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Factors influencing the prognosis of patients with duodenal ulcer disease

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FACTORS INFLUENCING THE PROGNOSIS OF PATIENTS WITH DUODENAL ULCER DISEASE

by

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OUTLINE

INTRODUCTION

Duodenal ulcer disease is a medical problem with which everyone in the medical profession will be confronted. A large bibliography has accumulated concerning the symptoms, signs, diagnosis and treatment of peptic ulcer disease because of its exceedingly variable manifestations. As yet no single, completely, satisfactory method of treatment has been found. The purpose of this thesis is to report the results of a retrospective study of University of Nebraska Hospital patients with proven duodenal ulcer disease, attempting to determine prognosis by correlating presenting symptoms, signs, type of therapy utilized and follow up condition.

Patient Selection and Method of Analysis

In order that a follow up of a minimum of 5 years could be made, the charts of all University Hospital patients with a final diagnosis of duodenal ulcer disease during the time period of 1953 - 1956 were requested to be reviewed. Of these charts, only those cases were selected for study in which there was unequivocal evidence of duodenal ulcer disease. This was determined by personal review of the upper gastrointestinal x-ray studies, in conjunction with Dr. F. F. Paustian, gastroenterologist, and by surgical and autopsy findings.

The charts selected were then submitted to a careful and detailed analysis of the history, physical findings, laboratory data, x-ray, gastric secretory studies and type of treatment. An attempt was then made to obtain follow-up information on each patient in order to correlate the findings and treatment during the initial hospitalization with the patients' current status regarding ulcer disease.

Results

In this section, the material extracted from the charts is tabulated and the percentage of occurrence of each factor is listed.

A. Race

The charts of 77 patients with unequivocal evidence of duodenal ulcer were selected for study and all cases finally considered were members of the white race. No colored individuals were proven to have a duodenal ulcer although 2 cases were considered before the x-rays were reviewed.

B. Sex

68.9 percent of the patients were male and 31.1 per cent were female or a ratio of 2.2:1.

C. Ingestion of Exogenous Substances

There was a history of significant ingestion of gastric secretory stimulants or mucosal irritants in 30 per cent of the cases. Of these 3.9 per cent admitted to the intake of 10 or more tablets of aspirin per day and 3.9 per cent used steroid medications. 22.2 per cent gave a history of use of alcoholic beverages varying from 2-3 to 10-12 bottles of beer or a fifth of whiskey per day.

D. Age of Onset

	Number	Per Cent of Total Group
0-20	10	13
0-16 (Ped)	5	6.5
21-30	8	10.4
31-40	12	15.6
41-50	12	15.6
51-60	14	18.4
Over 60	21	27.3

After reviewing the barium meal contrast x-ray studies of the upper gastrointestinal tract of the 107 patients with a final chart diagnosis of duodenal ulcer disease, only 71.9 per cent showed unequivocal evidence of the disease. In the pediatric age group 5 or 45.5 per cent were considered to have a duodenal ulcer. 1 of these was an unexpected autopsy finding in a newborn who died at the age of one week of heart failure due to a patent ductus arteriosus.

59.8 per cent of the ulcers occurred between the ages of 21 and 60. Of considerable importance is the fact that 27 per cent of ulcers occurred in the age group greater than 60.

E. Duration of Symptoms

	Number	Per Cent of Total Cases
less than 2 mo.	10	13.0
3 mo. - 1 yr.	19	24.7
1 - 2 yr.	3	3.9
2 - 5 yr.	13	16.9
5 - 10 yr.	7	9.1
Over 10 yr.	25	41.6

This chart graphically illustrates that duodenal ulcer disease is a chronic long standing disease manifesting itself over long periods of time.

41.6 per cent of the cases had symptoms for more than 10 years with the greatest duration being 40 years.

F. Character of Pain

	Number	Per Cent of Total Cases
Burning	17	22.1
Aching	11	14.3
Sharp	5	6.5
Cramping	8	10.4
Pressing	4	5.2
Burning, aching	1	1.3
Burning, pressing	1	1.3
Sharp, aching	6	7.8
Sharp, cramping	1	1.3
Aching, cramping	1	1.3
Character of pain not described	22	28.6

29 or 53 per cent of the patients who described their pain, characterized it as being burning and/or aching. In 28.6 per cent of the total number of cases the examiner did not describe the patient's description of pain.

G. Type of Pain

	Number	Per Cent of Total Cases
Ulcer	30	39
Constant	5	6.5
Atypical	11	14.3
Pain not adequately described	31	40.3

Typical ulcer distress is defined as pain which occurs 1-2 hours post prandially, before meals or late at night, but rarely before breakfast. The distress is aggravated by gastric acid stimulants and mucosal irritants and is usually relieved by milk and/or antacids. Constant pain is self explanatory.

Atypical ulcer pain is that discomfort which is episodic, unrelieved by antacids or food and occurrs in unusual locations, as the hypogastrium or flanks.

H. Pain Location

	Number	Per Cent of Totals
Right epigastric	8	10.4
Mid epigastric	32	41.6
Left epigastric	3	3.9
Umbilical	2	2.6
Low abdominal	3	3.9
Right & mid epigastric	4	5.2
Left & mid epigastric	2	2.6
Left, right & mid epigastric	2	2.6
Mid epigastric & umbilical	3	3.9
Mid epigastric & low abdominal	2	2.6
Umbilical & low back	1	1.3
Location not described adequately	18	23.4

The epigastrium, as might be expected on the basis of upper gastrointestinal visceral pain reference, was the most frequent site of distress. The mid epigastric area was the most frequently involved. 58.5 per cent of the total number of cases, and 76.4 per cent of those cases where the location was described had pain in this area. Interestingly, the right epigastrium was involved alone or with other areas in 14 cases or 18.2 per cent of the cases.

I. Nausea and Vomiting

	Number	Per Cent of Total Cases
Nausea	6	7.8
Vomiting	15	19.5
Nausea and vomiting	33	42.8

Nausea and/or vomiting was a prominent symptom and affected 54 or 70.3 per cent of the patients. In 61.2 per cent of those with this complaint, both nausea and vomiting were present.

J. Evidence of Blood Loss

	Number	Per Cent of Total Cases
Hematemesis	3	3.9
Melena	11	14.3
Anemia	8	10.4
Hematemesis & melena	10	13.0
Hematemesis & anemia	2	2.6
Melena & anemia	5	6.5
Hematemesis, melena and anemia	11	14.3
No bleeding	26	33.8

Anemia was arbitrarily decided as being a hemoglobin below 13 gm/100 ml. for males and below 12 gm/100 ml. for females.

66.2 per cent of the patients either by history or the findings upon admission bled at some time in the course of their disease. Melena was reported alone or in association with the other manifestations of bleeding in 37 or 72.6 per cent of the cases of bleeding.

