

## Predictor factors of marginal ulcer treatment in bariatric surgery

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### Abstract

Marginal ulcer is one of the most relevant complications after Roux-en-Y Bypass. The etiopathogenesis is multifactorial. Our objective is to determine the factors involved in its development. Material and methods: We included patients who underwent upper after a Roux-n-Y gastric bypass due to obesity between January-2011 to February-2022 with UM as a complication. The patients were categorized in two groups: favourable medical treatment response (Group A) and those who didn't response requiring surgical treatment (GroupB). Results: More than 60% of the sample responded to medical treatment, meanwhile the rest required revision surgery, majority gastrojejunal reanastomosis. Both groups female sex predominated. The most frequently associated

risk factors were Helicobacter pylori infection, smoking, DM-II, SSRIs and NSAIDs treatment. All variables were analyzed using logistic regression analysis and no association could be established between risk factors and delivery of UM. Conclusion: We couldn't determine the predictive factors of response to UM treatment. Therefore, more studies would be needed to determine which risk factors could be involved in the appearance of UM.

### Keywords:

- Marginal ulcer
- Treatment
- Risk factors

### Introduction

Currently, obesity is a global health problem, with laparoscopic Roux Y gastric bypass (BGYR) and vertical gastrectomy being the most frequently used surgical techniques in bariatric surgery for its treatment (1). Although it is a safe and reproducible technique, (early or late) complications exist, increasing the patient's comorbidity. Of the late complications (> 30 days following surgery), marginal ulcers (MU) are found, defined as an ulcer typically originating in the jejunal side, close to the gastrojejunal anastomosis. It has an incidence of 0.6-16%, according to the literature (2,3). Its pathophysiology is multifactorial and currently under discussion, likely to be related to acid hypersecretion, gastric reservoir size, rapid passage of acid bolus or the use of non-absorbable suture materials. Interpersonal risk factors are considered the most relevant, since they are partially modifiable, with smoking and NSAIDs being the most frequently described.

MU have been associated with DM-II, SSRI intake, high blood pressure and Helicobacter pylori infection. The most common clinical presentation is epigastric pain followed by upper gastrointestinal bleeding (HDA) (30%) and nausea or vomiting (20%). Initial therapeutic management is based on the use of proton pump inhibitors (PPIs) while surgical treatment, revision surgery, is reserved for refractory, recurrent or acute complications (4-7) risk factors, and treatment outcomes of symptomatic and incidentally, at routine endoscopy diagnosed, MU. Methods: All patients undergoing RYGB procedures between 2013 and 2018 at a single center were included. Upper endoscopy was performed in case of symptoms and/or routinely 2 and 5 years postoperatively. Results: In total, 568 patients (83.3% female).

The aim of this study is to determine the risk factors associated with the development of MU and its subsequent favorable or non-favorable response to medical treatment.

## Material and methods

A descriptive, observational and retrospective study was carried out, collecting data from patients operated on BGYR in our center between January 2011 and February 2022 who presented MU as a complication. Patients were categorized based on their favorable (Group A) or unfavorable (Group B) response to medical treatment, with the latter requiring surgical treatment. Epidemiological, clinical, diagnostic, therapeutic and complication variables were collected, as well as the subsequent evolution of the same. Variables were analyzed using Stata version 16, establishing statistically significant results for  $p < 0.05$ .

## Results

Of the initial sample of 743 patients undergoing BGYR, 21 developed MU as a complication, for an incidence of 2.82%. In both groups, a female prevalence was observed (A:61.5%; B:75%), as well as in the predominant symptomatology, which was nausea and vomiting (A:61.5%; B:100%), epigastric pain (A:54%; B:75%) and HDA (A:58.3%; B:37%)  $p < 0.05$ . In 90% of the cases, MU affected the gastrojejunal anastomosis, which was the most frequent location. The median time to diagnosis was 13 months (IQR: 7-21) after surgery. The presence of gastro-gastric fistula was infrequent (9.52%). Isolated medical treatment with PPI (57%) in monotherapy or in association with sucralfate (43%) was effective in 61.90% of patients. The remaining 38.10%, in which the treatment was ineffective, required surgical treatment, 53% undergoing gastrojejunal reanastomosis with reduction of the gastric reservoir via laparoscopy, the procedure of choice in most cases (85%). Regarding risk factors, a similar distribution was observed in both groups, finding: a higher prevalence of Helicobacter Pylori infection in group A (53.8%) versus B (37.5%), smoking (A:61%; B:50%), DM-II (A:53%; B:50%) and in SSRI and NSAIDs (A: 61.5% and 23%; B: 37.5% and 0%). However, in group B, the history of previous gastritis (100%) prevailed, as compared to group A (92%), although there were no statistically significant differences. Logistic regression analysis was unable to establish an association between the described risk factors and the development of MU.

## Discussion

The incidence of MU as detailed in the literature, is highly variable, with some studies describing 0.16% while others find a maximum of 30%; in our study the rate is approximately 2%. This could be because not all patients with clinical epigastralgia undergo gastroscopy procedures, but instead, treatment with PPI is initiated or intensified. In case of the persistence of clinical or partial responses, endoscopy may be performed. Another reason could be a lack of follow-up. In relation to the pathophysiological mechanism, this remains difficult to elucidate, since multiple risk factors have been studied, such as increased gastric acidity present in large gastric reservoirs, exposure to toxic substances (smoking, alcohol, NSAIDs) and H. pylori infection. A factor increasing its incidence is DM II, given its relationship with microvascular disease which causes tissue ischemia, thus delaying the healing of the anastomosis and, secondarily, decreasing vascularization of the rest of the reservoir (8.9) potential etiologies, and efficacy of treatment for patients found to have marginal ulcer. Methods: Patients presenting for upper gastrointestinal endoscopy after Roux-en-Y gastric bypass were included in this study. An institutional review board-approved database was queried for the period 1 June 2010 to 31 August 2011. Subgroup analysis was performed for patients with marginal ulcer. Statistical analysis was performed using PASW version 18 for Windows. Results: During the study period, 455 upper gastrointestinal endoscopies were performed for 328 consecutive symptomatic patients. Marginal ulcer, found in 112 patients (34 %).

Our sample findings are noteworthy in that MU does not appear as late as expected, with most of our patients developing MU between the first and second year following BGYR. This could suggest that etiopathogenesis was also more related to the surgical technique used. The use of a standard size for the preparation of the gastric reservoir, avoiding large quantities (6 cm long x 5 cm wide) or < 50 ml volume, may help prevent acid hypersecretion (8).

Conservative management treatment was effective in over 62% of our sample, less than expected as compared to other studies, probably because in our center the diagnosed MU are found in patients having persistent symptoms, and therefore, the treatment was effective, with a lower probability of a favorable medical therapeutic response. Patients with unfavorable medical evolution required

revision surgery, with the most frequently used technique being gastrojejunal reanastomosis with reduction of gastric reservoir by laparoscopy (2.5).

## Conclusion

MU secondary to bariatric surgery is a rare complication that occurs early on after the procedure. Predictors of MU treatment response have not been determined. Therefore, it is essential to establish the risk factors associated with their pathogenesis, especially modifiable ones, to promote their prevention.

## Thank you

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