

# Brief Communication:

## Is Small Bowel Length Measurement Necessary for Roux-en-Y Gastric Bypasses (RYGBP) to Prevent Malnutrition?



Mohammad Reza Abdolhosseini<sup>1</sup> , Parinaz Parhizgar<sup>2</sup> , Mehdi Tavallaei<sup>3\*</sup> 

1. Department of Surgery, Nikan Hospital, Tehran, Iran.

2. Student Research Committee, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

3. Department of General Surgery, Ayatollah Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.



**Please cite this article as** Abdolhosseini MR, Parhizgar P, Tavallaei M. Is Small Bowel Length Measurement Necessary for Roux-en-Y Gastric Bypasses (RYGBP) to Prevent Malnutrition? *Annals of Bariatric Surgery*. 2021; 10(1):57-60. <http://dx.doi.org/10.32598/ABS.10.1.3>

 <http://dx.doi.org/10.32598/ABS.10.1.3>



### Article info:

Received: 27 May 2021

Accepted: 21 Jun 2021

Publish: 30 Jun 2021

### Keywords:

Biliopancreatic bypass, Malnutrition, Roux-en-Y gastric bypass, Weight loss

## ABSTRACT

**Background:** Roux-en-Y Gastric Bypass (RYGBP) has received a lot of attention with the increasing prevalence of obesity. However, some patients report more weight loss and malnutrition, which is thought to be due to differences in Common Limb Length (CLL) in patients. Surgeons reported the Alimentary Limb Length (ALL) and biliopancreatic limb length (BPLL), but CLL is generally unknown.

**Methods and Materials:** This study was conducted on 600 patients undergoing RYGBP to evaluate CLL and Excessive Weight Loss (EWL) and malnutrition in Tehran City, Iran, from 2015 to 2017. Thirty minutes after the start of the surgery, the length of the small intestine the measurement was measured with micro forceps by grasping the midpart of the small intestine. The average measurement took seven minutes.

**Results:** The median length of the small bowel was 712 cm. This study showed that patients with CLL of less than 650 cm had more EWL% and malnutrition than those with CLL of more than 750 cm.

**Conclusion:** Since 0.5% and 2% of the participants in this study had a small bowel length of fewer than 4 m and 4.5 m, respectively, and assuming that the ALL + CLL should be more than 3 m, the length of the bypassed small bowel in these people is usually 2 m. If the BPLL is less than 125 cm, small bowel measurement is not necessary, but if it is longer than 125 cm, 2% of people may have shortness of small bowel, and it is better to measure the length of the intestine.

### \* Corresponding Author:

Mehdi Tavallaei, MD.

Address: Department of General Surgery, Ayatollah Taleghani Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

E-mail: [mohsentavallae@yahoo.com](mailto:mohsentavallae@yahoo.com)

## 1. Introduction

**A**s we know, the length of the small intestine varies from person to person (400-1200 cm), and the variation in intestinal length in humans is still under debate [1]. It is essential to note this variation in Roux-en-Y Gastric Bypass (RYGBP) that becomes increasingly popular in treating obesity. After surgery, several patients report Excessive Weight loss (EWL), malnutrition, resolution of comorbidities, and diabetes; some studies attributing these problems to differences in Common Limb Length (CLL). However, this hypothesis is still controversial and needs further investigation [2-5]. Surgeons reported Alimentary Limb Length (ALL) and Biliopancreatic Limb Length (BPLL), 100 to 150 cm and 50 to 75 cm, respectively, and CLL is generally unknown [6, 7].

