PAPERS AND ORIGINALS

Early Endoscopy of Oesophagus, Stomach, and Duodenal Bulb in Patients with Haematemesis and Melaena

P. B. COTTON, M. T. ROSENBERG, R. P. L. WALDRAM, A. T. R. AXON

British Medical Journal, 1973, 2, 505-509

Summary

Oesophago-gastro-duodenoscopy was successfully performed in 196 of 208 patients admitted with haematemesis or melaena, or both. A precise visual diagnosis was made in 80% of all patients and in 96% of those where the final diagnosis lay within the oesophagus, stomach, and first two parts of the duodenum. Bleeding oesophagitis was more common and bleeding duodenal ulcer less common than in other series using mainly radiology. Altogether, 26% of all patients with endoscopically-proved duodenal ulcers were bleeding from another site, and 15.4% of all patients had more than one lesion. This fact, and inability to detect surface lesions limits the value of acute barium radiology, which was performed in only 81 patients. Accurate diagnosis should lead to better understanding of individual lesions and more rational management of individual patients. Where a good service is available oesophago-gastro-duodenoscopy should be performed on all bleeding patients within 24 hours of admission.

Introduction

Acute upper gastrointestinal haemorrhage is a common cause of hospital admission with a significant mortality which persists despite modern techniques of resuscitation, anaesthesia, and surgery (Schiller *et al.*, 1970). Though peptic ulcers account for about half the cases in large series (Avery-Jones *et al.*, 1968; Palmer, 1969; Schiller *et al.*, 1970; Cocks *et al.*, 1972), there

are many other causes (Douvres and Jerzy Glass, 1968) and diagnosis in the individual patient may be difficult (Lancet, 1971). Clinical pointers are often misleading (Chandler *et al.*, 1960; Mailer *et al.*, 1965; Palmer, 1969). Ulcers may be found in the absence of previous symptoms and patients with known ulcers or varices may bleed from other sites. Barium-meal examinations can be performed for acute bleeding (Cantwell, 1960; Walls *et al.*, 1971; Allan *et al.*, 1972) but have two major drawbacks. Erosions and small ulcers cannot be seen nor can their presence be assumed if the x-ray appearances are negative. If a lesion is shown it may not be the actual source of bleeding. Visceral arteriography has important diagnostic and therapeutic potential but has not yet been evaluated in Britain.

For accurate diagnosis there can be no substitute for actually seeing the bleeding point (Lancet, 1971). Gastroscopy has been used for many years by a few advocates of the vigorous diagnostic approach (Avery-Jones *et al.*, 1968; Palmer, 1969; Cocks *et al.*, 1972), but gastric lesions account for only about a half of all bleeding episodes. Fibreoptic instruments have recently facilitated and extended the range of examinations. Our initial experience in bleeding patients was with a series of endoscopes which are now obsolete (Cotton and Rosenberg, 1971). The latest generation are highly flexible and manoeuvrable "panendoscopes," which allow a complete survey of the oesophagus, stomach, and duodenal bulb (Cotton and Williams, 1972). They are rapidly coming into use in many district hospitals and have obvious diagnostic potential in bleeding patients. During the period July 1971 to December 1972 we performed oesophago-gastro-duodenoscopy on 208 patients admitted with haematemesis or melaena or both.

Patients and Methods

Altogether, 135 males and 73 females were examined. Their mean age was 53.3 years (range 2-84 years). Of these, 68% presented with haematemesis with or without melaena, and 32% with melaena alone. The timing of examinations depended on the referring physicians. Early in the series patients were often referred several days after admission, having had a barium meal. Latterly we have been informed much earlier and have performed endoscopy within 24 hours. Of all patients in the series

St. Thomas's Hospital, London SE1 7EH

P. B. COTTON, M.D., M.R.C.P., Senior Medical Registrar

R. P. L. WALDRAM, M.B., M.R.C.P., Medical Registrar (At present: Lecturer in Medicine, King's College Hospital, London SE5 8RX)

A. T. R. AXON, M.B., M.R.C.P., Senior Medical Registrar

Brook General Hospital, London S.E.18

M. T. ROSENBERG, M.B., F.R.C.S., Consultant Surgeon

72% were examined within 48 hours of overt bleeding, 20% within 3-7 days, and the remaining 8% within two weeks.

