

# Weight loss eight years after gastric bypass

## *Evolução ponderal oito anos após a derivação gástrica em Y-de-Roux*

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### A B S T R A C T

**Objective:** To evaluate the effectiveness of banded Roux-en-Y gastric bypass in promoting weight loss after an eight-year follow-up. **Methods:** Two hundred and eleven obese patients underwent Roux-en-Y gastric bypass with banding by the same surgical team. The study design was longitudinal, prospective and descriptive. The analysis of weight decrease in the postoperative period was based on the loss of excess weight in percentage and BMI. Failure was considered when patients lost <50% of excess weight. **Results:** The loss of follow-up was 36.5%, therefore, 134 patients were included in this study. The loss of excess weight in global average rate in the postoperative period was: 67.6 ± 14.9% in the first year, 72.6 ± 14.9% in the second year, 69.7 ± 15.1% in fifth year and 66.8 ± 7.6 in eight years. Surgical treatment failure occurred in 15 patients (7.1%) over the period. **Conclusion:** Banded Roux-en-Y gastric bypass was effective in promoting and sustaining weight loss in the long term, with low failure rates.

**Key words:** Bariatric surgery. Weight loss. Gastric bypass. Obesity.

### INTRODUCTION

Obesity is a serious global public health problem, affecting developed and developing countries. People with a BMI > 30 kg/m<sup>2</sup> represent 7% of global population<sup>1</sup>. In Brazil, the prevalence of obesity increased from 2.4% in 1970 to 6.9% in the 1990s among men and 7% to 12.5% among women. The incidence of obesity continues to increase; it is estimated that Brazil has 3.7 million people with morbid obesity, which corresponds to 3% of the population<sup>2</sup>.

People with a BMI above 40 kg/m<sup>2</sup> have higher incidence of comorbidities<sup>3</sup> and more difficult to lose weight and maintain its loss compared with other groups. Clinical treatment based on diet, physical activity and medication is barely able to sustain weight loss, patients often regaining the lost weight over a period of one to five years<sup>4</sup>.

Significant weight loss and ability to keep it in the long run is the goal of bariatric surgery. Brolin *et al.*<sup>5</sup> suggest postoperative follow-up of at least five years to establish reliable assessment of the success of surgical treatment. Few studies have longer follow-up.

The objective of this study is to evaluate the effectiveness of banded Roux-en-Y gastric bypass (BRYGB) as for weight loss and its maintenance in eight years of follow-up.

### METHODS

Two hundred and eleven obese underwent BRYGB carried out by the same surgical team at the Hospital Universitário da Universidade Estadual de Londrina from May 1999 to December 2000. The sample was obtained by convenience, patients were selected prospectively and consecutively, which made the study observational, descriptive and longitudinal. The protocol was approved by the Ethics Committee in Research of the Hospital Universitário da Universidade Estadual de Londrina - number 55/99.

We analyzed demographic data (gender, age, weight, BMI) and weight loss. The analysis of this last variable during follow-up was done by comparing the percentage of excess weight loss (% EWL) with the preoperative values. Body weight was determined by reference to the table of the Metropolitan Life Insurance Company. The inability to lose more than 50% of excess weight was considered treatment failure.

To describe continuous data, we used the mean and standard deviation, and to describe smaller and discrete variables we used median and range.

Patient selection was based on the recommendation of the Brazilian Society of Metabolic and Bariatric Surgery. Patients initially underwent clinical

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evaluation by an interdisciplinary team. Follow-up was done through monthly outpatient visits in the first year, every six months until the fifth year and annually thereafter. The evaluation was made by the same multidisciplinary team.

## RESULTS

Clinical follow-up was performed in 134 (63.5%) patients in eight years. There were 101 (75.4%) female patients and 33 (24.6%) male. Mean age was  $43.4 \pm 10.6$  years (18-69 years). Body mass index (BMI) was  $44.2 \pm 5.1$  kg/m<sup>2</sup> (35-67 kg/m<sup>2</sup>) preoperatively. The distribution of patients according to BMI is shown in figure 1.

The mean BMI decreased from  $43.2 \pm 5.3$  kg/m<sup>2</sup> preoperatively to  $28.7 \pm 4.0$  kg/m<sup>2</sup> in the first year after surgery to  $27.6 \pm 3.7$  in the second postoperative year, increased to  $28.2 \pm 4$  in the fifth year and  $29, 6 \pm 3.6$  in the eighth year (Figure 2). The %EWL varied inversely with the BMI. The average change in the overall %EWL was  $67.6 \pm 14.9$  in the first postoperative year,  $72.6 \pm 14.9$  in the second,  $69.7 \pm 15.1$  in five years and  $66.8 \pm 7.6$  in eight.

