Acute upper gastrointestinal bleeding in operated stomach: Outcome of 105 cases

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Abstract

AIM: To compare the causes and clinical outcome of patients with acute upper gastrointestinal bleeding (AUGB) and a history of gastric surgery to those with AUGB but without a history of gastric surgery in the past.

METHODS: The causes and clinical outcome were compared between 105 patients with AUGB and a history of gastric surgery, and 608 patients with AUGB but without a history of gastric surgery.

RESULTS: Patients who underwent gastric surgery in the past were older (mean age: 68.1±11.7 years vs 62.8±17.8 years, \(P = 0.001\)), and the most common cause of bleeding was marginal ulcer in 63 patients (60%). No identifiable source of bleeding could be found in 22 patients (20.9%) compared to 42/608 (6.9%) in patients without a history of gastric surgery (\(P = 0.003\)). Endoscopic hemostasis was permanently successful in 26 out of 35 patients (74.3%) with peptic ulcers and active bleeding or non-bleeding visible vessel. Nine patients (8.6%) were operated due to continuing or recurrent bleeding, compared to 23/608 (3.8%) in the group of patients without gastric surgery in the past (\(P = 0.028\)). Especially in peptic ulcer bleeding patients, emergency surgery was more common in the group of patients with gastric surgery in the past [9/73 (12.3%) vs 19/360 (5.3%), \(P = 0.025\)]. Moreover, surgically treated patients in the past required more blood transfusion (3.3±4.0 vs 1.5±1.7, \(P = 0.0001\)) and longer hospitalization time (8.6±4.0 vs 6.9±4.9 d, \(P = 0.001\)) than patients without a history of gastric surgery. Mortality was not different between the two groups [4/105 (3.8%) vs 19/608 (3.1%)].

CONCLUSION: Upper gastrointestinal bleeding seems to be more severe in surgically treated patients than in non-operated patients.

Key words: Operated stomach; Active bleeding; Endoscopic hemostasis

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INTRODUCTION

Surgical management of peptic ulcer diseases has steadily decreased over the past 20 years. Several therapeutic improvements, such as the widespread use of acid suppressive drugs and the eradication of Helicobacter pylori, are responsible for this decrease[4-6]. Upper gastrointestinal bleeding, however, remains a common emergency situation presenting a high rate of morbidity and mortality[4-6]. This, despite the introduction and wide application of endoscopic hemostasis, has significantly reduced the need for emergency surgical hemostasis and improved the mortality and morbidity in these patients[7-11]. High or subtotal gastrectomy and antrectomy supplemented with vagotomy have been successfully applied in the past to the treatment of bleeding peptic ulcer. Anastomotic ulcer is a post-gastrectomy complication and bleeding of such an ulcer is a particularly frightening complication. Several factors mainly related to surgical inadequacies or uncommonly to the presence of ectopic hormone-producing tumors, are associated with the formation of an anastomotic ulcer after gastric surgery[12,13]. Few reports are available on the role of endoscopic hemostasis in active ulcer bleeding.

The purpose of this study was to compare the outcome between patients with a history of gastric surgery and active bleeding anastomotic ulcers and those with active upper gastrointestinal bleeding but without gastric surgery in the past.

MATERIALS AND METHODS

During the last 5 years, 105 patients with a history of gastric surgery and active upper gastrointestinal bleeding (AUGB) were admitted to our hospital. The outcome of this group of patients was compared to 608 patients with AUGB but without a history of gastric surgery. No patient was excluded because of age or concurrent diseases. Patients presented with hematemesis and/or melena, as well other clinical or laboratory evidence of acute blood loss, and those with iron deficiency anemia and history of gastric surgery who reported melena and/or hematemesis were included in this
study. All patients underwent emergency endoscopy either during the first 24 h after admission or immediately after resuscitation in case of massive bleeding. Three senior gastroenterologists performed all endoscopic examinations. Pre-medication included local pharyngeal anesthesia with xylocaine spray. Stigmata of active or recent bleeding were classified according to the Forrest classification[15]: Forrest Ia: active spurring bleeding; Ib: active oozing bleeding; IIa: non-bleeding visible vessel (NBVV); IIb: adherent clot; and IIc: spots. A NBVV was defined as a raised, red spot resistant to washing. Endoscopic injection hemostasis with adrenaline diluted at 1:10 000 in 0.9% saline (A/S) and/or end or clips were performed on all patients with active spurring or oozing bleeding or NBVV.