No patient has been refused endoscopy on grounds of age or illness, but prior blood replacement is essential. Examinations were performed in the endoscopy room with the patient in the left lateral position in his bed, without disturbing transfusion or monitoring apparatus. Gastric lavage was not used. Atropine (0.6 mg) and diazepam (0-20 mg) were given intravenously. Forward-viewing panendoscopes (Olympus GIFD or ACMI 7089A or 7089P) were used in 81% of patients; in 19% of these a lateral-viewing duodenoscope (Olympus JFB) was also used. The latter instrument alone was used for examination of 19% of patients; with experience this can be used to examine the distal oesophagus and entire stomach as well as the duodenal loop. A child aged 2 was examined with an Olympus fibre-bronchoscope.

Results

Three alcoholic patients could not tolerate examination. One woman aged 78 suffered a small upper oesophageal perforation which healed on conservative management. We have no evidence to suggest that endoscopy precipitated further bleeding in any patient. With rare exceptions the oesophagus, stomach, and duodenal bulb were examined in all patients, and the descending duodenum in most. Instruments were advanced past varices unless they were actively bleeding or showed adherent clot. The pylorus was passed in all but six patients; four had pyloric stenosis, and were correctly assumed to have duodenal ulcers. Gastric ulcers were bleeding profusely in two other patients, and examination was discontinued.

Blood was encountered in 25% of all patients, and in 33% of those examined within 48 hours of overt bleeding. In all except eight of these (3.8%) an adequate examination was achieved despite the presence of blood by posturing the patient, aspirating fluid blood through the instrument, or by washing suspicious areas with a jet of water through the instrument channel.

The endoscopic diagnoses are shown in table I. A lesion was designated the cause of bleeding only if no other source could be found in a full survey of oesophagus, stomach, or duodenal bulb, or, preferably, when the lesion showed unequivocal evidence of recent bleeding (black base, adherent clot, protruding artery, or actual bleeding). Such features were present in 79% of ulcers in patients examined within 48 hours of bleeding. Nineteen per cent. of gastric ulcers were multiple; one patient had four ulcers. Altogether, 32 patients (15.4%) were found to have more than one lesion (table II). Thus in the final analysis 18 out of 68 duodenal ulcers, four out of 63 gastric ulcers, and

TABLE II—Lesions Present in 32 Patients Which Were Not the Cause of Bleeding

Bleeding Site	Additional Lesion	No. of Patients
Oesophagitis	Duodenal ulcer	2
Gastric ulcer	Oesophagitis	2
	Oesophageal varices	2
	Duodenal ulcer	7
	Duodenal ulcer and oesophagitis	2
Gastric cancer*	Duodenal ulcer	1
	Oesophagitis	2
Gastric erosions	Duodenal ulcer	4
	Duodenal ulcer + oesophageal varices	1
Anastomotic ulcer	Oesophagitis	1
	Oesophagitis	2
Duodenal ulcer	Gastric ulcer	4
	Gastric varices*	1
Liver (haemobilia)	Anastomotic and duodenal ulcers	1

*Lesions not detected by endoscopy.

four out of 11 varices were not responsible for the bleeding episode.

The final diagnosis at hospital discharge or death is shown in table III. Two of the four patients in whom intubation failed were subsequently found to have oesophageal varices. The third also had cirrhosis, but bled from a duodenal ulcer, and no lesion was discovered in the fourth. There were eight patients in whom examination failed because of excess blood. Five were operated on, the findings being: gastric ulcer (2), duodenal ulcer (1), anastomotic ulcer (1), no diagnosis (1). Two of the remaining three were also undiagnosed, the third showed a duodenal ulcer on x-ray examination.

