LATE RESULTS IN PERFORATED GASTRO-DUODENAL ULCERS *

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Many articles have been written during the last ten years on the subject of late results following surgical treatment of chronic gastro-duodenal ulcers. On the other hand comparatively few papers have been published on the late results in perforated gastro-duodenal ulcers.

Eliot published in 1912 a very thorough study of immediate and late results following acute perforations of gastro-duodenal ulcers. However, most of the papers written on the subject of acute perforations confine themselves to a discussion of various surgical procedures and an investigation of the operative mortality.

It is stated very often as a positive fact that an acute perforation always leads to a complete healing of the ulcer with a formation of a simple scar. How this process of healing occurs does not seem to be quite clear to most authors. The acute perforation usually takes place in the centre of the ulcer. Although the perforation is only pin-point in size, the ulcer-area often varies from the size of a dime to that of a quarter. In the majority of cases the sutures which close the perforation have to be inserted in the area of acute inflammation. In spite of the fact that the inflamed area is not excised, most authors assume that a spontaneous process of complete healing follows an acute perforation.

One of the well-known procedures in the surgical treatment of chronic gastro-duodenal ulcers is based on the assumption that a spontaneous cure follows an acute perforation. Thus, the perforation is artificially produced by a cautery and the opening closed by sutures.

It seemed advisable to study the late results following acute perforation of gastro-duodenal ulcers with the same care which we used in the study of gastro-jejunal ulcers following gastro-enterostomy. The latter investigation brought to light the interesting fact that, at least in our material, gastro-jejunal ulcers occurred in 34 per cent. of the cases, with 18 per cent. proven by re-operation. The marked difference between this high figure and the usually accepted incidence of gastro-jejunal ulcers (about 5 per cent.) was explained by the fact that we studied our group very thoroughly in the follow-up clinic and did not rely on questionnaires, letters, etc.

In this paper I would like to present our conclusions as to permanent cures following the suture of acute perforated gastro-duodenal ulcers.

Stenbuck in a recent paper reviewed the operative causes of mortality following operations for perforated gastric and duodenal ulcers at Mount Sinai

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Hospital from 1915 to 1925. The mortality was 31 per cent. (twenty-seven deaths among eighty-eight cases).

With his kind permission I have used the same material with the object of getting some definite data as to end-results following operations for perforated gastro-duodenal ulcers.

In compiling these statistical data the same principles were employed as in the previous investigation on gastro-jejunal ulcers. Only those patients were included in this review who presented themselves personally in our follow-up clinic where we were able to study them carefully. As stated above, the only safe follow-up system for tabulating end-results is a thorough personal examination of the patient, with correlation of the X-ray findings and test-meals whenever these investigations are deemed important.

Thirty-three patients operated between 1915 and 1925 on the Surgical Services of Mount Sinai Hospital presented themselves in our return clinic for reëxamination. Years of operation are given in Table I.

TABLE I.

Distribution of Cases 1915–1925.

Year	Number of cases
1915	5
1916	4
1917	2
1918	2
1919	2
1920	3
1921	–
1922	4
1923	6
1924	3
1925	2

Twenty patients have been perfectly well and free from any gastric symptoms since the closure of the perforation. The perforation was located either at the pylorus or in the duodenum in eighteen cases. An exact differentiation between pyloric or duodenal ulcer is often impossible in acute perforations, as the inflammatory process makes the landmarks (for instance the pyloric vein) practically invisible.

In two cases the perforation was situated near the reëntrant angle.

In ten cases the operation consisted in simple closure of the perforation. In the other ten cases a gastro-enterostomy had been added, with or without pyloric exclusion (Berg's method). In six of these cases a Murphy button had been employed, which was used extensively on this service up to 1920.

Thorough X-ray examinations were performed in a considerable number of this group for two reasons: (1) We feel that in a follow-up clinic radiography ought to be employed freely, as this method gives us a very clear picture of the function of the stomach (size, emptying time, etc.), and (2) We were

interested to find out whether we could differentiate by an X-ray examination cases in which the ulcer had completely healed from those which were still suffering from a more or less active ulcer.

