IMMEDIATE PARTIAL GASTRECTOMY FOR PERFORATED PEPTIC ULCER

BY

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Between March, 1950, and December, 1951, five elective partial gastrectomies were performed at the University Surgical Unit for severe recurrent symptoms following simple closure of a perforated peptic ulcer. The simple closure antedated the ultimate resection by periods varying from six months to three years. Impressed with the inconvenience to the patients of disabling symptoms in the intervening period and of the increased technical difficulties at the time of the second operation, it was decided to treat certain selected cases of perforated peptic ulcers by immediate partial gastrectomy.

Some would consider that the treatment of a perforated peptic ulcer is a life-saving measure and that the simplest operation is all that should be attempted. Figures from Continental clinics support the contention that immediate gastrectomy is a safe procedure. Nuboer (1951) published a series of 131 immediate partial gastrectomies for perforated peptic ulcer with a mortality of 3.8%. Very low mortality rates are also revealed by certain Russian authors (Rozanov, 1953; Lidskii and Nurenberg-Charbiani, 1953). Lowdon (1952) performed partial gastrectomy without mortality in 51 consecutive cases of perforated peptic ulcer in patients between the ages of 20 and 70. These figures imply that in experienced hands the mortality rate from immediate partial resection can be expected to be no greater than that of simple suture.

The issue over which the various exponents of the major procedure are at variance is in the selection of the cases. In Nuboer's clinic "since 1943 partial gastrectomy has been done in nearly all cases of perforated ulcers. No regard is paid to the patients' age or duration of perforation." Nuboer justified this apparent lack of discrimination by suggesting on histological evidence that all the perforations, even in patients with a short history, were of a chronic nature. These findings, however, were not confirmed by Lowdon (1952) in some of his cases with a history of short duration. Forty (1951) quoted findings in 19 perforations examined histologically, in which no fewer than 15 were classified as being of an acute nature, and such findings imply that a critical assessment of each individual case is desirable. It would appear reasonable, therefore, to select individuals for immediate partial gastrectomy by estimating their probable prognosis after simple suture alone, the items of importance in such assessment being (a) the situation, appearance, and size of the perforation, (b) the duration and severity of the symptomatology prior to perforation, and (c) an appreciation of the statistical surveys of progress after peptic ulcer perforation.

Results

Between January, 1952, and June, 1954, 54 cases of perforated peptic ulcer were admitted under our care: 4 were treated conservatively with 2 deaths; 2 elderly patients with perforated gastric ulcer found to be unfit for resection were treated by simple suture, with 1 death; and 33 cases of perforated duodenal ulcer were treated by simple closure, with 3 deaths.

The following brief summaries describe the remaining 15 cases, which were treated by immediate partial gastrectomy:

Case 1.—Male, aged 65, with a two-year history of dyspepsia, perforated 16 hours before admission. Large perforation of duodenum with gross peritoneal soiling. Immediate partial gastrectomy; uneventful recovery.

Case 2.—Male, aged 60, with a long history of dyspepsia, perforated two hours before admission. Large perforation of anterior wall of first part of duodenum. Immediate partial gastrectomy; uneventful recovery.

Case 3.—Male, aged 55, with recent symptoms, perforated seven hours before admission. General condition poor. Perforated lesion found on distal third of greater curvature of stomach. Partial gastrectomy; developed paralytic ileus and renal failure; died on 11th post-operative day. Histology—benign gastric ulcer.

Case 4.—Male, aged 66, with recent dyspepsia and melaena, perforated 8 hours before admission. Perforation of anterior wall of stomach, with considerable peritoneal soiling. Immediate gastrectomy; general peritonitis and paralytic ileus; died on 10th post-operative day. Histology—chronic gastric ulcer.

Case 5.—Male, aged 64, with a long dyspeptic history, perforated six hours before admission. Large perforated duodenal ulcer, with gross peritoneal soiling; immediate gastrectomy; uneventful recovery.

Case 6.—Male, aged 64, with a four-year history of severe dyspepsia, perforated 15 hours before admission. Large perforation of pyloric antrum with early localization; uneventful recovery followed partial gastrectomy. Histology—gastric carcinoma.

Case 7.—Male, aged 60; previous gastro-enterostomy in 1933, perforated three hours before admission. Large perforated lesion just above the previous anastomosis seen at operation. Immediate gastrectomy; uneventful recovery. Histology—gastric carcinoma.