TABLE III—Final Diagnosis and Results

Final Diagnosis	No. of Patients	Missed by Endoscopy	Early Operation	Deaths
Oesophagus:				
Oesophagitis	15 (7.7)			
Ulcer	1			
Tear	2			
Varices	5	1	3	1
Stomach:				
Varices	2 (3.4)			
Ulcer	59 (28.3)	2	15	2
Cancer	4 (1.9)		1	1
Polyp	1			
Erosions	18 (8.6)		1	1
Angioma	1			
Anastomotic ulcer	6 (2.9)	1	2	
Duodenum:				
Ulcer	50 (24.0)	2	29	2
Duodenitis	3			
Erosions	5 (2.4)			
Telangiectasia	1			
Haemobilia	1	1	1	1
Pancreatic cancer	1	—		
Colonic cancer	1	—		
diverticula	1	—	1	
Undiagnosed	31 (14.9)		2	
Total patients	208 (100%)	7 (3.4%)	55 (26.4%)	8 (3.8%)

TABLE I—Results of Endoscopy

Endoscopic Findings	No. of Patients
Oesophagus:	
Oesophagitis	15
Ulcer	1
Tear	2
Varices	4
Stomach:	
Varices	2
Ulcer	57
Cancer	4
Polyp	1
Erosions	18
Angioma	1
Anastomotic ulcer	5
Duodenum:	
Pyloric stenosis	4
Ulcer	44
Duodenitis	3
Erosions	5
Telangiectasia	1
Positive diagnosis	167 (80.2%)
No lesions seen (good survey)	29 (13.9%)
Failed (no intubation, 4; too much blood, 8)	12 (5.9%)
Total patients	208 (100%)
No. with multiple lesions	32 (15.4%)

Lesions were not found in 29 adequate examinations. Four of the patients were subsequently found to have a distant lesion, and four were thought probably never to have bled. One endoscopic report was misleading. A patient continued to bleed 10 days after emergency Polya gastrectomy performed for bleeding after abdominal injury. A good endoscopic survey showed ulceration of the suture line, with extruding thread and adherent clot, and a non-bleeding duodenal ulcer at the apex of the afferent loop, which was free of blood. The papilla of Vater was healthy, and drained normal bile. Subsequent operation showed no other lesion but necroscopy showed haemobilia from previous liver injury. Another only partly successful endoscopy was clinically useful. The stomach was full of blood and a chronic duodenal ulcer was seen. It did not show evidence of recent bleeding, however, and the source was assumed to be obscured within the stomach. Because of this endoscopic information the surgeon ignored the duodenal ulcer and eventually found and oversewed a small bleeding ulcer

TABLE IV—Comparison of Results in 81 Patients Undergoing both Radiology and Endoscopy

Endoscopic Findings	Radiology Report							Total
	Negative	H.H.	Varices	G.U.	G.Ca.	Dilated Stomach	D.U./?D.U.	
No lesion seen	8							8
Oesophagitis	1	5						6
Oesophageal tear		1						1
„ varices	2		1					3
Gastric ulcer	8	2		13			2	25
„ cancer	1					1		2
„ erosion	3	7						10
„ polyp	1							1
„ varices					1			1
Anastomotic ulcer	1							1
Duodenal ulcer	6	2					12	20
„ duodenitis	2							2
„ telangiectasia	1							1
Total	34	17	1	13	1	1	14	81

G.Ca. = Gastric cancer. H.H. = Hiatus hernia. G.U. = Gastric ulcer. D.U. = Duodenal ulcer.

close to the cardia. Gastrectomy was performed later, after a subsequent endoscopy had shown the ulcer to be malignant. It was not visible on x-ray examination. Endoscopy provided a positive diagnosis in 80.2% of all patients, and in 96.6% of those in whom the final diagnosis lay within the oesophagus, stomach, or duodenum.

