Heater probe thermocoagulation for high-risk patients who show rebleeding from peptic ulcers

Yu-Hsi Hsieh, Hwai-Jeng Lin

Abstract

Aim To investigate whether heater probe therapy is effective for patients showing rebleeding from peptic ulcers.

Methods We retrospectively reviewed the case profiles in our previous studies on endoscopic therapy for high-risk patients with peptic ulcer bleeding in the past two decades. We analysed the outcomes of 191 patients who showed rebleeding after initial endoscopic haemostasis and received endoscopic therapy with heater probe thermocoagulation.

Results A total of 191 patients showing rebleeding received heater probe thermocoagulation. After re-therapy, 158 patients (82.7%) achieved ultimate haemostasis. Twenty-five of the 33 patients who failed to achieve haemostasis received surgical intervention. Ten patients (5.2%) died within 1 month after re-therapy.

Conclusion Heater probe thermocoagulation can be used as the first choice for management of patients showing rebleeding after initial endoscopic therapy.

Bleeding peptic ulcers remain a serious medical problem and are associated with significant morbidity and mortality. Endoscopic therapy significantly reduces the possibility of further bleeding, the need for surgery, and the rate of mortality in patients with bleeding peptic ulcers and this technique is now recommended as the first haemostatic modality for these patients.\(^1,2\)

Although a high initial haemostatic rate can be obtained with endoscopic therapy, rebleeding occurs in 10% to 30% of these patients.\(^2-5\) Rebleeding has been confirmed as the most important prognostic factor in these patients.\(^6,7\) Thus, if rebleeding is prevented, the mortality rate will reduce accordingly.

The ideal therapy for patients showing rebleeding has not been identified to date. Endoscopic retreatment, arterial embolisation, and surgery have been attempted with variable success rates.\(^3,5,8,9\) Endoscopic retreatment seems to be more easy to perform and more cost-effective than the other two therapies.

In this study, we retrospectively analysed 191 rebleeders who showed rebleeding after initial endoscopic haemostasis and received endoscopic re-therapy with heater probe thermocoagulation.\(^10-19\)

Methods

We retrospectively reviewed the case profiles of our previous studies on endoscopic therapy for high-risk patients with peptic ulcer bleeding in the past two decades. All these studies were approved by the Clinical Research Committee of the Veterans General Hospital, Taipei, Taiwan.
Patients underwent endoscopic therapy if a peptic ulcer with active bleeding or a nonbleeding visible vessel (NBVV) was observed within 12 h of hospital admission. Patients with an NBVV had to show one of the following signs of recent bleeding: "coffee grounds" or blood in the stomach or duodenum; shock; or initial Hb <10 g/L. The possibility of endoscopic therapy was discussed with patients and/or their relatives and written informed consent was obtained before the trial.

Patients were excluded from the study if they were pregnant, did not give written informed consent, or had a bleeding tendency (platelet count <50 x 10^9/L, serum prothrombin <30% of normal, or were taking anticoagulations), uremia, or bleeding gastric cancer.

For the enrolled patients, heater probe thermocoagulation, endoscopic injection with diluted epinephrine (1:10000), pure alcohol (99.8%), 3% saline solution, or 50% glucose/water, multipolar electrocoagulation, and haemoclips placement were used according to the protocols employed in respective studies.10–19

Patients’ vital signs were checked every hour for the first 12 h, every 2 h for the second 12 h, and every 4 h for the following 24 h until they became stable, then four times daily. The haemoglobin level and hematocrit were checked at least once daily, and a blood transfusion was given if the haemoglobin level decreased to lower than 90 g/L or if the patient’s vital signs deteriorated. The attending physicians or surgeons were made aware of the exact endoscopic finding and treatment given each case.

Active bleeding was defined as a continuous blood flow spurting or oozing from the ulcer base. An NBVV at endoscopy was defined as a discrete protuberance at the ulcer base that was resistant to washing and was often associated with the freshest clot in the ulcer base. Shock was defined as systolic blood pressure lower than 100 mmHg and a pulse rate of more than 100/minute accompanied by cold sweats, paleness, and oliguria. Initial haemostasis was defined as no visible haemorrhage lasting for 5 minutes after endoscopic therapy. Ultimate haemostasis was defined as no rebleeding within 30 days after endoscopic therapy. Rebleeding was suspected if unstable vital signs, continuous tarry, bloody stools, or a drop in the haemoglobin level of more than 20 g/L within 24 h was observed during hospitalisation.

For patients with suspected rebleeding, an emergency endoscopy was performed immediately. Rebleeding was diagnosed if we found blood in the stomach 24 h after therapy or if a fresh blood clot or bleeding in the ulcer base was found. For ethical reasons, we discussed treatment regimens with the patients who showed rebleeding.

