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CHRONIC GASTRIC ULCER

A COMPARISON BETWEEN A GASTROSCOPICALLY CONTROLLED SERIES TREATED MEDICALLY AND A SERIES TREATED BY SURGERY

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Chronic duodenal and gastric ulcers are usually studied together under the title of "peptic ulcer," but there is evidence to suggest that their aetiology is different. Duodenal ulcer is predominantly a disease of young adults with a thick hypersecreting gastric mucosa, while gastric ulcer is commonest in the middle-aged with a normal or thinning mucosa and is associated with normal or diminished acidity. The treatment of duodenal ulcer is to some extent physiological in that, whether by neutralization, vagotomy, or partial gastrectomy, the effect is to reduce the high acidity. In the case of gastric ulcer, however, the application of the same principles is less rational, although, at present, the only effective form of treatment. These considerations make it advisable to study them separately.

For economic and clinical reasons there has been an increasing tendency towards the use of surgery in the treatment of chronic gastric ulcer. It is no longer possible in larger centres to compare the late results in controlled series, the one treated medically and the other surgically, but some useful information may be forthcoming from an analysis of uncontrolled material.

Present Investigation

The present investigation concerns 498 patients with chronic gastric ulcer. They are divided into two series —one treated medically and the other surgically in the gastro-enterological clinic at St. James's Hospital during the years 1940–6 inclusive. Late information concerning nearly all was obtained in 1952, giving a minimum follow-up period of five and a maximum of twelve years.

There are 262 patients in the medical series, in which the criterion for inclusion was the presence of a gastroscopically confirmed *active* chronic gastric ulcer. In view of the rarity of the combination of even quiescent duodenal ulcer with gastric *carcinoma* (only two have been encountered in over 2,200 gastrectomies in ten years at St. James's Hospital) and the need for more evidence on the "ulcer-cancer" problem, those patients in whom a previous or concomitant duodenal ulcer was suspected have been omitted. Also excluded are those patients who were submitted to a curative operation within one year of gastroscopic diagnosis. Analysis of this series may be expected to reveal a preponderance of patients with short histories or mild symptoms, of those who respond rapidly to treatment and relapse rarely, of those who by reason of age or poor general condition are considered to be unsuitable for surgery, and of those who refuse operation.

In the surgical series there are 254 cases. Patients with additional duodenal ulcers or scars are not included. Those in whom the only operation was repair of a perforated ulcer are excluded, since this cannot be regarded as a curative procedure and since the localization of juxtapyloric perforations may be difficult at emergency operation. Because this is a clinic specializing in gastric disorders the surgical series contains a proportion of technically difficult cases which had been referred from elsewhere. For example, the incidence of high lesser-curve ulcers will be greater than is normally found.

Eighteen patients, sixteen men and two women, appear in both series.

Age and Sex

Of the 498 patients 387 were men and 111 were women, a ratio of 3.5:1, which is the usual recent finding, but a reversal of earlier statistical figures. The reason for this change is the great reduction in the incidence of gastric ulcer in *young* women.

It is not possible to give complete information on the ages at which the diagnosis of gastric ulcer was first made, since in a certain number of cases this was done by *x*-ray examination of a barium meal previous to the time of gastroscopy. Table I does, however, give some indication, and shows the age distribution of cases at

TABLE I.—*Gastric Ulcer: Age and Sex Incidence*

Age (years)	Medically Treated				Surgically Treated			
	Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%
10–19	—	—	1	1·4	—	—	—	—
20–29	7	3·7	1	1·4	2	0·9	—	—
30–39	17	8·9	6	8·5	27	12·7	2	4·8
40–49	51	26·7	15	21·1	56	26·4	9	21·4
50–59	51	26·7	26	36·6	86	40·6	21	50·0
60–69	53	27·7	17	23·9	37	17·5	7	16·7
70–79	12	6·3	5	7·0	4	1·9	3	7·1
Total	191		71		212		42	

Note: Combined figures are not given, since 16 men and 2 women appear in both series.

the start of the investigation, thus serving as a useful baseline. In addition it shows the ages at which patients came to operation.

It is unusual for patients with chronic gastric ulcer to present at hospital before the age of 30, but after this there is a steady increase in numbers until the middle fifties. As might be expected, most of the youngest and oldest patients were treated conservatively. In both sexes the highest operation rate was in the sixth decade and a higher proportion of men than of women were treated by surgery.

Age at Onset of Symptoms and Length of History

The average age at the onset of symptoms was 43.6 years in men and 44.6 years in women. The similarity between the two sexes is clearly shown in Table II, where the series are amalgamated. These figures confirm the fact that, although gastric ulcers may start at any age, they most commonly do so after the age of 30.