Endoscopy has latterly been used as the first investigation in bleeding patients. Early in the series 81 patients underwent prior barium-meal examinations in the x-ray department. The results (table IV) are biased towards endoscopy, since some patients were referred only because of negative radiology. Lesions were present in 26 of 34 patients with a negative barium meal, including 14 ulcers and one cancer. Findings at x-ray examination were positive in 47 cases; 15 patients (32%) were bleeding from another lesion at endoscopy. This discrepancy was largely due to 11 irrelevant hiatus hernias. Endoscopy showed 23 of 25 radiologically-diagnosed ulcers to be the cause of bleeding; two patients with duodenal ulcers were bleeding from gastric ulcers.

The patient's age, sex, and clinical history were poor guides to the cause of bleeding (tables V and VI). Gastric ulcers were much commoner than duodenal ulcers in women, especially those over the age of 60, but the incidence was about equal in men. A total of 106 patients gave a typical history of ulcer-type dyspepsia or were already known to have an ulcer. Eighty

(75%) were eventually found to be bleeding from ulceration, five from acute erosions, and nine from the oesophagus. No dyspeptic history was obtained in 30% of patients with a final diagnosis of bleeding ulcer. Bleeding acute erosions were found in only seven of the 49 patients who gave a history of recent salicylate ingestion. Prior administration of other drugs or excessive alcohol gave no consistent indication of likely bleeding site (table VI).

Twenty-three patients had previously undergone ulcer surgery. Causes of bleeding were: anastomotic ulcer (5), gastric ulcer (5), duodenal ulcer (4), gastric erosions (1), oesophagitis (1), Mallory-Weiss tear (1), haemobilia (1), undetermined (5). Fifty-five patients (26.4%) were operated on as an emergency—defined as within one week of endoscopy—table III; 12 others have so far undergone later elective surgery. It is striking that proportionally more of the duodenal ulcers (58%) than gastric ulcers (25.5%) were operated on urgently. Only eight patients (3.8%) died during their hospital admission. Three cirrhotic patients died in liver failure (two after operation), one after having bled from varices, one from gastric erosions, and one from duodenal ulcer. There were three other postoperative deaths, one having bled from gastric cancer, one from haemobilia, and one from gastric ulcer; this patient had been taking anticoagulants for an embolizing ventricular aneurysm. A woman aged 73 with a gastric ulcer and a man aged 82 with a duodenal ulcer were not operated on. The mortality for an emergency operation was 9.1%.

TABLE V—Relative Percentage Incidence of Most Common Bleeding Lesions according to Patients' Age and Sex

Bleeding Source	Percentage Incidence in Each Group			
	85 Males Under 60	30 Females Under 60	50 Males Over 60	43 Females Over 60
Oesophagitis/ulcer ..	5	0	12	8
Acute erosions ..	16	11	9	7
Gastric ulcer ..	20	36	28	40
Duodenal ulcer ..	28	16	30	11

TABLE VI—Correlation of Clinical History and Final Diagnosis

Clinical History	Final Diagnosis								Total
	Oesophagitis	Varices	Erosions	G.U.	A.U.	D.U.	Other Lesions	No Diagnosis	
Chronic dyspepsia	7		4	28	3	27	5	6	80
Dyspepsia and salicylates ..			1	13	1	8		1	26
Salicylates	1		6	6		4	2	6	23
Cirrhosis		2		1		1			4
Alcoholism		2		1		3		1	10
Phenylbutazone			1	1		1	1	2	6
Indomethacin	1			3					4
Corticosteroids	2					3	1		6
Anticoagulants	1		1	1					3
No history	3	3	7	5	2	3	8	15	46
Total	15	7	23	59	6	50	17	31	208

G.U. = Gastric ulcer. A.U. = Anastomotic ulcer. D.U. = Duodenal ulcer.

