

Clinical picture of peptic ulceration diagnosed endoscopically

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SUMMARY Clinical features and laboratory data are presented for 100 patients with benign gastric ulceration and 150 patients with duodenal ulceration confirmed endoscopically in a district general hospital unit. Abdominal pain was the commonest indication for endoscopy, but one third of examinations were performed for acute gastrointestinal haemorrhage. Although the patients were selected by referral for endoscopy their clinical presentation, age, and sex distribution were similar to those reported in previous general surveys. There were no clinical features which clearly distinguished gastric from duodenal ulceration. However, of those with gastric ulceration younger patients more often had distal ulcers and presented with pain, while elderly subjects tended to have high lesser curve involvement and presented with haemorrhage. Moreover, all females presenting with haemorrhage were aged over 50 years, while 6% of males bleeding from gastric ulceration and 40% of males bleeding from duodenal ulceration were under this age. Anaemia when present, except in two premenopausal females, indicated either a recent acute gastrointestinal haemorrhage or a coexistent second diagnosis.

Hitherto the clinical picture of peptic ulceration has been based largely on diagnoses made by routine radiology because the great majority of ulcers have until recently been diagnosed in this way. Compared with endoscopy, radiological methods have limitations for 20-55% of duodenal ulcers and 11-14% of benign gastric ulcers escape detection by conventional barium meal examination (Cotton, 1973). Furthermore, many patients with indirect radiological signs suggestive of ulceration, such as pylorospasm and irritability of the duodenal cap, may not have an active ulcer crater when examined endoscopically or at operation. Since the value of fiberoptic endoscopy in the diagnosis of upper gastrointestinal disease has been clearly demonstrated (McCull, 1972; Morrissey, 1972; Salmon *et al.*, 1972; Cotton, 1973) pandendoscopy and biopsy have become routine in most gastroenterological clinics during the last four years.

This present paper reports an analysis of the clinical features and laboratory data in a consecutive series of patients with peptic ulceration in whom an active benign gastric ulcer or duodenal ulcer had been seen endoscopically. Hence, all cases studied

had a definite ulcer crater, thus excluding those where the diagnosis was in doubt or based on indirect signs and including cases where operation was not contemplated.

Methods

Since 1970 an upper gastrointestinal endoscopy service has been in operation in this district general hospital. Patients selected for endoscopy were referred from general practitioners, hospital physicians, and surgeons, the majority of examinations being performed as an outpatient procedure. Intravenous diazepam and hyoscine were usually used as sedation and a lignocaine local anaesthetic spray to the pharynx was always employed. Usually an end viewing or fore oblique endoscope (Olympus GIFD, GIFD2 or GIF K) was used, whereas a side viewing duodenoscope (JFB or JFB2) was employed solely in some cases and as a second instrument in others. Intravenous hyoscine N-butyl bromide (Buscopan) was not employed routinely in examining the duodenal cap except when spasm or deformity interfered with adequate visualisation.

Findings of all examinations were recorded on a standardised report sheet for inclusion in the patient's case notes, a copy of each report was re-

tained and has allowed extraction of the cases considered here.

All patients with a definite benign gastric ulcer as judged by endoscopy, biopsy, and follow up, seen between October 1971 and November 1974 and all active duodenal ulcers from October 1971 to March 1975 are included. Thus, the only selection of cases that occurred was at the time of acceptance for endoscopic examination, before the diagnosis was known.

In this manner 100 patients with benign gastric ulcer and 150 patients with duodenal ulcer were identified. The clinical case notes and endoscopic records were obtained and analysed with respect to clinical features, endoscopic findings, and laboratory data; the results were transferred to cards. The clinical features included were presence and site of pain, vomiting, weight loss, haemorrhage, and duration of symptoms. Other features were excluded because the data were unreliable in a retrospective survey. Symptoms have been included in the study only where there was a definite positive or negative assertion in the case notes.