In Table III a comparison is given of the length of symptoms in the two series. It must again be borne in mind that in the medically treated series the times given are not necessarily those of the initial diagnosis. Amongst the men one finds that those with short histories tend to be treated medically. Why this does not hold good for women

TABLE II.—*Gastric Ulcer: Age at Onset of Symptoms*

Age at Onset (years)	Medical and Surgical				Men and Women	
	Men		Women			
	No.	%	No.	%	No.	%
10–	9	2·3	7	6·3	16	3·2
20–	48	12·4	7	6·3	55	11·0
30–	79	20·4	19	17·1	98	19·7
40–	115	29·7	33	29·7	148	29·7
50–	75	19·4	28	25·2	103	20·7
60–	35	9·0	11	9·9	46	9·2
70+	8	2·1	2	1·8	10	2·0
Unstated	18	4·7	4	3·6	22	4·4
Total	387		111		498	

TABLE III.—*Gastric Ulcer: Length of History*

Length of History (years)	Medically Treated				Surgically Treated			
	Men		Women		Men		Women	
	No.	%	No.	%	No.	%	No.	%
Under 1	40	20·9	7	9·9	21	9·9	7	16·7
1–3	25	13·1	14	19·7	20	9·4	10	23·8
3–5	26	13·6	8	11·3	28	13·2	7	16·7
5–10	32	16·8	13	18·3	51	24·1	8	19·0
10–20	31	16·2	12	16·9	52	24·5	4	9·5
Over 20	28	14·7	15	21·1	30	14·2	4	9·5
Unstated	9	4·7	2	2·8	10	4·7	2	4·8
Total	191		71		212		42	

Note: The majority of the "unstated" cases fell into the longer history groups. They were recorded as "many years."

is not clear. It would seem that women, if they do not have an operation early in their ulcer history, become adapted to its presence better than men, possibly because they can, for domestic reasons, treat their recurrences more thoroughly. There is a falling off of the operation rates in men with a history of over 20 years. These too will have learnt to "live with their ulcer," and for this reason their appearance at hospital should excite suspicion that recent symptoms which they attribute to their ulcer may be due to other causes (Tanner, 1951).

Sites of Chronic Gastric Ulcer

The impression in this clinic that the high posterior aspect of the lesser curve is the site of predilection for chronic gastric ulcers in women is confirmed (Table IV). There is a pronounced drop in the frequency as the lower stomach is approached, and ulcers in the pyloric antrum and canal are exceptional. This last observation has been made on several previous occasions (see Ivy, Grossman, and Bachrach, 1951), In men, on the other hand, the distribution of ulcers from the cardia to the pylorus is more even, with the highest incidence in the mid and lower body, and over 10% are found distal to the angulus. The reasons for these differences between men and women are unknown.

TABLE IV.—*Sites of Chronic Gastric Ulcer*

Vertical					Transverse				
Site	Medical and Surgical				Site	Medical and Surgical			
	Men		Women			Men		Women	
	No.	%	No.	%		No.	%	No.	%
					Posterior lesser curve	119	29·3	53	44·2
High body ..	78	19·2	52	43·3	Lesser curve	122	30·0	47	39·2
Mid body ..	109	26·8	39	32·5	Anterior lesser curve	33	8·1	10	8·3
Low body ..	88	21·7	20	16·7	Greater curve ..	1	0·2	1	0·8
Angulus ..	74	18·2	7	5·8	Angulus ..	74	18·2	7	5·8
Pylorus and antrum ..	55	13·5	1	0·8	Pylorus and antrum ..	55	13·5	1	0·8
Unknown ..	2	0·5	1	0·8	Unknown	2	0·5	1	0·8
Total	406		120		Total	406		120	

Note: 2 men had three ulcers each. 15 men and 9 women had two ulcers each.

TABLE V

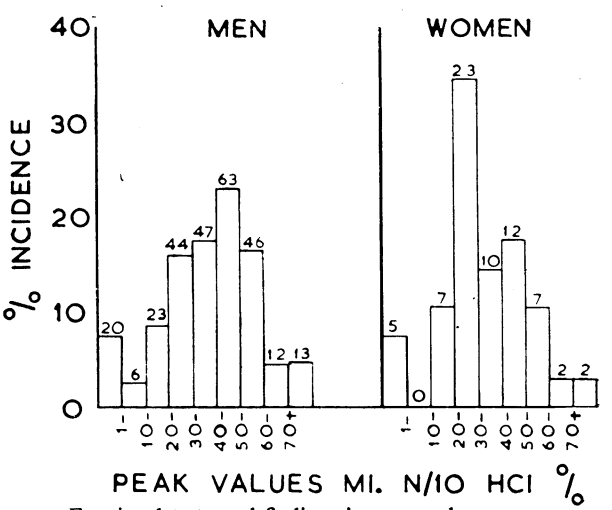
	High Lesser Curve			Mid Lesser Curve			Low Lesser Curve		
	Ant.	Mid.	Post.	Ant.	Mid.	Post.	Ant.	Mid.	Post.
Men ..	3	31	44	6	53	49	24	38	26
Women	3	20	29	6	16	17	1	11	7

In the body of the stomach the anterior lesser curve and anterior wall of the stomach are comparatively immune to peptic ulceration, while the posterior lesser curve is very susceptible (see Table V). In men the differences in anterior and posterior ulceration decrease as the angulus is approached, whilst in women the high proportion of posterior ulcers is maintained.