K. Aerophagia

	Number	Per Cent of Total Cases
Flatus	0	0
Belching	5	6.5
Distention	6	7.8
Flatus & belching	4	5.2
Flatus & Distention	3	3.9
Belching & distention	10	18.0
Flatus, belching & distention		2.6

30 of the 77 patients or 39 per cent developed some manifestation of aerophagia. Distention was included but it was

associated with signs or symptoms of obstruction in 16.7 per cent of the patients. No patients complained of flatulance alone but always in combination with other symptoms of aerophagia.

L. Weight Loss

33 or 42 per cent of the patients lost weight to some degree. This varied from 7 to 45 pounds.

M. Ulcer Location

	Number	Per Cent of Total
Channel	1	1.3
Post Bulbar	7	9.1
Lesser curve	6	7.8
Greater curve	2	2.6
Anterior wall	9	11.7
Posterior wall	13	16.9
Deformity (location not described)	37	48.1
Autopsy, location not described	1	1.3
Operation, location not described	1	1.3

Post bulbar ulcers made up 9.1 per cent of the total series. This makes this ulcer a fairly frequently appearing ulcer. Regretably, no attempt was made to describe each patient's body build as it has been reported that post bulbar ulcers are more frequent in the hypersthenic habitus.

Lesser curve ulcers were three times as frequent as greater curve ulcers. 11.7 per cent of the ulcers were in an anterior location while 16.9 per cent were in a posterior location. Duodenal cap deformity occurred nearly 3 times as frequent as any other configuration and constituted 48.1 per cent of the

total number of cases. This is the result of chronic duodenal ulcer disease with extensive scarring which prevents precise ulcer location.

N. Gastric Acid Secretion

	Number	Per Cent of Total Cases
Normal	26	33.8
I	11	14.3
II	6	7.8
III	10	13.0
IV	2	2.6
No analysis	22	28.6

The gradations of hypersecretion are as follows:

Normal - less than 50 degrees acid, I - 50-59 degrees free acid, II - 60-79 degrees free acid, III - 80-99 degrees acid and IV - over 100 degrees free acid.

In the majority of cases, alcohol test meals were given and a single determination of free and total acid was obtained 30 minutes to 1 hour after the meal. With this type of analysis one will note that in only 52.6 per cent of the cases tested was the gastric acid secretion elevated. In no patient was an overnight total secretion test conducted. Such analyses probably do not represent peak gastric secretory capacities inasmuch as the highest acid concentrations are usually obtained between 1 and 2 hours after administration of the meal. This may well explain the unusually high incidence of normal gastric acid concentrations in this group of duodenal ulcer patients.

O. Initial Medical Treatment

	Number	Per Cent of Totals
Milk	1	1.3
Milk & antacid	11	14.3
Milk & anticholinergic	2	3.6
Milk, antacid & anticholinergic	30	39.0
Milk, antacid, anticholinergic & sedation	10	13.0
Antacid, anticholinergic & sedation	3	3.9
No medical treatment	20	26.0

There was great variation in the medical treatment prescribed. It varied from a bland diet with an antacid midway between meals to a very strict diet consisting of milk every hour on the hour, an antacid every hour on the half hour, sedation and the use of anticholinergic drugs. The medical treatment was considered to be adequate in 46 or 80.8 per cent of the patients.

The criterion of adequacy was dependent on the intake of food, milk and antacids at frequent enough intervals to maintain a physiologic neutralization of gastric acid over a long enough period of time to allow healing of the ulcer. 19.2 per cent of the cases were considered to have received inadequate medical therapy.

Q. Indications for Surgical Treatment

	Number	Per Cent of Total Cases
Economic	1	4.8
Intractable	1	4.8
Obstruction	7	33.3
Free perforation	1	4.8
Hemorrhage	6	28.6
Obstruction & hemorrhage	1	4.8
Intractable & hemorrhage	1	4.8
Economic & hemorrhage	1	4.8
Indication not stated	2	9.5

Hemorrhage figured in the indication for a surgical procedure in 43 per cent of the cases. Obstruction was the second most common indication for surgery, appearing alone or in combination with hemorrhage in 38 per cent of the cases. The two alone or in combination with other indications accounted for 76.4 per cent of the indications for surgical intervention.

R. Environment Stress

As this is a retrospective study, and the history and physical were done by many different individuals, it was difficult to determine if each patient had been satisfactorily questioned about environmental stress factors. Nevertheless, it was possible to extract a history of stress in 32 or 41.5 per cent of the cases. These factors varied from deafness to a 9 year history of persistent prolapse of the cervical stump.

S. Follow-up

	Number	Per Cent of Totals
No return	16	20.8
Unclaimed, unknown	20	26.0
Insufficient address	3	3.9
Moved, left no address	6	7.8
Deceased	12	15.6
Living and well	6	7.8
Occasional ulcer symptoms	9	11.7
Seasonal ulcer symptoms	4	5.2
Medical treatment elsewhere	3	3.9
Surgical treatment elsewhere	1	1.3
Small stomach	2	2.6
Abdominal pain	2	2.6
Weakness, sweating, shaking post prandially	3	3.9
Weight loss	1	1.3
Weight gain	2	2.6
Diarrhea	2	2.6
Those operated on who survived 5 years	5	6.5

It was possible to obtain follow-up information on only 31 patients or 40.3 per cent of the total group. The letters were returned unopened in 37.7 per cent of the cases. Of those known to be dead, the following causes of death were given:

*1. Coronary failure, following an infarct - autopsy revealed the duodenal stump had dehisced.
2. Heart failure due to patent ductus arteriosus
3. Acute lymphocytic leukemia
4. Multiple myeloma, died of lobar and broncho pneumonia
*5. Esophageal varices
*6. Peritonitis with necrosis of terminal ilium
*7. Encephalomalacia secondary to cerebral thrombosis
8. Carcinoma of the lung
*9. Heart attack
10. Coronary occlusion
11. Hemorrhage from stomach
12. Cancer

* Patients who underwent an operation

Of those operated, 5 had died by the time of follow-up, and 5 were living, 3 of the latter or 60 per cent had complaints of post gastrectomy sequelae, such as small stomach, abdominal pain, weakness, sweating and shaking post prandially and weight loss. The condition of oer half of those cases operated is unknown. In those cases treated medically, only 7.2 per cent had been asymptomatic during the minimum 5 year interval since initial examination and treatment at the University Hospital.

Correlation of the Various Symptoms

In the patient with duodenal ulcer disease, the individual usually has no one complaint but rather presents with a symptom complex. Certain groups of symptoms may occur during the natural course of an ulcer patient's disease which may represent the early stage of development, of one of the complications of duodenal ulcer. If this is true, then the physician would be in a position to offer an operative procedure to the patient as an elective while he is in reasonably good condition. In this section the symptoms, signs, methods of treatment, and follow-up were correlated one with another in an attempt to determine symptoms relationships to each other and to prognosis. All correlations where no relation was apparent have been disgarded.