For gastric ulcers the number and site, whether high lesser curve (above the midpoint between cardia and angularis incisura), mid lesser curve, distal stomach (beyond the angulus), or elsewhere were recorded. The size of ulcers was measured by approximation with open biopsy forceps and they were grouped into those less than 1 cm, between 1 and 3 cm, and greater than 3 cm in diameter. Similarly, the number, site, and size of duodenal ulcers were recorded, although early in the series the ulcer site was not commented upon routinely. With increasing experience an attempt was made to site the crater more precisely. Sites considered were anterior, posterior, superior, inferior, juxtapyloric, and post bulbar. Ulcer size was measured by the open forceps in many cases. Because of technical difficulties in performing this manoeuvre, it was often not possible to obtain accurate values. The ulcers were classified as less than 0.5 cm, between 0.5 cm and 1 cm, and greater than 1 cm in diameter.

Results

INDICATIONS FOR ENDOSCOPY

Table 1 shows indications for endoscopy recorded at the time of examination. As more than one indication led to some examinations the totals add to over 100%. Although abdominal pain was the commonest, one-third of both series had acute gastrointestinal haemorrhage as the main indication.

AGE AND SEX DISTRIBUTION

The age and sex distribution for gastric and duodenal ulcer patients are shown in Figs. 1 and 2. The

Table 1 Indications for endoscopy expressed as percentages of patients examined

	Gastric ulcer (%)	Duodenal ulcer (%)
Abdominal pain	35	45
Acute bleeding	32	31
Inconclusive x-rays	35	11
Confirmation of x-ray findings	8	8
Loss of weight	10	0
Miscellaneous	5	5

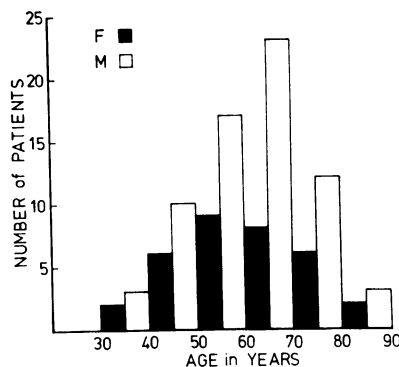


Fig. 1 Age and sex distribution for patients with gastric ulceration.

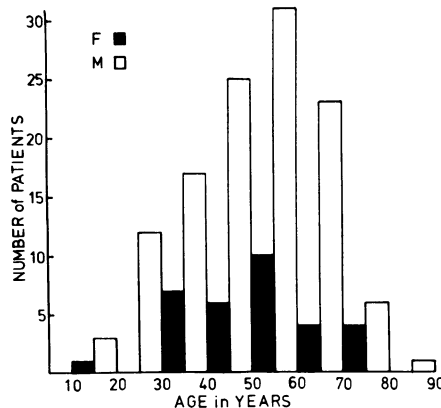


Fig. 2 Age and sex distribution for patients with duodenal ulceration.

mean age for gastric ulcer subjects was 60.1 years and for duodenal ulcer subjects was 49.0 years. Whereas 79% of patients with gastric ulcer were over 50 years, the corresponding figure for duodenal ulcer was 53%. There were only five individuals under 40 years compared with 40 in the duodenal ulcer group.

The male/female ratios for the gastric and duodenal ulcer patients were 2:1 and 4:1 respectively.

ENDOSCOPY FINDINGS (site and size of ulcers)

Gastric ulcers

In 48 patients an ulcer was located on the high lesser curve, in 32 on the mid lesser curve, in 19 an ulcer was found in the distal stomach, and in four on the greater curve. In one patient an ulcer occurred in the fundus, nine patients had multiple ulcers, and four had associated duodenal ulcers.

The largest ulcer in 39 patients was less than 1 cm in diameter, in 50 between 1 cm and 3 cm, and in 11 greater than 3 cm. When more than one ulcer occurred they were usually of similar size—that is, occurred in the same group. In only two patients, each with two ulcers, were the sizes different enough for the ulcers to be placed in different groups.