Endoscopic A/S hemostatic injections were performed via the working channel of an endoscope using a disposable injector. The injections were administered into the ulcer base in a circumferential fashion as close as possible to the visible vessel. As a routine, a total of 15 mL was injected, approaching to 30 mL was injected when control of bleeding was not easily achieved. Marginal ulcer was defined as the recurrent ulceration at or around the gastro-jejunal stoma or within the afferent or efferent loop.

After endoscopic hemostasis, patients were carefully observed and managed by the same medical team of gastroenterologists and surgeons. Blood pressure and pulse rate were checked before endoscopy, during and after injection therapy. After hemostasis, all patients with peptic ulcer bleeding routinely received intravenously the standard doses of proton pump inhibitors (omeprazole 40 mg/d). Blood transfusion was given, if Hb was less than 100 g/L and if there were signs of ongoing bleeding. After early stabilization of the patients, recurrence of bleeding was considered when vomiting of fresh blood and signs of massive melena were found in conjunction with either shock or decrease in hemoglobin concentration by at least 20 g/L over a 24-h period. In case of re-bleeding, endoscopy was repeated and in most cases, a second endoscopic hemostasis either by A/S injection, or by placement of endoclips was carried out. Although the criteria for emergency surgical hemostasis were individualized, in most cases patients received emergency surgery when bleeding was not controlled after endoscopic hemostasis and transfusion of more than 5 U of blood over a 24-h period or 12 U over 48 h, and when intra-hospital re-bleeding occurred while on sufficient medical treatment with hemodynamic evidence of shock (systolic pressure <100 mmHg, pulse rate >100/min).

After discharge, all patients were routinely followed up. A second endoscopy with biopsies was performed after 4-6 wk and if the ulcer was completely healed, a third endoscopy was performed after 1 year.

The patient’s age, sex, type of gastric operation, previous consumption of non-steroidal anti-inflammatory drugs (NSAIDs), clinical presentation, initial hemodynamic status, hemoglobin at admission, endoscopic findings, number of blood transfusions, days of hospital stay and clinical outcome were also analyzed.

Differences between groups were tested for significance. Continuous variables were expressed as mean±SD and compared using Student’s t test. Categorical variables were expressed as percentages and compared using χ² test. A P value less than 0.05 was considered statistically significant. Statistical analysis was performed using SPSS version 10.0 for Windows.

RESULTS
A total of 105 patients (96 men and 9 women, mean age 68.1±11.7 years) with a history of gastric surgery were admitted to our hospital due to AUGC. The investigated parameters in this patient group were compared to those in the well-matching group of patients with AUGC but without gastric surgery in the past and the cause of bleeding was due to a benign peptic ulcer. Table 1 provides an overview of the clinical characteristics and emergency endoscopic findings in both patient groups. A marginal ulcer with endoscopic stigmata of hemorrhage was identified in 63 patients (60%) in the first group. Endoscopy failed to show any source of bleeding in 22 patients (21%) and none of these patients received a new surgical intervention for severe bleeding. Spurting bleeding was identified in 10 (13.7%), oozing bleeding in 7 (9.6%) and NBVV in 18 (24.6%) patients (Table 2). Endoscopic hemostasis was permanently successful in 26 out of 35 (74.3%) patients. Twelve patients underwent a second endoscopic hemostasis with injection of A/S and/or endoclips because of re-bleeding while four patients with re-bleeding did not undergo second endoscopic injection therapy or any other hemostatic treatment. Emergency surgical hemostasis for persistent or recurrent bleeding was required in 9 out of 105 patients (8.6%) and in 9 out of 73 patients (12.3%) with peptic ulcer bleeding (Table 3). Four patients died (3.8%), two of them died after surgery with a post-surgical mortality of 22.9%. Causes of death were respiratory failure (n = 2, one of them preoperatively), cerebral ischemia (n = 1, the patient died post-operatively) and hemorrhagic shock (n = 1, the patient died pre-operatively).

