The Treatment of Chronic Peptic Ulceration

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SUMMARY

Gastric and duodenal ulcers are different entities. The duodenal ulcer is a problem for the physician while the gastric ulcer is a problem for the surgeon.

In duodenal ulcer the object of treatment is reduction of acid output by control or elimination of hypersecretion of gastric juice especially as far as the cephalic phase is concerned. In those cases that have earned surgical treatment gastric vagotomy is, therefore, of fundamental importance, and the best complementary procedure to eliminate the antral phase of gastric secretion is either antral resection or 'physiological antrectomy' by an adequate drainage operation.

In gastric ulcer the fear of carcinoma masquerading as a benign ulcer must still dictate the policy of management in our community. For this reason timely surgical intervention is recommended. Indeed, medical treatment without a thorough work-up to exclude malignancy is condemned as unscientific — I would go further and say, unethical. The main purpose of therapy is protection or removal of the sick gastric mucosa and the surgical treatment of choice remains distal gastrectomy which includes the ulcer.

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Although the gastric patient and his physician are still linked by an oath of mutual allegiance 'till death do us part', the old standpoint that operative treatment should be considered only after a prolonged course of medical treatment has been tried and has failed, is no longer tenable. Until recent years and in some circles even today the physician believed that one of his principal functions was to save the ulcer patient from the surgeon. At the same time there were, and still are, surgeons who erred in the opposite direction and many a patient found that his 'course of medical treatment' consisted of a packet of soda bicarbonate while he awaited admission to hospital.

During the past two decades these different attitudes have changed and it is accepted today that peptic ulcer is a medico-surgical problem which calls for co-operative teamwork between physicians and surgeons. It is also realized that surgical treatment should not be a last resort but rather an alternative method of treatment and, in certain cases, the primary treatment for peptic ulcers.

Today few patients can afford the luxury in time and/or money of full and repeated courses of medical treatment. In 1963 the total loss of personal income in the USA due to gastric and duodenal ulcer disease amounted to almost 500 000 000 dollars.[20] Here in Cape Town during the period 1961-1966 no fewer than 3 500 patients were investigated by the Gastro-intestinal Clinic at Groote Schuur Hospital, and of these 60% had gastric or duodenal ulcers (Table I). It should also be noted that 7·7% suffered from gastric cancer which emphasizes the need for full investigation to exclude cancer in every patient suffering from more than transient dyspepsia.

TABLE I. 3 500 PATIENTS INVESTIGATED FOR DYSPEPSIA—1961 - 1966

Diagnosis	No.	%
Duodenal ulcer	**1 449**	**41·5**
Gastric ulcer	**636**	**18·1**
Carcinoma of stomach	**269**	**7·7**
Postoperative dyspepsia	**291**	**8·3**
Postoperative ulcer	**55**	**1·6**
No diagnosis	**800**	**22·8**

It is agreed that gastric operations are much less hazardous than formerly, and that patients may safely be referred for surgery if necessary. Thus, during the decade 1955 - 1964 I performed 548 gastric resections for gastric or duodenal ulcers. Of these 409 were elective operations with no mortality; in addition, there were 139 emergency resections for massive haemorrhage with 8 deaths, i.e. 6% mortality, giving an over-all mortality of 1·5%. At Groote Schuur Hospital during the period 1960 - 1963 members of the surgical staff performed various elective surgical procedures for duodenal ulcer on 380 patients with only one death.[16]

Gastric and duodenal ulcers are different diseases and must be handled differently. There is a common thread, namely that both types are due to digestion of living tissue by the enzyme pepsin activated by hydrochloric acid, hence the term 'peptic ulcer'. Moreover, both are subject to the complications of perforation, haemorrhage and cicatrization and have pain related to meals as the leading symptom. There are, however, many differences including the age, sex and racial incidence, the social status, diet and psychosomatic make-up of the individuals and the structure and function of the stomach.

As far as gastric function is concerned, it is well established that most individuals who develop duodenal ulcers are hypersecretors of gastric juice and put out two or more times the normal amounts of hydrochloric acid. The fundamental physiological derangement appears to be vagal hypertonia. Arising from this, the main object of treatment, whether medical or surgical, is directed primarily at a reduction of the acid output by control or elimination of the cephalic phase of gastric secretion.

In contrast, patients who develop gastric ulcers have a normal or subnormal acid output and the pathogenesis of the ulceration remains in question. Probably several aetiological factors are concerned, including antral stasis with hypersecretion due to hormonal stimulation,[5] deficiency of the mucous barrier,[13] atrophic gastritis due to alkaline reflux[6] and abnormalities of gastric motility.[21] Whatever the cause of the ulceration, it is agreed that these patients have a 'sick' mucosa more easily digested by acid-pepsin. Arising from this, the main purpose of treatment is protection or removal of the sick mucosa and control of the antral phase of gastric secretion.