Fractional Test Meal

Results of a fractional test meal, using gruel as the stimulant, were available in 342 patients. The peak values of free hydrochloric acid measured as millilitres of N/10 HCl are shown in the Chart.

The highest incidence in men was with free acidity between 40 and 50 ml. (63), and in women 20 to 30 ml. (23). The age of the patient at the time of the test meal makes little difference to the findings, and it is only by gross



Fractional test meal findings in men and women.

grouping that any higher incidence of hypochlorhydria in the older patients can be shown (Table VI).

Amongst the women, in whom the numbers are smaller, the age of the patient seems to be completely unrelated to the test-meal findings. It seems to be the presence of a

TABLE VI.—*Chronic Gastric Ulcer: Acidity in Relation to Age (Men Only)*

Peak Values ml. N/10 HCl	Men under 50		Men over 50	
	No.	%	No.	%
0–19	15	14·3	34	20·1
20–39	35	33·3	56	33·1
40–59	41	39·0	68	40·2
Over 60	14	13·3	11	6·5
Total	105		169	

degenerate mucosa rather than the age of the patient which leads to the formation of a gastric ulcer, though age indirectly affects the incidence in so far as mucosal atrophy increases with increasing years.

Although there are differences in the fractional test meal findings when they are related to the site of the ulcer in the stomach, they are not great, and it has not proved possible to work out any definite correlation.

Comparison between different series of gastric analyses is well-nigh impossible owing to different techniques used and differing interpretations put upon the results. The results in this investigation are given here, since the gruel test meal is probably the type of gastric analysis most widely used in this country.

Early Results of Treatment

Medical Series

The unceasing flow of papers to the journals shows that there is no unanimity concerning the effectiveness of individual methods of treating gastric ulcers. Suffice it to say that nearly all will heal on rest in bed, regular feeds, and antacids, which were the general principles adopted in this series. Five men and one woman died during their initial stay in hospital—three of haemorrhage from their ulcers, two of pneumonia, and one of bronchial carcinoma.

The normal procedure is for a patient suspected of having a gastric ulcer to be gastroscoped within a few days of first being seen and then at regular intervals—usually fortnightly. Patients are kept under a strict regime until there is evidence, preferably gastroscopic, that the ulcer is healed. The Schindler gastroscope was used for the earlier cases and the Hermon Taylor gastroscope for the later ones.

Surgical Series

The procedures and immediate results in this series, which includes emergency operations, are shown in Table VII.

TABLE VII.—*Surgical Series: Procedure*

Procedure	No.	Deaths	Mortality
Local excision	4	3	75·0%
Gastro-jejunostomy	12	3	25·0%
Partial gastrectomy (whole series) ..	238	15	6·3%
Pastial gastrectomy (excluding 1940–1)	175	5	2·9%

Note: Operative deaths are taken as all deaths occurring within one month of operation.

In 1940 and 1941 there were 13 operative deaths (10 following partial gastrectomy, 3 following gastro-jejunostomy), and the figures for these two years account for the high mortalities. All these deaths occurred during the first five months of intensive night bombing on London, and, although the causes of death seemed to bear no direct relationship to the bombing, there can be little doubt that they were due to resistance being lowered as a result of stress (Tanner, 1946, 1951).

Many of these patients were operated on in the pre-penicillin era, and it is of interest to compare the figures with the more recent results. In the last 350 partial gastrectomies performed by one of us (N.C.T.) before 1953 for chronic gastric ulcer, unaccompanied by duodenal ulcers or scars or by oesophageal ulcers, there have been four operative deaths—an incidence of just over 1%. These include emergency operations for haematemesis, of which there were 38 cases with two deaths.

Surgery in the treatment of gastric ulcer may be expected to carry a higher mortality than for duodenal ulcer, since one is dealing with an older age group. Table VIII shows the correlation between the age of the patient and the operative mortality.

TABLE VIII.—*Surgical Series: Age of Patients Dying Post-operatively*

Age (years)	No. in Series	Died	
		No.	%
40–	65	2	3·1
50–	107	9	8·4
60–	44	7	15·9
70–79	7	3	42·9

Unless there is some strong indication for surgery, patients over the age of 65 are treated medically in this clinic, and the older age groups contain a high percentage treated by emergency operation for uncontrolled haemorrhage.

Local excision of ulcers was practised only as an emergency operation for those patients in dire straits from uncontrolled haemorrhage. Gastro-jejunostomy was reserved for the feeble and elderly with obstructive symptoms. Partial gastrectomy was the operation of choice both as an emergency and as a planned procedure. The type most frequently performed was the antecolic Polya–Hofmeister (196 cases), with or without a Pauchet extension, depending upon the site of the ulcer. In 1946 the Billroth I type of partial gastrectomy was used more often, and has since become the operation of choice for chronic gastric ulcer, as it is a simpler and perhaps more physiological procedure.