The first finding to be correlated is bleeding. Blood loss in this series was a frequent finding occurring in 66.2 per cent of the cases. After correlating bleeding with weight loss, it was found that of the 33 patients who lost weight, 25 or 78.8 per cent also bled.

14 of the 25 or 56 per cent of these patients subsequently underwent an operation. A t the time of follow-up 16 per cent were still having symptoms or post gastrectomy sequelae.

Bleeding was then correlated with pain location to learn if certain locations were associated with a higher incidence of bleeding.

	Number	Per Cent of Each Location that Bled
Right epigastric	6	75
Mid epigastric	24	66.7
Left epigastric	2	66.7
Lower abdomen	1	33.3
Right & mid epigastric	3	75
Left & mid epigastric	1	50
Left, rt and mid epigastric	1	50
Mid epigastric & umbilical	2	66.7
Mid epigastric & low abdomen	2	100

Bleeding was encountered in 75 per cent of those patients who complained of right epigastric pain alone or in combination with pain in other locations. However only 7.15 per cent of those who had right epigastric pain were operated. Of those in which it was possible to follow up, 75 per cent still had ulcer symptoms.

Im those patients with left epigastric pain, 57.2 per cent bled.

20 per cent of those patients who had left epigastric pain were operated on. It was possible to follow up only one person in this group.

After correlating bleeding with pain location, it follows logically that bleeding should be correlated with actual ulcer location.

	Bleeding	Per Cent of Total for Each Location
Channel	1	100
Post bulbar	4	57.2
Lesser curve	5	83.5
Greater curve	1	50.0
Anterior	5	55.6
Posterior	10	77.0
Deformity (location not described)	18	63.0

In this series 57.2 per cent of the post bulbar ulcers bled as compared to 66.2 per cent for all locations combined. None of the post bulbar ulcers were operated on. Only 2 patients could be followed up and both were still having ulcer symptoms.

16.7 per cent of the lesser curve ulcers were operated on and at follow up 33.3 per cent were still having ulcer symptoms. Of those with posterior ulcers, 69.3 per cent had operations and 1 of the six whom it was possible to follow still had ulcer symptoms and 1 was having post gastrectomy sequelae.

By breaking down the category of those who bled into an age corrected chart the following data was obtained.

Age at Onset	Number Bleeding	Per Cent of Total For Each Group
0-20	3	30
0-16 (ped)	0	0
21-30	6	75
31-40	9	75
41-50	10	83.5
51-60	[illegible]	53.2
Over 60	14	66.7

45 per cent of those with onset between the ages of 41 and 50 who hemorrhaged underwent an operation and 33.3 per cent of those followed were still experiencing ulcer symptoms.

Next an attempt was made to correlate bleeding with the duration of symptoms. The following chart illustrates the findings:

	Number Bleeding	Per Cent of the Total of Each Group
Less than 2 mo.	8	80.0
2 mo - 1 yr.	10	55.5
1 - 2 yr.	2	50.0
2 - 5 yr.	7	53.8
5 - 10 yr.	4	57.2
Over 10 yr.	18	72.0

Bleeding incidence was greatest at the extremes of the duration of symptoms. 80 per cent of those with symptoms of less than 2 months duration had bled. On the other hand, 72 per cent of those symptoms of over 10 years duration bled. This is a greater incidence than the incidence of bleeding in the group as a whole (66.2 per cent).

Only 20 per cent of those with symptoms of less than 2 month duration were operated on and of those in this age group, 2 of the 3 followed up were still having symptoms. 45 per cent of those patients with symptoms for over 10 years underwent an operation. At followup, it was found that 20 per cent were still having ulcer symptoms. All three with post gastrectomy sequelae were included in this group.

In order to decide if bleeding was more predominate in one sex blood loss and sex were correlated. It was found that a slightly higher percentage (68 per cent) of the men bled than of the women (58.4 per cent).

50 per cent of the women followed were living and well and 25 per cent were still having ulcer symptoms while 25 per cent were dead. Of the men followed, 50 per cent were dead, 16.7 per cent were living and well, 27.8 per cent were still having symptoms and 5.6 per cent complained of post gastrectomy sequelae.

Bleeding was then correlated with the given indication for surgery to determine the incidence of this symptom in those patients who were operated on. It was found that 81 per cent of those operated on no matter the indication stated, had bled to some degree.

The next symptom to be correlated was weight loss. First the correlation between weight loss and the type of pain was studied. This chart illustrates the findings.

	Weight Loss	Per Cent of Each Group
Ulcer	14	46
Constant	4	80
Atypical	3	30

80 per cent of those patients who complained of constant pain also lost weight. While only a small number of patients

had this complaint, its relation to weight loss is very consistent.

Of the 3 patients with constant pain and weight loss that it was possible to follow, 1 still had ulcer symptoms, 1 had post gastrectomy sequelae and the other patient was deceased.

Weight loss was then correlated with acid secretion to see if those patients who were known hypersecretors of gastric acid had a higher incidence of weight loss.

	Weight Loss	Per Cent of Each Group
Normal	11	42.3
Grade I	5	45.4
Grade II	4	66.7
Grade III	6	60.0
Grade IV	1	50.0

Over 50 per cent of those patients with Grade II hypersecretion or greater also lost weight while less than 50 per cent of those with normal or grade I hypersecretion lost weight.

When following up those patients with a grade II or higher hypersecretion, 42.8 per cent were deceased, 42.8 per cent were living and well and 15.4 per cent were having post gastrectomy sequelae.

In correlating weight loss with nausea and vomiting 25 of 33 or 76 per cent of those with weight loss also complained

of associated nausea and/or vomiting. 40 per cent of those followed were dead, 26.7 per cent were living and well and 13.4 per cent still had ulcer symptoms. All three patients with post gastrectomy sequelae were also included in this group.

When weight loss was correlated with aerophagia it was found that all patients who complained of distention also lost weight, and 75 per cent of the patients who complained of eructation and flatulance lost weight.

Only one patient who complained of distention could be followed and he was still having ulcer symptoms. Of those patients followed who complained of eructation and flatulance, 1 could not be followed, 1 was dead and 1 was still experiencing ulcer symptoms.

Next, weight loss was correlated with the age of onset of symptoms to learn if weight loss predominated in certain age groups. The following chart represents the results of this correlation.

	Weight Loss	Per Cent of Each Group
0-20		
0-16 (ped)		
21-30	4	50.0
31-40	4	33.3
41-50	6	50.0
51-60	7	50.0
Over 60	12	57.2

No patient under the age of 20 gave a history of weight loss. Nearly 50 per cent of those patients over the age of 20 lost weight.

