Hypo-absorption Or Malnutrition In OAGB Or Distal Bypass

DR SHASHANK SHAH

Past President and Trustee- Obesity Surgery Society of India (OSSI)

Past President- International Excellence Federation- (IEF) India

Past President - All India Association Of Advancing Research in Obesity (AIAARO)

Founder- AMASI-Association of Minimally Access Surgeons of India

Founder- APBSS-Asia Pacific Bariatric Surgery Society

Editorial Board Member- Journal of Bariatric Surgery, OSSI

Vivian Fonseca Scholar Award by ADA- American Diabetes Association for RCT on metabolic surgery

DISCLOSURES

CONSULTANT FOR

JOHNSON AND JOHNSON

NOVO NORDISC

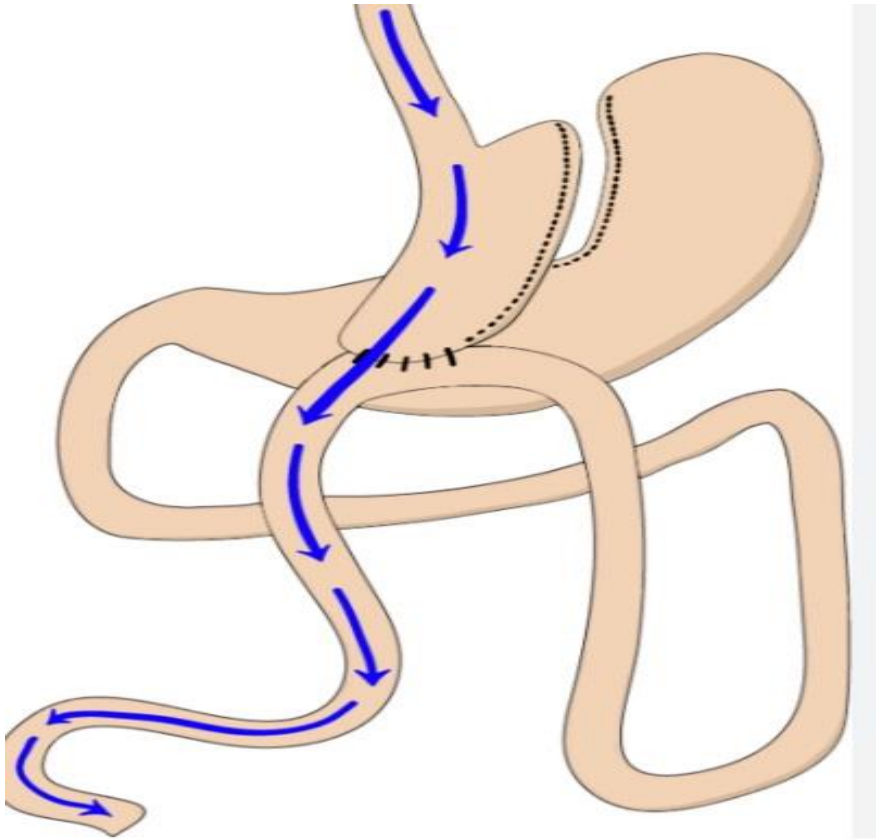
ASTRA ZENECA

INTRODUCTION

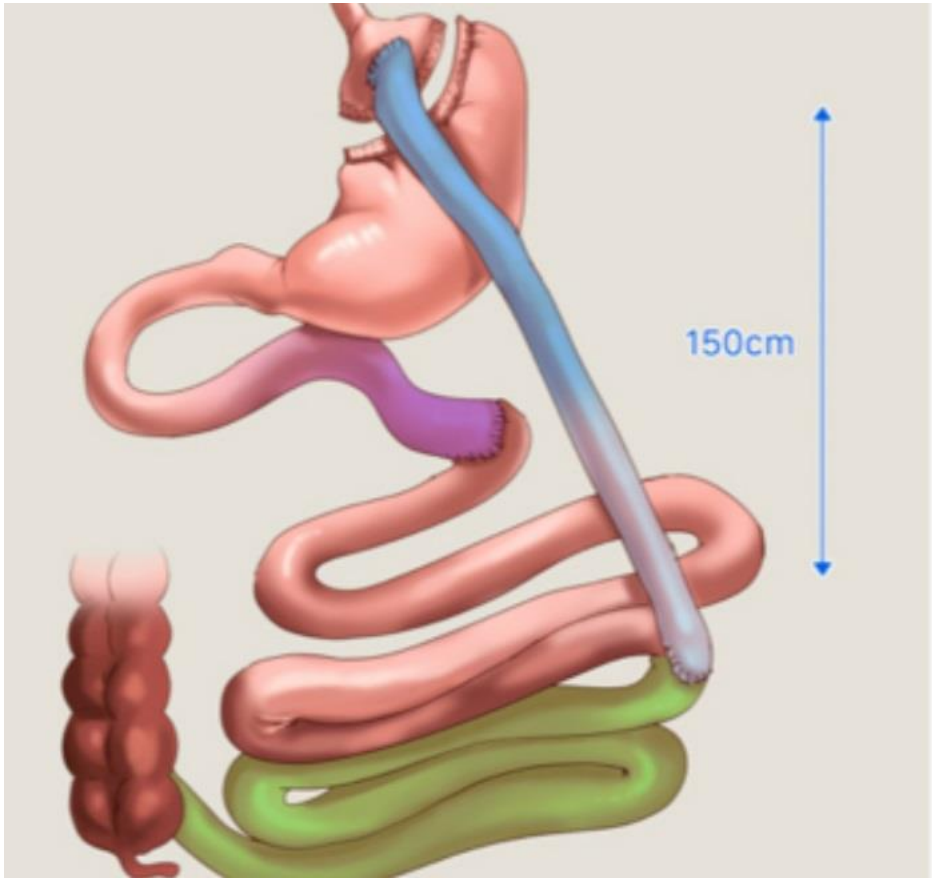
- One-anastomosis gastric bypass (OAGB) and distal gastric bypass (DGB) have emerged as popular alternatives to the traditional Roux-en-Y gastric bypass (RYGB) due to their relative simplicity and effectiveness

- While these surgeries can lead to substantial weight loss and improvements in conditions such as type 2 diabetes, they also pose a significant risk of nutritional deficiencies and malnutrition