Method of Follow-up

A circular letter containing a questionary was sent to the last known address of the patient requesting him to attend at the clinic if possible, or, if unable to do so, to complete the questionary. In the event of failure to receive a reply to this and a postcard reminder, or the letter being returned as "unknown," "gone away," or "house demolished," any other addresses of the patient or next of kin were tried. The response was good, but many remained uncontacted. Personal visits were next paid to all possible addresses. It was often found that the house had disappeared as a result of bombing, in which case the nearest intact dwelling was tried. By this means enough information was obtained to trace well over half the missing patients. Householders were almost without exception extremely co-operative, frequently going out of their way to gather information. Where they were unable to give exact details they could often give some help. For instance, the name of the road to which the patient had moved might be known, when reference to the voters' list would give the number. One patient was run to earth working in a public lavatory and another selling newspapers outside a well-known football ground. Some 400 miles of the streets of South London were covered in this part of the follow-up, which also included tracing a series of achlorhydric patients (in press). Where known and still practising, family doctors gave assistance, and for certain cases the medical superintendents and staff of other hospitals were of invaluable help. Local registrars of births and deaths and the Registrar-General provided details of dates and causes of deaths. In addition, particulars of any of the untraced patients who would now be aged over 50 were sent to the latter in case they had died and were identifiable in the records. Insurance House and the Central Pensions Branch of the Ministry of National Insurance were able to help in tracing some of the remainder.

Results of Follow-up—Both Series

The results of the follow-up investigations are given in Table IX.

TABLE IX.—*Results of Follow-up*

	Medical Series		Surgical Series	
	No.	%	No.	%
Alive and contacted	181	70·7	169	72·5
Dead	61	23·8	56	24·0
Alive, but not contacted	1	5·5	2	3·4
Emigrated and not contacted	3		2	
Nothing known	10		4	
Total	256		233	

Note: 6 patients in the medical and 21 in the surgical series died during their initial stay in hospital (see above) and are not included in the late analysis.

Deaths

Sixty-one patients in the medical and 56 in the surgical series have died since their initial stay in hospital. The causes of death in these cases are shown in Table X.

TABLE X.—*Causes of Death*

Cause	Medical Series		Surgical Series	
	Men	Women	Men	Women
A. Gastric:				
Carcinoma	2	1	3	1
Ulcer haemorrhage	4	1	—	—
Ulcer perforation	1	—	—	—
Ulcer—unspecified	1	—	—	—
Late post-operative	—	—	1	2
B. Other alimentary:				
Carcinoma large bowel	3	—	1	—
Appendicitis	1	—	—	—
Toxic hepatitis	—	—	1	—
C. Respiratory:				
Acute infections	7	1	7	—
Chronic bronchitis	1	1	4	—
Tuberculosis	3	—	6	—
Carcinoma of bronchus	3	1	3	—
Carcinoma of maxillary antrum	1	—	—	—
D. Cardiovascular:				
Heart disease	11	3	9	2
Cerebral vascular accidents	7	—	2	1
Syphilitic aortitis	—	—	1	—
E. Genito-urinary:				
Chronic nephritis	—	—	—	2
Hypernephroma	—	—	2	—
Post-prostatectomy	1	—	—	—
F. Metabolic:				
Diabetes mellitus	1	—	—	—
Addison's disease	—	—	—	1
G. Other:				
Basal-cell carcinoma	1	—	—	—
Bombing	—	2	—	—
Suicide	—	—	2	—
Unknown	2	1	4	1
Total	50	11	46	10

Note: Patients in the medical series who later had resections performed and who are not included in the surgical series have not been followed beyond the time of operation.

Despite the fact that the medical series might be expected to contain the majority of the aged and infirm patients, the death rates in the two series are almost exactly the same. No particular disease in either series predominates. There are too many factors involved for a more detailed statistical breakdown of the causes and rates of death to be of value, but two conditions, gastric carcinoma and pulmonary tuberculosis, require further analysis.

Gastric Carcinoma

Fifteen patients in the medical and 11 in the surgical series have developed carcinoma. In 10 (6 and 4 respectively) the primary growth was probably in the stomach. Brief particulars of these cases are presented in Table XI.

It has often been pointed out that the differentiation between chronic gastric ulcer and gastric carcinoma may be impossible before operation or even before microscopical examination of the specimen. The first two cases are almost certainly such examples, though, in both, operation was advised on account of the possibility of malignancy. In at least two of the remaining eight cases the carcinoma arose at a different site from the ulcer. It is interesting to note that in at least two, and possibly three, of the cases the removal of the large portion of the stomach, including the chronic gastric ulcer, did not prevent the subsequent development of a carcinoma.

