

ESOPHAGEAL MOTILITY, SYMPTOMS, FOOD INTAKE AND WEIGHT LOSS AFTER ROUX-EN-Y GASTRIC BYPASS

Motilidade esofágica, sintomas, resultado alimentar e perda de peso após derivação gástrica em Y-de-Roux

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ABSTRACT - Background - Abnormal manometry findings can be found in the obese population. It is controversial if the manometry should be used to choose the adequate operation or if the motility status could predict symptomatic outcomes. **Aim** - To correlate the esophageal motility with postoperative symptoms, alimentary outcome and weight loss after Roux-en-Y gastric bypass. **Methods** - One hundred and fourteen patients were submitted to the operation and were prospectively studied. They had no GERD symptoms or diseases that might interfere with esophageal motor function. One year after surgery patients were interviewed regarding current symptoms and eating habits. **Results** - Excess weight loss was 66.2 %. Sixty (52.6%) patients had an abnormal manometry. Hypertensive lower esophageal sphincter was found in 18 (16%) patients and hypotonic sphincter in 31 (27%). Dumping syndrome was mentioned by 27 (23.6%) patients and 21 (18.4%) complained of regurgitation. Excellent, good, moderate and poor alimentary outcome was present in 32 (28%), 31 (27.2%), 39 (34.2%), 12 (11.6%) patients, respectively. Sphincter pressure and esophageal amplitude did not correlate with excess weight loss. Its average was significantly higher for patients with hypertensive esophageal amplitude. Regurgitation was more frequent in patients with a hypotensive sphincter. There is no correlation between dumping and sphincter pressure status; between dumping or regurgitation and esophageal amplitude; between alimentary outcomes and sphincter pressure status or esophageal amplitude. **Conclusion** - Esophageal manometry before Roux-en-Y gastric bypass is of limited clinical significance.

HEADINGS - Roux-en-Y gastric bypass. Manometry. Weight loss.

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RESUMO - Racional - Achados anormais de manometria podem ser encontrados na população obesa. É controverso se a manometria deveria ser usada para escolher a técnica cirúrgica e se a função esofágica poderia prever os sintomas pós-operatórios. **Objetivo** - Correlacionar a motilidade do esôfago com sintomas pós-operatórios, resultado alimentar e perda de peso após a derivação gástrica em Y de Roux. **Método** - Cento e catorze pacientes submetidos à derivação foram estudados prospectivamente. Eles não apresentavam sintomas de refluxo gastroesofágico ou doenças que pudessem interferir com a função motora do esôfago. Um ano após a operação foram entrevistados sobre os sintomas e hábitos alimentares. **Resultados** - A perda do excesso de peso foi de 66,2%. Sessenta pacientes (52,6%) tiveram manometria anormal; quarenta e nove (43%) alterações manométricas no esfíncter inferior do esôfago no pré-operatório; pressão elevada em 18 pacientes (16%) e baixa em 31 (27%). A síndrome de dumping foi encontrada em 27 (23,6%) pacientes e 21 (18,4%) queixaram-se de regurgitação. Resultado alimentar excelente, bom, moderado e pobre esteve presente em 32 (28%), 31 (27,2%), 39 (34,2%), 12 (11,6%) pacientes, respectivamente. A pressão do esfíncter inferior e amplitude de contração do esôfago não se correlacionam com perda do excesso de peso, cuja média foi significativamente maior para os pacientes com hipertensão na amplitude de contração. Regurgitação foi mais frequente em pacientes com hipotonia do esfíncter. Não houve correlação entre dumping e pressão do esfíncter inferior; entre amplitude de contração e dumping ou regurgitação; entre os resultados alimentares e pressão do esfíncter ou amplitude de contração do esôfago. **Conclusão** - A manometria esofágica antes da derivação é de importância clínica limitada.

DESCRITORES - Obesidade. Derivação gástrica. Manometria. Perda de peso

INTRODUCTION

The study of esophageal motility before bariatric operations is gaining importance. A high prevalence of abnormal manometric findings – either at the level of the lower esophageal sphincter (LES) or the esophageal body - can be found in the obese population^{1,2,3,4}. Some authors believe a tailored approach should be used to choose the adequate operation in the presence of these manometric abnormalities⁵ others believe the motility status can predict symptomatic outcomes^{6,7,8}.