OAGB



DISTAL GASTRIC BYPASS



MECHANISM OF HYPO-ABSORPTION

The bypassed section of the small intestine is crucial for the absorption of various nutrients, including iron, calcium, vitamin B12, and fat-soluble vitamins (A, D, E, and K).

Consequently, the reduction in the absorptive surface area can lead to hypo-absorption, where the body fails to absorb adequate nutrients from the diet.

The length of common limb available for absorption also has importance in hypo absorption.

ANATOMICAL & PHYSIOLOGICAL DIFFERENCES

	OAGB	DISTAL BYPASS
ROUX LIMB	0	+
POUCH SIZE	LARGER	SMALL
COMMON CHANEL	LONGER	SHORT
MIXING OF FOOD & JUICES	TOTAL LENGTH -150 CMS	200 TO 300 CMS
B P LIMB	150 CMS	TOTAL- (ALIMENTARY+COMMON)
GJ ANASTOMOSIS	5 TO 6 CMS	< /= 4CMS

ANATOMICAL & PHYSIOLOGICAL DIFFERENCES

	OAGB	DISTAL GBP
VAGOTOMY	LOWER LEVEL	HIGHER LEVEL
CARBOHYDRATE ABSORBTION	COMMON CHANNEL	ROUX LIMB + COMMON CHANNEL
VOLUME OF FOOD	+++	+
ENTEROHEPATIC CIRCULATION	?	?
ACID IN STOMACH	MORE	LESS
HYPOGLYCEMIA	LESS REPORTED	?