Estimates of the incidence of malignant change in chronic gastric ulcers—"ulcer-cancer"—have come almost entirely from the pathologists, and very strict criteria for the diagnosis have been laid down, culminating in those of Newcomb (1932). If a certain percentage—for example, 3, 6, 10, or more—of gastric ulcers become malignant, it is remarkable that in none of the present cases do we find macroscopic or microscopical evidence of "ulcer-cancer." In the medical series alone the 262 patients have had some 2,000–3,000 years of ulcer history. When may we expect them to become malignant and show the features of "ulcer-cancer"?

Brinton (1864) described ulcerating carcinomata in which ulceration kept pace with growth for many years. According to Palmer and Humphreys (1944) such cases may show all the features of "ulcer-cancer." In a previous study of patients with gastric carcinoma (Swynnerton and Truelove, 1951) the evidence suggested that the histological diagnosis of "ulcer-cancer" was not always supported by the clinical facts. The problem of malignant degeneration of gastric

TABLE XI.—*Cases in Which there was Evidence of Gastric Carcinoma*

Case No.	Sex	Age	Length of History	Gastroscopy	Remarks
				Medical Series	
1	M	55	4 years	Irregular ulcer high lesser curve; ? carcinoma. Failed to heal	Refused operation. Died 19 months later of "carcinoma of stomach." No necropsy
2	M	57	6 ,,	Antral ulcer. Only one examination	Refused operation. Developed ascites. Died 1 month later of "carcinomatosis." No necropsy
3	F	74	50 ,,	High posterior lesser curve ulcer. Soundly healed after 5 weeks' treatment	Died 6 years later of "haematemesis due to gastric carcinoma." Before death had lost weight and became deeply jaundiced with enlarged liver. No necropsy
4	M	56	9 ,,	Ulcer at angulus. Healing 2 weeks later	2 years symptom-free, then recurrence lasting 1 year before admission with epigastric mass. Resection of prepyloric carcinoma. No evidence noted of preceding ulcer
5	M	53	16 ,,	Ulcer at angulus. Only one examination	Readmitted 6½ years later with gastric retention. At operation small localized prepyloric carcinoma, separate from old ulcer scar at angulus
6	M	51	1 week	Mid. anterior lesser curve ulcer. Soundly healed in 6 weeks	4 years symptom-free, then 1 year recurrence of dyspepsia before resection of high ulcerating diffuse spheroidal-cell carcinoma
				Surgical Series	
7	M	51	4 years	High posterior lesser curve ulcer	Partial gastrectomy. Histologically chronic peptic ulcer. Readmitted 9 years later with 2 years periodic dysphagia and substernal pain. Carcinoma of cardia resected
8	M	47	13 ,,	Ulcer at angulus	Partial gastrectomy. Histologically chronic peptic ulcer. Well for 6 years, then pain and diarrhoea for 4 months before death. Necropsy—diffuse carcinoma of stomach remnant
9	M	70	2 ,,	High lesser curve ulcer	A huge gastric ulcer penetrating and fixed to the liver treated by gastro-jejunostomy. Recurrent dyspepsia for 5 years, when he was admitted with an epigastric mass and nodular liver. Died—no necropsy
10	F	54	2 ,,	Low lesser curve ulcer	Partial gastrectomy. Histologically chronic peptic ulcer. 3½ years later admitted elsewhere with Krukenberg tumour of ovary and generalized abdominal carcinomatosis. Primary? stomach. Died 8 months later. No necropsy

ulcers is a clinical as well as a pathological one, and there is all too little clinical evidence in the literature. If there is an association between gastric ulcer and carcinoma, it seems to us to be due to a preference of both for the same soil rather than any direct association.

Pulmonary Tuberculosis

Pulvertaft (1952) has suggested that there may be an increased incidence of pulmonary tuberculosis following gastric resection of peptic ulcer. Among the 233 cases in the present surgical series six men have died of this disease —one seven months, three three years, one five years, and the other eight years after operation at the ages of 52, 49, 58, 62, 56, and 63 respectively. In none was the diagnosis recorded at the time of operation, but two patients who had active pulmonary lesions when operated on are still alive after seven and nine years, and their lesions are reported to be inactive. One woman died of Addison's disease 10 years after operation, and another was diagnosed as suffering from pulmonary tuberculosis seven years after gastrectomy.

In the medical series three men have died of pulmonary tuberculosis, in one only of whom was the diagnosis recorded at the time of admission for gastric treatment. The evidence concerning an increased risk of pulmonary tuberculosis following gastrectomy is inconclusive.

Manifest Haemorrhage

At least 139 (27.9%) of the 498 patients have had at some time haematemesis or melaena during the course of their ulcer career, and, of these, 22 (15.8%) have bled on more than one occasion.

Medical Series—Remaining Patients

After subtracting those patients who have died, those who have developed gastric carcinoma, and those who have been lost, there remain 178 on which to base the late results of medical treatment (Table XII). Transient gastric symptoms have not been considered sufficient evidence of recurrence. There must have been symptoms suggestive of gastric ulcer lasting for at least several days at a time before a diagnosis of recurrence was made. Occasional recurrences have been defined as those occurring less frequently than once a year. The seven patients who have died as a direct result of the ulcer are not considered further, since there is no adequate information on the subsequent gastric history in those who died from other causes for comparison.