Of the group over 20 who lost weight and who could be followed, 45 per cent were dead, 27.8 per cent were living and well, and 11.1 per cent were still having ulcer symptoms. All three with post gastrectomy sequelae were included in this group.

In order to determine if weight loss was of any prognastic value in those patients who were operated on, this symptom was correlated with the indication for surgery.

	Weight Loss	Per Cent of Total of Each Group
Economic	1	100
Intractable	1	100
Obstruction	6	86
Free perforation		
Hemorrhage	5	83.5
Obstruction & Hemorrhage	1	100
Economic & hemorrhage	1	100
Intractable & hemorrhage		

In the only two indications with large enough series to attach any importance to, weight loss for obstruction was 86 per cent and for hemorrhage, 83.5 per cent. In the group with obstruction as an indication for surgery, no patient lost over 20 pounds and one half lost less than 10 pounds. In the group with hemorrhage only one lost less than 10 pounds,

3 lost 10-20 pounds and 1 lost between 20-30 pounds. In the two patients with combinations of complications, both lost between 20 and 30 pounds.

If the group as a whole is considered, 79 per cent of those for whom an indication for surgery was spelled out lost weight.

When the patients were contacted, it was found that all three patients with post gastrectomy sequelae had lost weight prior to having had an operation.

It was of interest to know if certain types of pain were more apt to occur in some ulcer location than others.

Reported as Per Cent of Each Type of Pain

	Ulcer	Constant	Atypical
Channel			
Post bulbar	10.0		18.4
Lesser Curve	6.7	20.0	9.1
Greater curve			
Anterior	10.0		18.4
Posterior	26.7	20.0	9.1
Deformity(location not described)	47.4	60.0	45.5

3 of 5 or 60 per cent of those with constant pain demonstrated a persistent deformity.

Only one of these was operated on and at followup, this individual was deceased.

45 per cent of those with atypical pain demonstrated persistent deformity by x-ray studies of the upper gastrointestinal tract.

Only 3 of these persons could be followed. One was dead, one had ulcer symptoms and one was suffering post gastrectomy sequelae.

The next logical step was to determine, if possible, a relationship between the type of pain and pain location. This material is represented in chart form.

Reported as Per Cent of Each Type of Pain

	Ulcer	Constant	Atypical
Right epigastric			18.4
Mid epigastric	63.4	40	18.4
Left epigastric	10.0		
Umbilical	3.3		
Lower abdominal	6.7		9.1
Right & mid epigastric	3.3		18.4
Left & mid epigastric			9.1
Left, rt, & mid epigastric			
Umbilical & low abdominal		20	
Mid epigastric & umbilical	3.3		
Mid epigastric & low abdominal		40	

The mid epigastric region alone or combined with other regions was the site of pain in 70 per cent of those cases complaining of typical ulcer pain, in 80 per cent of those with constant pain and in only 45.5 per cent of those cases of atypical pain.

Of those patients who were experiencing pain of some type in the mid epigastrium and who could be followed, 40 per cent were deceased, 15 per cent were living and well,

and 25 per cent were still having ulcer symptoms. Included were all 3 patients with post gastrectomy sequelae. These made up 15 per cent of the group.

After correlating the type of pain with the duration of symptoms, the following statistics were noted.

Reported as Per Cent of Each Type of Pain

	Ulcer	Constant	Atypical
Less than 2 mo.	10.0		36.3
2 mo.-1yr.	16.7	40	36.3
1-2 yr.	3.3		
2-5 yr.	13.3	20	
5-10 yr.	10.0	20	
Over 10 yr.	46.7	20	27.2

60 per cent of the patients with constant pain had symptoms more than 2 years.

Of these patients, 66.7 per cent were operated on. They were still experiencing difficulty at followup. 72.6 per cent of those with atypical pain had their symptoms less than 1 year, the rest over 10 years.

When followup was made on the group of patients with symptoms of less than 1 year, only 3 responded and 2 were still having ulcer symptoms. Only one patient who had had symptoms for more than 10 years could be followed. Nearly one half (46.7 per cent) of those with typical ulcer type pain had had symptoms over 10 years.

35.7 per cent of these patients could be followed and

2 were dead, 1 was living and well, 1 was still having ulcer symptoms and 1 was having post gastrectomy sequalae.

In order to see if certain types of pain predominated in some age groups, the relationship of type of pain to age of onset of symptoms was studied.

Reported as Per Cent of Each Type of Pain

	Ulcer	Constant	Atypical
0-20	16.7		9.1
0-16 (ped)	6.7		9.1
21-30	6.7		18.2
31-40	16.7		18.2
41-50	20.0	40	18.2
51-60	20.0	20	9.1
Over 60	20.0	40	27.3

All the patients who complained of constant pain were over the age of 40.

At followup, 40 per cent could not be contacted. 20 per cent were dead, 20 per cent continued to have ulcer symptoms and 20 per cent were having post gastrectomy sequelae.

Next the type of pain was correlated with the indication for surgery. The statistics produced are shown on the next chart.

Reported as Per Cent of Each Type of Pain

	Ulcer	Constant	Atypical
Economic			
Intractable	3.3		
Obstruction	13.3	20	9.1
Free perforation	3.3		
Hemorrhage	10.0		9.1
Obstruction & hemorrhage		20	
Economic & hemorrhage	3.3		
Intractable & hemorrhage			

The only two patients of the group with constant pain operated on had as a given indication for operation; 1. obstruction and 2. obstruction and hemorrhage.

When followed, it was learned that one patient was dead and the other still had ulcer symptoms.

In an effort to learn more of these patients followup condition, pain was correlated with the followup condition.

	Some Type of Pain	Per Cent of Follow-Up
Living & well	2	33.3
Occasional ulcer symptoms	7	77.8
Seasonal ulcer symptoms	3	75.0
Medical treatment elsewhere	1	33.3
Surgical treatment elsewhere	0	
Small stomach	2	100.0
Abdominal pain	2	100.0
Weakness, sweating and shaking post prandial	2	66.7
Weight loss	1	100.0
Weight gain	2	100.0
Diarrhea	2	100.0

Only 33 per cent of those living and well at the time of followup had had, at first admission, complaints of pain. On the other hand 75-78.8 per cent of those who complained of intermittent pain on followup had prior to being seen at University Hospital, complained of pain. 66.7 per cent of those who were having post gastrectomy sequelae had experienced pain when seen initially at University Hospital.

When pain location was correlated with acid secretion it was found that 55.3 per cent of those patients who had hypersecretion of hydrochloric acid complained of pain in the mid epigastrium. If those patients who complained of mid epigastric pain combined with pain in another location are included, then it is noted that 69 per cent of the patients with hypersecretion are included.

