Value of a centralised approach in the management of haematemesis and melaena: experience in a district general hospital

R A E Holman, M Davis, K R Gough, P Gartell, D C Britton, R B Smith

Abstract

All patients presenting with acute upper gastrointestinal bleeding between November 1986 and April 1988 were admitted to a centralised joint medical/surgical unit, with a policy of early clinical and endoscopic assessment and rapid surgical intervention in those at high risk. Of the 430 patients admitted 69.5% were over the age of 60 and 30% had significant additional medical conditions. 50.4% were bleeding from peptic ulcers and one third had been taking non-steroidal anti-inflammatory agents. Fifty five patients underwent surgery, which in two thirds was carried out within 24 hours of admission, usually for continued bleeding. In patients with peptic ulcer the operation rate was 21.6%. Overall mortality was 3.7%, and in those with bleeding gastric or duodenal ulcers 5.5%; surgical mortality in the later group was 15.2%. All patients who died had serious concomitant pathology and 87% were over 70 years of age. Adoption of a centralised approach to management of haematemesis and melaena is feasible in a District General Hospital and associated with an improved survival.

Bleeding from the upper gastrointestinal tract is a common medical emergency, but in spite of advances in techniques for diagnosis, resuscitation, and surgical and anaesthetic management, the overall mortality has remained constant over the past three decades at around 10%.¹⁻⁶ We analysed the mortality from upper gastrointestinal bleeding in patients admitted to the Royal United Hospital, Bath, in the years 1981 to 1985 and found rates of 10 to 12%, comparable with the results from other non-specialised centres.^{4,7,8}

A logical approach to management involves admission of patients to a central unit staffed by medical and surgical gastroenterologists to allow prompt resuscitation and evaluation. This, coupled with an aggressive surgical policy in those identified as being at high risk, has been shown to lead to a significant reduction in mortality.^{9,10} The feasibility of such an approach, however, outside a major teaching centre has been questioned. To address this problem we negotiated the agreement of our medical and surgical colleagues to test the applicability and value of such an approach in this district general hospital. In this paper we report the first 18 months experience of such a team approach and conclude that such a policy may readily be applied by adaptation of existing resources, and results in a significant reduction in mortality.

Methods

PATIENTS

All patients admitted to the Royal United Hospital with suspected upper gastrointestinal bleeding are admitted to an 11 bedded ward jointly managed by two physicians and two surgeons with a specialist interest in gastroenterology. Other patients with gastrointestinal problems deemed best managed jointly by physicians and surgeons, generally those with severe inflammatory bowel disease and patients receiving total parenteral nutrition, or short term admissions after oesophageal dilatation or palliative intubation for carcinoma are also accommodated in this unit. Twenty four hour consultant cover is available for clinical and endoscopic assessment, and for all management decisions. Patients with haematemesis and melaena are endoscoped within 24 hours of admission by an experienced endoscopist. A regular ward round at 8.30 am is conducted by a consultant gastroenterologist and the majority of endoscopic assessments are carried out after this in a room adjacent to the ward. The nursing staff rotate through the main endoscopy unit so that they are experienced in endoscopic techniques and the care of the instruments. During the day management is coordinated by one of the three house physicians attached to the medical gastroenterology unit; at night and at weekends the admitting house physician assumes this role.

All patients included in this series had suffered a significant upper gastrointestinal bleed, defined as: (1) a vomit in excess of an estimated 100 ml fresh or altered blood or (2) a definite melaena stool as witnessed by the admitting doctor.

No exclusions have been made for age and all patients deemed unfit for surgery are included if the entry criteria were satisfied.

After initial clinical assessment, including identification of previous drug therapy, early endoscopy is performed. In patients with peptic ulceration a detailed visual assessment of the ulcer crater is made to document the presence of stigmata denoting an increased risk of rebleeding – that is, a visible, bleeding or non-bleeding vessel or an adherent clot in the ulcer base.^{11,12}

Management policy is for early intervention in the over 60s where mortality is highest and a more conservative approach in patients under this age. In the present series intervention is surgical in all cases. The indications for surgery are as follows: age over 60 – continuing bleeding with spurting vessel at endoscopy. One rebleed. Transfusion requirements greater than four

Royal United Hospital,
Bath

R A E Holman
M Davis
K R Gough
P Gartell
D C Britton
R B Smith

Correspondence to:
Dr Michael Davis, Royal
United Hospital, Combe Park,
Bath BA1 3NG.