The %EWL in eight years, stratified by BMI, showed a reduction of  $70.3 \pm 17.2\%$  after the first year,  $74.3 \pm 17.6\%$  in the second,  $71.4 \pm 16.5\%$  after the fifth and  $69.7 \pm 13.6\%$  in the eighth year after the operation in patients with BMI <40 kg/m<sup>2</sup>. In the group with BMI between 40 and 50 kg/m<sup>2</sup>, weight loss was  $66 \pm 13.7\%$  after the first year,  $72\% \pm 13.6$  after the second,  $69.5 \pm 14.4\%$  after fifth and  $66.8 \pm 15.1\%$  after the eighth postoperative year. In patients with BMI 50-60 kg/m<sup>2</sup>, weight loss was  $60 \pm 11.8\%$  after the first year,  $66\% \pm 9.7$  after the second,  $61 \pm 11.7\%$  after the fifth and  $60.3 \pm 14\%$  after the eighth year. In patients with a BMI > 60 kg/m<sup>2</sup> the %EWL was

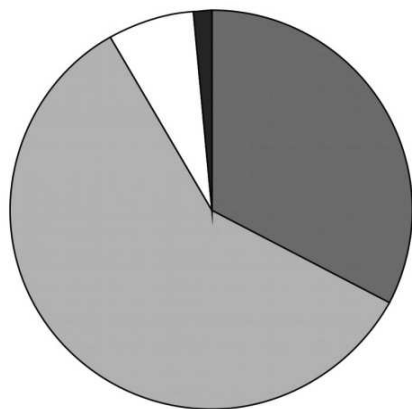


Figure 1 - Preoperative distribution of patients according to BMI.

$70\% \pm 2\%$  over the first year,  $76 \pm 4\%$  in the second,  $77\% \pm 6.6$  in the fifth and  $73.3 \pm 9.8\%$  in the eighth year (Figure 3).

Failure was found in 15 patients (7.1%) over the eight years. In super-obese patients (BMI  $\geq 50$ ), one of 11 (9.1%) had treatment failure.

## DISCUSSION

The results of conservative treatment for morbid obesity are associated with disease recurrence. Bariatric surgery is an effective treatment for this form of obesity. Its success is defined as loss of at least 50% overweight<sup>6,7</sup>.

Mason & Ito<sup>8</sup> introduced, in 1967, the concept of reducing gastric surgery in the treatment of obesity. Printen and Mason<sup>9</sup> changed the procedure in 1972, suggesting a closer anastomosis, because they understood that the limiting factor would increase weight loss. In 1977, Griffen<sup>10</sup> recommended that the gastro-jejunal anastomosis was performed in a Roux-en-Y fashion. Torres and Oca<sup>11</sup> began using the small curvature in the construction of the gastric pouch in 1980.

The use of prostheses in the terminal portion of the gastric pouch began with Laws and Piantadosi<sup>12</sup> in 1981, and Linner and Drew<sup>13</sup> in 1985, who used a silicone ring to prevent the expansion of gastro-jejunal anastomosis. The

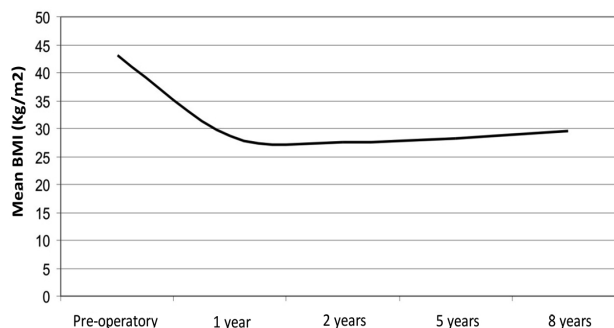


Figure 2 - Change in average BMI in eight years.

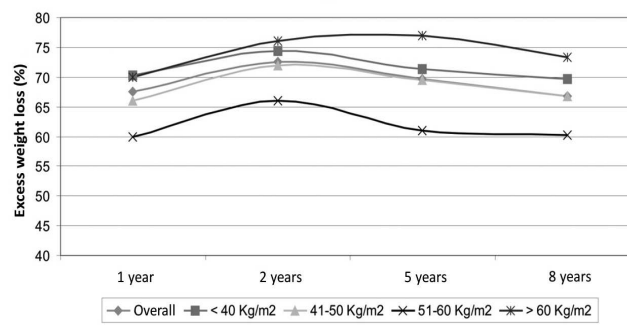


Figure 3 - Percentage of excess weight loss and overall averages stratified according to BMI.

controversy as to whether restricting gastric emptying would be necessary to obtain better surgical outcomes was started.

Fobi<sup>14</sup>, reported the placement of silicone ring above the anastomosis in RYGB in 1986. In 1990, Capella<sup>15</sup> described a similar process, where the silicone band was placed around the distal end of the gastric pouch, which was later replaced by a polypropylene mesh. Recently, Salinas *et al.*<sup>16</sup> have studied the importance of the restricting factor and concluded that a circumferential silicone band of 6.0 cm is well tolerated in most patients. These authors emphasize that if such prostheses are not used, patients may not lose weight or may be more likely to recover some of the weight lost after the operation.