After the followup information was obtained on this group of patients, it was noted that of those who could be followed that 54.5 per cent were deceased, 27.2 per cent were living and well, and 18.2 per cent were either having ulcer symptoms or post gastrectomy sequelae.

The ulcer location was then correlated with the other findings. The first such correlation was with acid secretion.

Per Cent of Each Location with Gastric Analysis

	Normal	I	II	III	IV
Channel		100			
Post bulbar	25	25	25	25	
Lesser curve	60	20		20	
Greater curve	100				
Anterior wall	40	20		40	
Posterior wall	30	40	10	10	10
Deformity (location not described)	51.4	10.8	10.8	14.8	2.7

75 per cent of those with post bulbar ulcer on whom a gastric analysis was run showed increased acid secretion. 70 per cent of the posterior ulcers also showed increased

hydrochloric acid. 60 per cent of those with anteriorly located ulcers showed hyperacidity. Only one patient was included under the channel and greater curve so no significance can be placed on the data in those groups. Less than 50 per cent of those with lesser curve ulcers or deformity on whom a gastric analysis was done, had increased hydrochloric acid secretion.

It was shown at followup in those patients with ulcer locations which showed high percentages of hypersecretion, i.e. post bulbar, posterior wall and anterior wall, that 50 per cent were dead and 50 per cent were living and well. However, only 22.1 per cent could be followed and results of the followup can be discarded.

Ulcer location was then correlated with nausea and vomiting in an effort to see if the two were related.

	Per Cent of Nausea and/or Vomiting
Channel	
Post bulbar	85.7
Lesser curve	66.7
Greater curve	100.0
Anterior	66.7
Posterior	69.2
Deformity	63.0
Spasticity	100.0
Suspicious	87.5

When considering the group as a whole, 70.1 per cent of the group suffered nausea and/or vomiting. This is a very frequent complaint. Some groups are more likely to show this symptoms such as: 1. Greater curve (100 per cent), 2. Post bulbar ulcer (85.7 per cent), 3. Lesser curve (66.7 per cent), and 4. Anterior (66.7 per cent).

When followup was considered, none of those with greater curve ulcers could be followed, both post bulbar ulcers followed were still having symptoms, 2 of the 3 lesser curve ulcer patients were dead, and one of the individuals with an anterior ulcer was dead while the other was living and well.

The relationship of the ulcer location to the sex of the patient was then considered.

Per Cent of Each Sex

	Male	Female
Channel		4.2
Post bulbar	7.6	12.5
Lesser curve	11.3	
Greater curve		8.4
Anterior	7.6	20.8
Posterior	20.8	8.4
Deformity	35.9	33.3
Spasticity	1.9	4.2
Suspicious	13.2	4.2

A slightly higher percentage of females (12.5 per cent) had post bulbar ulcers than males (7.6 per cent). All the lesser curve ulcers were in men and accounted for 11.3 per cent of the ulcers found in men. All the greater curve ulcers

were in women and made up 8.4 per cent of the ulcers in women. 20.8 per cent of women had anterior ulcers and 7.6 per cent of men developed an ulcer at the same location. The situation was reversed in the case of the posterior ulcers. It can be seen that a higher percentage of men than women will develop lesser curve and posterior ulcers while more women will tend to develop post bulbar, greater curve and anterior ulcers.

Of the women with ulcers in the 3 previously mentioned locations, only 2 could be followed and both were having duodenal ulcer symptoms. 33.3 per cent of the men with lesser curve and posteriorly located ulcers were all that could be followed. 40 per cent of these still had ulcer symptoms, 40 per cent were living and well and 20 per cent were deceased.

When ulcer location was correlated with the indication for surgery it was learned that 43 per cent of the patients operated on for obstruction and 83.5 per cent of those operated on for hemorrhage had posterior ulcers. 615 per cent of posterior ulcers were operated. Too few patients in the other categories made any interpretation of that data useless..

	Economic	Intractable	Obstruction	Free perforation	Hemorrhage	Obstruction & hemorrhage	Economic & hemorrhage	Intractable & hemorrhage
Channel								100
Post bulbar								
Lesser curve					16.7			
Greater curve								
Anterior	100		28.6					
Posterior			43.0	100	83.5			
Spasticity								
Deformity		100				100		
Suspicious			28.6					

At followup 50 per cent of those operated on for obstruction were still having ulcer symptoms or deceased and 50 per cent were dead. 2 of those who had posterior ulcers and who were operated on for hemorrhage could be followed. One was dead and the other complained of post gastrectomy sequelae.

Acid secretion was then correlated with nausea and/or vomiting. The results are recorded in the following chart.

	Nausea and/or vomiting
Normal	73.2
I	63.6
II	83.5
III	90.0
IV	100.0

89 per cent of those patients with a grade II or higher hypersecretion complained of nausea and/or vomiting.

Of those patients whom it was possible to followup, 42.8 per cent were dead, 28.6 per cent were living and well and 28.6 per cent were either still having ulcer symptoms or post gastrectomy sequelae. 73.2 per cent of the patients whose gastric analysis was reported as normal also complained of nausea and/or vomiting.

4 of this group of persons could be followed. 2 were dead, one was having ulcer symptoms and the other was living and well.

When acid secretion was correlated with age of onset, it found that no gastric analyses was performed on the pediatric age group.

In the age group from 41-50, 58.4 per cent had hypersecretion. 54.5 per cent of those tested in the 51-60 age group had excess hydrochloric acid. 50 per cent of those tested in the age groups 0-20 and over 60 were found to have greater than normal amounts of free acid.

	Normal	I	II	III	IV
0-20	20	10		10	
0-16 (ped)					
21-30	37.5		12.5	12.5	
31-40	66.7	16.7	8.4		
41-50	25.0	33.3	16.7		8.4
51-60	35.7	21.4	7.2	7.2	7.2
Over 60	23.8	14.3	4.8	4.8	

75 per cent of those who had onset between 51-60 and were known to be hypersecretors were dead at the time of followup. The other 25 per cent were suffering post gastrectomy sequelae.

Only one of those with onset between the ages of 41 and 50 could be followed and this person was living and well.

Next acid secretion was correlated with the indication for surgery.

	Normal	I	II	III	IV
Economic				100	
Intractable	100				
Obstruction	33.3		33.3	33.3	
Free perforation		100			
Hemorrhage	50	50			
Obstruction & hemorrhage				100	
Economic & hemorrhage	100				
Intractable & hemorrhage		100			

16 of the 21 operated on had gastric analyses and of these 16, 62.5 per cent had some degree of gastric acid. elevation.

80 per cent of these patients who could be followed were dead at the time of followup. The others followed were living and well.

