

Two Important Criteria for Reducing the Risk of Postoperative Ulcers at the Gastrojejunostomy Site after Gastric Bypass: Patient Compliance and Type of Gastric Bypass

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Keywords

Roux-en-Y gastric bypass · B-II gastric bypass · Ulcer · Gastrojejunostomy · *Helicobacter pylori* · Nicotine · Alcohol · NSAIDs

Summary

Background: Ulcers at the gastrojejunostomy site are a common problem after gastric surgery. Their postoperative development seems to be associated with *Helicobacter pylori*-related gastritis or abuse of nicotine, alcohol or non-steroidal anti-inflammatory drugs (NSAIDs), but is also dependent on the choice of surgical method (Roux-en-Y or B-II gastric bypass). **Patients and Methods:** This study evaluated the follow-up of 1,908 patients over a period of 5 years (January 2006 to December 2010). In 1,861 cases, we performed a Roux-en-Y gastric bypass, and in 47 cases a B-II gastric bypass. **Results:** All patients (n = 407) with symptoms such as dysphagia, reflux, nausea, vomiting or epigastric pain underwent gastroscopy. In 52 cases, ulcers were found at the gastrojejunostomy site. Of these patients, 39 (75%; p < 0.0001) had consumed alcohol, nicotine or NSAIDs; in 14 patients (27%; p < 0.0001) we detected *H. pylori*-related gastritis. A total of 2.4% of the patients after Roux-en-Y gastric bypass (45/1,861) and 14.9% of the patients after B-II gastric bypass (7/47) developed ulcers at the gastroenteral junction. The difference is clearly significant (Fisher's exact test, p = 0.0002). Furthermore, there were significant differences regarding the recurrence rate: 86% of the B-II gastric bypass group and 13.3% of the Roux-en-Y gastric bypass group needed to be treated several times. **Conclusions:** Every patient needs to be informed preoperatively that there is a markedly increased risk of ulcers at the gastroenteral junction, particu-

larly if the patient cannot avoid potential risk factors (nicotine, alcohol, NSAIDs). Preoperative gastroscopy with *H. pylori* testing and subsequent eradication can also reduce the risk of ulcers. An increased incidence of peptic ulcers after B-II gastric bypass was noted. All of these patients were converted to Roux-en-Y.

Introduction

An ideal management of super-obese patients does not exist, but gastric bypass is one of the most common procedures with the best results concerning efficacy, morbidity and mortality [1–7]. If a decision for gastric bypass is made after the relevant preoperative diagnostics (body mass index, comorbidities, diabetes mellitus), the surgeon has a choice between Roux-en-Y and B-II gastric bypass. Compared to Roux-en-Y, the B-II gastric bypass (also known as mini gastric bypass, one-anastomosis gastric bypass, Rutledge bypass) has a lower complication rate, and is technically simple and almost as effective [8–10]. Particularly in super-obese patients with less space in the abdominal cavity and a fatty omentum, or after various prior surgeries, B-II gastric bypass is recommended [11]. In these situations, a more tubular, low-capacity pouch is created, which is connected to a loop of jejunum 200 cm distal to the ligament of Treitz. Both anastomoses (Roux-en-Y, B-II) are linearly stapled and closed with absorbable sutures. However, despite its near perfect results, ulceration at the gastrojejunostomy site is a well-recognized problem after Roux-en-Y gastric bypass surgery. The ulcer incidence ranges between 1 and 20% in the scientific litera-

ture [12–16]. Studies concerned with the gastric resection analogue Billroth II have already demonstrated the ulceration risk of that surgery and its association with acidity [17–20]. Understandably, common factors associated with stomal ulceration are pouch size, peptic acid production, pouch orientation, staple line integrity, mucosal ischemia, and suture material [14, 16, 21, 22]. Other widely discussed risk factors, which are mostly regarded as contributors, are consumption of alcohol or nicotine, non-steroidal anti-inflammatory drugs (NSAIDs), and *Helicobacter pylori*-associated gastritis in the preoperative course [14, 15].