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TABLE I Age and sex of patients admitted with acute upper gastrointestinal bleeding

Age	<30	31-40	41-50	51-60	61-70	71-80	>80
Men n=227	16	18	25	31	48	57	32
Women n=203	5	8	6	22	36	62	54

units blood in 24 hours. Age under 60 – continuing bleeding with spurting vessel at endoscopy. One rebleed. Transfusion requirements greater than 8 U of blood in 24 hours or greater than twelve units in 48 hours.

Operations are performed by a consultant, senior registrar or experienced registrar. Post-operatively patients are returned to the unit to allow collaborative management of coexisting medical problems and are returned to a general surgical ward when their condition is stable. Patients not requiring surgery are kept on the unit until stable and then discharged home or transferred to a general medical ward. All patients with peptic ulceration, erosions and oesophagitis are started on H₂ receptor blockers; these are continued in the long term in patients over the age of 60 with bleeding peptic ulcers. Repeat endoscopy is performed in patients with gastric ulceration to monitor healing and for histological and cytological assessment.

Variceal bleeding is managed with pitressin, Sengstaken tube and early injection sclerotherapy.

Records of all patients were entered into a standardised database (DataEase, Sapphire Systems Ltd) on a Hewlett Packard Vectra Computer. Statistical analysis was by χ^2 test.

Results

Between November 1986 and April 1988 430 patients were admitted (227 men, 203 women) (Table I). 69.5% were over the age of 60 and 32% were over 80 years of age. 95.8% of patients underwent endoscopy within 24 hours of admission; in 15 patients the procedure was delayed to allow resuscitation and three patients died before they could be adequately resuscitated.

CAUSES OF BLEEDING

Two hundred and seventeen patients had peptic ulcers, accounting for just over 50% of the total with gastric and duodenal ulceration being almost equally divided (Table II). Gastric or duodenal erosions accounted for just over one third of the total, whilst Mallory Weiss tears, oesophageal varices and gastric carcinoma comprised just over 8%. In a further 30 patients bleeding was either from another source or no cause for the haemorrhage could be found.

USE OF ASPIRIN AND NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

34.6% of patients had taken aspirin or a non-aspirin non-steroidal anti-inflammatory drug (NSAID) in the week before admission and 84% of these were over the age of 60 (Table III). Use of NSAIDS was significantly more common in patients over the age of 60 while the reverse was the case for salicylate ingestion.

OVERALL OUTCOME

Rebleeding

Rebleeding occurred in 18 patients (4.2%); all but one of these had either peptic ulcers or oesophageal varices (Table IV). Surgery was necessary to treat rebleeding or continued bleeding in 46 of 218 patients with gastric or duodenal ulcers and two of 16 with oesophageal varices. In the latter group, haemorrhage was satisfactorily controlled in the remainder by injection sclerotherapy. No patient with gastric or duodenal erosions, oesophagitis or Mallory Weiss tear required surgery.

Ulcer stigmata and rebleeding

A major stigma (spurting vessel, visible vessel or adherent clot in ulcer base) was present in 66 patients (Table V). Twenty seven (40.1%) required surgery to control continued bleeding or a recurrent haemorrhage compared with 19 of 141 without these stigmata ($\chi^2=35.44$, $p<0.001$).

Surgery

Fifty five patients (21.7%) were operated on for continued or recurrent haemorrhage, 46 of these were for peptic ulcers (Table IV). Forty nine

TABLE II 430 admissions with upper gastrointestinal bleeding November 1986–April 1988

Gastric ulcer	109	(25.3%)
Duodenal ulcer	108	(25.1%)
Gastric/duodenal erosions	95	(22.0%)
Oesophagitis	52	(12.1%)
Mallory Weiss	16	(3.7%)
Varices	16	(3.7%)
Gastric carcinoma	4	(0.9%)
Other, including no identifiable source	30	(7.0%)

TABLE III Use of aspirin and NSAIDS in patients with peptic ulcer

Age	<60 n=42	>60 n=175	
Salicylates	8 (19%)	15 (8.6%)	$p<0.01$
NSAIDS	4 (9.5%)	48 (27.4%)	$p<0.001$

TABLE IV Rebleeding and surgery in 540 patients with acute upper gastrointestinal bleeding

Final diagnosis	Rebled	No rebled	Surgery
Gastric/duodenal ulcer	14	203	46
Gastric/duodenal erosions	1	94	0
Oesophagitis	0	52	0
Mallory Weiss tear	0	16	0
Oesophageal varices	3	13	3
Gastric carcinoma	0	4	2*
Other	0	30	6

*Neither operation for bleeding.