Discussion

Any new diagnostic technique must be shown to be feasible, safe, and more accurate than currently available methods. Routine fibroptic oesophago-gastro-duodenoscopy is now well established; failures and complications are rare (Cotton, 1973). The oesophageal perforation in this series is one of only two we have experienced in over 2,500 examinations (both

healed on conservative management). Endoscopy is more difficult in bleeding patients. Patients are anxious and may be confused. Diazepam is given intravenously as required but heavy sedation should be avoided as it may make the patient's subsequent clinical status more difficult to assess. Blood in the stomach may render examinations difficult or impossible. Prior administration of metaclopramide (Bader, 1973) has appeared useful in some of our patients, but no control data are available. Gastric lavage before endoscopy has been pronounced by some to be essential (Palmer, 1969; Stadelman *et al.*, 1972), and by others unnecessary (Cremer *et al.*, 1972). It is effective only if performed carefully with a large tube and can cause mucosal artefacts closely resembling acute erosions. Without using lavage we encountered blood in 33% of patients examined within 48 hours of overt bleeding; however, in only 4% did this prevent a diagnostic examination. The logical procedure in these few patients (if well enough) is to withdraw the instrument, wash out the stomach, and repeat the examination. This is preferable to performing unnecessary routine lavage on the remaining 96%. There is no suggestion in this or other series that endoscopy provoked further bleeding, but firm evidence is difficult to obtain. It is unwise to advance an endoscope past clot which is adherent to the oesophageal wall, and indeed unnecessary since this indicates the bleeding source (oesophagitis, tear, varices). Non-bleeding varices should be passed to find the bleeding site beyond.

In this series oesophago-gastro-duodenoscopy provided a firm diagnosis in 80.2% of all patients and in 96.6% of those in whom the final diagnosis lay within the "dyspeptic" area. Endoscopic information is usually precise; little doubt remains after seeing an ulcer with a haemorrhagic base, a protruding artery, or frank bleeding. The alternative diagnostic techniques—clinical acumen and barium radiology—are indirect and inevitably less exact. Clinical histories of chronic dyspepsia or known ulcer, of known cirrhosis or recent salicylate ingestion, may have statistical value but are frequently irrelevant in the individual patient. Altogether, 30% of our patients with bleeding ulcers reported no prior dyspepsia and 25% of those with chronic dyspepsia were not bleeding from ulcers. In Palmer's (1969) large series 41% of patients with previously diagnosed ulcers were bleeding from another lesion. Our patients with a history of salicylate ingestion but no dyspepsia were more likely to be bleeding from ulcers than acute erosions. It is common experience in the U.S.A. (McCray *et al.*, 1969; Bonanno, *et al.*, 1972; Khodadoost and Jerzy Glass, 1972) and Europe (Paul *et al.*, 1972a; Peeters and Cremer, 1972) that patients with cirrhosis and known varices are equally likely to bleed from another site. Two of our four patients with previously diagnosed cirrhosis were not bleeding from varices, and non-bleeding varices were present in four other patients.

The presence of more than one potential bleeding site is a major hazard in attempting an exact diagnosis by x-ray examination. Multiple lesions were found in 15.4% of our patients (table II), and have been reported in 4% (Seifert *et al.*, 1972), 8% (Bigard, 1972), 11% (Segal *et al.*, 1972), 30% (Domjan and

Bruncsak, 1972), 33% (Paul *et al.*, 1972b), and 51% (Palmer, 1972) in other series using some form of endoscopy. Of our patients with endoscopically-proved duodenal ulcers 26% were bleeding from another source—usually acute erosions or oesophagitis. In bleeding patients this fact alone reduces the value of barium radiology, even if x-ray films were 100% accurate in ulcer diagnosis. Radiological reviews (Cooley, 1961) suggest that barium meals detect about 85% of ulcers in patients without haemorrhage, and greater accuracy in acutely ill patients would be surprising. Detection rates of 73% (Walls *et al.*, 1971), 84% (Mailer *et al.*, 1965), and 92% (Allan *et al.*, 1972) are reported. X-ray films showed 27 of the 46 ulcers early in this series (table IV), but this is not a true assessment of radiology, since some of these patients were selected for endoscopy because of negative x-ray appearances. A radiological diagnosis of hiatus hernia is irrelevant; it does not indicate bleeding oesophagitis nor exclude other lesions. X-ray films cannot detect acute erosions nor can their presence be assumed if radiographs are negative. Only three of our 34 patients with negative x-ray appearances were found to be bleeding from erosions.