This study aims to correlate the esophageal motility with postoperative symptoms, alimentary outcome and weight loss after laparoscopic Roux-en-Y gastric bypass to assess whether it is possible to select the surgical technique based on pre-operative manometry.

METHOD

The protocol was approved by local ethics committee. Informed consent was obtained from all individuals.

Two hundred and fifty-six patients underwent gastric bypass for treatment of obesity. Individuals were operated between July/2008 and December/2010 at the State University of Londrina. Patients were excluded in case of the presence of gastroesophageal reflux disease symptoms and diseases (such as diabetes) that might interfere with esophageal motor function, and those who refused to participate in the study or lost follow-up. Were prospectively studied 114 patients with a mean age of 43.2 ± 11.3 (22 – 61 years) with 84 (74%) women and body mass index of 43.9 ± 5.1 (35 – 58 Kg/m²).

For esophageal manometry patients were fasting for at least 8h before testing. Medications that might interfere with esophageal function were discontinued. All individuals underwent esophageal manometry by the same investigator that was performed with an eight channel water perfused catheter. Esophageal body function was assessed by giving 10 swallows of 5 ml of water at 30 second intervals. A software program (Synetics[®]) was used for interpretation and data analysis. The following manometric parameters were evaluated: 1) mean respiratory pressure of the LES; 2) distal esophageal amplitude at 3 cm above the upper border of the LES and 3) esophageal peristalsis. Data acquisition and analysis were accomplished with the indicated software. LES pressure was considered normal between 14-34 mmHg and wave amplitude between 64-154 mmHg.

About eating habits and symptoms patients were interviewed one year after operation. Alimentary outcome was graded as excellent if no food restriction was referred; good if unable to eat chunks of meat or

bread; moderate if unable to eat vegetables and fruits; and poor if fed only on soft food.

For statistics values were reported as mean \pm standard deviation. Student's t test was used for comparison of means. Spearman test was used for correlations. Fisher exact test and Chi-squares for contingency tables were used to compare non-parametric variables. Friedman test was used for comparison of the alimentary outcomes ranks. A p value of less than 0.05 was considered statistically significant.

RESULTS

About weight loss at one year follow-up, mean BMI was 29.1 ± 4.1 (23-41) kg/m². Excess weight loss (EWL) was 66.2 ± 14.9 (37-110%). Sixty (52.6%) patients had an abnormal manometry. Forty-nine (43%) had abnormal LES manometry pre-operatively. LES was hypertensive in 18 (16%) and hypotensive in 31 (27%) patients. Esophageal hypertensive waves were found in 19 (17%) patients and abnormal peristalsis in seven (6%) patients. Ten patients (8.7%) had more than one alteration at manometry.

According to symptoms dumping syndrome was felt by 27 (23.6%) patients and 21 (18.4%) complaint of regurgitation. Excellent, good, moderate, and poor alimentary outcome was present in 32 (28%), 31 (27.2%), 39 (34.2%), 12 (11.6%) patients, respectively.

Esophageal manometry, weight loss and symptoms

LES pressure ($y = 0.04006774011 x + 18.66812029$, $r = 0.058$, $p = 0.59$) and peristalsis alteration ($y = 0.6987989517 x + 78.72050443$, $r=0.021$, $p=0.06$) do not correlate with EWL which average was not different among patients with hypotensive, normal or hypertensive LES pressure ($p=0.52$ for hypotensive x normal, $p=0.86$ for hypotensive x hypertensive, $p=0.40$ for normal x hypertensive). The average EWL was significant higher for patients with hypertensive esophageal amplitude compared to normal amplitude (74.8 ± 16.0 vs 66.7 ± 13.8 , $p=0.0359$).

