders of patients seeking obesity treatment. *BMC Psychiatry*. 2013 Jan 2;13:1.







Morbidly Obese Patients: Psychopathology and Eating Disorders^[5]

- Aim: To analyze the importance of psychological evaluation prior to gastric bypass
- Subjects: 547
- Results: > 50% suffered from 1 or more mental disorders
- Conclusion: Important to identify patients who are not ideal candidates for bariatric surgery, or need additional psychiatric treatment

Kinzl JF, Maier C, Bösch A. [Morbidly obese patients: psychopathology and eating disorders - Results of a preoperative evaluation] *Neuropsychiatry*. 2012;26(4):159-65.



Roux-en-Y

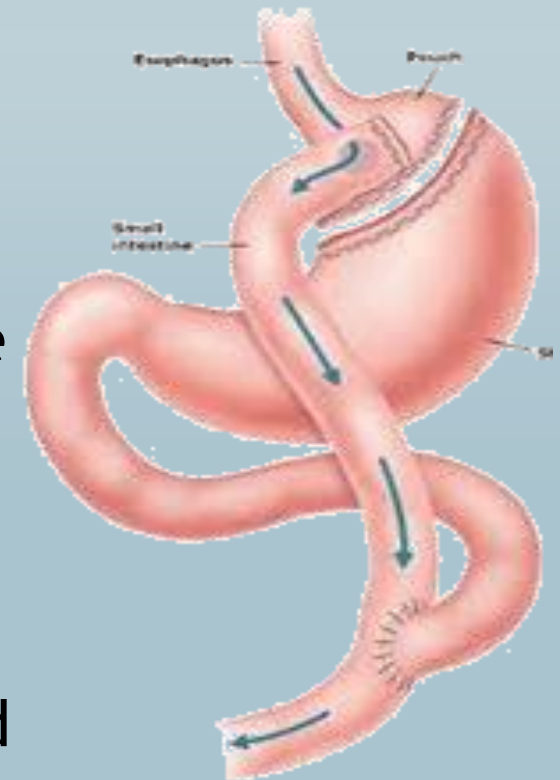
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- A form of restrictive and malabsorptive bariatric surgical procedure
 - Best accepted and most commonly performed^[6]
 - Achieves and maintains substantial long-term weight loss
 - Neurohormonal pathways
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Neurohormonal Pathways^[7]

- **Objective:** To analyze GI motility in order to examine the effects of altered anatomy on hormonal changes post RYGB
- **Subjects:** 17 patients and 9 healthy control
- **Results:** Fast pouch emptying associated with Increased secretion of GLP-1 and PYY
- **Conclusions:** The rapid exposure of the gut epithelium contributes to the exaggerated release of GLP-1 and PYY after RYGB.

Roux-en-Y Procedure^[6]

- Involves gastric resectioning
- The creation of a small gastric pouch(20-30mL)
- Bypassing distal stomach and entire duodenum
- Jejunum is connected to the upper portion of the stomach
- Biliopancreatic limb is anastomosed to distal jejunum




http://www.webmd.com/diet/weight-loss-surgery/slideshow-weight-loss-surgery#surgical_methods_animation.

Diet Recommendation after Roux-en-Y^[8]

Diet Stage	Begin	Foods/Fluids
Stage I		
	Post op day1-2	Clear Liquids
Stage II		
	Post op day 3	Clear Liquid → GBP full liquids
Stage III		
Week 1	Post op day10-14	Full liquids → soft foods
Week 2	4 weeks post op	Protein, Pureed → chopped, ground
Week 3	5 weeks post op	Protein, fruits & vegetables
Stage IV		
		Supplements, Healthy solid diet









Complications after Gastric Bypass^[9]

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- **Wound Infection**
 - **Anastomotic Leakage**
 - **Vomiting**
 - **DVT/Pulmonary Embolism**
 - **Gallstones/Kidney Stones**
 - **Hernia**
 - **Marginal Ulcers**



Nutritional Implications^[6,9]

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- Decreased oral intake
 - Early satiety
 - Dumping syndrome
 - Fat maldigestion/malabsorption
 - FTT
 - Osteoporosis
 - Nutritional deficiencies

Supplementation after Roux-en-Y^[9]






Supplement	Monitoring	Supplement	Monitoring
Vit A		Calcium	25-Hydroxyvitamin D
Vit B1	Thiamine	Vitamin D	
Vit E		Vit B 12	CBC, Vit B12
Vit K	PT/INR	Selenium	
Iron	TIBC, ferritin, CBC	Zinc	
Folic acid	RBC folate	Copper	
Biotin			



