ORIGINAL ARTICLE

Bleeding Peptic Ulcer: Experience with Endoscopic Therapy

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Summary

Bleeding is a serious complication of peptic ulcer and mortality rate has remained at approximately 10% or more. Traditionally surgeons selected patients who were at significant risk of continued or re-bleeding and advocated early surgery. However, patients with bleeding peptic ulcers are generally elderly with coexisting medical illness and surgery results in significant morbidity and mortality. In the last decade, endoscopic haemostatic therapy has been effective in arresting the bleeding with surgical option considered only after endoscopic treatment has failed. We report the outcome of 196 patients who were endoscopically diagnosed to have bleeding from peptic ulcers. One hundred and thirty patients were diagnosed to have active bleeding or recent bleed from the ulcer. Endoscopic adrenaline injection therapy was used in 53 patients who had active bleeding ulcers and another 77 patients with endoscopic evidence of recent bleed. The injection therapy was successful in 127 (97.7%) patients. The treatment failed in three patients and they underwent urgent surgery. Re-bleeding occurred in 26 (20.5%) patients and endoscopic adrenaline therapy was repeated in these cases. Haemostasis was achieved in 19 patients, however 7 patients continued to bleed and required surgery. There were 3 deaths, principally from advanced age and coexisting medical illness. Endoscopic therapy for bleeding peptic ulcers is simple to apply, safe and effective. In cases of re-bleeding after initial endoscopic hemostasis, re-treatment is a preferable alternative to surgery. The role of surgery is limited to bleeding that is refractory or inaccessible to endoscopic control.

Key Words: Bleeding peptic ulcer, Adrenaline injection, Haemostasis, Simple and effective

Introduction

Despite the availability of effective peptic ulcer treatment, hospital admissions for ulcer bleeding have not decreased during the last three decades, and mortality rate has remained at approximately 10% or more in most published series[1-3]. Traditionally, the responsibility for the initial diagnosis and treatment of bleeding peptic ulcers belonged to general surgeons. Surgeons selected patients who were at significant risk of continued or re-bleeding and advocated early surgery [4-6]. However, patients with bleeding peptic ulcers are generally elderly with coexisting medical illness and surgery in them results in significant morbidity and mortality [7,8]. In the last decade,

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there has been a remarkable transition from surgical to endoscopic management of bleeding ulcers made possible by rapid advances in the application of endoscopy as a therapeutic tool [9-12]. Endoscopic haemostatic therapy has been shown to stop bleeding and reduce the risk of further hemorrhage and option for surgery is considered only after endoscopic treatment has been attempted.

We examined the outcome of consecutive patients admitted for upper gastrointestinal bleeding over a 1-year period to a surgical unit that practiced endoscopic haemostasis as initial therapy.

Materials and Methods

All patients with upper gastrointestinal bleeding requiring admission were admitted to a single unit in Ipoh Hospital and managed according to a defined protocol. The patients underwent a clinical evaluation and resuscitation to restore hemodynamic stability. The endoscopic treatment was discussed with the patients and their relatives and patients who were unable or unwilling to give a written consent were excluded from the study. The patients underwent endoscopy within 6 hours of admission. Patients who were actively bleeding were treated on an emergency basis and endoscoped urgently.

The study patients were selected at endoscopy, and only patients with endoscopic evidence of peptic ulcer were included. Patients with more then one source of bleeding or suspicion of malignancy were excluded.

Specialists trained in endoscopy performed the procedures and Forrest classification was used to classify the endoscopic signs of the bleeding ulcers[13] The treatment protocol used is shown in Table I. Endoscopic application of haemostasis was adopted for the peptic ulcers with evidence of recent bleed or active bleeding at endoscopy. Loose blood clots were flushed out, while the adherent clots were left alone. Injection therapy with adrenaline (1:10,000 dilution) was applied to ulcers, that were actively bleeding, or with evidence of recent bleed (Forrest classification Ia, Ib, IIa, IIb). The adrenaline was injected in 0.5 to 1 ml aliquots with a total volume up to 10 ml., around and into the bleeding point until the bleeding ceased. Haemostatic clips (Olympus haemostatic clip application) were used if there was a visible vessel that was actively bleeding.