The distribution of patients according to postoperative symptoms and alimentary outcome in relation to the esophageal motility is depicted in Table 1. Regurgitation was more frequent in patients with a hypotensive LES ($p=0.021$). There is no correlation between dumping ($p=0.86$) and LES pressure status. There is no correlation between dumping ($p=0.15$) or regurgitation ($p=0.20$) and esophageal amplitude. There was no correlation between alimentary outcomes and LES pressure status ($w=0.67$, $p=0.07$) or esophageal amplitude ($w=0.25$, $p=0.31$).

TABLE 1 - Postoperative symptoms and alimentary outcome in relation to the esophageal motility

	Hypotonic LES (n=31)	Normal LES (n=65)	Hypertonic LES (n=18)	Normal amplitude (n=95)	Hypertonic amplitude (n=19)	Normal peristalsis (n=107)	Abnormal peristalsis (n=07)
Symptoms: n (%)							
Dumping +	6 (19.3)	17 (26.2)	4 (22.2)	19 (20)	8 (42.1)	27 (25.2)	0 (0)
-	25 (80.7)	48 (73.8)	14 (77.8)	76 (80)	11 (57.9)	80 (74.8)	7 (100)
Regurgitation +	20 (64.5)*	10 (15.4)	3 (16.7)	21 (22.1)	6 (31.6)	14 (13.1)	1 (14.3)
-	11 (35.5)	55 (84.6)	15 (83.3)	74 (77.9)	13 (68.4)	93 (86.9)	6 (85.7)
Alimentary outcome: n (%)							
Excellent	7 (22.5)	15 (23.1)	2 (11.1)	27 (28.4)	2 (10.5)	32 (29.9)	2 (28.6)
Good	3 (9.7)	8 (12.3)	4 (22.2)	15 (15.8)	2 (10.5)	12 (11.2)	3 (42.8)
Moderate	15 (48.4)	38 (58.5)	9 (50)	48 (50.5)	9 (47.5)	52 (48.6)	2 (28.6)
Poor	6 (19.4)	4 (6.1)	3 (16.7)	5 (5.3)	6 (31.5)	11 (10.3)	0 (0)

LES – lower esophageal esfincter; * = p < 0.05

DISCUSSION

The main components of esophageal function are coordinated peristalsis and LES relaxation; manometry is among the most effective methods to evaluate these functions.

The difficulty emptying imposed by surgical procedures such as calibrated anastomosis; silastic ring; gastric banding or low gastric capacity may impose feeding difficulties. Studies about the function of the esophagus in these patients are contradictory, some show normal esophageal manometry^{9,10} and others not normal¹¹. In a previous paper with a smaller number of patients these authors showed no association between esophageal motor function and postoperative symptoms¹².

These results show that: 1) regurgitation is more prevalent in patients with a hypotensive LES; 2) alimentary outcome does not correlate with preoperative esophageal manometry, and 3) weight loss correlates with hypercontractility of the distal esophagus.

Although all patients included in this study were free of gastroesophageal reflux disease symptoms, almost half of them had a defective LES and was found a higher prevalence of regurgitation in these patients. Intuitive thinking leads to a parallel to gastroesophageal reflux disease where LES dysfunction and regurgitation are common¹³ added to the narrowing of the gastric outlet (anastomosis of 1.5cm) presenting as a resistance to the passage of food and higher intragastric pressure¹⁴. Other series show a high prevalence of regurgitation/vomiting after Roux-en-Y gastric bypass, up to 70%¹⁵. A hypotonic LES has also been implicated in the genesis of regurgitation before⁶.

Dumping did not correlate with esophageal manometry findings, probably because the symptom is linked to gastric emptying¹⁶ and dietary habits¹⁷. The same is probably true to alimentary outcomes.

Weight regain after bariatric operations is a major problem. The percentage of excess weight loss

clearly decreases in a long-term follow-up¹⁸. Several authors concerned with this drawback of obesity surgery tried to identify predictors to surgical failure. Interestingly, however, no previous paper focused on the correlation between weight loss and manometric findings. Was found that weight loss correlates with hypercontractility of the distal esophagus. The authors are unsure if it is an incidental finding or a clinical phenomenon since was unable to give an explanation for this association.

CONCLUSION

Esophageal manometry before Roux-en-Y gastric bypass is of limited clinical significance as a predictor of weight loss and feeding adaptation.

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