When correlating nausea and/or vomiting with age of onset it was learned that between the ages of 21 and 60 the incidence of nausea and/or vomiting in ulcer patients was between 75 per cent and 83.5 per cent. When the extremes of the age group are looked at, one findsthe pediatric age group had

a 40 per cent incidence of these symptoms while those over 60 had an incidence of nausea and/or vomiting in 51.7 per cent of the cases.

	Nausea and/or vomiting
0-20	60
0-16 (ped)	40
21-30	75
31-40	83.5
41-50	75
51-60	78.5
Over 60	51.7

When followup was made on the group between 21 and 60 who had experienced nausea and vomiting it was found that 25 per cent were living and well, 31.2 per cent were having ulcer symptoms and 18.8 per cent were experiencing post gastrectomy sequelae.

After correlating nausea and/or vomiting with the age of onset, this symptom was related to the duration of symptoms.

	Nausea and/or vomiting
Less than 2 mo.	70
2 mo. - 1 yr.	66.7
1-2 yr.	50
2-5 yr.	53.8
5-10 yr.	71.5
Over 10 yr.	80

Nausea and vomiting is seen at the extremes of the duration of symptoms. 70 per cent of the cases of less than 2 months duration complained of these symptoms, while 71.5 per cent of those who had had symptoms for between 5 and 10 years and

80 per cent of those with symptoms over 10 years duration also complained of nausea and/or vomiting.

In only 2 of those with symptoms of less than 2 months duration was followup information available. 1 patient was still having ulcer symptoms and the other was dead. 41.7 per cent of those with longstanding ulcer disease who were followed were dead. 41.7 per cent were having ulcer symptoms, 8.4 per cent were having post gastrectomy sequelae and 16.7 per cent were living and well.

The next correlation was between nausea and/or vomiting and the indication for surgery.

	Nausea and/or vomiting
Economic	
Intractable	100
Obstruction	100
Free perforation	100
Hemorrhage	50
Obstruction & hemorrhage	100
Economic & hemorrhage	100
Intractable & hemorrhage	

All who were operated on for obstruction complained of nausea and vomiting. Only 50 per cent of those with hemorrhage as an indication for surgery, had the same complaint. 74.2 per cent of the total group of those for whom the indication of surgery was spelled out, complained of nausea and/or vomiting.

In studying the followup of those patients with complaints of nausea and vomiting who were operated on for obstruction it

was noted that half were dead and the other half were either suffering ulcer symptoms or post gastrectomy sequelae. Of those in the hemorrhage group 75 per cent were deceased and the rest had post gastrectomy sequelae.

All patients suffering post gastrectomy sequelae, had before their operation suffered nausea and/or vomiting.

When the relation of aerophagia to the onset of symptoms was studied, it was found that only 16.7 per cent of the persons suffering from aerophagia were under the age of 30 and 70 per cent were over the age of 40. Only 10 per cent of the patients under 20 developed symptoms of aerophagia.

	Aerophagia
0-20	10
0-16 (ped)	0
21-30	50
31-40	33.3
41-50	50
51-60	50
Over 60	38.1

Followup revealed that 30 per cent of those over the age of 40, it was possible to follow, were deceased. 30 per cent were living and well and 40 per cent were still having symptoms of duodenal ulcer disease.

The next logical correlation was between aerophagia and the duration of symptoms.

	Economic	Intractable	Obstruction	Free perforation	Hemorrhage	Obstruction & hemorrhage	Economic & hemorrhage	Intractable & hemorrhage
Channel								100
Post bulbar								
Lesser curve					16.7			
Greater curve								
Anterior	100		28.6					
Posterior			43.0	100	83.5			
Spasticity								
Deformity		100				100		
Suspicious			28.6					

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Over 60	23.8	14.3	4.8	4.8	

75 per cent of those who had onset between 51-60 and were known to be hypersecretors were dead at the time of followup. The other 25 per cent were suffering post gastrectomy sequelae.

Only one of those with onset between the ages of 41 and 50 could be followed and this person was living and well.

Next acid secretion was correlated with the indication for surgery.

	Normal	I	II	III	IV
Economic				100	
Intractable	100				
Obstruction	33.3		33.3	33.3	
Free perforation		100			
Hemorrhage	50	50			
Obstruction & hemorrhage				100	
Economic & hemorrhage	100				
Intractable & hemorrhage		100			

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Less than 2 mo.	70
2 mo. - 1 yr.	66.7
1-2 yr.	50
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5-10 yr.	71.5
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	Nausea and/or vomiting
Economic	
Intractable	100
Obstruction	100
Free perforation	100
Hemorrhage	50
Obstruction & hemorrhage	100
Economic & hemorrhage	100
Intractable & hemorrhage	

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	Aerophagia
0-20	10
0-16 (ped)	0
21-30	50
31-40	33.3
41-50	50
51-60	50
Over 60	38.1

Followup revealed that 30 per cent of those over the age of 40, it was possible to follow, were deceased. 30 per cent were living and well and 40 per cent were still having symptoms of duodenal ulcer disease.

The next logical correlation was between aerophagia and the duration of symptoms.

	Aerophagia
Less than 2 mo.	50
2 mo. - 1 yr.	27.8
1-2 yr.	50
2-5 yr.	38.5
5-10 yr.	57.2
Over 10 yr.	36

33.3 per cent of those patients with symptoms of aerophagia had experienced ulcer symptoms less than 1 year and nearly 33 per cent had experienced ulcer symptoms more than 10 years. This appears to be a symptom of the fairly acute case and of the very protracted case.

20 per cent of those patients with aerophagia who had symptoms of less than 1 year were operated and 45.5 per cent of those with symptoms over 10 years underwent a surgical procedure.

When the age of onset was correlated with the indication for surgery the following information was gained.

Economic		12.5				
Intractable				8.4		
Obstruction	10	25		8.4	7.2	9.5
Free preforation				8.4		
Hemorrhage			8.4	16.7		14.3
Obstruction & hemorrhage						4.8
Economic & hemorrhage		12.5				
Intractable & hemorrhage					7.2	

Not one pediatric case was operated on and only 1 person

under the age of 20. 50 per cent of the persons with onset between 21 and 30 were operated on and 41.7 per cent of those with onset between 41 and 50 also had operations. 35 per cent of those who had the onset of their disease after the age of 60 were operated on.

At followup one of the patients with onset between the ages of 21 and 30 was dead. One was living and well and one was having post gastrectomy sequelae. Only one patient with onset of duodenal ulcer disease between the ages of 41 and 50 who was operated could be followed and the individual was still having symptoms. Of the group over 60, all who could be folhwed were dead.

Next the duration of symptoms was correlated with the indication for surgery.