TABLE XII.—*Late Results in the Medical Series*

	Men		Women		Total	
	No	%	No.	%	No.	%
Recurrence requiring gastrectomy	46	36·5	11	21·2	57	32·0
Frequent recurrences	28	22·2	16	30·8	44	24·7
Occasional recurrences	23	18·3	12	23·1	35	19·7
No recurrences	29	23·0	13	25 0	42	23·6
Total	126		52		178	

In three-quarters of the patients the symptoms of gastric ulcer have recurred despite the fact that these cases might be expected to be mild or of recent onset. The large number of deaths should by the end of five to twelve years have eliminated the majority of patients who were not operated on initially because of age or infirmity. Re-examination of the criteria for inclusion of patients in this series does not reveal any obvious factor in the method of selection of cases to account for the appalling results, and one is forced to conclude that medical treatment, though it may heal the ulcer, will keep it healed in less than a quarter of the early or milder cases. These findings are in accord with those of Althausen (1949) for peptic ulcer as a whole.

The cases have been analysed to see if any factors influencing the recurrence rate can be found.

Age of Patient

That the age of the patient at the time of gastroscopic diagnosis is related to the incidence of recurrence is shown in Table XIII. There is a steady increase in freedom from recurrence with increasing age. There are several possible explanations of this finding, of which the most likely is that many of the patients whose ulcers recur frequently will have been operated on before they reach the age of 60. In addition, the older patients will be able to rest and relax more and to pay more attention to diet, etc.

TABLE XIII.—*Recurrence Rate in Relation to Age of Patient*

Age Group (years)	Recurrences					
	None		Occasional		Frequent	
	No.	%	No.	%	No.	%
Under 50	12	15·2	16	20·3	51	64·6
50–59	16	28·6	11	19·6	29	51·8
60+	14	32·6	8	18·6	21	48·8

Length of History

It might be expected that those patients with short histories prior to diagnosis would respond well to treatment and relapse rarely. Table XIV indicates that although they appear to do better than those with longer histories, their chances of remaining symptom-free are still under 50%. The numbers when divided into groups are small, but with a history of between one and twenty years the chances of prolonged freedom are only about one in eight. The results have been analysed in relation to both length of history and the age of the patient. Numbers are too few to yield significant results, but the trend is for patients under the age of 50 to have a higher incidence of recurrences than those over 60, no matter what the length of history. This, as mentioned above, may well be because those patients whose ulcers recur frequently are operated on before they reach an advanced age.

TABLE XIV.—*Recurrence Rate in Relation to Length of History*

Length of History (years)	Recurrences					
	None		Occasional		Frequent	
	No.	%	No.	%	No.	%
Under 1	14	40·0	7	20·0	14	40·0
1–	5	9·3	13	24·1	36	66·7
5–	6	23·1	5	19·2	15	57·7
10–	3	11·1	6	22·2	18	66·7
20+	11	36·7	4	13·3	15	50·0

Note: In 6 patients the length of history was unknown.

Diet and Alkalis

No coherent picture emerges from a study of the relationship of dieting and taking alkalis to recurrences. Some diet the whole time, some when they have pain, and the remainder never. The position may be summarized by saying that exactly 75% of those who have had no further recurrences have given up dieting, while 61.4% of those with frequent recurrences have stuck to a diet the whole time. Nearly all patients, whether they have had recurrences or not, try to avoid certain foodstuffs or other factors. Fatty foods, including fried fish, chipped potatoes, pastry, bacon, and pork are eschewed by the great majority. Other factors considered by the patients to be a cause of relapse are pickles, condiments, highly seasoned foods, tobacco, worry, and irregular meals. Since most of these are advised against in their diet sheets it is not possible to say whether they avoid them from personal experience.

The position of alkalis is even more involved. Few patients appear to take them prophylactically, but nearly all list them as giving the most immediate relief when symptoms are present. "Doctor's medicine" is usually the chief stand-by, but most take proprietary brands as well, frequently changing from one to another. Even patients who

state that they have had no further trouble keep alkalis to hand. Rest, milk, diet and regular meals, olive oil, liquid paraffin, and belladonna in various combinations were popular for ending attacks.

Most of the replies to the question of what gave the most relief were orthodox, but one man treated his recurrences by starvation, chlorodyne, and 3 pints of beer, another recommended stout, and a woman found that a little whisky taken medicinally was an excellent remedy. One patient had been "cured" by writing to a faith-healer, and two had obtained long remissions from an expensive medicine obtained from a pharmacist "specializing" in stomach troubles.

Surgical Series—Late Results

The late results in the 169 traced survivors have been assessed according to the grading of Visick (1948), which is as follows:

Grade I.—No gastric symptoms (fullness after an extra large meal is allowed).