Duodenal ulcers

The majority of ulcers were situated either on the anterior (47%) or posterior wall (27%). There were only two post bulbular ulcers in the series. Fourteen patients had multiple duodenal ulcers and seven had associated gastric ulcers. In only half the cases (83) was the size of the ulcer measured (the largest crater if more than one ulcer)—29 were less than 0.5 cm, 23 were between 0.5 and 1.0 cm, and 31 were greater than 1 cm.

CLINICAL FEATURES

Table 2 shows the similarity between gastric and duodenal ulcers where symptoms were concerned. Abdominal pain was the commonest symptom but 7% of patients with gastric ulcers and 13% with duodenal ulcers were free from pain. When patients experienced pain, it occurred at night in 56% of those with gastric ulcers and 84% of those with duodenal ulceration.

DURATION OF HISTORY OF PAIN

The mean length of history for gastric and duodenal ulcer patients was 80.5 months and 98.6 months respectively. Forty-three per cent of those with duodenal ulcer had a history of more than five years compared with 33% of the gastric ulcer subjects.

CROSS-CORRELATION OF DATA

The age of the patients, their clinical features, and endoscopic appearances were correlated in several ways.

Tables 3 and 4 show age against the presenting features of acute gastrointestinal haemorrhage and abdominal pain, for gastric and duodenal ulcer subjects respectively. Elderly patients presented more

Table 2 Clinical features of patients with gastric and duodenal ulceration

	Gastric ulcer (%)	Duodenal ulcer (%)
Pain	93	87
Upper abdominal	77	75
Night pain	56 ¹	84 ¹
Vomiting	57	55
Weight loss	39	30
Acute haemorrhage	32	31

¹Night pain as percentage of number with pain at any time.

Table 3 Age of patients with gastric ulcer correlated with presenting features of acute haemorrhage and pain

Age (yr)	Number	Acute bleed		Pain	
		(no.)	(%)	(no.)	(%)
<40	4	0	0	3	75
40-49	14	2	14	8	57
50-59	30	6	20	10	33
60-69	29	11	38	8	28
70-79	18	10	55	4	22
80-	5	3	60	2	40

Table 4 Age of patients with duodenal ulcer correlated with presenting features of acute haemorrhage and pain

Age (yr)	Number	Acute bleed		Pain	
		(no.)	(%)	(no.)	(%)
<40	40	9	23	24	60
40-49	31	7	22	18	58
50-59	41	11	27	17	41
60-69	27	12	44	8	30
70-79	10	6	60	1	10
80-89	1	1	100	0	0

commonly with haemorrhage, while younger patients tended to present with pain.

No female patients under the age of 50 years with either a duodenal or gastric ulcer presented with acute bleeding. However, 40% of males presenting with haemorrhage from a duodenal ulcer were in this age group, as compared with 6% bleeding from a gastric ulcer.

Table 5 shows site of gastric ulcer against the age of patients. Elderly patients are more likely to have high lesser curve ulceration, while younger patients more often have mid-lesser curve or distal ulcers.

Of 46 patients with a duodenal ulcer who presented with acute bleeding, 14 gave no history of abdominal pain. Table 6 shows that the longer the history of pain the less likely the patients were to present with acute haemorrhage. There was no such correlation for patients with gastric ulceration.

Table 5 Sites of gastric ulcer correlated with age of patients

Age (yr)	Number	High lesser curve		Mid lesser curve		Distal lesser curve prepyloric		Greater curve	
		(No.)	(%)	(No.)	(%)	(No.)	(%)	(No.)	(%)
<40	4	0	0	2	50	2	50	0	0
40-49	14	6	43	3	21	6	43	0	0
50-59	30	12	40	11	33	6	20	3	10
60-69	29	15	52	11	38	3	10	0	0
70-79	18	12	66	4	22	1	6	1	6
80 <	5	3	60	1	20	1	20	0	0

Of 54 patients with recorded anterior wall duodenal ulcers 20 (37%) presented with acute gastrointestinal bleeding, while of 31 individuals with posterior wall ulcers only five (16%) bled. Otherwise, there was no significant correlation between the site of duodenal ulcers and symptomatology, or age of the patients.