TABLE V Effect of ulcer stigmata on outcome

Stigma	Rebled or continued to bleed (surgery)
Spurting vessel n=15	12 (12)
Visible vessel n=20	4 (4)
Adherent clot n=31	13 (11)
Spots n=10	0 (0)
None n=141	19 (19)

TABLE VI Interval between admission and surgery (h)

	0-12	13-24	25-48	49-72	73-96	>96
All patients	10	25	8	2	2	8
Gastric and duodenal ulcers	8	22*	7†	1‡	2‡	6‡

*One for rebleeding; †Four for rebleeding; ‡All for rebleeding.

TABLE VII Surgery in patients with upper gastrointestinal bleeding

Gastric or duodenal ulcers	
Vagotomy and pyloroplasty	26*
Bilroth I	6
Polya	5
Oversew alone	5
Ulcer resection alone	2
Proximal gastrectomy	1
Total gastrectomy	1
Varices	
Gastroportal disconnection	1
Oversew of varices	2
Carcinoma	
Total gastrectomy	2
Other	
Oversew duodenal fistula	1
Resection of ischaemic small bowel	1
Repair of aortoduodenal fistula	1
Gastroenterostomy and insertion Celestin tube	1

*Plus hemicolectomy for carcinoma of caecum in one.

TABLE VIII Mortality in patients with upper GI bleeding

	Age ≤60	61-70	71-80	>80	Total
Overall	1/131 (0.8%)	1/84 (1.3%)	5/119 (4.2%)	9/96 (9.5%)	16/430 (3.7%)
Peptic ulcer overall	1/42 (2.3%)	1/48 (2.1%)	4/66 (6.1%)	6/61 (9.8%)	12/217 (5.5%)
Surgery overall	1/6 (16.7%)*	1/12 (7.6%)	2/18 (11.1%)	5/19 (26.3%)	9/55 (16.4%)
Surgery in gastric and duodenal ulcer	1/5 (20%)	1/9 (9.1%)	2/15 (13.3%)	3/17 (17.6%)	7/46 (15.2%)

*Also underwent hemicolectomy for carcinoma of caecum.

(89%) of the patients were over the age of 60. Two thirds of the operations were performed within 24 hours of admission, all but one for continued bleeding (Table VI). Surgery for bleeding gastric or duodenal ulcers carried out later than 24 hours after admission was for rebleeding in all but three cases. All patients fulfilling the criteria for surgery were operated on with the exception of three who were moribund on admission and who died shortly thereafter.

TABLE IX Analysis of deaths

Age	Diagnosis	Time to surgery (h)	Time to death (d)	Other major pathology	Cause of death
No surgery					
71	Gastric ulcer		5	Severe osteoarthritis	Bronchopneumonia
78	Gastric ulcer		5	Severe osteoarthritis	Bronchopneumonia
82	Oesophagitis		4		CVA following prolonged hypotension prior to admission
83	Duodenal ulcer		12	Severe rheumatoid arthritis	Bronchopneumonia
85	Oesophageal ulcer		1		Shocked on admission. Never fully resuscitated
86	Duodenal ulcer		1	Severe rheumatoid arthritis	Shocked on admission, never fully resuscitated
87	Duodenal ulcer		1	Severe rheumatoid arthritis	Shocked on admission, never fully resuscitated
Surgery					
54	Gastric ulcer	168	8	Ankylosing spondylitis. Ischaemic heart disease. Carcinoma of caecum	Bronchopneumonia
63	Duodenal ulcer	24	10		CVA after surgery
73	Duodenal ulcer	24	6		CVA after surgery
79	Gastric ulcer	24	25		Myocardial infarct. after surgery
80	Aortoduodenal fistula	12	7		Bronchopneumonia
82	Gastric ulcer	24	9	Ischaemic small bowel resected	Bronchopneumonia
83	Duodenal ulcer	24	17	Severe chronic obstructive airways disease on steroids	Bronchopneumonia
84	Gastric ulcer	12	2	Recent myocardial infarct.	Congestive cardiac failure
90	Gastric ulcer	48	6	Severe ischaemic heart disease	Congestive cardiac failure

