

# EXPERIENCES WITH THE TREATMENT OF DUODENAL ULCERATION IN THE JOHANNESBURG HOSPITAL

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The medical treatment of duodenal ulceration is not always successful, and in such cases surgical treatment becomes necessary to prevent the occurrence of complications which may have serious consequences. The primary treatment is thus medical and the indications for surgical treatment are relapse after adequate medical treatment or the presence of complications, such as serious haemorrhage, obstruction or perforation.

Originally the operation of choice for a duodenal ulcer was gastro-jejunostomy. This procedure was most effective as a cure for the ulcer but, with the passage of time, a high incidence of jejunal ulceration was found, and for this reason gastro-jejunostomy was supplanted by partial gastrectomy.<sup>1</sup> This operation reduced the incidence of jejunal ulceration, but the loss of the gastric reservoir brought with it many undesirable side-effects<sup>3</sup> which resulted in a search for an effective operation without these disturbances. This was provided by Dragstedt<sup>2</sup> who demonstrated that vagotomy with a suitable drainage procedure would control the majority of duodenal ulcers without the disadvantages of a partial gastrectomy.

A study of the experiences in the treatment of duodenal ulceration in the Johannesburg Hospital clearly illustrates this evolution in therapy.

## I. THE TREND IN THE TYPE OF OPERATION PERFORMED IN THE JOHANNESBURG HOSPITAL FOR DUODENAL ULCERATION

### *Material*

The operation register of the main theatre in the Johannesburg Hospital was studied for the years 1926-1931, 1946, 1957 and 1964 to ascertain the incidence as well as the type of operations performed for duodenal ulceration.

### *Results*

These are reflected in Table I and are illustrated graphically in Fig. 1. The trend from gastro-jejunostomies to par-

TABLE I. INCIDENCE AND TYPE OF OPERATION PERFORMED

Year	Total operations	Gastro-jejunostomies	Gastrectomies	Vagotomies	Incidence of ops. for DU
1926	912	13	1	0	1.3%
1927	848	7	1	0	0.9%
1928	661	8	0	0	1.2%
1929	649	10	0	0	1.6%
1930	704	4	1	0	0.6%
1931	568	8	0	0	1.4%
1946	3,787	7	19	1	0.8%
1957	4,233	5	77	1	2.0%
1964	4,180	0	44	46	2.1%

tial gastrectomies is clearly seen in 1946, and in 1957 partial gastrectomy seems to have been the unquestioned operation of choice. On 8 August 1946, Mr. A. Lee McGregor performed the first vagotomy for duodenal ulcera-

tion in this hospital and by 1964 vagotomy had overtaken partial gastrectomy in frequency.

An incidental observation is that the incidence of operations done for duodenal ulceration has remained fairly constant, in spite of a very significant increase in the total number of operations performed.

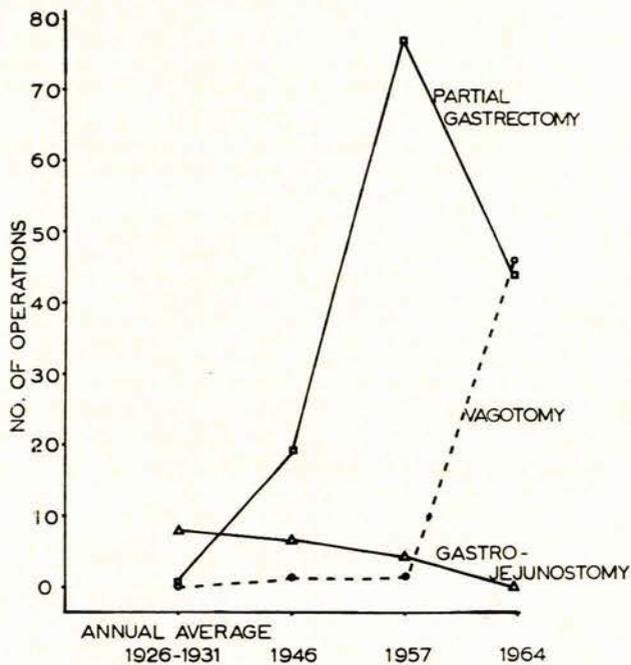


Fig. 1. Types of operations performed for duodenal ulceration in the Johannesburg Hospital.