Case 8.—Male, aged 56; continuous dyspepsia since a previous perforation was successfully sutured in 1943. Perforated duodenal ulcer treated by immediate partial gastrectomy; uneventful recovery.

Case 9.—Male, aged 60, with a 20-years history of dyspepsia, perforated 12 hours before admission. Perforation in a stenosed duodenum treated by immediate gastrectomy; uneventful recovery.

Case 10.—Male, aged 42, with a history of two previous perforations, was admitted four hours after his third. Perforated duodenal ulcer treated by immediate gastrectomy; uneventful recovery.

Case 11.—Male, aged 71, with a 25-years history of dyspepsia, presented with a perforation and haematemesis. Partial gastrectomy for a large perforated duodenal ulcer; uneventful recovery.

Case 12.—Male, aged 56; long history; perforated eight hours before admission. Immediate partial gastrectomy performed in presence of perforated and stenosed duodenum; uneventful recovery.

Case 13.—Male, aged 44; eight years' dyspepsia, perforated three hours before admission. Perforated lesion of lesser curve dealt with by a Pauchet type of partial gastrectomy; uneventful recovery. Histology—chronic gastric ulcer.

Case 14.—Male, aged 59; recent symptoms. Large perforation of duodenum treated by partial gastrectomy five hours after onset of symptoms; uneventful recovery.

Case 15.—Male, aged 70, perforated three hours before admission. Very large perforation of duodenum treated by partial gastrectomy. Satisfactory recovery followed resuture of a wound dehiscence on the seventh post-operative day.

Discussion

If the patient's general condition permits, a partial resection is the operation of choice in nearly all cases of perforated gastric ulcer. Such perforations, especially if chronic, are often difficult to suture, the amount of intraperitoneal contamination is great, and containment of the infective material is unsatisfactory. The greater mortality following treatment by simple suture and toilet of patients with perforated gastric as compared with duodenal ulcers has been demonstrated by Chamberlain (1951) and Gilmour (1953). Another justification for routine immediate resection is the high proportion of carcinomas of the stomach which appear in the guise of simple gastric perforation. Thus Doll (1950) quoted 17 cases of perforated carcinoma of the stomach occurring in the eleven years 1938-48 in the Central Middlesex Hospital. Perforations were found at operation in 11 cases, but only 3 were recognized to be neoplastic, and 7 were discharged from hospital with the diagnosis of simple gastric ulcer. Kennedy (1951) quoted a five-year series of 111 acute perforations from the London Hospital which included seven cases of perforated gastric carcinoma. In the present series Cases 6 and 7, thought at operation to be of a simple nature, proved on histological examination to be malignant.

In the case of perforated duodenal ulcers the possibility of neoplasm is so rare as to be disregarded. The size of the ulcer, however, should be considered when deciding on the procedure to adopt. Simple closure is unwise where considerable cicatricial narrowing is present or in cases of large perforation, as simple closure may produce complete stenosis. The occlusion of a large duodenal perforation by an omental plug, although perhaps immediately successful, leaves an area of very imperfectly constituted duodenal wall which, in the continued presence of hyperchlorhydria, will inevitably re-ulcerate and perhaps re-perforate. Luer (1949) found that if the perforation was 1 cm. in diameter or more, the mortality rate following simple suture was more than double the rate in smaller perforations. The experience in this small series of cases suggests that radical operation in such emergency cases is no more difficult than in elective cases and that the subsequent smooth post-operative course is most satisfactory.

A history of previous perforation was taken as an indication for gastric resection if the case was in other respects satisfactory (Cases 8 and 10).

In either gastric or duodenal perforations the co-existence of haemorrhage increases the mortality rate (Avery Jones *et al.*, 1950). This dangerous combination is most satisfactorily dealt with by immediate partial gastrectomy, and in the present series was regarded as a definite indication if the patient's general condition allowed (Case 11).

The appearance of chronicity in a perforated duodenal ulcer may be simulated by inflammatory oedema, and in the absence of previous ulcer dyspepsia it may well be that the lesion is an acute one and immediate resection is unjustifiable: nor should duration of symptoms alone be taken as unequivocal evidence of chronicity. If the perforation is small, even with a long preceding period of dyspepsia, it may be, as contended by Forty (1951), that the patient has had a series of acute or subacute ulcers, each healing in turn. If, however, the perforation has the appearance of being in a chronic ulcer and the patient gives a well-defined period of disabling dyspepsia with perhaps previous hospital treatment and radiological confirmation of a chronic ulcer, immediate partial gastrectomy is justifiable.