In patients with gastric or duodenal ulcer a vagotomy and pyloroplasty or partial gastrectomy was the most common operation (Table VII). In only seven was minimal surgery performed – that is, oversew or ulcer resection alone. One patient who had a vagotomy and pyloroplasty for a gastric ulcer with a clot in the base also underwent a right hemicolectomy for an unsuspected caecal carcinoma discovered at laparotomy.

Patients undergoing surgery stayed one to 27 days (median six days) in the unit whereas the corresponding figures for those treated medically was one to 17 days (median three days). Average bed occupancy throughout the period of study was 86%.

Mortality

Sixteen patients died giving an overall mortality of 3.7% (Table VIII). The mortality from peptic ulcers was 5.5% and in those undergoing surgery 15.2%. There was a progressive rise in mortality with increasing age; all but one of the patients who died were over the age of 60 and 87% were more than 70 years old. Table IX analyses the patients who died. All had serious concomitant pathology and three were admitted in a moribund state and died within a few hours of admission. A further patient found to have a gastric ulcer with no stigmata, deteriorated progressively after admission but on laparotomy was found to have total ischaemia of the small bowel and died on the operating table.

As well as increasing age and other medical problems, mortality was significantly higher in patients who rebled, who had a systolic blood pressure of <90 mmHg, or admission haemoglobin of 10 g/dl or less on admission than in those without these complications (Table X).

Discussion

The proportion of patients presenting with upper gastrointestinal haemorrhage who are elderly has increased markedly over the past 30 years^{3,7,8} and the advanced age of many of the

TABLE X Mortality in relation to risk factors

Risk factor	Deaths	
Rebleeding (n=19)	3 (16.7%)	p<0.001
No rebleeding (n=411)	13 (3.2%)	
Systolic BP ≤90 (n=27)	6 (22.2%)	p<0.001
Systolic BP >90 (n=403)	10 (2.5%)	
Hb ≤10 (n=199)	11 (5.5%)	p<0.001
Hb >10 (n=231)	4 (1.73%)	
Age >60 (n=299)	15 (5%)	p<0.005
Age ≤60 (n=131)	1 (0.8%)	
Other medical problems (n=129)	8 (6.2%)	p<0.005
No other medical problems (n=301)	8 (2.6%)	

patients in the present series reflects this national trend. Increasing use of non-steroidal anti-inflammatory drugs in patients over the age of 60 in an important contributory factor. One third of our patients with peptic ulcer had been taking these agents before admission and over 80% of these were over the age of 60 which is a similar proportion to that reported elsewhere.¹³

Upper gastrointestinal haemorrhage in the elderly carries a high mortality; there is often significant coexisting pathology, as shown in the present series and blood loss is poorly tolerated. Rebleeding or continued bleeding are important additional risk factors and up to 30% of such patients may die.^{2,14,15} Effective management of patients with upper gastrointestinal bleeding centres around balancing the risks of rebleeding against the hazards of surgery in elderly, debilitated patients; surgical mortality rates of up to 50% have been described in this situation. A policy of indiscriminate early surgery has been shown to convey no survival benefit over medical management alone;¹⁶ the proportion dying from complications of surgery was similar to the proportion who were treated medically and who died from the complications of continued or recurrent bleeding.¹⁷ Surgery must therefore be reserved for those who are more likely to die if nothing is done. Such a policy can only be effectively applied if all patients are admitted to a central unit staffed by physicians and surgeons with special expertise in gastroenterology; not only does this allow rapid assessment and resuscitation but also close monitoring by nursing staff acquainted with the particular problems likely to be encountered.