Patients with peptic ulcers classified as Forrest Ia, Ib, IIa and IIb on endoscopy were considered to be at risk of re-bleeding and nursed in the high dependency unit and closely monitored for at least 48 hours.

Re-bleeding was considered if there was fresh hematemesis, malena or hemodynamic instability after the initial stabilization. These patients were subjected to urgent repeat endoscopy and the ulcer was treated as per protocol.

Endoscopic technique was deemed unsuccessful if one of the following events occurred:

a) When there was failure of endoscopic haemostasis in active arterial bleed.
b) Technical difficulties in applying endoscopic technique.
c) When there was re-bleed after two successful attempts at endoscopic haemostasis.

Patients who failed endoscopic treatment were submitted to emergency surgery that most often consisted of under-running of ulcers. Patients were discharged if clinically there was no evidence of further bleed and patient was stable.

Table I: Forrest Classification of Stigmata of Haemorrhage and Endoscopy Therapy.

Type	Stigmata of haemorrhage	Description	Endoscopy therapy
Forrest I a	Spurting arterial bleeding	Active bleeding	Clips / Adrenaline injection
Forrest I b	Oozing bleed	Active bleeding	Adrenaline injection
Forrest II a	Non-bleeding visible vessel	Recent bleed	Adrenaline injection
Forrest II b	Adherent blood clot	Recent bleed	Adrenaline injection
Forrest III	Clean based ulcer	No bleed	No Treatment

Data analysis was performed using Epi Info 2000 stastical package.

Results

Characteristics of patients

A total of 385 patients were admitted and endoscoped for upper gastrointestinal bleeding for the period January 1999 to December 1999. One hundred and ninety six patients were diagnosed to have bleeding from peptic ulcers and they consisted of 169 male patients and 27 female patients (M: F= 6.3: 1). The age of the patients ranged from 28 to 93 years (mean was 65.3 +/- 12.2 years).

The proportion of bleeding peptic ulcers among the three main ethnic groups in the country was as follows: Chinese 116 (59.1%), Malays 66 (33.7%) and Indians 14 (7.1%). History of non-steroidal anti-inflammatory drug (NSAID) use was elicited in 94 (48.0%) patients, smoking in 73 (37.2%), alcohol in 15 (7.6%) and use of steroids in 13 (6.6%) patients. Seventy-seven (39.3%) of the patients had at least one coexisting medical illness and hypertension and ischaemic heart disease were the most common illness.

The endoscopic features of the bleeding ulcers are shown in Table II. Fifty-three patients (27.0%) had active bleeding ulcers and another seventy-seven patients (39.3%) the ulcers showed evidence of recent bleed at endoscopy. The ulcer was clean based in 66 (33.7%) of the cases. The ulcers were predominately located in the duodenum 85 (43.4%) or the pylorus (38.2%) and 57.7% of the peptic ulcers were more the 1 cm. in size.

Endoscopic haemostasis was applied on 130 patients with stigmata of bleeding (Forrest classification I a, I b, II a and II b). The injection therapy was possible and successful in 127 patients (97.7%). Haemostatic clips had to be used in addition to injection treatment in 10 patients with active arterial bleeding (Forrest I a ulcers). Endoscopic therapy failed in 3 patients, 2 of the patients had deformed and narrowed duodenum and injection therapy was technically difficult, in 1 patient, the duodenal ulcer was more then 2 cm in size and adrenaline injection therapy failed to arrest the bleeding. These 3 patients underwent urgent surgery.

Two of the patients who had successful arrest of the bleeding subsequently died of causes not related to bleeding. Both patients were elderly and had severe multiple co-existing medical problems.