The results of a follow-up study of 733 cases of perforation treated by simple suture are valuable in assessing the probable ultimate prognosis after perforation (Illingworth *et al.*, 1946). It was found that remission of ulcer symp-

toms after perforation was seldom of long duration, within five years 70% having relapsed and 50% developing severe symptoms. The prognosis was found to be worse in cases with a long antecedent history, whilst the incidence rate of major complications, particularly re-perforation and haematemesis, was 20% within five years of perforation.

When the series presented in this paper was started it was hoped that a critical selection of cases for immediate gastrectomy would eliminate the expected 20% of major complications and a proportion of the remaining cases which would be expected on the above statistical evidence to relapse. On making the selection we were influenced by the fact that the majority of patients seen in this hospital are industrial workers, miners, and others in whom the economic factor of loss of work is important and in whom prolonged dietary out-patient treatment is often impracticable.

In assessing fitness for immediate partial gastrectomy the patient's general condition was the main guide, and no arbitrary time interval since the onset of symptoms was laid down. For example, in Case 1, although the ulcer had perforated 16 hours previously, the patient was in excellent general condition and, following partial gastrectomy, made an uninterrupted recovery. A gross degree of peritoneal soiling was usually regarded as a contraindication to gastric resection, although in the first case in the series recovery followed gastrectomy in the presence of gross peritoneal contamination.

In no case did the technique of operation present any marked difficulty, and in general Nubner's findings were confirmed. It was usually easy to free the duodenum, pylorus, and stomach from the inflamed and oedematous surrounding tissue. As Lowdon pointed out, the anterior duodenal perforation is usually unassociated with the technical difficulties so common with posterior and penetrating ulcers. In the majority of cases the closure of the duodenal stump was simple, although when dealing with perforated duodenal ulcers it was in most cases necessary to perform an open division and closure of the duodenum as the oedema of its walls and the size of the perforations prevented the application of a clamp distal to the ulcer. No case of leak from the duodenal stump occurred.

The two fatalities occurred early in the series, and in each case a considerable degree of peritoneal contamination accompanied the perforation. This subsequently led to a more cautious attitude in such cases, although an uneventful recovery followed immediate resection in Cases 1 and 5, in both of which peritoneal soiling was considerable. Tanner (1954) has reported similar successful cases of immediate gastrectomy performed in late perforation with frank pus in the peritoneal cavity.

The remaining cases all had a smooth post-operative recovery, the results encouraging us to continue the policy of performing immediate resection in selected cases.

Summary

Experience with immediate partial gastrectomy for perforated gastric duodenal lesions is recorded.

The operation was performed in carefully selected cases only.

The chief criteria for such selection in a patient fit for resection were (a) any perforated gastric lesion, (b) large perforations, (c) a history of previous perforation, (d) a long preceding history of ulcer dyspepsia, and (e) concomitant haematemesis.

Fifteen cases were selected for immediate gastrectomy in a series of 54 perforations dealt with over a period of 30 months. There were two fatalities.

The operation in no case presented any technical difficulty and the post-operative period was uneventful.

ADDENDUM.—Since June, 1954, a further 15 cases of perforated peptic ulcer have been admitted to the University

Surgical Unit. Four of these cases were dealt with by immediate partial gastrectomy without mortality.

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CONGENITAL ATRESIA OF THE BILE DUCTS

REPORT OF CASE TREATED SUCCESSFULLY BY CHOLECYSTOJEJUNOSTOMY

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John Thomson, of Edinburgh, first aroused interest in this condition by his careful analysis of 50 cases in 1892. Holmes (1916) collected 120 cases from the literature, described a large number of variations in malformations of the extrahepatic bile ducts, and concluded that about 16% of the patients could be amenable to surgical treatment. Ladd (1928) was the first surgeon to operate successfully upon a case of congenital atresia of the choledochus. Gray *et al.* (1948), in reporting two cases of their own which were successfully treated by cholecystogastrostomy, state that between 1928 and 1948 only 17 cases were recorded in the literature as being cured by surgical measures.