All these facts inevitably limit the diagnostic potential of acute barium studies, and also the accuracy of published series based mainly on radiology. The incidence of duodenal ulcers as a cause of bleeding in published British series not using modern panendoscopy (29–41%, table VII) is higher than ours (24%), but a further 9% of our patients had duodenal ulcers which were not bleeding. Thus, duodenoscopy may actually lower the number of patients diagnosed as bleeding from duodenal ulcers. By contrast, the routine use of oesophagoscopy shows oesophagitis to be a more common cause of acute bleeding than previously thought. It is difficult to compare series with respect to the proportion of undiagnosed cases, since criteria for diagnosis vary. In some series the authors exclude patients without unequivocal evidence of bleeding; others accept hiatus hernia as a cause, or may diagnose acute erosions on the basis of salicylate ingestion and a negative barium meal (Desmond and Reynolds, 1972).

This study shows that oesophago-gastro-duodenoscopy can usually provide a precise diagnosis without undue discomfort or risk. Does this benefit the patient? Though it is reasonable to expect that improved diagnosis may lead to better management and prognosis, proof of benefit to individual patients is difficult to obtain. The overall hospital mortality in this series was 3.8% which compares favourably with published figures from Britain of 8% (Walls *et al.*, 1971), 8.9% (Schiller *et al.*, 1970), and 9% (Mailer *et al.*, 1965), and from U.S.A. of 8% (Palmer, 1969), 8% (Hedberg, 1966), and 29% (Crook *et al.*, 1972). Early in the period covered by this series some patients admitted with bleeding were not referred for endoscopy. The mortality rate would appear reduced if the series included only the less ill patients, and if some patients died without endoscopy. No such cases have come to light after a search of the hospital diagnostic index, but the index is not completely accurate and the possibility remains. If anything, however, the series may be biased in the opposite direction. Endoscopy at the Brook

TABLE VII—Percentage Incidence of Main Diagnoses in Published Series

Authors:	U.S.A. Series				British Series					
	Crook <i>et al.</i> , 1972	Palmer, 1969	Hedberg, 1966	Katz <i>et al.</i> , 1964	Schiller <i>et al.</i> , 1970	Cocks <i>et al.</i> , 1972	Mailer <i>et al.</i> , 1965	Avery-Jones <i>et al.</i> , 1968	Walls <i>et al.</i> , 1971	Present Series
Total patients	768	1,400	323	250	2,149	2,928	87	3,836	165	208
Endoscopy	few G.	O.G.	O.G.	H.G.D.	—	G.	H.G.D.	G.	F.G.	F.O.G.D.
Diagnosis (%):										
Varices	11	19	6	17	2	2	1	17	3	3
Gastric ulcer	18	13	15	8	15	36	11	12	12	28
Acute erosions	11	12	17	20	—	8	8	27*	10	11
Duodenal ulcer	42	28	8	20	29	36	39	35	41	24
Oesophagitis	—	7	10	2	—	—	—	—	—	8
Hiatus hernia	3	—	19	—	—	3	7	2	8	—
No diagnosis	—	7	10	22	26	4	6	—	16	15

*Some not diagnosed positively.

G = Semiflexible gastroscope. O = Rigid oesophagoscope. F.G. = Fibreoptic gastroscope. H.G.D. = Early Hirschowitz gastro-duodenoscopy. F.O.G.D. = Fibreoptic oesophago-gastro-duodenoscopy.