From the point of view of over-all management, however, the crucial difference between gastric and duodenal ulcers is that gastric ulcers may be mimicked by an ulcerating carcinoma of the stomach and that without full investigation it is often impossible to decide that an apparently benign gastric ulcer is not malignant. In duodenal ulceration, on the other hand, this risk is negligible.

THE CURRENT APPROACH

Duodenal Ulcers

The uncomplicated duodenal ulcer is essentially a medical problem. Complicated ulcers often require surgical treatment either as an emergency measure or as an elective procedure after 1 - 2 months. The uncomplicated ulcer that fails to respond to medical treatment might have to be treated surgically *provided the patient has earned his operation*. In general, this implies that symptoms have been present for 5 or more years, that an adequate trial, preferably two, of medical treatment has failed and that 10% of working time has been lost. However, concessions have to be made to patients in the lower socio-economic class while women and men under the age of 30 years are much better off with the physicians.

Elective Procedures of Choice:

Vagotomy and drainage (pyloroplasty, gastroduodenostomy or gastrojejunostomy) especially for patients who are poor risks and those who do not secrete excessive quantities of gastric juice (MAO below 45 mEq/hour).

The principal advantage of this procedure is the low operative mortality. At Groote Schuur Hospital the mortality for elective operations has remained at zero and most authors report a mortality of less than 0·5%.[16,25] On the other hand, this low mortality, coupled with the comparative ease of the operation, has led to its abuse in that patients who have not earned surgery are unnecessarily operated upon. In a series of cases investigated by us, there were unsatisfactory functional results in 15% and most of them were due to poor selection of patients.[28] The major drawback of vagotomy and drainage has been the relatively high incidence of recurrent ulceration. At Groote Schuur Hospital the recurrence rate has been 6% duodenal/jejunal ulceration and 2% gastric ulceration, while a further 3% of patients have had suspected but unproven recurrences, i.e. an over-all recurrence rate of 8%, possibly 11%. Other authors have reported recurrences varying from 4·5% to 16%.[16,25] Many of these recurrences have been due to incomplete vagotomy. In this connection we have found selective vagotomy less likely to be incomplete than truncal vagotomy.[1]

Vagotomy and antral resection especially for patients who are good risks and for those who secrete excessive quantities of gastric juice (MAO above 45 mEq/hour).

Our experience indicates that the most satisfactory control of the ulcer diathesis is afforded by vagotomy and antral resection. In a series of 86 patients subjected to vagotomy and antral resection during the period January 1960 - June 1963, there were no deaths and there have been no recurrent ulcers. Moreover, satisfactory long-term results have been obtained in 95%.[28] Similar results have been observed in other large series, i.e. mortality rates of 0·5% - 1%, recurrence rates of less than 1% and thoroughly satisfactory long-term results in about 95%.[25] However, when vagotomy and antral resection have been doggedly used in large numbers of consecutive cases including poor-risk and elderly patients with massive haemorrhage, the over-all operative mortality rate has risen to almost 3%, which is not an acceptable figure today.[25]

It is well to remember that no single operation will suit every patient and that we must tailor our operations according to our patients' needs. In 1963 I reported on a series of 194 patients treated by selective surgery for duodenal ulcer.[16] The selection was based primarily, although not entirely, on the preoperative acid output and the procedures used were vagotomy with drainage, vagotomy with antral resection, vagotomy with partial gastrectomy and partial gastrectomy only. There were no deaths, there have been no recurrent ulcers and satisfactory results have been obtained in 95% of patients. Today I still believe that selective surgery offers the best results, but I now limit the choice of procedures to vagotomy with drainage and vagotomy with antral resection.

Gastric Ulcer

Gastric ulcer is essentially a surgical problem. It is not suggested that every gastric ulcer should be operated upon, but there are two factors of great importance in dictating our attitude, namely the fear of malignancy and the poor long-term results of medical treatment.

It must be remembered that gastric carcinoma may masquerade as a benign gastric ulcer and it is therefore the duty of every practitioner to be reasonably sure that the ulcer is, in fact, benign before prescribing a course of medical treatment. To what extent this consideration will affect the programme adopted in any particular centre depends upon a number of factors:

Incidence of Gastric Cancer in the Community

Operative intervention to exclude malignancy is justified only if gastric carcinoma is reasonably frequent in the community. In a series of 3 500 patients investigated for dyspepsia by our Gastro-intestinal Clinic from 1961 to 1966, no fewer than 269 (i.e. 7·7%) suffered from gastric carcinoma, while 636 (i.e. 18·1%) had benign gastric ulcers (Table I). In other words, 30% of the patients with demonstrable gastric lesions had carcinoma.