HAEMOGLOBIN CONCENTRATION

The values of the haemoglobin at presentation are set out in Figs. 3 and 4. Thirty-two per cent of patients with gastric ulcers compared with 31% of duodenal ulcer subjects presented with an acute bleed. When anaemia (haemoglobin less than 13 g/dl in men and less than 12 g/dl in women) was present it was almost always associated with a history of a recent acute gastrointestinal haemorrhage in both series. When there was no such history, anaemia was associated with a second diagnosis except for two premenopausal women, one each with gastric and duodenal ulcer, with haemoglobins of 11.6 g/dl and 11.8 g/dl respectively. Second diagnoses included scleroderma, rheumatoid arthritis treated with steroids and antirheumatic drugs, and two patients with associated gastric and duodenal ulcers.

SERUM ALBUMIN AND SERUM CALCIUM IN DUODENAL ULCER PATIENTS

Fourteen patients had values for serum calcium of less than 2.5 mmol/l usually associated with a low serum albumin. In most cases, the latter appeared to be due to a previous acute gastrointestinal haemorrhage, as, of 20 patients with a serum albumin of less than 35 g/l, 16 had recently bled. There was only one patient with hypercalcaemia and he was known to have primary hyperparathyroidism.

ESR

In general in both gastric and duodenal ulceration the ESR was normal. In both groups a value greater than 20 mm in one hour (Westergren) was associated either with an age of 55 years or over, or a known second diagnosis, except in three instances.

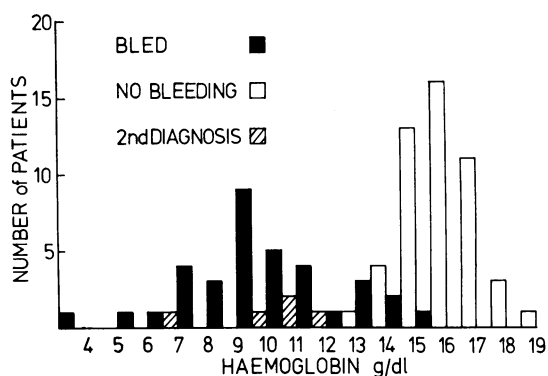


Fig. 3 Haemoglobin values at presentation for patients with gastric ulceration.

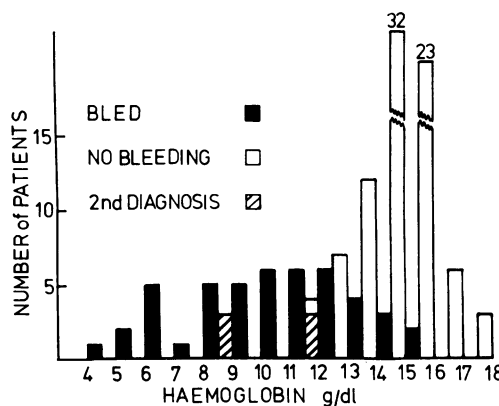


Fig. 4 Haemoglobin values at presentation for patients with duodenal ulceration.

MANAGEMENT AND OUTCOME

In both groups of patients management was the responsibility of the referring doctor and was based on the usual clinical criteria but with knowledge of endoscopic findings.

Although the aim of this study was not primarily

Table 6 *Length of history of duodenal ulceration correlated with acute gastrointestinal haemorrhage*

Duration (months)	Patients (no.)	Patients with bleeding (no.)	Percentage
<12	19	10	58
12-59	47	14	30
60-119	19	5	26
>120	49	3	6

to consider the natural history or follow-up of peptic ulceration, some points of interest have emerged.

Gastric ulcers

Treatment was initially medical in 83% and surgical in 17%, although after one year a further 15% had required operation. Four patients died during the limited follow-up, one after surgery for haemorrhage, two with congestive cardiac failure associated with carbenoxolone therapy (both had rheumatoid arthritis), and one from bronchopneumonia five months after endoscopy. Their respective ages were 76, 73, 58, and 80 years.