INCIDENCE

- Systematic review involving 49,991 OAGB patients found that severe malnutrition requiring in-hospital treatment occurred in 0.9% of cases. This malnutrition was linked to the length of the biliopancreatic limb (BPL), with longer limbs (>150 cm) associated with higher rates of nutritional deficiencies. The review highlighted the need for standardized surgical techniques and robust data collection to better understand and address these issues

- Revisional surgery for severe protein-energy malnutrition (PEM) following OAGB has been studied as well. A single-center retrospective analysis of patients undergoing revision for severe PEM revealed that revisional procedures, such as conversion to Roux-en-Y gastric bypass (RYGB) or shortening of the BPL, were necessary for some patients. Nutritional optimization before surgery was crucial for improving outcomes, and the type of revisional surgery played a significant role in resolving malnutrition

- In another study comparing OAGB with Roux-en-Y gastric bypass (RYGB), it was found that OAGB patients had a higher incidence of nutritional deficiencies, particularly when the BPL was extended beyond 200 cm. This underscores the importance of carefully considering limb length to minimize the risk of malnutrition.

NUTRITIONAL DEFICIENCIES AND MALNUTRITION

Patients undergoing OAGB or DGB are at risk for several specific nutrient deficiencies:

Iron Deficiency: Iron absorption primarily occurs in the duodenum and proximal jejunum. Bypassing these areas significantly reduces iron absorption, leading to iron deficiency anemia if not properly managed.

Vitamin B12 Deficiency: The absorption of vitamin B12 requires intrinsic factor, which is produced in the stomach, and the presence of specific receptors in the ileum. Bypassing portions of the stomach and ileum can hinder this process, leading to vitamin B12 deficiency and potentially pernicious anemia.

Calcium and Vitamin D Deficiencies: Calcium absorption is dependent on vitamin D, which is absorbed in the proximal small intestine. Bypassing this area can lead to deficiencies in both calcium and vitamin D, increasing **the risk of osteoporosis and other bone disorders**.

Fat-Soluble Vitamin Deficiencies: Vitamins A, D, E, and K are absorbed in the small intestine along with dietary fats. Hypo-absorption of fats due to the bypass can lead to deficiencies in these vitamins, resulting in various health issues, such as impaired vision (vitamin A), poor immune function (vitamin E), and bleeding disorders (vitamin K).

Malnutrition related information in published studies

GJ=Gastrojejunostomy; NA=Not available; BMI=Body mass index; BPL=Billiopancreatic limb; RYGB=Roux en y gastric bypass

Studies	Patients number	Time frame	Number of patients with malnutrition	Distance of GJ from ligament of Treitz[20]	Intervention
Taha *et al*.[14]	1520	2009-2015	3	150-250	Reoperation (not specify)
Rutledge and Walsh[6]	2410	1999-2004	31	180	**Division of the GJ, and gastro-gastrostomy**
Musella *et al*.[1]	2678	2006-2015	5	165-260	2 - conservative treatment 1 **- restaurative laparoscopic surgery 2 - loop resizing**
Chen *et al*.[17]	1583	2001-2015	14	NA	**Convert to sleeve**
Carbajo *et al*.[13]	1200	2002-2008	14	250-350	Medical treatment
Genser *et al*.[16]	2934	2005-2015	26	180	Division of the GJ, and gastro-gastrostomy
Noun *et al*.[15]	1000	2005-2011	4	150 (and increased by 10 cm for each BMI point above 40)	2 - convert to sleeve 2 - total reverse
Chevallier *et al*.[12]	1000	2006-2013	2	200	Medical treatment
Alkhalifa *et al*.[5]	1731	2001-2015	43	150-250	Reoperation (not specify)
Lee *et al*.[11]	1322	2001-2009	9	NA	Reoperation (not specify)
Hussain and El-Hasani[24]	519	2014-2018	1	NA	**Shortening of BPL**
Bolckmans *et al*.[25]	28 complicated patients	2007-2016	1	NA	**Shortening of BPL and conversion to RYGB**