The literature in this field is controversial and needs more research. A study on 443 patients who underwent laparotomy showed that the shorter Common Limb (CL) increases the risk of complications such as malnutrition. The authors of this study recommended that at least 250-300 cm is required for ALL+CLL [1]. Research suggests that if the CLL% is less than 50% of the total small intestine length, the complications of malnutrition are greater in patients, and they need to take dietary supplements [8]. However, a study of 90 patients undergoing laparoscopic RYGBP (fixed 150 cm ALL and 75 cm BPLL) showed no results indicating the relationship between CL length difference and weight loss [9]. Since there is very little research in Iran in this field, this study aimed to evaluate CLL and Excessive Weight Loss (EWL) and malnutrition in patients undergoing RYGBP in Tehran City, Iran.

## 2. Materials and Methods

This study evaluated CLL and Excessive Weight Loss (EWL) and malnutrition in patients undergoing RYGBP in Tehran City, Iran, from 2015 to 2017. Totally, they were 750 patients; 150 of them were excluded due to safety and conditions during surgery. As a result, 600 patients were included in the study. To measure the length of the small intestine, 30 minutes after the start of the surgery, we performed the measurement by micro forceps by grasping the midpart of the small intestine between mesenteric and antimesenteric borders. The average measurement took seven minutes because of the difficulty of this process, as the patient's position was head down (Trendelenburg) and the patient tilts right or left up. No embolism complications were observed during the measurement except 2 cases of perforation, which

were repaired during surgery. In general, the duration of the operation was 10 minutes, and no embolic complications were observed. After surgery, the patients underwent a 2-year follow-up to evaluate EWL and malnutrition.

## 3. Results

Among 600 patients, there are 4 (0.5%) patients with total Small Bowel Length (SBL) less than 400 cm (about 0.66%). But there are 15 (2%) patients with a total SBL of less than 450 cm (2.5%). There are 133 patients (22.16%) more than 900 cm, 37 patients (6.16%) more than 1000 cm, 7 patients (1.16%) more than 1100 cm, and 2 patients (0.33%) more than 1200 cm. The median length of the small bowel was 712 cm. Also, the results of measurement show a difference between Jejunal Length (JL) and ileal length.

In this study, the patients were divided into two groups: group A (ALL=120 cm, BPLL=90-120 cm, and CLL <650 cm) and group B (ALL=120 cm, BPLL = 90-120 cm, and CLL >750 cm). Based on the results, EWL has a better decrease in group A, and the EWL% chart has a more appropriate slope. Follow-up results showed that people with a bowel length of more than 8.5 m did not seem to have a different average weight loss compared to the obese population. It is also worth noting that unlike the BMI of 40-45 kg/m<sup>2</sup>, there is no difference in BMI less than 40 kg/m<sup>2</sup> in CL length.

## 4. Discussion

RYGBP is a malabsorptive procedure. Theoretically, differences in limb lengths can affect nutrition status and weight loss [5]. Many studies have identified BPLL as an essential and influential factor in EWL, but the role of CLL still needs further research [9]. The results of research related to the role of CLL with EWL and malnutrition are controversial. The first study in 2008 found a weak inverse relationship between CLL and weight loss in super-obese patients at the end of the first year of follow-up [10]. In another study, Abellan et al. [8] showed that the lower CLL% corresponds with the higher rate of malnutrition and the need for dietary supplements. The result of our study was also in favor of the relationship between CLL and weight loss and malnutrition. Unlike the above research results, another research has shown no relationship between the variations in CLL length with weight loss [9].

One reason for these contradictory results is the difference in accuracy and method of measuring small bowel lengths [11]. Other reasons include differences in age,

BMI, race, and genetic differences in the sample population. Therefore, further research is necessary to reach a definite conclusion about the relationship between CLL and EWL and malnutrition.

## 5. Conclusion

The present study results showed that 0.5% and 2% of the participants in this study had a small bowel length of fewer than 4 m and 4.5 m, respectively. Assuming that the ALL+CLL should be more than 3 m, the length of the bypassed small bowel in these people was usually 2 m. If the BPLL is less than 125 cm, small bowel measurement is not necessary, but if it is higher than 125 cm (especially in mini-gastric bypass surgery, which is BPLL considered 150-200 cm), 2% of people may end up with shortness of small bowel, and it is better to measure the length of the intestine.