Table II: Characteristics of bleeding ulcers

Characteristics	Number (%)
Endoscopic stigmata	
I a	18 (9.2%)
I b	35 (17.8%)
II a	28 (14.3%)
II b	49 (25.0%)
III	66 (33.7%)
Total	**196 (100%)**
Ulcer location	
Duodenum	85 (43.4%)
Gastric	36 (18.4%)
Pylorus	75 (38.2%)
Ulcer size	
<1cm	83 (42.3%)
1-2 cm	85 (43.4%)
>2cm	28 (14.3%)

Re-bleeding occurred in 26 patients (20.5%), 6 with Forrest I b ulcers, 7 with Forrest II a ulcers and 13 with Forrest II b ulcers. (Table III) Re-bleeding did not occur in patients with a clean base ulcer (Forrest III). Forrest classification of the bleeding ulcers failed to show any statistical significance as a predictive factor when chi-square test was applied (Table IV). Patients with re-bleeding were re-endoscoped, bleeding confirmed and treated according to protocol. Haemostasis was achieved in 19 patients and they were discharged home well. In 7 patients, repeat endoscopic therapy failed and they underwent surgery. Six of these patients recovered well from surgery and went home well, however one of the patients succumbed to severe post-operative pulmonary infection. The therapy possibly caused a perforation of the peptic ulcer in one patient necessitating surgery. He was discharged well after simple closure of the perforation.

Surgery was required in 10 (7.7%) of the 130 patients with endoscopic stigmata of active bleeding or recent bleed. There were 3 deaths in our study, giving an overall mortality rate of 2.3%. Ulcer perforation as a result of the injection therapy occurred in only one patient giving a low complication rate of 0.8%.

Table III: Outcome of active bleeders

Endoscopic classification	No. of patients	Success at Initial haemostasis		Failed Haemostasis /Re-bleeding	
		No.	%	No.	%
Forrest I a	18	15	83.3%	3	16.7%
Forrest I b	35	35	100%	6	17.1%
Forrest II a	28	28	100%	7	21.4%
Forrest II b	49	49	100%	13	26.5%

**Failed Haemostasis at initial therapy*
*** re-bleeding after initial haemostasis*

Table IV: Surgery in bleeding peptic ulcers

Endoscopic classification	No of patients	Surgery
Forrest I a	18	3 (16.7%)
Forrest I b	35	2 (5.7%)
Forrest II a	28	1 (3.6%)
Forrest II b	49	4 (8.2%)

Chi-square=0.489, p=0.484

Discussion

Bleeding from peptic ulcers ceases spontaneously in 70 to 80% of the patients, however the challenge to the clinician is further bleeding that occurs in 20 to 30% [10, 11]. Recurrent bleeding in

these patients may be catastrophic as many are elderly with co-existing medical illness. The College of Surgeons, Malaysia and Malaysian Society of Gastroenterology and Hepatology in their consensus guideline on the management of peptic ulcer have advocated early surgery for patients selected to be at risk of recurrent bleeding [6]. However, this approach will subject the patients to the additional surgical risk. Endoscopic haemostatic therapy, which avoids the complications of surgery, is gaining widespread acceptance as the principle method of treatment of bleeding peptic ulcers[9,12,14-17]. Endoscopic features; active arterial spurting or oozing of blood, non-bleeding visible vessel and adherent clots have been identified as predictors of persistent or recurrent bleeding [18,19]. The endoscopic stigmata are used to determine patients who will benefit from endoscopic therapy. The National Institute of Health (NIH) consensus on therapeutic endoscopy and bleeding ulcers recommends treatment should only be applied in ulcers with high-risk stigmata[9]. In our study, 130 patients had active bleeding or stigmata of recent bleed and they were identified for endoscopy therapy.