Reversal of Gastric Bypass

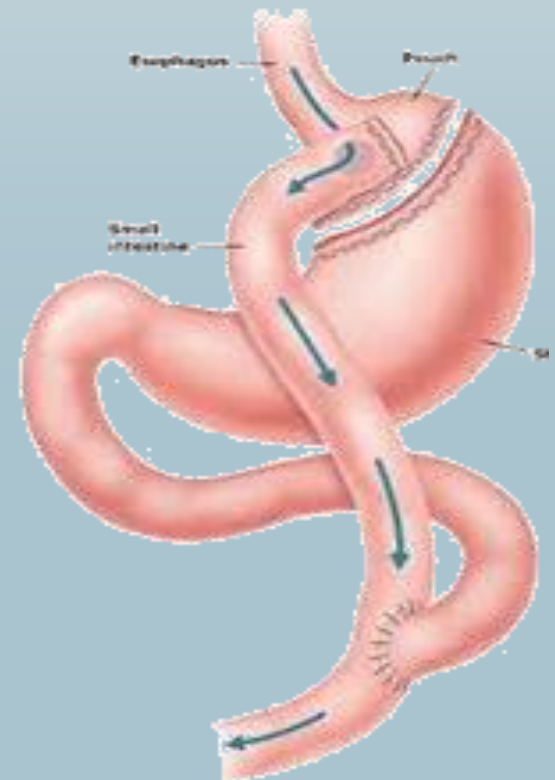


Most common indications^[10]

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- Short gut syndrome
 - Renal failure
 - Marginal ulceration
 - Malnutrition
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Roux-en-Y Reversal

- Anastomosis of the proximal gastric pouch to the remnant stomach
- Reversal of the Roux-en-Y loop
- Often performed as an open procedure





Case Study Patient

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- 33 YO, Hispanic, F; Mrs. X
 - Marital Status: Married
 - Religion: Catholic
 - Education: Some college
 - Profession: Legal assistant
 - Social hx: Tobacco use
 - Allergy: Mushrooms
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Past Medical History

Pre-GBP Hx

- Morbid obesity (BMI:49.9)
- PTSD
- Sleep Apnea
- Chronic back pain
- Laparoscopic GBP (2008)

Post-GBP Hx

- Encephalopathy with hepatic insufficiency
- Laparoscopic cholecystectomy (2009)
- Severe Protein/Kcal Malnutrition
- Reversal Roux-en-Y (2013)


Previous Admissions at LifeCare

Admit Date	DX	BMI	Wt kg	Intake %	Misc
10/16-12/10/09	Encephalopathy	21.8	6 ↑	25 ↓ 100	Regular psychological therapy
3/19-5/24/10	Liver dysfunction	22.7	7.4 ↑	varied	Increased ammonia level
8/6-8/30/12	Complications of Bariatric procedure	27.1	5.3 ↓	varied	Paracentesis

Primary focus of care: Nutrition



LifeCare Admission

- Admitted: 1/23/13 from Methodist Specialty Transplant Hospital
 - Dx: s/p Roux-en-Y reversal with hepatic insufficiency, FTT and severe malnutrition
 - PO Diet: Regular
 - Tube feed: Promote @50cc/hr/NGT (1200 kcal, 72g pro)
 - 16kcal/kg & 1g pro/kg
- 



Assessment

- Ht:5'5"
- Wt:73.1kg (161#)
- BMI: 26.7 (overweight)
- IBW: 125# (128%)
- UBW: 300 # (pre-GBP)
- UBW: 155# (103%, post GBP)



Estimated Needs


- **Energy Needs**

- 73.1kg (CBW):20-25 kcal/kg
- 1462-1828 kcals/d

- **Protein Needs**

- 73.1kg (CBW):1.5-2.0g/kg
- 109-146g/d

- **Fluid**

- 1800ml (1ml/kcal)
- 



Nutrition Diagnosis

Altered GI function (NC-1.4) R/T S/P
gastric bypass (Roux-en-Y) AEB poor
appetite, FTT, malnutrition and EN for
nutrition support therapy

Medical Nutrition Therapy

- **Enteral**

Jevity 1.5 @ 45ml/hr/NGT + ProPass 2sc
TID/NGT

(1620 + 180 = 1800 Kcal/d)