Hospital has been performed by a surgeon (M.T.R.). Initially, patients were referred for endoscopy only when surgery was being actively considered. This is reflected in the higher incidence of transfusion (90%) and operation (49%) in the Brook cases as compared with St. Thomas's (61% and 18% respectively). The overall rate for emergency surgery (within a week of endoscopy) of 26.4% was higher than that for the Oxford (Schiller *et al.*, 1970) (19%) and Glasgow (Mailer *et al.*, 1965) (13%) series, and for two large American series (Crook *et al.*, 1972; Palmer, 1969) (14.5% and 15%). This suggests that our group of patients were no less ill than those in other series, or that endoscopy has led to more frequent and helpful surgical intervention. It is striking and unusual that our patients with bleeding duodenal ulcers were operated on more often than those with bleeding gastric ulcers (58% to 25.5%). Respective figures published by Cocks *et al.* (1972) were 23% and 30%, and by Schiller *et al.* (1970) 32% and 37%.

The value of early diagnosis should not be measured only in terms of mortality. It facilitates decisions concerning medical as well as surgical treatments and the need for intensive monitoring, further investigation, and the length of hospital stay. A patient presenting with a possible haematemesis may not even require admission if a full endoscopic survey does not show a lesion or blood. A similar negative examination in a patient with profuse melaena would indicate an urgent need for investigation of the distal bowel.

Diagnostic information is clearly more useful before rather than after a further episode of bleeding, which is most likely to occur within the first 48 hours (Northfield, 1971). If endoscopy is delayed erosions may have already healed, and ulcers may lose the features—black base or adherent clot—which enable the observer to pin-point them as bleeding sources. Such features were seen in 79% of ulcers observed within 48 hours of bleeding, but in only one of 21 examined thereafter. Dvorakova *et al.* (1972) found erosions in 34% of patients endoscoped within three days of bleeding, but in only 18% of those examined later. In our own series 31 patients remained undiagnosed at the time of leaving hospital. However, all but four had been endoscoped within 48 hours of a bleeding episode.

The average district hospital admits from one to four bleeding patients each week. The main problem of early endoscopy is simple—who has the time and energy to do it? The time involved depends largely on the state of evolution of routine endoscopy in that hospital. If there is an endoscopy room and an endoscopy nurse running the service then it is not difficult to examine patients within 24 hours of admission, since it should take less than 20 minutes of a doctor's time. If routine endoscopy is performed only rarely in shared premises—for example, the theatre—with no designated supporting staff urgent endoscopy is difficult to arrange and prohibitively time consuming.

With modern forward-viewing instruments it is not necessary to delay endoscopy until after a barium or gastrografen meal. When endoscopy fails to provide a diagnosis it is logical to proceed to radiology. If endoscopic failure results from the presence of excessive bleeding urgent barium-meal radiographs are also likely to be difficult to interpret, and it is in these patients that arteriography is most likely to show a lesion. The early published results of selective intra-arterial infusion of vasopressin are encouraging (Baum and Nusbaum, 1971; Conn *et al.*,

1972). This is not the only potential avenue of non-surgical therapy; fibrescopes have been used to coagulate lesions in the oesophagus and stomach (Classen *et al.*, 1972; Paul *et al.*, 1972a; Blackwood and Silvis, 1972).

The diagnostic yield of early endoscopy in bleeding patients has led rapidly to its acceptance as a routine procedure in our hospitals, and is one of many potent reasons for the development of efficient endoscopic services. In the long term, precise diagnosis of large groups of patients will improve understanding of the aetiology and prognosis of individual bleeding lesions, and should lead to improved management.