#### Comment

Many of the partial gastrectomies performed for duodenal ulceration in 1964 were done for acute haemorrhage and, if the figures were to be studied for elective operations only, the preponderance of vagotomies would be much more striking. However, some of the partial gastrectomies were performed in elective cases by surgeons who are not yet convinced that vagotomy and drainage offers an overall advantage over partial gastrectomy.

#### 2. THE TREATMENT OF DUODENAL ULCERATION IN THE PROFESSORIAL SURGICAL UNIT, JOHANNESBURG HOSPITAL, 1959 - 1964

##### Cases

All cases of duodenal ulceration admitted to the professorial surgical unit during the 6 years 1959 - 1964 were analysed. This series does not include those patients seen and treated in the outpatient department and comprises only those cases treated primarily in the professorial surgical unit. Patients treated surgically elsewhere and then later referred to this unit because of an unsatisfactory result are not included in this series.

##### Results

There were 205 patients with duodenal ulceration admitted to the professorial surgical unit over the 6-year period under review, and of these 117 (57%) were males and 88 (43%) females. These cases can be divided into 2 big groups, those with a good indication for surgical treat-

ment and those without such a clear indication for operation.

##### (a) Patients Without a Clear Indication for Surgery

Ninety-three patients (45%) were not considered to require surgical treatment and were given a full course of medical treatment as the definitive form of therapy. In 14 instances this was not successful and those patients were subsequently given the benefit of surgical treatment (hereafter called the 'surgical group') whereas the remaining 79 patients responded satisfactorily to medical treatment ('medical group'). The significant differences between these 2 groups of patients were as follows:

*Sex.* In the surgical group 71% were males, whereas only 58% were males in the medical group.

*Age.* In the surgical group 93% of the patients were between 35 and 55 years of age, whereas in the medical group 71% were between 30 and 59 years; 3 were under 30 and 17 were over 60.

*Duration of symptoms.* None of those requiring surgery had a history of less than 2 years, but in the medical group 27% had a history of less than 1 year. On the other hand, in the surgical group 21% had a duration of over 11 years and in the medical group 19% had a duration of over 11 years.

*Gastric secretory studies.* On the average the patients requiring surgery had a higher acid output than the others, but the difference was not significant. It was striking, however, that none of the patients requiring surgery had a basal acid secretion of below 1 mEq. total acid per hour (as compared with 20% in the medical group) and only 10% had a total acid secretion of less than 20 mEq. (in males) and 8 mEq. (in females) per hour after maximal histamine stimulation (as compared with 25% in the medical group). The medical vagotomy test did not show any difference between the two groups.

*Previous medical treatment.* All the patients had received medical treatment elsewhere before being admitted. Many of these treatments had been inadequate, as judged by the patient's history, but it was striking that 29% of those who relapsed after our medical treatment had had more than one previous course of medical treatment, and in the medical group only 16% had had more than one such course before being admitted to our ward.

An interesting finding was that relapses after medical treatment occurred fairly soon, and 50% of those who needed surgery had the operation within 6 months of our course of medical treatment and 79% had their operations within 3 years.

##### (b) Patients With a Clear Indication for Surgery

The remaining patients all had a good indication for surgical treatment, and with the 14 requiring surgery in the first group, constituted 126 cases. The indications for surgery were as follows:

Relapse after adequate medical treatment	53 (45%)
Perforation	34 (29%)
Severe haemorrhage (past or present)	22 (18%)
Obstruction	17 (8%)

The 34 patients with perforations were all treated surgically by simple suture of the perforation. There were 5 deaths in this group (15%).