	Less than 2 mo.	2 mo.-1 yr.	1-2 yr.	2-5 yr.	5-10 yr.	Over 10 yr.
Economic						4
Intractable					14.3	
Obstruction		5.4		7.7		20
Free perforation						4
Hemorrhage	10	15.7				8
Obstruction & hemorrhage		5.4				
Economic & hemorrhage						4
Intractable & hemorrhage	10					

40 per cent of those patients who had had their symptoms more than 10 years were operated on. 24.1 per cent of those patients who were seen with symptoms of less than 1 year were operated on.

66.7 per cent of those patients operated on for hemorrhage had been having symptoms less than 1 year and 71.5 per cent of those who were operated on for obstruction had had their disease more than 10 years.

Both patients that were operated on for economic reasons had been having their symptoms more than 10 years.

	Male	Female
Economic	1.9	
Intractable		4.2
Obstruction	9.5	8.4
Free perforation	1.9	
Hemorrhage	9.5	4.2
Obstruction & hemorrhage	1.9	
Economic & hemorrhage	1.9	
Intractable & hemorrhage		4.2

In this correlation the only two portions upon which any weight can be placed are hemorrhage and obstruction. Each of the other categories had only one patient included. 9.5 per cent of the men and 8.4 per cent of the women in this study were operated on for obstruction. 9.5 per cent of the men and 4.2 per cent of the women were operated on for hemorrhage. The percentage of men being operated on for hemorrhage is twice as large as the percentage of women.

DISCUSSION

When the cases of those patients with unquivocal duodenal ulcer disease were studied, it was found that only Caucasian individuals remained in the series. This may represent a sampling error. However, Kozoll[19] found in his series of acute perforated gastroduodenal ulcers that this complication occurred predominately in white individuals. While his series showed a lower proportion of white people, nevertheless, the majority were of the white race. This date coupled with the results of Kozoll's series would lead one to assume that duodenal ulcer disease predominates in the white race.

Most series of duodenal ulcer disease in the literature consistently report a higher incidence of duodenal ulcer in men than in women. Kippen[4] reported the ratio to be 3:1 and Chandler[5] 3.5:1, male to female. In investigating this series, the ratio was found to be 2.2:1. This is a lower ratio than the other series, but nevertheless agrees that duodenal ulceration is distinctly more common in the male.

The majority of individuals develop duodenal ulcers during their active, productive life. It was found in this study that 59.8 per cent of the ulcers occurred between the ages of 21 and 60. 70 per cent of those patients who were operated on also fell into this group. Those persons over the age of 60 constituted a second large group and accounted for

27.3 per cent of the total number of cases. 28.6 per cent of the persons who were operated on fell into this group. 13 per cent of the patients were under the age of 20. This breakdown points out the fact that while the majority of ulcer patients developed ulcers during their active productive life, this disease can manifest itself at anytime during a person's life.

Duodenal ulcer disease is a chronic persistent problem. 41.6 per cent of the cases in this series had symptoms lasting more than 10 years. Brown[6], et. al. noted that 58 per cent of patients had suffered ulcer symptoms for over 10 years and Thomson[7] found that 40 per cent of his patients had intermittent symptoms for 10 years. In this series it was found that eventually 40 per cent of the patients in this group required an operation.

In discussing the prognosis of the patients in this series, the problem shall be approached by discussing the apparent course of the patients studied, and correlation of the various symptoms under the headings of the indications for surgery, namely: 1. hemorrhage, 2. obstruction, 3. intractable, 4. perforation and 5. economic.

HEMORRHAGE

It has been stated in the literature[8], that 25 per cent of all cases of peptic ulcer will at sometime bleed. However, in this series it was noted that 66.2 per cent of the patients studied at sometime in their disease had bled. The major difference in the data presented by Coyer[8] and that found in this series is that he states "all patients with peptic ulcer" while this series is limited to hospitalized patients with duodenal ulcer. By including all patients with ulcer, gastric ulcer as well as duodenal ulcer must be included, also patients with the relatively mild, uncomplicated ulcer usually treated on the out-patient basis are also included. From the results of this study, it is apparent that in the patient with duodenal ulcer in need of hospitalization, bleeding may well be a problem.

75 per cent of the patients who experienced pain in the right epigastric area alone or in combination with pain in the mid epigastric bled. This may be a reflection of posterior penetration involving the posterior body wall and/or adjacent structures. Those who complained of left epigastric pain had a lower percentage of bleeders than for the group as a whole.

The most common complaint was that of melena. It occurred alone or in combination with other evidences of blood loss in 72.6 per cent of the bleeding cases. 78.5 per cent

of the cases of melena were in men. It makes this complaint (melena) primarily one of men.

Boles, Cassidy and Jordan[9] of the Lahey Clinic have found that of their bleeding ulcer patients, 69.1 per cent complained of melena. This compares quite favorably with the finding in this series of 72.6 per cent complaining of melena. Coyer[8] states that he has noted that melena is the more frequent complaint in cases of duodenal ulcer while hematemesis is more common in those who have a gastric ulcer. Since a duodenal ulcer may bleed quietly for a long period of time, it follows that occasionally a duodenal ulcer patient may present with a marked, chronic blood loss anemia.

In correlating the various symptoms, it was noted that 75.8 per cent of those patients who lost weight also bled. 66 per cent of the patients with bleeding and weight loss subsequently underwent an operation and at the time of followup 16 per cent were still having symptoms of post gastrectomy sequelae. Loss of weight in a known ulcer patient may serve as a warning signal to the physician and alert him to the fact his patient may have begun to bleed without the patient realizing it.

Duodenal ulcers which develop in certain locations have more of tendency to bleed. The recorded incidences of

post bulbar ulcers which have bled varies from 37 per cent to as high as 72 per cent[2]. The post bulbar ulcers in this series which bled correlated closely with Ransdells' paper but bled no more frequently than the group as a whole. Those ulcers which demonstrated the greatest tendency to bleed were lesser curve ulcers with an incidence of 83.5 per cent and posterior ulcers of which 77 per cent bled. 16 per cent of the lesser curve ulcers were operated on and of those with posterior ulcers, 69.3 per cent also had operations. It has been reported that in 15 per cent of ulcer patients, hemorrhage is the first manifestation of this disorder.[8] Wilkinson and Tracy[11] in a series of bleeding ulcer patients found 50 per cent had gross hemorrhage as the first indication of ulcer disease. Cole[12] has found in his experience that 25 per cent of the persons with massive bleeding from an ulcer have no previous history of duodenal ulcer disease. In this series, it was found that 80 per cent of those patients with symptoms of less than two months duration had bled to some degree. Wilkinson[11] found that 35.5 per cent of his bleeding ulcer cases had symptoms less than six months. The results of this series are nearly doubled those which have been reported in the literature prior to this time.