Grade II.—No pain, mild occasional symptoms easily controlled by care. Care implies limitation of size of meal, rest, and avoidance of certain articles of diet.

Grade III.—Mild symptoms not controlled by care, slight abdominal discomfort. This grade is subdivided as follows: Grade IIIs, satisfactory (both the investigator and the patient are satisfied with the result; symptoms do not interfere with the enjoyment of life or with work); and Grade IIIu, unsatisfactory (either the investigator or the patient is not satisfied with the result; either the symptoms or the care taken to avoid them interferes with the patient's enjoyment of life or his efficiency at work).

Grade IV.—Not improved, severe symptoms.

The results in the present series are presented in Table XV.

TABLE XV.—*Chronic Gastric Ulcer: Surgical Series—Late Results*

Grading	Men		Women		Total	
	No.	%	No.	%	No.	%
Grade I	74	52·9	11	37·9	85	50·3
Grade II	38	27·1	12	41·4	50	29·6
Grade IIIs	14	10·0	3	10·3	17	10·1
Grade IIIu	9	6·4	3	10·3	12	7·1
Grade IV	5	3·6	—		5	3·0

Out of every 10 patients still alive the result has been satisfactory in 8, moderately successful in 1, and poor in 1. There is a small late operative morbidity which must be taken into account when judging the late operative results. One man died five years after partial gastrectomy following reduction of a retrograde jejunal intussusception, one woman two months afterwards following division of bands causing obstruction, and another four years later following operative procedures designed to relieve "dumping." A further three patients have been successfully operated on for obstruction due to adhesions. None of the unsatisfactory results were due to cases of recurrent ulceration following partial gastrectomy. Indeed, despite careful investigation of many post-operative cases in these years, we have been unable to find any case of proved stomal or gastric ulcer following gastrectomy for gastric ulcer. There have been several cases of iron-deficiency anaemia which have responded well to iron. In one case megaloblastic anaemia was given as a contributory cause of death. No patient has been encountered with any gross nutritional deficiencies, although many are below their best pre-operative weight.

Analysis of the late results to determine whether there are any specific factors influencing them shows that amongst the five patients in Grade IV three suffer from severe chronic bronchitis, one from angina pectoris, and the other, in whom there is no obvious associated disease, has been relieved, at any rate temporarily, since the start of this investigation by the type of gastric suspension operation described by Capper and Butler (1951). Of the twelve in Grade IIIu three suffer from chronic bronchitis, two from cardiac disease, another from chronic sciatic pain, and a seventh from osteoarthritis. On the evidence it would seem that the disgruntled chronic invalid is intolerant of any post-gastrectomy disability or discomfort.

The age of the patient at the time of operation makes little difference to the late results so far as gastric symptoms are concerned (Table XVI). Neither does the length of history of symptoms before operation affect the results to any significant degree.

TABLE XVI.—*Late Results in Relation to Age of Patient. Surgical Series*

Age at Time of Operation	Grades I, II, and IIIs		Grades IIIu and IV	
	No.	%	No.	%
Under 40 years	30	93·75	2	6·25
40— ,, ...	43	86·0	7	14·0
50— ,, ...	58	89·2	7	10·8
60+ ,, ...	21	95·5	1	4·5

Comparison of Late Results

Symptoms due to chronic gastric ulcer tend to be intermittent while the non-ulcer complications following surgery tend to be constant, so no exact comparison of the symptoms in the two series is possible. If Visick Grades I and II are taken as being equivalent to no recurrences in the medical series, Grade IIIs as occasional recurrences, and Grades IIIu and IV as frequent recurrences the results shown in Table XVII are obtained.

TABLE XVII.—*Chronic Gastric Ulcer: Comparison of Results in the Medical and Surgical Series*

	Medical Series		Surgical Series	
	No.	%	No.	%
"No" recurrences ..	42	23·6	135	79·9
"Occasional" ,, ..	35	19·7	17	10·1
"Frequent" ,, ..	101	56·7	17	10·1
Total	178		169	

Only a quarter of the patients in the medical series, compared with over three-quarters in the surgical series, have had no further trouble. This despite the probability that the medical series contained the majority of patients whose ulcers were initially considered to be mild or of short duration.

Discussion

Absolute indications for surgery are perforation, certain cases of manifest haemorrhage, obstruction due to hour-glass deformity or pyloric stenosis, and suspicion of malignancy, which includes all ulcers on the greater curve and the majority in the pre-pyloric region. Elective surgery is advisable when there is failure to respond to medical treatment or recurrence after a previous course or courses of strict treatment.

The analysis shows that partial gastrectomy is by far the most satisfactory method available at present for the treatment of chronic gastric ulcer. Before it is advocated various factors must be considered. These include the length of history and severity of symptoms, the presence of intercurrent disease, and the operative mortalities. Early operative mortalities will depend to a large extent on local factors, but they have significantly diminished in most parts of the world since the earlier part of this series. Late operative deaths and complications will probably be fairly constant wherever the operation is performed. In the present series the late operative complications are more than counterbalanced by the late deaths directly due to the ulcer in the medical series.