Thirteen patients were treated by an emergency operation for a bleeding duodenal ulcer which would not re-

spond to conservative treatment. In 10 cases a partial gastrectomy was performed and, of these, 5 died in hospital. These patients were all poor risks with prolonged and severe bleeding. In 3 instances, because of the poor condition of the patient, the emergency operation performed was a vagotomy, with oversewing of the bleeding ulcer and pyloroplasty. In 2 cases this failed to stop the bleeding permanently and the patients died in hospital.

The remaining 79 patients were treated by elective operation, 22 by partial gastrectomy and 57 by vagotomy and drainage. At the beginning of the 6-year period partial gastrectomy was the operation most frequently performed, but during the last 3 years of the period under review all the elective operations were vagotomy and drainage and no partial gastrectomies were performed as elective procedures for duodenal ulceration (Fig. 2). There were no

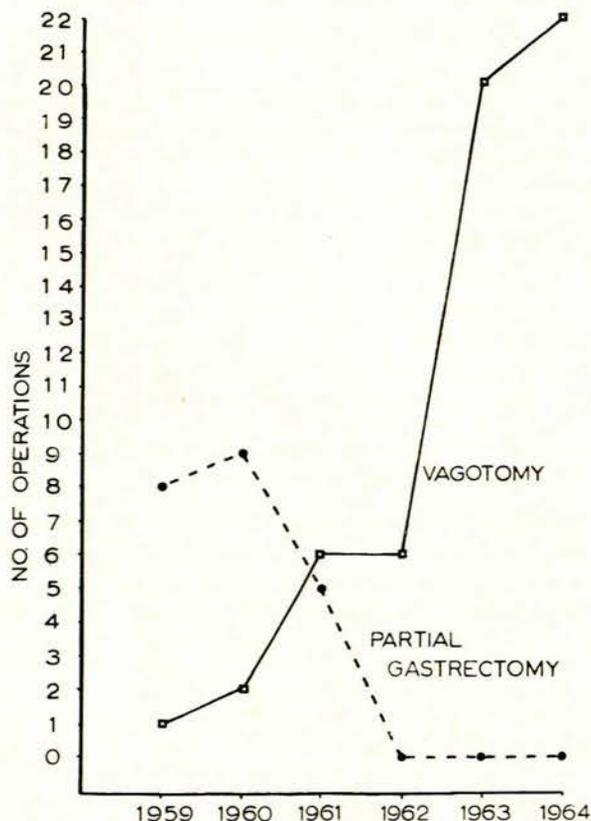


Fig. 2. Types of elective operations performed for duodenal ulceration in the professorial surgical unit, Johannesburg Hospital.

deaths in this group of 79 elective operations. The drainage procedures used in association with the vagotomy were gastro-jejunostomy in 45, pyloroplasty in 9 and a pylorotomy in 3. In 3 instances a selective vagotomy was performed, but in the remainder a truncal vagotomy was carried out.

#### Comment

These figures illustrate the very conservative approach adopted in the treatment of duodenal ulceration. Surgical treatment is only carried out for a complication or after relapse following adequate medical treatment.

It would save unnecessary hospitalization if we could anticipate correctly who would not respond to medical treatment and in such cases proceed with surgical therapy without the preliminary trial of medical therapy. This we have not been able to do, and a review of our experiences over the 6-year period indicates that there are no reliable criteria for such a decision. We can say that certain patients are more likely to respond satisfactorily to adequate medical treatment, and this includes females, patients under 35, those with a history of less than 2 years in duration, and patients with low acid secretion. In such cases medical treatment is mandatory to avoid unnecessary operation. On the other hand, a long history is not necessarily an indication for surgery, and in our group not requiring operation there are many with histories over 11 years. The explanation for this is probably that the same ulcer has not been present all that time, but that the patient has developed repeated ulceration at times of stress.