It seemed possible that the duodenum might show a perfectly normal bulb in those cases in which the ulcer had evidently healed completely. However, Doctor Goldfarb, who studied these groups for me, reports that a deformity of the bulb persists as a result of the layer suture of the perforation even in those cases which have been free from ulcer symptoms since the occurrence of the acute perforation. In other words, in the presence of a previous operation on the pylorus or duodenum a deformed bulb is not a definite indication for the presence of a recurrent ulcer. On the other hand marked tenderness of this region during the fluoroscopic examination, niches and retention, indicate that the patient still suffers from an inflammatory process at or near the pylorus.

I wish to discuss somewhat more in detail the group of failures, comprising thirteen cases. (Table II.)

Eight cases (No. 1, 2, 3, 6, 7, 8, 9, 10) are undoubtedly suffering from a recurrent ulcer. They have the seasonal attacks of epigastric pains, constipation, heartburn and sour eructations. While they have no retention in the stomach, they have to be very careful with their diet. A number of them have not been able to go back to work.

One patient (Case 10) has a pyloric stenosis. He passes the stomach tube every day and obtains a quart of fluid and semi-solid material. We advised re-operation (subtotal gastrectomy) to which he has not consented.

Another patient (Case 4) had three subsequent operations one and two years after the primary perforation. I feel sure that if I had performed a subtotal gastrectomy, when he reëntered the hospital the first time following the perforation, this patient would have been cured completely. These operations were performed, before we had instituted subtotal gastrectomy as a method of choice both for gastro-duodenal and gastro-jejunal ulcers.

Case 5 had a suture of the acute perforation with a gastro-enterostomy performed in 1920. He developed a gastro-jejunal ulcer and was operated by another surgeon. Re-operation for recurrent symptoms in 1924 revealed a duodenal ulcer perforated into the pancreas. A partial gastrectomy was performed. He made an uneventful recovery. He did not become anacid. He has the clinical and radiographic evidences of a gastro-jejunal ulcer. This patient belongs to the very rare group of a re-formation of an ulcer after resection of the stomach.

Two cases (11 and 13) in which a simple closure of the perforation had been performed one year previously, came to re-operation on account of the severity of recurrent symptoms. In the first case, two ulcers were found, one at the site of the old perforation and another (kissing ulcer) on the posterior wall of the duodenum. In the other case (No. 13) the perforated gastric ulcer had healed, but a penetrating duodenal ulcer was the cause of the persistent symptoms. Both patients were subjected to subtotal gastrectomy and made

TABLE II.

Follow-up Notes in 13 Cases of Perforated Gastro-duodenal Ulcers with Recurrent Symptoms.

Case	Year	Name	Location of ulcer. Operation	Subsequent course
1	1916	M.W.	Duodenal. Suture	1927: Epigastric distress. Sour eructations. X-ray examination shows recurrent ulcer.
2	1916	F.R.	Duodenal. Suture	1927: Sour eructations, pains. X-ray examination shows irregular bulb.
3	1917	J.T.	Duodenal. Suture. Gastro-enterostomy	1927: Pains, belching, blood in stool. X-ray examination shows: gastro-enterostomy normal; nothing going through pylorus. Diagnosis: recurrent ulcer.
4	1919	S.K.	Duodenal. Suture	1920: Re-perforation, walled off by liver. Suture of perforation, gastro-enterostomy. 1921: May: Gastro-jejunal ulcer. Disconnection of stoma. Ulcer excised. Jejunum closed. New gastro-enterostomy. 1921: December: Large recurrent gastro-jejunal ulcer. Jejunostomy. 1927: Patient still suffering. Does not want another operation (subtotal gastrectomy.)
5	1920	C.E.	Pyloric. Suture. Gastro-enterostomy	1921: Gastro-jejunal ulcer. Excision of ulcer. Disconnection of stoma. 1924: Partial gastrectomy for ulcer in posterior wall of duodenum with perforation into pancreas. 1927: Patient has clinical and radiographic evidences of recurrent gastro-jejunal ulcer.
6	1920	L.S.	Pyloric. Suture	1927: Patient felt well until 1922. Recurrent attacks once or twice a year. X-ray examination shows a niche and a constriction in the duodenum.
7	1922	A.R.	Pyloric. Suture	1927: Patient has a 27-year-old history of ulcer. Symptoms still persisting. X-ray examination shows an irregular bulb and 1/5 residue after 6 hours.
8	1923	M.D.	Pyloric. Suture	1927: 3 marked recurrences since operation, 2 in 1924, 1 in 1926. Patient is just recovering from 4th recurrence. X-ray examination shows a marked deformity of the duodenal bulb and hypermotility of the stomach.
9	1923	A.D.	Duodenal. Suture	1927: Sour eructations, pain, occasional vomiting. X-ray examination shows irregular bulb.
10	1923	M.L.	Duodenal. Suture	1927: Patient has typical symptoms of recurrent duodenal ulcer. Refused X-ray examination.
11	1924	E.F.	Duodenal. Suture	1925: Subtotal gastrectomy for recurrent duodenal ulcers. Findings: one ulcer at site of old perforation, another ulcer on posterior wall of duodenum, adherent to pancreas. 1927: Perfectly well.