SURGICAL REVISION

➢ Revision to:

- Normal anatomy.
- Sleeve gastrectomy.
- Roux-en-Y gastric bypass.
- Shortening of BPL length

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Distal gastric bypass: 2-m biliopancreatic limb construction with varying lengths of common channel

Kamran Shah, M.D. • Bent Johnny Nergård, M.D. • Morten Wang Fagerland, M.Sc., Ph.D. • Hjörtur Gislason, M.D., Ph.D.

Published: May 13, 2019 • DOI: https://doi.org/10.1016/j.soard.2019.05.003 • Check for updates

PlumX Metrics

Highlights

- Weight loss is determined by the length of the total alimentary limb length
- Biliopancreatic diversion is essential for durable long-term results in superobese
- Length of the biliopancreatic limb should correspond roughly to one third of the total length of the small bowel
- Common channel should not be shortened to less than 200 cm due to higher frequency of malnutrition and internal hernia.

Conclusion

Sustainable weight loss in a long-term follow-up is achieved by shortening the total alimentary limb length with a 2-m BPL diversion that **should not be attached <200 cm from the ileocecal junction owing to higher rates of internal hernia and vitamin and mineral deficiencies.**

Surgery for Obesity and Related Diseases
Volume 7, Issue 2, March–April 2011, Pages 189-193

Original article

Long-term results of malabsorptive distal Roux-en-Y gastric bypass in superobese patients

John M. Kellum M.D., Silas M. Chikunguwo M.D., James W. Maher M.D., Luke G. Wolfe B.S., Harvey J. Sugerman M.D.

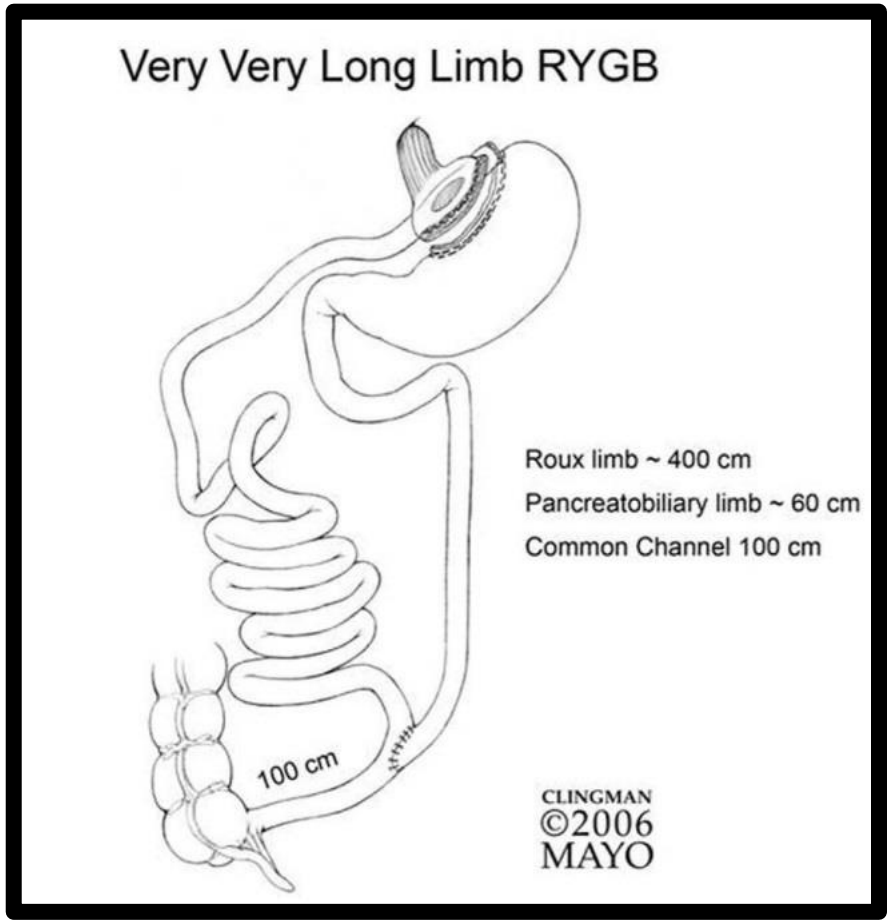
Although D-RYGB afforded superior long-term weight loss, it caused **protein-calorie malnutrition requiring frequent revision**. The **non-revised patients had frequent severe metabolic derangements.** Thus, D-RYGB should not be the primary operation for morbid or superobese patients.