## Ethical Considerations

### Compliance with ethical guidelines

There were no ethical considerations to be considered in this research.

### Funding

This research did not receive any grant from funding agencies in the public, commercial, or non-profit sectors.

### Authors' contributions

All authors equally contributed to preparing this article.

### Conflict of interest

The authors declared no conflict of interest.

## References

- [1] Tacchino RM. Bowel length: Measurement, predictors, and impact on bariatric and metabolic surgery. *Surgery for Obesity and Related Diseases*. 2015; 11(2):328-34. [DOI:10.1016/j.soard.2014.09.016] [PMID]
- [2] Gleysteen JJ. Five-year outcome with gastric bypass: Roux limb length makes a difference. *Surgery for Obesity and Related Diseases*. 2009; 5(2):242-7. [DOI:10.1016/j.soard.2008.08.005] [PMID]

- [3] Lee S, Sahagian KG, Schriver JP. Relationship between varying Roux limb lengths and weight loss in gastric bypass. *Current Surgery*. 2006; 63(4):259-63. [DOI:10.1016/j.cursur.2006.05.001] [PMID]
- [4] Orci L, Chilcott M, Huber O. Short versus long Roux-limb length in Roux-en-Y gastric bypass surgery for the treatment of morbid and super obesity: A systematic review of the literature. *Obesity Surgery*. 2011; 21(6):797-804. [DOI:10.1007/s11695-011-0409-y] [PMID]
- [5] Stefanidis D, Kuwada TS, Gersin KS. The importance of the length of the limbs for gastric bypass patients: An evidence-based review. *Obesity Surgery*. 2011; 21(1):119-24. [DOI:10.1007/s11695-010-0239-3] [PMID]
- [6] Elder KA, Wolfe BM. Bariatric surgery: A review of procedures and outcomes. *Gastroenterology*. 2007; 132(6):2253-71. [DOI:10.1053/j.gastro.2007.03.057] [PMID]
- [7] Madan AK, Harper JL, Tichansky DS. Techniques of laparoscopic gastric bypass: On-line survey of American Society for Bariatric Surgery practicing surgeons. *Surgery for Obesity and Related Diseases*. 2008; 4(2):166-72. [DOI:10.1016/j.soard.2007.08.006] [PMID]
- [8] Abellan I, Luján J, Frutos MD, Abrisqueta J, Hernández Q, López V, et al. The influence of the percentage of the common limb in weight loss and nutritional alterations after laparoscopic gastric bypass. *Surgery for Obesity and Related Diseases*. 2014; 10(5):829-33. [DOI:10.1016/j.soard.2014.06.009] [PMID]
- [9] Navez B, Thomopoulos T, Stefanescu I, Coubeau L. Common limb length does not influence weight loss after standard laparoscopic Roux-en-Y gastric bypass. *Obesity Surgery*. 2016; 26(8):1705-9. [DOI:10.1007/s11695-015-1992-0] [PMID]
- [10] Savassi-Rocha AL, Diniz MTC, Savassi-Rocha PR, Ferreira JT, de Almeida Sanches SR, Diniz MdFHS, et al. Influence of jejunoileal and common limb length on weight loss following Roux-en-Y gastric bypass. *Obesity Surgery*. 2008; 18(11):1364-8. [DOI:10.1007/s11695-008-9475-1] [PMID]
- [11] Ruiz-Tovar J, Carbajo MA, Jimenez JM, Luque-de-Leon E, Ortiz-de-Solorzano J, Castro MJ. Are there ideal small bowel limb lengths for One-Anastomosis Gastric Bypass (OAGB) to obtain optimal weight loss and remission of comorbidities with minimal nutritional deficiencies? *World Journal of Surgery*. 2020; 44(3):855-62. [DOI:10.1007/s00268-019-05243-0] [PMID]

This Page Intentionally Left Blank