Therapeutic options included a second haemoclip placement, injection, heat probe thermocoagulation, electrocoagulation, embolisation, or surgery. One biopsy specimen from the gastric antrum was obtained for a rapid urease test. Patients who had a positive urease test received a 1-week course of esomeprazole (40 mg twice daily), clarithromycin (500 mg twice daily), and amoxicillin (1 g twice daily) after discharge. Rockall score was recorded for each patient in this study.20

At study entry, the following data were recorded: age, sex, the location of the ulcer (oesophagus, stomach, duodenum, or gastrojejunal anastomosis), ulcer size, the appearance of gastric contents (clear, coffee grounds, and blood), stigmata of bleeding (spurting, oozing, and NBVV), volume of blood transfusion, presence of shock, initial haemoglobin, nonsteroidal anti-inflammatory drug ingestion, cigarette smoking, wine drinking, and comorbid illness.

The primary end points were haemostatic efficacy and recurrent bleeding after a second therapy within 30 days. At day 30, volume of blood transfused, number of surgeries performed, hospital stay and the mortality rates were assessed.

Results

In the past two decades, we have conducted numerous studies concerning peptic ulcer bleeding.10–19 A total of 1663 patients of high-risk peptic ulcer bleeding received various endoscopic therapies (injection with diluted epinephrine, normal saline, 3% saline, 50% glucose/water, pure alcohol, heater probe thermocoagulation, multipolar electrocoagulation, and haemoclips placement). Among them, 288 patients (17.3%)
rebled. After having discussed the options with the patients or their family members, we treated 191 of these patients with heater probe thermocoagulation.

The male to female ratio was 164:27. Age was 65.7±1.08 years (mean±SEM). The initial haemoglobin was 9.1±0.2 g/dL (mean±SEM). The ulcer size was 1.0±0.11 cm (mean±SEM). The gastric contents were clear in 10 patients, coffee grounds in 80 patients and blood clots in 101 patients.

The location of bleeders was as follows: duodenal bulb, 76 patients (39.8%); antrum, 22 patients (11.5%); gastric body, 65 patients (34%); anastomotic site, 13 patients (6.8%); and fundus, 15 patients (7.9%). The ulcer bases showed spurting haemorrhage in 55 patients (28.8%), oozing haemorrhage in 57 patients (29.8%) and NBVV in 79 patients (41.4%). At presentation, shock was observed in 90 patients (47.1%). Comorbid illness occurred in 139 patients (72.8%). The Rockall score was 6.42±0.51 (mean±SEM).

After re-therapy, 158 patients (82.7%) achieved ultimate haemostasis. Total volume of blood transfusion was 2777±173 ml (mean±SEM). The hospital stay was 6.62±0.35 days (mean±SEM).

Thirty-three patients showed continued bleeding after heater probe thermocoagulation. Twenty-five of them (25/191, 13.1%) received surgical intervention, two died of postoperative complication. Three of them received multipolar electrocoagulation and achieved ultimate haemostasis. Five others received supportive management because of poor underlying illness and died thereafter. There was no case with perforation after re-treatment.

Eight patients died of unrelated illness (hepatoma, two cases; aspiration pneumonia, four cases, renal abscess, one case, and cerebrovascular accident, one case). Thus, 10 patients (5.2%) died within 1 month after re-therapy.

Discussions

In this study, we enrolled 191 patients who showed rebleeding after initial endoscopic therapy. They received a back-up therapy with heater probe thermocoagulation in the past 20 years. Ultimate haemostasis was achieved in 158 patients (82.7%), thereby, proving that heater probe thermocoagulation is an effective rescue therapy for patients who show rebleeding after initial endoscopic therapy. Our result is better than that reported by other authors.

Who is prone to rebleeding after initial endoscopic therapy? Elmunzer et al reviewed 10 prospective studies that evaluated predictive factors for endoscopic failure. The authors based their findings on the frequency of rebleeding and the statistical strength of various factors, and they found haemodynamic instability, active bleeding, large ulcer size, and posterior duodenal location appear to be the most important predictors for rebleeding. Large ulcers located over the posterior wall of duodenum or lesser curvature of the high body are likely to erode into large artery complexes, thereby limiting the efficacy of endoscopic therapy.

For patients who rebleed after initial endoscopic therapy, the choice between a second endoscopic attempt and immediate surgery is a matter of debate. Such patients are often elderly with comorbid illnesses and they are likely to benefit if a second
successful endoscopic therapy is obtained. A recent consensus recommends a second attempt at endoscopic therapy in the cases of rebleeding.\textsuperscript{23}

Repeat endoscopic therapy may incur the risk of gastrointestinal perforation the initial therapy due to accumulated tissue injury. Lau et al reported that two patients suffered from gastrointestinal perforation in their studies.\textsuperscript{21} We did not observe perforation in any patient after re-treatment.