(65 + 36 = 101 g pro/d) & Fiber: 26.4g/d

Providing: 25kcal/kg & 1.4 g pro/kg

- **Diet order**


- Regular



Monitoring/Intervention



Goal



Meal Intake > 75% → D/C TF when PO intake adequate



Monitor

- Wt U/D, maintenance
- Tube feed tolerance at goal rate
- Labs



Intervention



Add HP smoothie(4 oz)L&D

Nutrition Intervention

1/24	Jevity 1.5 @45ml/hr/NG + Regular diet
1/25	Added to diet: HP smoothie 4 oz+ pro powder 2sc TID/NG +Regular diet, small portion sizes
1/29	▲ supplement to Ensure Complete, strawberry flavor, 4 oz, L&D/ PO
1/30	Snacks, pulled FT R/T clogging
1/31	48 hrs calorie count ordered, NG D/C by the MD
2/2	HS snack changed by MD, Regular portion sizes, Calorie count:101% kcal & 53% pro
2/5	Ensure Complete D/C
2/7	MD ordered: No dietary restrictions

Nutrition Monitoring

	1/24	1/25	1/29	1/30	1/31	2/2	2/4
Wt:kg	73	72		71			
Intake %	10%	33%	68%	38%	67%	78%	100%
BMs	0	2	0	2	1	1	1
TF/diet tolerance	WNL	WNL	WNL	WNL	WNL	WNL	WNL
Emesis	0	0	0	0	0	1	0

Nutrition Monitoring

	2/7	2/8	2/9	2/10	2/11	2/12	
Wt: kg	73			70	70		
Intake %	100%	77%	15%	70%	73%	50%	
BMs	1	2	3	1	1	2	
Diet tolerance	WNL	WNL	WNL	WNL	WNL	WNL	
Emesis	0	1	0	0	0	0	

Labs

	Normal Range	1/24	1/27	1/30	2/4	2/8
Pre-Alb	20-40 mg/dL	10.3			12.1	
Alb	3.4- 5.0 mg/dL	2.2	2.3		2.4	2.3
Mag	1.8-2.4 mg/dL	1.7				1.6
Na	136-145 mmol/L	134				
Cl	98-107 mmol/L	97				
K	3.5-5.1mmol/L		3.4			
ALKP	50-136 U/L	154	168		186	173
AST	15-37 U/L	63	39		50	38
ALT	25-65 U/L	67				
AMMON	11-35 umol/L				39	50
Glu	70-109mg/dL		127	137		

CBC

	Normal Range	1/24	1/27	1/30	2/4	2/8	2/12	
RBC	3.80-5.20M/uL	3.36	3.52	3.35	3.64	3.68		
HGB	12-16 g/dL	9.8	10.3	9.6	10.6	10.5		
HCT	36-46%	29.9	31.1	30.2	32.6	32.7		
PLT	150-400 K/uL				144	145		

Lipid Profile

CHOL	< 199mg/dL					66		
TRIG	< 149mg/dL					73		
HDL	>60mg/dL					23		

Vit D-25	30-100 ng/mL						12	
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Pertinent Medications PTA_[11]

Medication	Function	Nutritional Consequences
Aldactone	Diuretic	Anorexia, ↓wt, ↑thirst, avoid natural licorice
Bumetanide	Diuretic	↑thirst, dehydration, electrolyte imbalance
Cipro	Antibiotic	Nausea, dehydration
Protonix	Anti-GERD	Nausea, abd pain, diarrhea, ↑ gastric pH
Selenium	Supplement	↑ Requirement in GBP
Thiamine	Supplement	Nausea, ↑ requirement in GBP
Lovenox	DVT	Avoid if pork allergy

Pertinent Medications PTA_[11]

Medication	Function	Nutritional Consequences
Lactulose	Laxative/tx of ammonia	N/V, diarrhea, ↑ absorption of Ca & Mag
Remeron	Anti-depressant	↑ appetite, ↑ wt, ↑ thirst
Xanax	Anti-anxiety	Anorexia, ↓ wt
Zofran	Anti- N/V	Xerostomia, abd pain, constipation
Dilaudid	Opiod	↓ motility, N/V, constipation
Vit D 2	Supplement	Anorexia, ↓ wt , ↑ Ca absorption
Zinc Sulfate	Supplement	N/V, diarrhea, dyspepsia

Pertinent Medications^[11]

Medication	Function	Nutritional Consequences
Mag sulfate	Mineral supplement	N/V, cramps, diarrhea
Heparin	Anticoagulant	N/V, abd pain, Gi bleeding
Lorazepam	Anti-anxiety	Anorexia, N/V, xerostomia
Dulcolax	Laxative	Nausea, diarrhea, wt↓
K chloride	Electrolyte	GI irritation, ↓N/V ,abdominal pain, diarrhea, flatulence










Nutrition Diagnosis

Not ready for diet changes (NB-1.3) R/T denial of need to change AEB current intake patterns.



The True Practice of Dietetics!!!!

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- Looking at the big picture
 - Inconsistency of information
 - General misconceptions of the family
 - Bottom Line: finding the right balance
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