Capella<sup>15</sup> published his first results in 1991, and in 1996 showed that BRYGB promoted more significant weight loss than the Mason's vertical banded gastroplasty<sup>17</sup>. The results obtained in these years following mixed bariatric procedures have become the gold standard for surgical treatment of obesity<sup>18-20</sup>. A systematic review focusing on long-term weight loss demonstrated that BRYGB and biliopancreatic derivation are the procedures that promote the best result in five years of follow-up<sup>21</sup>.

Banded Roux-en-Y gastric bypass causes satiety and reduces caloric intake by delaying gastric emptying and induces satiety even with low food intake, although there are other factors involved in weight loss after bariatric surgery, such as the gastrointestinal hormones. The silicone ring, in addition to its restrictive function, contributes to the reduction of undesirable side effects (dumping syndrome, flatulence).

The role of the ring in the prevention of weight regain in the long term remains controversial. The malabsorptive component of BRYGB is another important factor in weight loss. Despite the anatomical factor, the role of incretins is important in weight loss. BRYGB generally promotes intense and lasting weight reduction<sup>22</sup>, which is initially rapid and lessens later<sup>23,24</sup>. After the second or third postoperative year the patient seems to adapt to the

operation and suffer its side effects less intensively, which brings a certain tendency to weight regain<sup>25</sup>. The small amount of weight gain is due to the patient's adaptation to the operation, lower intensity of dumping syndrome, gastric pouch dilation, increase in the diameter of the gastrojejunal anastomosis<sup>26</sup> and possibly lower restriction of gastric emptying caused by loosening of the ring<sup>17,27</sup>.

The loss of excess weight has been used as the main factor analysis of the results of bariatric surgery. Capella<sup>28</sup> observed an average 77% EWL in five years, with 93% of patients losing over 50% of excess weight. MacLean *et al.*<sup>6</sup> had treatment failure of 7%. Fobi *et al.*<sup>19</sup> showed 72% EWL in 10 years, with 5% failure rate. Sugerman<sup>29</sup>, with no use of the ring, reported average 60% EWL in five years and White *et al.*<sup>30</sup>, 70% over the same period. Kruseman *et al.*<sup>31</sup> showed, in an eight-years study, that 59% of patients had more than 50% excess weight loss. The present study found a 66.8% EWL in eight years, where 92.9% of patients lost more than 50% of excess weight.

Regarding follow-up, there is greater incidence of weight regain after the third year after surgery<sup>32</sup>. Scozzari *et al.*<sup>33</sup> showed 60.9% EWL three years after surgery, 57% in five years and 53% in seven years after the operation. Others showed no weight regain over the years<sup>34</sup>. The data from this study show no significant recovery of weight after the fifth postoperative year.

Brolin<sup>5</sup> established the time of five years as the minimum follow-up to analyze patients' weight regain. MacLean *et al.*<sup>6</sup> conducted a follow up of 88.6% of patients between three and five years. Capella and Capella<sup>7</sup> showed that only 63% of patients completed five years of follow-up. White *et al.*<sup>30</sup> showed mean follow-up of 48.6 months. This included 63.5% of patients in eight years postoperatively.

In conclusion, the BRYGB was effective in promoting weight loss and its long-term maintenance, with low rates of treatment failure.

## R E S U M O

**Objetivo:** Avaliar a eficácia da derivação gástrica com bandagem em Y-de-Roux na promoção da perda de peso após oito anos de seguimento. **Métodos:** Duzentos e onze obesos foram submetidos à derivação gástrica com bandagem em Y-de-Roux, pela mesma equipe cirúrgica. O desenho do estudo foi longitudinal, prospectivo e descritivo. A análise da diminuição do peso no pós-operatório foi baseado na perda do excesso de peso em percentual e no cálculo do IMC. Falha terapêutica foi considerada quando os pacientes perderam <50% do excesso de peso. **Resultados:** A perda de seguimento foi de 36,5%, portanto, 134 pacientes foram incluídos neste estudo. A perda do excesso de peso em percentual média global no pós-operatório foi de: 67,6 ± 14,9% no primeiro ano, 72,6 ± 14,9% no segundo ano, 69,7 ± 15,1% no quinto ano e 66,8 ± 7,6 em oito anos. Falha no tratamento cirúrgico ocorreu em 15 pacientes (7,1%) ao longo dos oito anos. **Conclusão:** A derivação gástrica com bandagem em Y-de-Roux foi efetiva na promoção e manutenção da perda de peso no longo prazo, com baixa taxa de falhas.

**Descritores:** Cirurgia bariátrica. Perda de peso. Derivação gástrica. Obesidade.

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