Lau et al compared efficacies of endoscopic retreatment with surgery in patients in whom bleeding recurred after initial endoscopic therapy.\textsuperscript{21} In a 40-month period, 1169 patients with bleeding peptic ulcers were treated by epinephrine injection followed by thermocoagulation. Ninety-two rebleeders were randomised to endoscopic therapy (N=48) and to surgery (N=44) groups. Endoscopic retreatment was able to control bleeding in 35 (73\%) patients. With intention-to-treat analysis, the endoscopic retreatment and surgery groups did not differ in mortality at 30 days (10\% vs 18\%; \textit{p}=0.37), hospital stay (median, 10 vs 11 days; \textit{p}=0.59), or units of blood transfused (median, 8 vs 7 units; \textit{p}=0.27). However, patients who underwent surgery were more likely to have complications (7 vs 16; \textit{p}=0.03).

The role of surgery has changed in the past two decades, thereby, obviating the need for routing early surgical intervention in patients presenting with acute peptic ulcer bleeding.\textsuperscript{24} Surgery remains an effective therapy for treating selected patients with uncontrolled bleeding or patients who may not tolerate recurrent or worsening bleeding.\textsuperscript{25} Unfortunately, surgery is also associated with a mortality rate as high as 20–40\%.\textsuperscript{9,26} For most patients with recurrent or persistent bleeding, a second attempt at endoscopic therapy is often effective with fewer complication than surgery and is the recommended management.\textsuperscript{22,23,27}

Angiographic embolisation can be recommended as an alternative to surgery for patients in whom endoscopic therapy has failed.\textsuperscript{23,28} Gelatin sponges, polyvinyl alcohol, cyanoacrylic glues, and coils have been used to embolise the vessels feeding bleeding lesions.\textsuperscript{29} Primary rates of technical success range from 52\% to 98\% with rebleeding occurring in about 10\% to 20\% of the patients.\textsuperscript{23}

In the previous retrospective studies, angiographic embolisation has been compared with surgery in terms of rebleeding, morbidity and mortality. Ripoll et al enrolled 70 patients with refractory peptic ulcer bleeding: 31 patients underwent angiographic embolisation and 39 patients received surgery. There were no major differences in rebleeding (29\% vs 23\%) or mortality (26\% vs 21\%).\textsuperscript{30} Eriksson et al enrolled 40 patients receiving angiographic embolisation and 51 patients receiving surgery after failed endoscopic therapy. The 30-day mortality rate was lower in the angiographic embolisation group (3\% vs 14\%).\textsuperscript{28}

Some potential limitations in our study design need to be mentioned. First, this was a retrospective study, therefore, some information may be lacking. Second, this was a non-comparative study. Because of ethical reasons, we had to discuss therapeutic modalities for treating rebleeding with the patients and their family members before therapy. Third, an intravenous bolus followed by continuous infusion of proton pump inhibitor (PPI) therapy should be used to decrease rebleeding and mortality in patients with high-risk stigmata who have undergone successful endoscopic therapy.\textsuperscript{23}
High-dose intravenous PPI therapy (80 mg bolus plus 8 mg/h continuous infusion) reduced the possibility of rebleeding, the need for surgical intervention and the rate of mortality.\textsuperscript{23} Lower doses of PPI reduced rebleeding but yielded no evidence of an effect on mortality.\textsuperscript{23} We regret that in this retrospective study, we used cimetidine, and low- and high-dose PPIs after initial endoscopic therapy depending on the protocols.

In our study, 139 (72.8\%) patients had comorbid illnesses and 90 (47.1\%) patients were in shock at presentation. In spite of these facts, the success rate after re-therapy with heater probe thermocoagulation was good. In addition, this is the biggest study on re-therapy for patients showing rebleeding after initial haemostasis, and the results of this study should be accessible to all gastroenterologists.

In conclusion, heater probe thermocoagulation can be used as the primary therapy for patients showing rebleeding after initial endoscopic therapy.

**Competing interests:** None.

**Author information:** Yu-Hsi Hsieh, Staff, Division of Gastroenterology, Department of Medicine, Buddhist Dalin Tzu Chi General Hospital, Chia-Yi and Buddhist Tzu Chi University, School of Medicine, Hwalien, Taiwan; Hwai-Jeng Lin, Professor, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Taipei Medical University Hospital and School of Medicine, Taipei Medical University, Taipei, Taiwan

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**Correspondence:** Hwai-Jeng Lin, Division of Gastroenterology and Hepatology, Department of Internal Medicine, Taipei Medical University Hospital, No. 252, Wuxing St., Taipei 11031, Taiwan. E-mail: buddhistlearning@gmail.com

**References:**