References

- Allan, R. N., Dykes, P. W., and Toye, D. K. M. (1972). *British Medical Journal*, 4, 281.
- Avery-Jones, F., Gummer, J. W. P., and Lennard-Jones, J. E. (1968). *Clinical Gastroenterology*, p. 548. Oxford, Blackwell Scientific.
- Bader, E. (1973). *Lancet*, 1, 101.
- Baum, S., and Nusbaum, M. (1971). *Radiology*, 98, 497.
- Bigard, M. A. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 8. Basel, Karger.
- Blackwood, W. D., and Silvis, S. E. (1972). *Gastroenterology*, 62, 883.
- Bonanno, C. A., Robilotti, J. G., and Martel, A. J. (1972). *Gastroenterology*, 62, 883.
- Cantwell, D. F. (1960). *Clinical Radiology*, 11, 60.
- Chandler, G. N., Cameron, A. D., Nunn, A. H., and Street, D. F. (1960). *Lancet*, 2, 507.
- Classen, M., Rosch, W., and Demling, L. (1972). Second European Congress of Digestive Endoscopy, Paris, Abstracts, p. 56.
- Cocks, J. R., Desmond, A. M., Swynnerton, B. F., and Tanner, N. C. (1972). *Gut*, 13, 331.
- Conn, H. O., Ramsby, G. R., and Storer, E. H. (1972). *Gastroenterology*, 63, 634.
- Cooley, R. N. (1961). *Progress in Medical Science*, 242, 628.
- Cotton, P. B. (1973). *British Medical Journal*, 2, 161.
- Cotton, P. B., and Rosenberg, M. T. (1971). *British Journal of Hospital Medicine*, 6, Suppl., p. 52.
- Cotton, P. B., and Williams, C. B. (1972). *British Journal of Hospital Medicine*, 8, Suppl., p. 35.
- Cremer, M., *et al.* (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 1. Basel, Karger.
- Crook, J. N., Gray, J. W., Nance, F. C., and Cohn, I. (1972). *Annals of Surgery*, 175, 771.
- Desmond, A. M., and Reynolds, K. W. (1972). *British Journal of Surgery*, 59, 5.
- Domjan, L., and Bruncsak, A. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 34. Basel, Karger.
- Douvres, P. A., and Jerzy Glass, G. B. (1968). *Progress in Gastroenterology*, 2, 466.
- Dvorakova, H., Jirasek, V., and Setka, J. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 48. Basel, Karger.
- Hedberg, S. E. (1966). *Clinics of North America*, 46, 499.
- Katz, D., Douvres, P., Weisberg, H., Charm, R., and McKinnon, W. (1964). *American Journal of Digestive Diseases*, 9, 447.
- Khodadoost, J., and Jerzy Glass, G. B. (1972). *Biologie et Gastroenterologie*, 5, 608.
- Lancet*, 1971, 2, 415.
- McCray, R. S., Margin, F., Amir-Ahmadi, H., Sheahan, D. G., and Zamech, N. (1969). *American Journal of Digestive Disease*, 11, 755.
- Mailer, C., Goldberg, A., Harden, R. McG., Grey-Thomas, I., and Burnett, W. (1965). *British Medical Journal*, 2, 784.
- Northfield, T. C. (1971). *British Medical Journal*, 1, 26.
- Palmer, E. D. (1969). *Journal of the American Medical Association*, 207, 1477.
- Paul, F., Seifert, E., and Krause, H. (1972a). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 57. Basel, Karger.
- Paul, F., Seifert, E., and Otto, P. (1972b). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 64. Basel, Karger.
- Peeters, J. P., and Cremer, M. (1972). *Biologie et Gastroenterologie*, 5, 615.
- Schiller, K. F. R., Truelove, S. L., and Williams, S. G. (1970). *British Medical Journal*, 2, 7.
- Segal, S., Diot, J., and Maffioli, A. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 13. Basel, Karger.
- Seifert, E., Paul, F., and Bar, U. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 60. Basel, Karger.
- Stadelman, O., Meiderer, S. E., and Kaufer, C. (1972). *Urgent Endoscopy of Digestive and Abdominal Diseases*, p. 25. Basel, Karger.
- Walls, W. D., Glanville, J. N., and Chandler, G. N. (1971). *Lancet*, 2, 387.