Several methods of endoscopic haemostasis are advocated; injection therapy, thermal-contact devices and laser treatment[20-22]. The results of randomized trials, examining the relative effectiveness of each of the treatments also show no conclusive differences between the various treatment modalities [23]. We adopted the injection technique popularized by Chung and co-workers using dilute adrenaline because of the simplicity of application, low cost and good clinical results [20]. It has been reported that the initial rates of haemostasis exceed 96% in patients who receive adrenaline injection alone. The haemostasis in this approach is achieved through a combination of tissue tamponade, vasoconstriction and platelet aggregation [24]. We were able to achieve initial haemostasis in 127 patients (97.7%). Two of the bleeding ulcers were inaccessible for endoscopic injection therapy due to technical difficulties. Variable rates are reported on the failures to apply the endoscopic technique and the expertise of the endoscopist is an important compounding factor [25,26]. Side viewing endoscopes permits excellent view and access to some of the difficult ulcers and we have adopted it for technically challenging cases. Endoscopic therapy failed in only one case and in this situation the ulcer was large and bleeding was significant. Active hemorrhage inaccessible to endoscopic control and bleeding refractory to endoscopic treatment were indications for primary emergency surgery in our study. Only 3 out of 130 patients had primary emergency surgery to control hemorrhage.

The major challenge in applying the endoscopic therapy for bleeding peptic ulcers is that the haemostasis is not permanent in about 15-20% of the cases [26]. The factors identified to be associated with failure of endoscopic therapy include; age, NSAID use, concomitant diseases and endoscopic factors [27-29]. It is important to identify this group of patients for intensive monitoring. We encountered a 20.5% re-bleed rate after initial endoscopic therapy with adrenaline injection. Many surgeons believe that re-bleeding is an indication for surgical intervention. Lau et al compared endoscopic re-treatment with surgery in patients with recurrent bleeding after initial endoscopic control of bleeding ulcers and concluded that endoscopic re-treatment reduces risk of surgery without increasing the risk morbidity or mortality [26]. We chose to repeat the endoscopic therapy for the re-bleeders and achieved satisfactory results. Permanent haemostasis was achieved in 19 out of the 26 re-bleeders and thus avoiding surgery in a substantial number of patients. Various attempts are being made to improve haemostasis and to prevent re-bleeding. Comparative studies of different endoscopic treatments have in general failed to show any superiority of one technique over another. Combination therapy involving injection and thermal techniques is claimed to offer an advantage over single-method therapy 30. While waiting for trials to identify better techniques, improved competency in endoscopic injection therapy can reduce re-bleeding rates.

Meta-analysis have proven that endoscopic treatment is clearly effective and when compared to standard treatment results in reduced rates of recurrent or continued bleeding, emergency surgery, and mortality [23,31]. The report by Chung et al noted that seven out of 10 patients with arterial spurting required surgery if no endoscopic therapy is performed [20]. Endoscopic therapy reduced the need for emergency surgery in this study. The initial endoscopy revealed 18 patients had active arterial spurting (Forrest 1a) and another 35 had actively oozing ulcers on endoscopic examination. Only 3 (17%) patients with active arterial spurting and 2 (6%) with oozing ulcers required surgery. If traditional approach were adopted to treat these patients, most of them would have had urgent surgery. Two deaths occurred in spite of successfully control of the bleeding. Many studies in the past also have observed that a proportion of deaths will occur in patients with severe co-morbidity in whom even minor hemorrhage is poorly tolerated. The fact that peptic ulcer bleeding occurs in the very old or those with severe co-existing medical conditions means some deaths may not be preventable. The overall mortality rate in our study 2% is also lower than many of reports using the traditional approach [3,32]. There are fears that the use of adrenaline will result in necrosis and perforation, however only one of our patient developed this complication.

The endoscopic approach to bleeding peptic ulcers is effective, simple and safe to use. There is a reduction in the rate of emergency surgery and mortality from bleeding ulcers compared to traditional approach. In cases of re-bleeding after initial endoscopic haemostasis, re-treatment is a preferable alternative to surgery. The role of surgery is limited to bleeding that is refractory or inaccessible to endoscopic control. Surgeons must train not only to be competent in performing emergency surgery for bleeding ulcers but also be proficient in endoscopic techniques.

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