Durell and Halliwell (1952) described a case of congenital atresia of the common bile duct which was cured by cholecystogastrostomy, and remarked that surgical intervention had been successful apparently in only 21 cases up to 1949. Moore (1953) explored 31 cases of congenital atresia of the bile ducts and performed 8 anastomoses, only one of these patients surviving operation. Likewise, Greaney *et al.* (1954) explored 33 cases, 9 which were suitable for biliary-intestinal anastomosis, and 3 of which were cured. Gross (1953), in by far the largest series, records 146 cases: in 119 nothing could be done on abdominal exploration; in 27 the gall-bladder or the hepatic or common duct was available for anastomosis to the duodenum, and 12 of these were cured.

So far as can be ascertained from published articles, 38 cases of congenital atresia of the extrahepatic bile ducts have been successfully treated by surgery. The majority of the successful operations for this rare abnormality have been recorded by American surgeons. Durell and Halliwell (1952) gave an excellent account of the first case to be cured by cholecystogastrostomy in this country.

So far as I am aware the case described below is the first recorded account of a successful cholecystojejunostomy combined with jejunojejunostomy for atresia of the common bile duct to be published in the British literature.

Pathology

In this congenital abnormality one or more parts of the external biliary tract are either absent or exist as fibrous cords. The extent of such obliteration determines the operability of the case. It will be operable if the atresia exists in the lower portion of the hepatic duct or in the common duct, or if the gall-bladder and cystic duct communicate with the hepatic duct which is distended with bile.

The gall-bladder may be found in one of four pathological conditions: (1) it may be absent or atretic; (2) it may contain a small lumen which does not communicate with the ductal system; (3) it may be distended with white bile—mucocoele; and (4) it may be normal or enlarged and contain normal bile, indicating that the blockage is in the common duct. The liver is enlarged, stained dark green, and diffusely nodular, portraying the picture of portal cirrhosis of the obstructive type. The edge of the spleen is usually palpable and portal hypertension is a common feature. Ascites may or may not be evident. Petechiae, extravasation of blood in the subcutaneous tissues, and cerebral haemorrhage have been observed in some of these cases.

Diagnosis

The clinical picture is similar in most cases. The outstanding sign is jaundice, which is present at birth or appears two or three weeks later. This is at first mild, the skin being merely tinted pale yellow, but gradually increases until at the end of a month or so it is intense and gives place to a greenish-yellow hue.

The congested cirrhotic liver at the same time gradually enlarges and feels unduly hard on palpation, its edge being rounded and firm. The notched margin of the spleen is frequently detected. The stools are white, putty-like in consistency, and acholic, while the urine is bile-laden and dark brown. It should be noted that the stools are always white from birth even though jaundice may not be noticed until the second or third week of life.

The icteric index varies in different infants and from day to day in the same patient, ranging mostly between 50 and 200; the blood picture shows a secondary anaemia; the red cells are not unduly fragile; there is no microspherocytosis; the clotting time is seldom elevated; the prothrombin time may be lowered; and the liver-function tests support a diagnosis of obstructive jaundice.

The condition may be confused with icterus neonatorum, erythroblastosis foetalis, jaundice of haemolytic sepsis, congenital syphilis, or congenital haemolytic anaemia. Every attempt should be made to arrive at a diagnosis within the first four or five weeks of life and not to delay exploratory laparotomy beyond the second month, as the majority of patients will die of liver failure within five months if the blockage is not relieved. It is a surprising fact, however, that a few patients possessing no extrahepatic ducts have lived to be 8 to 10 months old. The diagnosis can be arrived at by a process of elimination with a fair degree of certainty by the end of the first month of life, and sometimes earlier than this. In other words, the diagnosis is made by excluding other causes of jaundice and by proving that the infant under investigation is suffering from obstructive jaundice.

To-day, about 20 to 25% of these babies present conditions of the extrahepatic ducts which are correctable only by operative measures.

Operative Treatment

Pre-operative measures include the correction of dehydration, one or two small transfusions of blood, and the administration of vitamin K. Penicillin is given intramuscularly before and after operation.

The anaesthetic of choice is open ether. Satisfactory relaxation of the abdominal muscles cannot be obtained with local analgesia. The use of muscle relaxants is definitely contraindicated. There is a choice of two incisions: right