On the figures in the present analysis a strong case can be made out for surgery as soon as the diagnosis is arrived at, except in those patients with very short histories and those with signs of senility or intercurrent disease, especially severe chronic bronchitis. There are few who would be prepared to operate on all such cases, and a full course of medical treatment will relieve a small proportion for at

least a number of years. Recurrence after a strict course of medical treatment should be regarded as an indication for surgery, whether or not a strict post-ulcer regime has been followed.

Summary

The case records of 498 patients with chronic gastric ulcer who were treated in the gastro-enterological clinic at St. James's Hospital, London, during the years 1940–6 inclusive are analysed. Adequate follow-up data concerning nearly all were obtained in 1952.

The patients fall into two series, the one treated medically and the other surgically. In the former there are 262 and in the latter 254 patients, 18 appearing in both series.

The criterion for inclusion was the presence of an active chronic gastric ulcer, which in the medical series must have been seen gastroscopically. Patients with additional duodenal ulcers or scars have been excluded.

The ratio of men to women was 3.5:1.

The symptoms may start at any age, most commonly after 30, the average age being 44. The average age at the time of operation in those surgically treated was in the fifties.

The sites of gastric ulcers differ greatly between men and women. In women the site of predilection is the high posterior aspect of the lesser curve, and ulcers in the pyloric antrum are exceptional. In men the distribution along the lesser curve is more even, with a maximum incidence in the mid and lower body, while 10% are situated distal to the angulus.

The results of a fractional test meal, using gruel as the stimulant, are given. The age of the patient influences the level of acidity to only a slight extent, and it is concluded that the presence of a degenerate mucosa rather than the age of the patient accounts for the findings.

A quarter of the patients in each series have subsequently died. There is no predominant cause of death.

The problem of the malignant degeneration of chronic gastric ulcers is considered. In none of those who later developed gastric carcinoma is there enough evidence to label them "ulcer-cancers," and it is concluded that if an association between gastric ulcer and gastric carcinoma exists it is due to a preference of both for the same type of degenerate mucosa.

The evidence concerning the incidence of tuberculosis following gastric resection is presented. No conclusion concerning this is reached.

In 28% of patients an incident of manifest bleeding occurred during the course of their ulcer histories. In 16% of these there was more than one episode.

In the medical series it is concluded that although treatment will nearly always heal the ulcer it will keep it healed in only a quarter of the milder or earlier cases. A quarter have symptomatic recurrences more often than once a year, and a further third have had subsequent resections performed for recurrence. Some of the factors which may influence the recurrence rates are analysed.

Three-quarters of those who have had no further trouble have given up dieting, while nearly two-thirds of those with frequent trouble have kept to a diet the whole time.

In the surgical series a very satisfactory result has been obtained in 80%, a moderately successful one in 10%, and a poor result in the remaining 10%.

A high proportion of those with poor results have some other chronic incapacitating disease, most frequently chronic bronchitis.

The choice of treatment for those presenting at hospital with a chronic gastric ulcer is discussed. It is concluded that surgery at present offers the best results, but before it is advocated certain factors, including local operative mortality figures, the severity and length of history of symptoms, and the presence of intercurrent disease, should be taken into account.

Mr. Colin Craig has very kindly allowed us to make use of his late results for patients operated on in 1946. We wish to thank the many people who co-operated in the follow-up of patients, and are grateful to the staff of St. James's Hospital for their interest and advice. We are particularly indebted to Miss Kirwin, who, in addition to secretarial duties, suggested ways and means which led to the tracing of many "lost" patients. The cost of the investigation was met by a grant from the Weir Research Fund.

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CANCER AND THE COMMUNITY*

BY

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In considering the scope of this discussion I have assumed that the Section of Preventive Medicine is not directly concerned with treatment, except in respect of diseases whose spread in the community can be reduced by early treatment of patients infective to others. This absolves me from dealing with the rather controversial questions of how far the community might be influenced to seek medical advice at an earlier stage of cancer and what effect that could have upon ultimate survival. Those aspects of the problem are important to the community and interesting to statisticians, whether in Toronto or London, but, while they may affect the fatality of cancer, they cannot, so far as we know at present, affect the incidence or prevention of the disease.

Attitudes to the Cancer Problem

Some will say that since we can do so little as yet to prevent cancer it is unrealistic to discuss it at all in this Section. Such an attitude seems generally to stem from a fixed idea that cancer is a complication of growing old, or a mode of departing from this life, which is inevitable for a proportion of people in the same sense that arteriosclerosis is inevitable, and I propose to deal with some of the misconceptions mixed up with that idea. According to my observations it is the medical people rather than the lay community who tend to the cheerless view that the best we can do is to try to

*Read in opening a discussion in the Section of Preventive Medicine at the Annual Meeting of the British Medical Association, Cardiff, 1953.