| Table 1 Characteristics of patients recruited in the study |
|----------------------------------------------------------|
|                                                        |
| Gastric surgery in the past n = 105 group A, n (%)       |
| No surgery in the past n = 608 group B, n (%)            |
| P                                                        |
| Age (yr)                                                 |
| 68±11.7                                                  |
| 62±17.8                                                  |
| 0.001                                                    |
| Sex: men/women                                          |
| 96/9                                                     |
| 470/138                                                  |
| 0.0009                                                   |
| NSAIDs                                                  |
| 41/105                                                   |
| 398/608                                                  |
| <0.0001                                                  |
| Ht at admission (%)                                     |
| 27.9±6.5                                                 |
| 26.9±7.8                                                 |
| NS                                                      |
| Gastric ulcers                                          |
| 0                                                        |
| 141 (23.1)                                               |
| Dusenadal ulcers                                        |
| 9 (1.6)                                                  |
| 219 (35.3)                                               |
| 0.00019                                                  |
| Marginal ulcers                                         |
| 63 (60)                                                  |
| 0                                                        |
| NS                                                      |
| Dieulafoy’s ulcers                                      |
| 1 (1)                                                    |
| 4 (0.7)                                                  |
| NS                                                      |
| Varices                                                 |
| 1 (1)                                                    |
| 83 (13.7)                                                |
| NS                                                      |
| Mallory-Weiss                                          |
| 1 (1)                                                    |
| 31 (5.1)                                                |
| NS                                                      |
| Esophagitis                                             |
| 1 (1)                                                    |
| 8 (1.3)                                                  |
| NS                                                      |
| Gastric cancer                                          |
| 3 (2.9)                                                  |
| 18 (2.9)                                                |
| NS                                                      |
| Erosions                                                |
| 1 (1)                                                    |
| 46 (7.5)                                                |
| NS                                                      |
| None                                                    |
| 22 (20.9)                                                |
| 42 (6.9)                                                |
| 0.0003                                                  |
| Other                                                   |
| 1 (1)                                                    |
| 5 (0.8)                                                  |
| Non-cooperative                                         |
| 1 (1)                                                    |
| 15 (2.5)                                                |

When the results of patients with a history of gastric surgery were compared with those patients who had no
gastric surgery, there was a statistically significant difference in age, consumption of NSAIDs, number of blood transfusions, length of hospital stay, percentage of patients with spurring bleeding and need for surgical intervention (Tables 1-3). In the control group, endoscopy failed to show any source of bleeding in 42 (6.9%) patients (P = 0.0003). Similarly in the control group, the re-bleeding/continued bleeding rate and the mortality rate did not differ statistically from the patients who had gastric surgery in the past. Nineteen patients in the control group (3.1%) died after surgery.

Table 2 Endoscopic stigmata of the patients with bleeding peptic ulcers

|                  | Patients with gastric surgery in the past and benign ulcers n = 73/105, n (%) | Patients without surgery in the past and benign ulcers n = 360/608, n (%) | P     |
|------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------|
| Forrest Ia       | 10 (13.7)                                                                       | 30 (8.3)                                                                 | NS    |
| Forrest Ib       | 7 (9.6)                                                                           | 32 (8.8)                                                                 | NS    |
| Forrest Ila      | 18 (24.6)                                                                         | 63 (18.6)                                                                | NS    |
| Forrest IIB      | 8 (11.0)                                                                          | 33 (10.5)                                                                | NS    |
| Forrest IIC      | 3 (4.1)                                                                           | 41 (11.3)                                                                | NS    |
| Forrest III      | 27 (36.9)                                                                         | 152 (42.2)                                                               | NS    |