Failure of response to medical treatment must be clearly defined. It is our experience that an uncomplicated duodenal ulcer will always respond to vigorous medical treatment in hospital, and if the patient does not lose his symptoms there is some other cause for them. Our aim is to give a 2-3-week course of treatment in hospital, which is followed by another similar period of vigorous treatment at home and then 3 months 'ambulant' treatment while the patient is back at work. If the patient cooperates this therapy is always successful, but the ulcer may recur later, and then only do we accept that medical treatment has failed. Failure is thus not failure to heal the ulcer but failure to keep the ulcer healed.

Normally we prefer relapse after 2 such courses of medical treatment before deciding on surgery, but possibly relapse after 1 course is sufficient indication if other factors such as sex, age, duration and acid secretory studies suggest that the patient is likely to require operative treatment eventually.

It is very important that the medical treatment should be adequately carried out. All our patients had received medical treatment elsewhere before admission, but mostly this was inadequate, consisting frequently only of antacids taken after meals. Failure of such treatment to heal the ulcer must not be used as an indication for surgery. It is the responsibility of the surgeon to ensure that the indications for his operation are adequate, and he may thus have to carry out his own medical treatment if previous treatments have not been adequate. Although all our patients had previously received medical treatment elsewhere, this was repeated, either to give them another chance or because previous treatments, judging from the description given by the patients, did not appear to have been adequate.

### 3. COMPARISON OF THE RESULTS OF PARTIAL GASTRECTOMY AND VAGOTOMY WITH DRAINAGE IN THE TREATMENT OF DUODENAL ULCERS

As has been indicated above, there was no mortality after either type of operation when done as elective procedures; so the change from partial gastrectomy to vagotomy and drainage must therefore be justified by the late effects of these 2 procedures.

#### Cases

This series is confined to patients operated on in the professorial surgical unit for duodenal ulcer and followed up at the gastroenterology clinic. A complete follow-up was not achieved and there are 29 patients with partial gastrectomies to compare with 31 patients with vagotomy and drainage. The drainage procedure adopted in these 31 cases was gastro-jejunostomy in 18, pylorotomy in 3 and the remainder had a pyloroplasty.

The duration of follow-up was understandably longer for the patients with partial gastrectomy, in which group the follow-up was over 2 years in 79% of cases, whereas the follow-up after vagotomy was over 2 years in only 39% of cases.

### Results

Reduction in the capacity of the stomach, with resultant premature fullness and even discomfort, was naturally more common after partial gastrectomy, with significant symptoms present in 59%. The symptoms of dumping, presumed to be due to rapid emptying of the stomach, were also more common after partial gastrectomy, having been encountered in 55% of cases as opposed to only 26% following vagotomy and drainage.

Vomiting was found in 41% of the patients with partial gastrectomies, but only in 26% after vagotomies. The vomiting in all cases seemed to be due to either the reduced capacity or to biliary reflux, and no instances of afferent or efferent loop obstruction were seen.

In view of these differences it is not unexpected to find that 45% of the patients after gastrectomy lost weight, whereas this was only encountered in 16% after vagotomy. The loss of weight was probably largely due to inadequate intake, but no doubt disturbances of absorption were also of some importance, although gross steatorrhoea was not found.

Anaemia (with a haemoglobin below 12 G/100 ml.) was found in 17% of patients after gastrectomy, but only in 6% after vagotomy, and another striking finding was that the iron saturation was below 15% in 66% of patients with gastrectomies and in only 3% following vagotomies. In this connection it must be kept in mind, however, that the follow-up period of the gastrectomies is longer than for the vagotomies.

In view of the reported diarrhoea following vagotomy, careful attention was paid to the bowel habits of these patients. Following vagotomy there were 5 patients with a history of diarrhoea (16%), but only in 1 instance was this severe. This symptom was present in only 1 (3%) case following gastrectomy. An interesting side-light on this question is that 71% of patients after vagotomy stated that their bowels were not altered by operation, but only 31% of patients after gastrectomy thought that their bowels were unchanged, and the rest maintained that pre-operative constipation had been relieved by the operation.