A second group of symptoms which were prominent in the group of bleeding ulcers were nausea and vomiting. 84.4 per cent

of those who had nausea and/or vomiting also bled. Nausea and/or vomiting was associated with 76 per cent of those who lost weight. As has been seen previously, the incidence of bleeding was greater over the age of 20. The same is also true of nausea and vomiting. Between the ages of 21 and 50 the incidence of nausea and/or vomiting was between 75 and 83.5 per cent. The incidence of bleeding in the age group between 21 and 50 was also between 75 and 83.5 per cent. 33 per cent of those patients in this age group who complained of bleeding and nausea and/or vomiting were operated on.

Dr. Cole[12] states that mild hemorrhage is more common than massive hemorrhage. Weber, Schroeter and Riddell[1] have found that in their hands that 75 per cent of actively bleeding ulcers have spontaneously stopped. Coyer[8] is of the opinion that mortality is greater with the first bleeding episode. He also is of the opinion that at the onset of massive hemorrhage medical treatment yields better results than surgical treatment. He notes a mortality of 25 per cent in those operated on during the acute episode of massive bleeding. Donaldson[10] found that in his study all who died with the first bleeding episode were over 50 years of age.

In the follow-up of those who had bled, 23.8 per cent

of those that were operated on were dead and 10.7 per cent of those treated by medical treatment were dead. One of those who was deceased had not previously bled. Of those who were operated on, two died of possible complications of the operation.

1. myocardial infarct and dehiscence of the duodenal stump and
2. necrosis of the terminal ilium and peritonitis.

OBSTRUCTION

Obstruction, Brown[13] maintains, is caused by pylorospasm, edema, inflammatory swelling or scar tissue. If one were able to relieve the causes of pylorospasm, edema and inflammatory swelling by conservative means, it follows that a large percentage of persons presenting with obstruction could be relieved. Sippy[3] recognized this and stated that 90 per cent of all cases of pyloric obstruction respond favorably to adequate medical management.

In examining the data, several interesting possibilities were found which may be of importance in the patient with obstruction due to duodenal ulcer disease.

First, 9.5 per cent of the men were operated on for obstruction and 8.4 per cent of the women. 40 per cent of those patients who complained of constant pain were operated on for obstruction. 25 per cent of those operated on for obstruction complained of constant pain and all those with constant pain were men. It would appear that constant pain in males may be an indication of at least partial obstruction. All patients

with constant pain were over the age of 40 and 80 per cent of those patients with constant pain also suffered nausea and vomiting.

85 per cent of those operated on for obstruction also had nausea and vomiting. 57.2 per cent of the obstruction cases also had symptoms of aerophagia. 71.5 per cent of those in the group with gastric stasis had been having ulcer symptoms for over 10 years. Haubrich, et. al.[26] believe that obstruction or as they phrase it, gastric stasis, may well be the result of repeated confined perforations with resultant cicatrix formation. "It would seem unreasonable that obstruction would cause penetration; it is logical, however, to assume that in a majority of patients with significant retention penetration has contributed to the obstruction." It is not unreasonable to assume that the constant pain may be the result of a penetrating ulcer with resultant edema and scarring which narrow the duodenal lumen.

Pursuing the complaint of constant pain further it was found that in addition to a high correlation with males, onset of duodenal ulcer disease over the age of 40, long standing ulcer disease, and nausea and/or vomiting that 60 per cent also complained of low abdominal pain. The ulcer location of all those with constant pain was as follows, lesser curve 20 per cent posterior 20 per cent, and persistent deformity (location not described) 60 per cent. Again the frequency with which these

3 locations appear in patients with complicated duodenal ulcer disease becomes apparent. Of those operated on with constant pain, 1 had a posterior located ulcer and the other a radiological impression of persistent deformity.

Symptoms which might well be beacons pointing towards obstruction are as follows:

1. Men who are complaining of constant ulcer pain.
2. Persons who have had the onset of their disease after 40 and who have had their disease for over ten years.
3. Persons suffering with nausea and vomiting.
4. Patients with low abdominal pain in addition to the typical epigastric pain.
5. Lesser curve and posterior ulcer locations, as well as persistent deformity in patients who present with combinations of the above symptoms.

INTRACTABILITY

2 patients in this series were operated on for intractability. The only items both had in common were bleeding and onset of duodenal ulcer disease over the age of 40. These are not enough cases to place any significance on the findings. Haubrich[26] found that in all operations for intractability that 63.7 per cent had confined perforation and/or fibrous adhesion.

PERFORATION

One patient was operated on for perforation. This represents a4.76 per cent incidence of perforation in those

persons with complicated duodenal ulcer in this series. The literature[18] states that perforation occurrs in 10-15 per cent of chronic ulcer patients and is the commonest cause of death in peptic ulcer patients. Thus, the literature reports a higher incidence of this complication than was found in this study.

ECONOMIC

Not enough patients were included in this grouping to allow any conclusion to be made. In this series this indication was used in 2 patients who had long standing duodenal ulcer disease of an intermittent nature which was disabling enough to make the holding of the job difficult. This indication is one which must be arrived at by agreement between the physician and patient as to how disabling is his problem.

Both patients in this series where economics was a factor had the following material in common.

1. Both individuals were males.
2. Both developed ulcer symptoms between the ages of 21 and 30 and had symptoms for at least 5 years, one for over ten years.
3. Both had pain centered in the mid epigastric region which was typical ulcer pain.
4. Both had lost weight.
5. One had an anterior ulcer and the other had persistent deformity.

When looking over the material on those persons who reported having post gastrectomy sequelae, the following interesting points were noted which may have a hand in these complaints. 2 of the 3 patients with these complaints were women. All had suffered from duodenal ulcer disease for more than 5 years, 2 more than 10 years. All were widowed and when first seen at University Hospital complained of nausea and/or vomiting, and weight loss. These findings while on a very small group point up the fact that these persons were having a great deal of digestive difficulty prior to operation. Problems existed prior to operation and these problems in some instances hold over after the operation.

SUMMARY

1. Duodenal ulcers occur more frequently in men.
2. In the majority of cases, the onset of duodenal ulcer disease occurs between the ages of 21 and 60.
3. Duodenal ulcers are chronic and persistent with a great number of at least 10 years duration.
4. Over half the patients in this series had some manifestation of hemorrhage. Factors which are frequently associated with bleeding are; 1. Right epigastric pain, 2. Weight loss, 3. Nausea and vomiting, and 4. Demonstration of a lesser curve or posterior ulcer.
5. A significant number of patients who were operated on for obstruction complained of constant pain. A number of factors which are often associated with constant pain are; 1. Men with onset of duodenal ulcer disease over the age of 40, 2. Nausea and vomiting, 3. Ulcer symptoms for over 10 years, 4. Low abdominal pain and 5. Radiological impression of lesser curve ulcers, posteriorly located ulcers or persistent deformity.
6. Persons with long standing duodenal ulcer disease who have marked disturbances in digestive function prior to operation, may be more prone to develop sequelae postoperatively.

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