TABLE II.—*Continued*

Follow-up Notes in 13 Cases of Perforated Gastro-duodenal Ulcers with Recurrent Symptoms.

Case	Year	Name	Location of ulcer. Operation	Subsequent course
12	1924	J.H.	Pyloric. Suture	1927: Patient felt well for 3 months. Since then symptoms have recurred. Marked hunger pain. Patient uses tube every day and drains about one quart from stomach. X-ray examination shows marked retention.
13	1925	P.K.	Gastric at reëntrant angle. Suture	1926: Subtotal gastrectomy for recurrent duodenal ulcer. Findings: scar of previously closed gastric ulcer. Ulcer at posterior wall of duodenum, perforated into pancreas. 1927: Perfectly well.

an uneventful recovery. They are perfectly well and free from any gastric symptoms.

I have recently re-operated a patient, who had been operated on this service for an acute perforation in 1926. This case is reported on page 955. He was not included in this statistical survey. Since we define late results as those occurring after at least two years, we carried our reëxaminations up to 1925. Re-operation of this patient revealed an active ulcer, perforated into the head of the pancreas.

A number of patients were subjected to a partial or subtotal gastrectomy on this service since 1922 for recurrent symptoms in whom the primary operation had been performed in other hospitals. They are not included in this review.

It seems to me that this investigation brings out two important points:

(1) A closure of an acute perforation of a gastro-duodenal ulcer (with or without gastro-enterostomy) failed to cure the patient in 39 per cent. of the cases.

(2) In those cases which were subjected to a subsequent partial or subtotal gastrectomy we found another ulcer on the posterior wall of the duodenum which I believe had been overlooked at the time of the primary operation. We have learned from our experiences in resection of the stomach that multiple ulcers occur in about 50 per cent. of the cases. It is therefore apparent that a simple suture of an acute perforation at the pylorus or in the duodenum may fail to relieve the patients of their symptoms in a large number of cases.

The conclusion must necessarily be drawn from this report, that our conservative measures heretofore applied in acute perforations of gastro-duodenal ulcers fail to effect a permanent cure in a very large percentage of the cases. In view of these results the question arises whether it might not be advisable to treat these acute perforations by a more radical procedure. For many years we used conservative methods for chronic gastro-duodenal ulcers and adopted the more radical procedure of subtotal gastrectomy only after we had been convinced that gastro-enterostomy with or without excision of the ulcer

left many patients in a much worse condition than they had been before the operation.

Kreuter, Schwarz, Bruett, Paul and others have published fairly large series of cases showing that, even in the presence of a peritonitis, subtotal gastrectomy does not increase the mortality, if the patient is operated not later than 6 to 12 hours after the perforation has occurred.

We are not prepared at present to adopt this procedure in the presence of an extensive infection of the peritoneal cavity. After all, partial or subtotal gastrectomy is an operation of considerable magnitude. In spite of favorable statistics advocating this procedure we feel at the present time that the mortality might be increased materially, if partial or subtotal gastrectomy would be adopted as a routine procedure in acute perforations of gastro-duodenal ulcers.

However, it may be advisable to attempt a radical cure in cases which come to operation very early and where the infection has not spread beyond the immediate neighborhood of the ulcer.

Furthermore every patient who has been subjected to the conservative procedure should be watched carefully in the follow-up clinic. If the patient still has marked symptoms six to eight months following the operation he should be subjected to a partial or subtotal gastrectomy.

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