An important feature of the long-term results is the relative incidence of jejunal or recurrent duodenal ulceration following surgical treatment for duodenal ulceration. In this series this did not occur after gastrectomy, but after vagotomy and gastro-jejunostomy we have encountered jejunal ulceration once, and in another case it is suspected although not yet definitely proven.

### Comment

These results confirm other reports that the postoperative morbidity is much less after vagotomy and drainage, but that there is a higher incidence of recurrent ulceration. We feel, as do many other workers, that the benefit of the vagotomy and drainage operation is so great that it outweighs this disadvantage of a higher incidence of recurrent ulceration. Those few who do develop recurrent ulcers can then have a gastrectomy in the knowledge that any postoperative morbidity is fully justified and that the vast majority of patients have been saved these after-effects of partial gastrectomy.

The cause for recurrent ulceration is not always evident, but probably incomplete vagotomy is the main reason. It is an interesting theory that some patients have largely a hormonal type of hypersecretion as the cause for the duodenal ulceration and that they will not be cured by vagotomy and drainage. It is maintained that these cases can be recognized by the *medical vagotomy test* and that in them an antrectomy

should be done with the vagotomy.<sup>1</sup> We carry out the medical vagotomy test as a routine, but prefer not to vary our operation on the strength of it. We perform vagotomy and drainage in all cases and shall retrospectively evaluate the medical vagotomy test in the light of our follow-up findings.

### 4. RESULTS OF PARTIAL GASTRECTOMY DONE ELSEWHERE AND SEEN IN THE PROFESSORIAL SURGICAL UNIT

The morbidity associated with our gastrectomies as indicated above is not unusual, and is also seen in patients operated on elsewhere but who eventually seek further aid from us.

### Cases

There were 69 patients treated by partial gastrectomy elsewhere, in different parts of the country, and seen in the follow-up clinic or admitted to the professorial surgical unit. This was naturally a selected group of patients who attended because of symptoms following their operations. In this group there were 43 males and 26 females, and the previous operations performed were a Polya type of partial gastrectomy in 66 and a Bilroth I gastrectomy in 3.

The original gastrectomy was performed for intractability of the ulcer in 27 instances, and in the remainder for complications.

The lapse of time between the attendance of the patient with us and the original operation was less than 1 year in 9 instances, but in the remainder it was variable, ranging up to over 10 years.

### Results

Our diagnosis was afferent-loop stasis in 3 patients, biliary reflux in 20,<sup>2</sup> dumping in 26, jejunal or recurrent duodenal ulcer in 10 and the remainder had a variety of symptoms which did not enable us to place them in one or other specific group, but our impression was that these patients had been poorly selected for the original gastrectomy.

The treatment carried out in these cases varied with the severity and the type of complaint. Of the 20 patients with biliary reflux, 10 were subjected to a vagotomy and a Roux-Y anastomosis, and of these all 6 who are attending the follow-up clinic have had good results. In the group of 26 patients with dumping symptoms a jejunal implant was performed in 6 instances, and 4 of the 5 of these attending the follow-up clinic have had good results. The patients with jejunal or recurrent duodenal ulcers were all operated on, the standard procedure being a vagotomy and refashioning the original gastrectomy. All 6 patients in this group attending our follow-up clinic have had good results.

It is of some interest to note the significant symptoms complained of by patients in this group. Sixty of the 69 patients vomited either food or bile, or a combination of the two. Fourteen had diarrhoea, 37 severe loss of weight, and 25 had significant anaemia with an additional 14 manifesting an iron saturation below 15%.

### Comment

It must be stressed that these patients comprised a selected group who attended our follow-up clinic because of symptoms following their previous operations. They do not represent the average result following gastrectomy, but certainly do clearly indicate the unsatisfactory results so frequently encountered after this operation.

The high incidence of anaemia, or latent anaemia, is of some importance and indicates once again the necessity for

the routine administration of additional iron following gastric resection.