The malabsorptive very, very long limb Roux-en-Y gastric bypass for super obesity: Results in 257 patients

Wayne K. Nelson, BA,[a] Javairiah Fatima, MD,[a] Scott G. Houghton, MD,[a]
Geoffrey B. Thompson, MD,[a] Michael L. Kendrick, MD,[a] Jane L. Mai, RN,[a] Kurt A. Kennel, MD,[b]
and Michael G. Sarr, MD,[a] *Rochester, Minn*

16% incidence of kidney stones, most of which are believed to be calcium oxalate stones.

As with any malabsorptive procedure, serious nutritional and metabolic complications need to be understood, acknowledged, and screened for regularly. Severe, **clinically intolerable steatorrhea** complicated by **impending protein/calorie malnutrition developed in "only" 4%, requiring proximal relocation of the entry of biliopancreatic** digestive juices 100 to 200 cm proximally. Others have reported a much greater incidence of steatorrhea after distal gastric bypass



The Lancet Diabetes & Endocrinology
Volume 12, Issue 4, April 2024, Pages 267-276

Articles

Efficacy and safety of one anastomosis gastric bypass versus Roux-en-Y gastric bypass at 5 years (YOMEGA): a prospective, open-label, non-inferiority, randomised extension study

The conversion rate from OAGB to RYGB was higher than previously described (8% vs 2%) and mainly due to gastro-oesophageal reflux disease, but also due to vitamin deficiencies and diarrhoea.

DIAGNOSIS OF HYPO-ABSORPTION

- Exaggerated weight loss.
- Hypo-albuminemia.
- Decreased iron levels and hemoglobin.
- Low levels of calcium and vitamins.
- Diarrhea / Steatorrhea.

Management and Prevention

- To mitigate the risks of hypo-absorption and malnutrition, patients undergoing OAGB or DGB require careful preoperative assessment and long-term follow-up.

- This includes:
- Nutritional Counseling: Educating patients about the importance of a balanced diet and the need for lifelong supplementation of essential vitamins and minerals.

- Routine Monitoring: Regular blood tests to monitor levels of iron, vitamin B12, calcium, vitamin D, and other essential nutrients. Early detection of deficiencies allows for timely intervention.

- Supplementation: Prescribing appropriate vitamin and mineral supplements, such as multivitamins, iron supplements, calcium citrate with vitamin D, and vitamin B12 injections or sublingual tablets.

- Dietary Adjustments: Encouraging a diet rich in protein and nutrients, with an emphasis on foods that are easier to absorb, and advising against foods that may exacerbate malabsorption issues.
- Standardized surgical techniques and limb lengths.

Management : MGB to SLEEVE: Different Technique

CONCLUSION

While one-anastomosis gastric bypass and distal gastric bypass are effective surgical options for weight loss and metabolic improvement, they carry a substantial risk of hypo-absorption and malnutrition

Understanding the mechanisms behind these nutritional challenges and implementing proactive management strategies are essential for ensuring long-term health and well-being of patients undergoing these procedures.

Close collaboration between surgeons, dietitians, and primary care providers is crucial in optimizing patient outcomes and preventing the potentially severe consequences of nutritional deficiencies.

THANK YOU !