Duodenal ulcers

Forty-four per cent of patients in this series were treated surgically, two-thirds of these as initial management and one-third when they presented with recurrent symptoms or complications. Six patients died during the limited follow-up period, two after surgery for haemorrhage (aged 74 and 60 years) three of unrelated causes (cerebrovascular accident, carcinomatosis, and status asthmaticus) and one which may have been associated with carbenoxolone therapy (aged 81 years).

Discussion

This survey was undertaken to assess the clinical picture of peptic ulceration presenting to a district general hospital endoscopy unit. No attempt was made to delineate the natural history of peptic ulcer disease or define its incidence in the population. Selection of cases for endoscopy was made on clinical grounds (Table 1), and, for inclusion in the survey, demonstration of an active gastric or duodenal ulcer crater at endoscopy. Thus, the sample may not be representative of all ulcers occurring in the community (catchment area about 330 000) but the clinical presentation, age, and sex distribution of the patients are similar to those reported from more general surveys. Thus, the mean age for gastric ulcer patients was 60.1 years and for duodenal ulcer patients 49.0 years, which compares with figures quoted by Edwards and Coghill (1968) of 53.1

years and 44.1 years respectively. The male:female ratio for gastric ulcers was 2:1—the same as that given by Mowat *et al.* (1975) but unlike that of 3.5:1 found by Jamieson *et al.* (1949). The ratio for duodenal ulcers of 4:1 (male:female) compares with the figures of 3:1 quoted by Edwards and Coghill (1968), but it is greater than those of Watkinson (1960) (2:1) and Petrie *et al.* (1972) (2.5:1).

The similarity between the symptoms of gastric and duodenal ulcer re-emphasises the difficulty or impossibility of distinguishing between these two conditions on clinical grounds alone which has been commented on by others (Edwards and Coghill, 1968). The epigastrium was the commonest site of abdominal pain but 12% of duodenal ulcer patients and 16% of gastric ulcer patients had pain elsewhere and 13% and 7% of the two groups respectively were free from pain. There was no difference between the two groups as regards duration of history. An expectedly high proportion of duodenal ulcer subjects complained of night pain (84%) but a considerable number of gastric ulcer patients (56%) also had this symptom. This compares with figures of 75% and 50% for duodenal ulcers and 30% and 43% for gastric ulcers from the studies of Gainsborough and Slater (1946) and Edwards and Coghill (1968) respectively. Vomiting occurred in over 50% of patients with either type of ulcer in the present series and more than 30% complained of some loss of weight, usually in association with vomiting.

Gastric ulcers were designated benign at the time of examination from gross endoscopic appearances. Criteria employed were a circular or regular crater with clear cut edges and a smooth base, although large ulcers with typical edges often had a granular base. The majority were submitted to biopsy. To date, no evidence of malignancy has been found histologically in an ulcer classified as benign on macroscopic appearances. Thus, the endoscopic features of a benign gastric ulcer, as here used, appear to be reliable.

Forty-eight per cent of gastric ulcer patients had an ulcer located on the high lesser curve, which is at variance with previous surveys based on conventional radiological findings where the incidence was far lower. Thus Boudreau *et al.* (1951) and Braasch *et al.* (1955) found only 7% and 5% of gastric ulcers on the high lesser curve respectively. Sun and Stempien (1971) stated that 70.5% of ulcers lay along the lesser curve within 72 mm of the pylorus while 85% were within 90 mm. However, Amberg and Zboralske (1966) found that in 42% of patients over the age of 70 years with a gastric ulcer the high lesser curve was involved. Recently, Stevenson (1975) has compared the sites of gastric ulcers demonstrated by a double contrast barium meal with

endoscopic findings. In this series radiology and endoscopy were in agreement showing a distribution of ulcers similar to our own.

The disparity between series is probably explained by the ages of patients included and the difficulty experienced when examining the high lesser curve radiologically. Although this area may present problems to the endoscopist also, meticulous technique and modern instruments allow excellent views of the region, so reducing to a minimum errors in diagnosis. This point is further emphasised by the considerable number of patients in whom a high lesser curve ulcer was found endoscopically but had not been detected by previous radiology (Cockel *et al.*, 1975). It is now our policy to advise assiduous study of this area especially in the elderly and in those presenting with acute haemorrhage.