The results of the present series confirms the value of such an approach. Our overall mortality rate of 3.7% is significantly lower than the figures of 15.1% and 11.7% reported in recently published series from district general hospitals in the United Kingdom.^{7,8} The proportion of patients with peptic ulceration and oesophageal varices, who are most prone to rebleeding and in whom the mortality is highest, was similar in these two series to ours. Our mortality rate also compares favourably with the figure of 2.7% reported by Hunt *et al*⁹ whose policy was similar to our own. These workers did not report the ages of their patients but in a more detailed study describing the outcome of patients with duodenal ulcer¹⁸ ages were younger than in the present series. Our management policy was based on that described by Morris *et al*¹⁰ who reported an overall mortality of 2% in patients with bleeding peptic ulcers undergoing early surgery. The mortality in our patients with gastric and duodenal ulcers

was higher, but Morris *et al* did not include those deemed unfit for surgery, whilst in the present series there were no exclusions if the entry criteria were met.

Our operation rate in peptic ulcers is similar to that reported by Morris *et al*¹⁰ and nearly two thirds of our patients who underwent surgery were operated on within 24 hours of admission; the main indication was for continued bleeding. The value of identifying an actively bleeding vessel, a visible vessel or a clot in the ulcer base as a likely indicator of rebleeding^{11,12} is emphasised in the present series but over half of our patients with such stigmata settled spontaneously. Similarly nine of the 14 patients who rebled and subsequently required surgery had no such ulcer stigmata (Table V) and this emphasises the need for close monitoring of all patients by experienced medical and nursing staff. The value of this approach is shown in our low rate of rebleeding in patients with peptic ulceration (6.4%) which is considerably lower than the figures^{7,8,14,15} reported in other series. Such a policy of close monitoring also improves survival in high risk patients; mortality was higher in those with recognised risk factors including increasing age, rebleeding, hypotension or anaemia on presentation but was lower than in corresponding patients reported by other workers not using a centralised team approach to the problem.^{2,7,8}

Intervention for patients with recurrent or continued bleeding in the present series was surgical in all cases. Medical treatment, with H₂ receptor blockers or tranexamic acid¹⁹⁻²² had made little impact but endoscopic techniques for haematemesis with the laser, the heater probe or injection of adrenalin into the ulcer base²³⁻²⁵ have produced promising results and may help to reduce mortality in the future. Up to one third of bleeding peptic ulcers, however, are unsuitable for such therapies either because they are endoscopically inaccessible or because bleeding is from a major vessel as the gastroduodenal artery. In such cases serious consideration must be given to limiting the procedure to that necessary to achieve haemostasis and avoiding major resectional procedures, particularly in the elderly. Patients can thereafter be maintained on H₂ receptor blockers or other antiulcer agents to minimise the chance of recurrence. Wheatley *et al* adopted a policy of non-resectional surgery wherever possible and reported a surgical mortality of 4%.²⁶

Various objections have been raised to the implementation of a centralised policy for management of upper gastrointestinal bleeding. Consultant colleagues may be reluctant to hand over the management of their patients through fear of depriving their junior staff of clinical experience. We have found that any such reservations are outweighed by the educational benefit of observing coordinated care, and in our hospital the nature of the junior staff rota ensures active involvement with specialist senior cover. The approach is very similar to that in a coronary care unit. The policy requires active consultant cover, but with the application of a standard protocol, together with a regular morning ward round, 'out of hours' callouts are rarely neces-

sary, although a commitment to weekend cover is obviously needed.

Provision of the necessary resources in the face of financial constraints is obviously a potential problem. The key to successful management is admission of all patients to a single identifiable ward, and although a joint medical/surgical ward is desirable, it is not essential. Nursing expertise is central to the success of such a policy, but with a standardised protocol this is not difficult to implement and the same results should be achievable by reserving beds for patients with haematemesis and melaena on a specific ward. Our 11 bedded unit catered satisfactorily for a catchment population of 410 000 and no patient requiring admission had to be turned away. The current practice of admitting these patients to medical rather than surgical beds is appropriate because of the high proportion with significant additional pathology. The other advantage of a centralised approach is that patients with minor lesions can rapidly be discharged.

We conclude that it is possible to apply a policy of centralised management for patients with haematemesis and melaena in a district general hospital by adaptation of existing resources, and this leads to benefits for patients, junior staff training, and utilisation of beds.

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