In our Cape Coloured community, in both males and females, the incidence of carcinoma of the stomach is nearly twice that found in the USA and moreover, the peak incidence is a decade earlier (Table II).[9] There is little doubt that the fear of malignancy is something which must influence our attitude in this area.

TABLE II. CANCER OF THE STOMACH — AGE-ADJUSTED INCIDENCE PER 100 000 POPULATION

	Cape Town		USA
	White	Coloured*	All races
Male	**35·7**	**60·5**	**34·1**
Female	**15·6**	**28·8**	**18·3**

* In the Coloured the peak incidence is a decade earlier.

Diagnostic Accuracy of the Team

With a combination of modern, sophisticated diagnostic techniques and highly trained personnel, an accuracy rate of 99·3% in differentiating between benign and malignant ulcers has been achieved.[11,12] We would agree with Nyhus that 'when diagnostic acumen reaches this level, operative intervention cannot be justified simply on the basis of fear of malignancy'.[20] On the other hand, the individual cytologist or gastroscopist who claims that his particular investi-

gation can be equally accurate, is fooling himself and his unfortunate patient. Some radiologists have claimed an accuracy rate of 95% in selected series,[18] but most radiologists will agree that the over-all accuracy is about 80 - 85%.[26] With a full diagnostic work-up a degree of accuracy exceeding 99% is far from universal.[20] There are a number of reasons for this, well illustrated by our own experience.[17] During the period January 1961 - April 1962 one hundred consecutive cases of gastric carcinoma were investigated with the following results:

Positive X-rays (83%). In 4% the barium meals were reported as normal and in 13% benign lesions were diagnosed.

Acid studies. Histamine-fast achlorhydria was found in 34% and the maximal acid output was less than 5 mEq/hour in a further 36%. (In a control group of benign gastric ulcers there were none with achlorhydria—a gastric ulcer cannot be 'peptic' if there is no acid—and only 7·3% with a maximal acid output of less than 5 mEq/hour.)

Positive cytology (71%). The investigation was done in only 68% of the patients because in the rest the material obtained was unsuitable for examination.

Positive gastroscopy (73%). In 2% carcinoma was excluded (!) and in 25% the procedure failed for technical reasons.

Full work-up. By using a combination of radiology, acid studies, cytology and gastroscopy our diagnostic accuracy was 96%. In the remaining 4% the diagnosis was made at laparotomy. There can be no question that in our set-up a full work-up is mandatory if malignancy is to be excluded.

The Value of Operation for 'Early' Malignancy

Operative intervention to detect and deal with gastric carcinoma would be meaningful only if a reasonable 5-year survival rate could be obtained. Unfortunately, there is a general belief, especially among physicians, that the 5-year survival rate of carcinoma of the stomach is so bad (over-all less than 10%) that a concerted effort at operative treatment is unwarranted. This may be true for most series of unselected cases in whom a preoperative diagnosis of carcinoma is made, because the reason for the poor results is essentially 'late diagnosis'. This is well illustrated by a series of 100 consecutive cases treated by us during the period 1961 - 1963 (Table III). The overall 5-year survival rate was 15% but in those in whom a curative resection was performed, i.e. no obvious residual tumour was left, the survival rate was 43%, while in those in whom resection was possible but apparently incomplete, 19% have survived. However, curative resections were possible in only 22%.

TABLE III. CARCINOMA OF THE STOMACH — 100 CONSECUTIVE PATIENTS

Procedure	No.	Op. deaths	Survivors
No operation	7	—	0
Laparotomy only	20	1 (5%)	0
Short circuit	19	1 (5%)	0
Palliative gastrectomy	32	1 (3%)	6 (19%)
Radical gastrectomy	22	3 (14%)	9 (.3%)
Over-all	100	6 (6%)	15 (15%)

More significant are the findings of Runyeon and Hoerr.[24] In a series of 24 patients operated on with a preoperative diagnosis of benign or indeterminate gastric ulcer in whom carcinoma was found at operation, the 3 - 5-year survival rate was 46%. Olsson and Endresen,[22] in a similar study, found 64% survival of more than 3 years. Furthermore, Brown *et al.*[2] have reported that the 5-year survival rate in patients with apparently benign ulcers which turn out to be malignant at operation, is markedly altered by delay in resection, viz. early operation: 92%; delayed operation: 60%. It should also be noted that Comfort *et al.*[4] found that the 5-year survival rate for malignant ulcers of less than 1·1 cm was 82·4%. Hawley *et al.*[10] in a study of 205 patients found a 40% 5-year survival rate in the absence of lymph node involvement and an 11% 5-year survival rate with involved nodes.

Early diagnosis and surgical intervention are obviously essential if carcinoma of the stomach is to be cured. Unfortunately, in patients in whom a preoperative diagnosis of carcinoma is made there is no correlation between length of history and prognosis,[10] and the time to make the diagnosis is when the carcinoma is still masquerading as a benign lesion. This in turn demands a full work-up in *every* patient with more than transient dyspepsia.