Post-bulbar duodenal ulceration was detected only twice in this series (1.33%), in both cases using a side-viewing duodenoscope. Forward-viewing instruments sometimes cannot be persuaded beyond the duodenal bulb even in normal individuals because of the acuteness of angulation encountered. Thus, a side-viewing instrument should possibly be employed if a lesion in this area is expected. The present series therefore is likely to underestimate the incidence of post-bulbar ulceration as both types of instrument were not used in all cases.

There did not appear to be any relationship between the site or size of ulcers and the presence, absence, or site of pain, but large ulcers may present special problems. Of 11 patients with a gastric ulcer greater than 3 cm in diameter, six bled acutely and, of these, five came to surgery. Large ulcers are not necessarily malignant, which has been the experience of others (Nyhus, 1970). There appears to be a wide variation in the incidence of multiple gastric ulcers ranging from 1.2% to 36.1% (Boyle, 1971; Winans *et al.*, 1972). In the present study nine patients were found to have multiple ulcers. Six of these were referred for endoscopy because of difficulties in interpreting radiographs. The incidence of associated duodenal ulceration has been low (four patients) but others from radiological studies have found between 21%-67% of patients with combined ulceration (Rumball, 1971; Petrie *et al.*, 1972; Mowat *et al.*, 1975). The apparent high incidence of combined ulceration in radiological studies is probably related to the considerable difficulty in interpreting deformity of the duodenal bulb on radiographs, and its relationship to active duodenal ulceration. It seems likely that figures from endoscopic series will more closely reflect the true incidence of associated gastric and duodenal ulceration.

When the age of patients was correlated with their clinical presentation it was demonstrated that

elderly patients were more likely to have had an acute gastrointestinal haemorrhage, while younger patients tended to present with abdominal pain. This held true for both gastric ulceration irrespective of the site of the lesion in the stomach and also for duodenal ulceration. When women alone are considered, this trend is most marked, as no female under the age of 50 years in this series bled acutely from either a gastric or duodenal ulcer. Pulvertaft (1968) also found in his series that the risk of haemorrhage from peptic ulcer rises with increasing age. Thirteen per cent of the duodenal ulcer patients and 7% of those with gastric ulcers presented with symptoms other than pain. When pain was present, the longer the history, the less likely was a duodenal ulcer patient to develop an acute bleed. By contrast this was not true for gastric ulcer subjects.

The findings of a higher incidence of bleeding anterior wall ulcers compared with those on the posterior aspect of the duodenal cap was unexpected and at variance with standard surgical opinion. The explanation for this disparity is not clear. Brown *et al.* (1973), have shown that, in uncomplicated duodenal ulceration, the position of lesions seen endoscopically correlates well with the findings at surgery, but in that series the surgeon was paying particular attention to the location of the ulcer.

Uncomplicated benign gastric or duodenal ulceration only rarely causes anaemia. When a low haemoglobin concentration occurred there was usually a history of recent acute gastrointestinal haemorrhage—when no such history was present an alternative cause for anaemia was usually found. However, in two cases anaemia was associated with the presence of combined gastric and duodenal ulceration and no further pathology could be found. Two premenopausal women had haemoglobin values of between 11 and 12 g/dl for which there was no obvious cause, although at this age associated menorrhagia is a possibility.

A considerable proportion of the patients, 32% of the gastric ulcer group and 44% of the duodenal ulcer group, were treated surgically but this probably reflects the current attitudes of the referring clinicians. Cotton *et al.* (1973) also found a higher incidence of early operation for duodenal ulcer (58%) compared with gastric ulcer (25.5%) in their series of cases where endoscopy was performed for acute haemorrhage.

Ten patients are known to have died during the limited follow-up period, all were aged over 50 years and six were over 70 years. Seven presented with acute gastrointestinal bleeding and three developed congestive cardiac failure associated with carbenoxolone therapy. The need for caution when prescribing carbenoxolone and the importance of

regular follow-up of patients receiving this drug (Davies *et al.*, 1974) should again be stressed.

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