Table 3 Outcome of patients recruited in the study

|                  | Patients with surgery in the past total n = 105 benign ulcers n = 73 | Patients without surgery in the past total n = 608 benign ulcers n = 360 | P     |
|------------------|----------------------------------------------------------------------|------------------------------------------------------------------------|-------|
| Blood transfusions| 3.34±4.0                                                             | 1.5±1.7.                                                                | 0.0001|
| Hospital d        | 8.57±4                                                               | 6.86±4.75                                                               | 0.001 |
| Re-bleeding       | 13/105                                                               | 66/608                                                                  | NS    |
| Emergency surgery (overall), n (%)  | 9/105 (8.6)                                                              | 23/608 (3.8)                                                            | 0.028 |
| Emergency surgery, n (%)  (peptic ulcers) | 9/73 (12.3)                                                             | 19/360 (5.3)                                                            | 0.025 |
| Duodenal ulcers   | 1                                                                    | 1                                                                       |       |
| Gastric ulcers    | –                                                                    | 7                                                                       |       |
| Marginal ulcers   | 7                                                                    | –                                                                       |       |
| Dieulafoy’s ulcers| 1                                                                    | 1                                                                       |       |
| Mortality (overall), n (%) | 4/105 (3.8)                                                          | 19/608 (3.1)                                                            | NS    |
| Post-surgical mortality, n (%) | 2/9 (22.2)                                                        | 6/23 (26)                                                               | NS    |

DISCUSSION

Gastric surgery has been successfully used in the treatment of peptic ulcer disease; however, the potential complications after gastric surgery are numerous[13,16]. Ulcer recurrence rate after surgery for peptic ulcer diseases varies according to the nature of the procedure, pathophysiology of the underlying disease, and operator’s skill. One of the major complications is bleeding from marginal ulcers[17,18]. Recurrent ulcers after Billroth II gastrectomy may result in retained antral mucosa in the closed duodenal stump, which can be a source of hypergastrinemia. In patients after vagotomy and pyloroplasty, a recurrent ulcer may be due to an incomplete vagotomy[19,25].

In this study, recurrent ulcers were found in 70% of patients with AUBG after gastric surgery. Marginal ulcer was detected in 63% of patients, while recurrent duodenal ulcer was found in 8.6%. All patients with recurrent duodenal ulcers underwent pyloroplasty and elective vagotomy. Two patients in the group had Dieulafoy’s ulcer. The majority were male and elderly patients. It is well known that patients after partial gastrectomy are at high risk of developing adenocarcinoma[26,27]. In our study, three patients (2.9%) after Billroth II gastrectomy were proved to have adenocarcinoma in the anastomotic area. In patients who had gastric surgery in the past, diagnostic failure at emergency endoscopy for AUBG occurred in 22 patients (21%), and 18 of them underwent a new endoscopy check after 24 h, though it failed to detect any lesions. These patients were admitted because of iron deficiency anemia and reported melena and/or hematemesis. None needed emergency surgical intervention. An explanation for this high incidence of missed lesions at the emergency endoscopy stage is that the presumed lesions are superficial and they heal quickly. Anemia is a sequel of gastrectomy. AUBG was not found in 42 (6.9%) of the control group of patients. According to Cheng et al[27], peptic ulcers including marginal ulcer and Dieulafoy’s lesions are the major missed diagnosis during AUBG. Limited endoscopic vision due to excessive blood and clots is a well-known problem which results in inadequate examination during AUBG.

When the two groups of patients were compared, the upper gastrointestinal bleeding seemed to be more severe in patients with a history of gastric surgery. The need for new surgical intervention was greater in this group. This may be due to the differences in blood supply in the anastomotic area. The marginal ulcer receives blood from the jejunal branches of the superior mesenteric artery or gastric branches of the celiac artery[28]. In this study, the presence of a spurring artery was noted more in patients who had gastric surgery in the past. Similarly, the successful rate of endoscopic intervention was higher in the control group. In a previous study, we also found that an anastomotic ulcer is a factor associated with failure of endoscopic injection hemostasis in bleeding peptic ulcers[29]. A new surgical intervention was required in 8.6% of patients after gastric surgery, compared to 3.8% of patients in the control group who underwent surgical hemostasis. Seven of the nine operated ulcers in the gastric surgery group were marginal ulcers and located mostly at the saddle area of the jejunal loop. The angulation phenomenon characterizing the saddle area makes it a weak point during food impulsion. Furthermore, it also receives the last supply of blood[29]. Whether blood supply or other aggressive factors attribute to the development of resistant bleeding marginal ulcers needs to be confirmed. The mortality rate (overall and post-surgery) was the same in the two groups.

In conclusion, upper gastrointestinal bleeding in surgically treated patients seems to be more severe than that in non-operated patients. New surgical intervention is a significant challenge, not only because of the technical difficulties of a further operation, but also because of the requirement of a more radical procedure. More studies are required to confirm our findings.

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