Operative Mortality and Postoperative Morbidity of Gastrectomy for Benign Gastric Ulcers

It is often argued that the advantage of discovering an early carcinoma at surgery is offset by the operative mortality of gastric resection. Nyhus[20] concludes that where the mortality is below 2% for gastric ulcer surgery, early intervention should be strongly considered, but if the mortality is over 5% the moderate risk of masked malignancy must be accepted. At Groote Schuur Hospital the over-all mortality of elective gastrectomy for benign ulcers (gastric and duodenal) is 12·2% and in the case of gastric ulcers the recurrent ulcer rate is less than 1%, while satisfactory results are obtained in 95% of cases. The same applies to many other institutions.

Results of Medical Therapy for Chronic Benign Gastric Ulcers

Nyhus[20] sums it up succinctly: 'Recurrent trouble is the rule'. At the Gastro-intestinal Clinic, Groote Schuur Hospital, it has been found that at least 50% of chronic gastric ulcers which have healed completely on medical treatment, recur within a year and that further recurrences are the rule in subsequent years. This applies particularly to patients who have very large and very deeply penetrating ulcers, but also to those with small ulcers. Moreover, even if there is radiological healing after 6 weeks of treatment there may still be some gastroscopic evidence of incomplete healing. Welch and Burke[29] reviewed various series and concluded that excellent results may be obtained with medical treatment in only 20 - 30% of patients with benign gastric ulcers. Dworken *et al.*[7] in a study of 135 patients, found that 80% had at least one recurrence and Larson *et al.*[14,15] present a similar bleak experience. It is obviously important to compare this recurrence rate with the incidence of postoperative problems following surgery for gastric ulcer. Moreover, many of the recurrent ulcers may be complicated by perforation and haemorrhage and the mortality of these complications must be weighed

against the operative mortality of gastrectomy. There is little doubt that in our set-up a very strong case can be made for elective surgery in benign gastric ulcer.

RECOMMENDED PROGRAMME

In view of the above, surgical treatment is recommended for the following:

1. All gastric ulcers which are complicated or have been complicated. The operation may have to be an emergency procedure or carried out electively 1 - 2 months later.
2. Gastric ulcers complicating duodenal ulceration.
3. 'Giant' gastric ulcers, i.e. over 4 cm in size. A short course of preoperative medical treatment is advisable.
4. Gastric ulcers in patients with a history of previous hospitalization for the same complaint. By the same token, an ulcer which recurs after successful medical treatment should be operated upon.
5. If there is any suspicion of malignancy on full investigation by barium meal, acid-output studies, gastroscopy, gastrocamera, gastric cytology and peroral gastric biopsy. If all investigations are negative for carcinoma but there is still clinical suspicion, surgery is recommended especially if the MAO is less than 5 mEq/hour.
6. If controlled medical treatment fails.

Controlled medical treatment is indicated only if, after a full work-up, there is no suspicion whatsoever of malignancy. 'Controlled' implies:

1. That the patient is kept under strict observation.
2. That a repeat barium meal is done after 2 weeks. The crater of an uncomplicated benign ulcer will reduce by 50% in size during this time.[20] Failure to obtain such a response will prompt many surgeons to operate without further delay[23] and I would agree with this if the patient still has symptoms. However, we are usually prepared to wait another month for the next step, viz.:
3. That a repeat barium meal and gastroscopy are done after 6 weeks of treatment. Uncomplicated benign gastric ulcers will heal in this time. If healing as determined by barium meal and gastroscopy is not complete, the ulcer is presumed to be either complicated or malignant and operation is, therefore, performed without further delay.

The elective procedure of choice for benign gastric ulcer is partial gastrectomy with Billroth I anastomosis.[20] However, if there is a suspicion of malignancy which cannot be confirmed by frozen section, it is wiser to perform a Billroth II type of anastomosis in case later paraffin sections reveal carcinoma. The latter type of anastomosis is also preferred in cases with a very high acid output (MAO over 40 mEq/hour). The results of partial gastrectomy with Billroth I anastomosis are consistently good. The operative mortality at Groote Schuur Hospital has remained in the vicinity of 1 - 2% and the same applies to many other institutions.[20] The recurrent ulceration rate is less than 1% and satisfactory results are obtained in about 95%.[20]

In recent years pyloroplasty or gastrojejunostomy with excision of the ulcer and also vagotomy and drainage with biopsy of the ulcer have been suggested as alternative procedures.[3,8,19] Results at least as good as those of gastrectomy have been reported by some, but others have encountered many problems.[30] In our opinion the standard approach to benign gastric ulcer must remain distal gastrectomy with removal of the ulcer. If the ulcer is situated high up in the lesser curve an extended Pauchet manoeuvre as recommended by Tanner[27] should be used.

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