Patients and Methods

The follow-up examinations of 1,908 patients, who underwent gastric bypass surgery between January 2006 and December 2010, were evaluated. Data was collected prospectively using a questionnaire which encompassed consumption of alcohol, nicotine, NSAIDs, results of preoperative *H. pylori* testing, general condition, and type of surgery (B-II/Roux-en-Y gastric bypass). Both types of surgery were performed in a standardized manner. In all cases, the gastrojejunostomy was completed by linear stapling, and the ventral wall approach was closed with absorbable material. The final decision regarding the type of gastric bypass was made applying the above mentioned criteria. A total of 1,861 patients underwent Roux-en-Y, and 47 patients B-II gastric bypass. *H. pylori* was eradicated in the preoperative course, and all patients remained under proton pump inhibitor therapy for the first 6 weeks after surgery. In the follow-up examination, each patient was seen by a multidisciplinary team (nutritionist, bariatric nurse, surgeon). Patients that suffered from symptoms such as dysphagia, reflux, nausea, emesis, and epigastric pain were referred to undergo gastroscopy. For statistical analysis, comparisons were made with Fisher's exact test. P values < 0.05 were considered to be significant.

Results

In 4 cases, a laparoscopy was carried out due to perforated ulcers. The other 403 patients with symptoms underwent a gastroscopy. In 52 patients, ulceration at the gastrojejunostomy site was found (ulcer rate 2.6%). 39 (75%) of the patients with stomal ulceration consumed alcohol, nicotine or NSAIDs ($p < 0.0001$). *H. pylori*-associated gastritis was found in 14 (27%) patients ($p < 0.0001$). A clearly significant difference ($p = 0.0002$) was detectable when comparing the ulcer rates of both types of surgery; 2.4% of patients after Roux-en-Y (45/1,861) and 14.9% of patients after B-II gastric bypass (7/47) developed ulceration at the gastrojejunostomy site. Clearly significant differences were also found for the recurrence rate; 13.3% of patients after Roux-en-Y and 86% of patients after B-II gastric bypass needed to be treated several times.

Discussion

Without a doubt, ulceration at the gastrojejunostomy site is a clinical problem leading to discomfort and even bleeding or

perforation. In our study, the ulceration incidence at the gastrojejunostomy site was 2.6% (52/1,908 patients). This study supports the thesis that the development of ulcers is related to the abuse of nicotine, alcohol or NSAIDs [14, 15], and among all identified ulceration patients we calculated an incidence of 75% ($p < 0.0001$). 39 of 52 patients either smoked cigarettes or drunk alcohol or took NSAIDs. Although there are certain doubts regarding the destructiveness of these factors [21], the incidence in this study is quite significant. Some authors discuss irreversible damage to the mucosal barrier due to *H. pylori* as a causal factor, even when the patient has been medically treated [15]. This suspicion is supported by our study, since 14 (27%) of 52 patients ($p < 0.0001$) suffered from stomal ulceration even after *H. pylori* had been eradicated. On the other hand, the most reviewed and ascertained pathognomonic factor for ulceration at the gastrojejunostomy site is local acidity [14, 16, 21] which is influenced by the interrelation of pouch size/form and acid production [14, 21] and the existence of biliopancreatic reflux [23]. In this study, the B-II gastric bypass was created with a more tubular pouch. The most effective area of acid production is located in the body of the stomach. This translates into higher acidity after B-II gastric bypass (due to elevated acid production and biliopancreatic reflux) based on it being a one-loop and one-anastomosis method. Relating to this, we detected a clearly significant difference in ulceration rate between the two operative methods (2.4% after Roux-en-Y and 14.9% after B-II gastric bypass). The problem of recurrent ulceration after gastric surgery has been known since the introduction of Billroth I, II, and Roux-en-Y anastomosis after gastric resection to treat peptic ulcer disease. The high risk for recurrent ulceration at the gastrojejunostomy site is highlighted in this study by the 86% of patients that needed to be treated several times after B-II gastric bypass. However, the operative method plays an important role concerning the postoperative ulceration risk.

Conclusion

Roux-en-Y gastric bypass is considered by many surgeons to be the gold standard for obesity treatment, but the 'sine qua non' for successful gastric surgery is patient compliance. Besides the marginal changes in nutrition, patients need to be informed in the preoperative course that there is a significantly increased risk of complications after surgery if potential risk factors such as nicotine, alcohol or NSAIDs are not avoided lifelong. Furthermore, preoperative gastroscopy with *H. pylori* testing and subsequent eradication should be performed by all bariatric centers, as the bacterium seems to potentiate marginal ulcer formation. We perform B-II gastric bypass only in selected patients with corresponding conditions and a need for combined restrictive and malabsorptive intervention. We accept the disadvantage of a higher ulceration

rate to reduce the surgery risk. Acidity has been found to be a causal factor contributing to stomal ulcer. Therefore, all our patients receive proton pump inhibitors over 6 weeks after surgery. If a patient develops ulceration, he/she is converted to a Roux-en-Y situation after successful weight loss.

Disclosure Statement

The author declared no conflict of interest.

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