It is our feeling that a significant number of patients who present with symptoms following gastric surgery do so not because of a specific complication, but merely because the patient was poorly selected for this type of procedure. The altered intestinal physiology following on gastric resection will inevitably produce some symptoms, and if the patient was not well selected he will complain bitterly of these symptoms which, under normal circumstances, would not be sufficient to produce much disability.

#### DISCUSSION

The treatment of duodenal ulceration is unquestionably medical in the first instance, and surgery should only be contemplated if a complication exists or if a patient fails to respond to medical treatment. Failure of medical treatment does not mean that the ulcer cannot be healed. It is our feeling that all uncomplicated duodenal ulcers will respond to adequate medical treatment, but the real problem is to keep the ulcer healed when the patient returns to normal life. This requires cooperation by the patient, who may have to modify his life to some extent to keep his ulcer healed in spite of his ulcer diathesis. Failure of the patient to do this will result in a relapse of the duodenal ulcer, but in such an instance it is more the patient that is intractable than the ulcer. Gastric surgery in this type of patient is likely to have poor results. If, however, the patient does take normal precautions against relapse of the ulcer, such as attention to diet and the way of living, and relapse still occurs, then gastric surgery is indicated.

The type of operation we prefer at present is vagotomy and drainage. The vagotomy is largely a truncal vagotomy, although a few selective vagotomies have been performed. We are at present worried that selective vagotomies may be incomplete more frequently than truncal vagotomies and, in addition, we fear that the very extensive mobilization of the stomach necessary for selective vagotomy may lead to the future development of a hiatus hernia. For the time being, therefore, we are concentrating on truncal vagotomies. As has been indicated, the incidence of diarrhoea is not particularly significant with truncal vagotomies, and we have therefore been encouraged to continue this treatment. In any event, it has been pointed out above that diarrhoea also is a significant complication following other forms of gastric surgery, and one wonders whether it is indeed the vagotomy and not the drainage procedure which is responsible for the majority of these cases of diarrhoea. The type of drainage procedure we prefer is a

gastro-jejunoscopy close to the pylorus. We are reluctant to use pyloroplasty, partly because it is more likely to leak or obstruct, but more particularly because we visualize that, just as gastric ulceration is the end stage of a severe gastritis,<sup>8</sup> duodenal ulceration is probably the end result of a long-standing and severe duodenitis.<sup>5</sup> The damaged duodenal mucosa would then be more likely to form another ulcer after pyloroplasty than the jejunum after gastro-jejunoscopy. Until there is clarity on this aspect we prefer gastro-jejunoscopy, although we recognize the physiological advantages of a pyloroplasty. Antrectomy is never performed in association with vagotomy, because we feel that the pyloric antrum has a protective function and should therefore be preserved if at all possible.<sup>7</sup> In those few instances where recurrent ulceration occurs after vagotomy and drainage, a standard partial gastrectomy is carried out.

It is an interesting theory that the medical vagotomy test might indicate those patients who will not respond to surgical vagotomy, and that in those cases an antrectomy should be done in addition to the vagotomy.<sup>7</sup> Theoretically this theory has much to recommend itself and may yet turn out to be worth while. However, in view of the fact that we regard the pyloric antrum as a protective mechanism,<sup>7</sup> we are not performing antrectomies, even if the medical vagotomy indicates that there is not a significant reduction of acid secretion with vagal inhibition. In due course, after follow-up studies, we shall be able to evaluate these cases retrospectively, and we hope in this way to obtain some clarity as to the value of this investigation.

In our unit perforations of duodenal ulcers are sutured and definitive surgery is not carried out in the acute stage.

Bleeding duodenal ulcers are, on the whole, treated conservatively with few exceptions. If the bleeding persists or recurs, the operation of choice is a partial gastrectomy. In the few instances where vagotomy, pyloroplasty and oversewing of the ulcer has been carried out, the results have been discouraging and we reserve this method of treatment for very poor-risk patients who may not be able to stand the standard type of gastrectomy.

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