

WHICH OPERATION FOR CHRONIC DUODENAL ULCER?

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THERE is strong evidence to support the theory that duodenal ulcer is the result of gastric hypersecretion. The two known factors that increase secretion of hydrochloric acid in the stomach are: (1) vagal stimulation from the higher centers, and (2) hormonal stimulation from the mucosa of the gastric antrum. In the patients whose ulcer symptoms cannot be controlled by medical treatment, operation may be necessary. An "ideal" operation for duodenal ulcer, from a physiologic standpoint, would eradicate or neutralize both sources of stimulation. Vagus resection with resection of the antrum theoretically should be the ideal operation if it could be used safely in every patient requiring surgical treatment for ulcer.

Unfortunately, there is as yet no universally applicable operative procedure for chronic duodenal ulcer. Instead, there is a choice of three operations, any one of which may give an excellent result in one patient while failing in another. The surgeon may select from the following:

1. *Subdiaphragmatic vagus resection with posterior gastrojejunostomy* ("Vagotomy with gastroenterostomy").
2. *Subdiaphragmatic vagus resection with conservative gastric resection* ("Vagotomy with hemigastrectomy").
3. *Radical subtotal gastric resection* (Removal of three-fourths or more of the stomach).

There are three potential disadvantages that apply in varying degrees to each of these procedures: (1) risk of operative fatality; (2) recurrent ulceration; (3) disabling postoperative sequelae.

Risk of operative fatality. No surgeon is blind to the importance of calculating risk in operations of election, and, unless the result will justify it, no patient will knowingly submit to an operation that has an appreciably greater risk than the disease for which the operation is being performed. In experienced hands, none of the three operations entails a great risk to life. With *vagotomy with gastroenterostomy* the mortality rate is likely to be less than 1 per cent, but with *radical gastric resection* it is apt to exceed 2 per cent. The proponents of *radical gastric resection* concede that in a small group of patients this operation will be significantly more dangerous than gastroenterostomy. In these patients, where the risk is recognizably higher because of constitutional disease or because of technical problems such as extreme obesity, a poorly taken anesthesia, or an inflammatory mass about the ulcer—will it not be reasonable to perform a *vagotomy with gastroenterostomy*, and avoid a possible

operative fatality at the small cost of reducing slightly the chance of curing the ulcer? The most enthusiastic resectionist will, under such circumstances, occasionally resort to a gastroenterostomy alone, or perform the antral stripping procedure, or the two-stage resection of McKittrick. *Vagotomy with gastroenterostomy* probably in time will replace these other substitutes for a complicated gastric resection.

Recurrent ulceration. It is becoming clear that *radical subtotal gastric resection* gives the patient a high degree of protection against recurrent ulceration, probably in the neighborhood of 98 per cent. Some surgeons have reported an almost equal degree of protection by *vagotomy with gastroenterostomy*, but other surgeons have not been so fortunate. In a series of patients studied at the Cleveland Clinic the incidence of recurrent ulceration after vagotomy with gastroenterostomy rose to 8 per cent in a follow-up study extending beyond three years. This figure is identical with the rate of recurrence in a series of patients treated by conservative (two-thirds) gastric resection performed prior to 1945.

Disabling postoperative sequelae. Although serious nutritional disturbances occurring after operation have been minimized by surgeons who favor removing up to 19/20 of the stomach, the experience of most observers has been that the greater the amount of stomach removed, the greater the likelihood of crippling sequelae. Some patients will tolerate even total gastric resection very well, maintaining their original weight, and eventually reverting to a regimen of three meals a day. But such a response to an extensive resection is exceptional, and most surgeons remove as little of the stomach as they believe to be consistent with a high probability of cure of the ulcer. It may be that the body type of the patient, and his state of nutrition at the time of operation, will offer an accurate index to the amount of stomach which should be removed. Studies by Zollinger suggest that obese patients will tolerate extensive resections without incurring significant loss of weight, while thin or undernourished patients may suffer a further loss in weight after a small resection.

A hopeful compromise between *vagotomy with gastroenterostomy* on the one hand and *radical gastric resection* on the other, is the *vagotomy and hemigastrectomy* advocated by Johnson and Orr in England and by Smithwick in this country. This procedure may prove to be as effective as radical gastric resection in preventing recurrent ulcer, and appears to result in a lower incidence of "gastric cripples."

Some surgeons are restoring intestinal continuity following gastric resection by anastomosing the duodenum directly to the gastric remnant (the Billroth I procedure) in the belief that this operation has a nutritional advantage over the gastrojejunostomy (the Billroth II). Both the incidence and the severity of the dumping syndrome are said to be less with the Billroth I operation, but sufficient time has not yet elapsed to permit a reliable assessment of the results. The cause and the prevention of the dumping syndrome are not yet fully understood, although its incidence appears to increase with an increase in the amount of

gastric tissue removed. Efforts to combat the syndrome by decreasing the size of the gastric stoma have not been fully evaluated.

A study of the pertinent data does not provide a final answer to the question: "Which operation for duodenal ulcer?" Each of the three operations mentioned has strong advocates, and each has implacable opponents. It is possible that additional studies may yet swing opinion one way or another. For example, the observations of Dragstedt indicate that if the gastroenterostomy is placed near the pylorus there is an inhibiting effect on gastric acidity but if it is placed farther from the pylorus it may increase the secretion. This hitherto unsuspected correlation between the position of the gastroenterostomy and the depression of gastric acidity may well account for differences in results reported by various investigators!

In the light of available data, it appears that the operation to be employed in most patients requiring surgery for chronic duodenal ulcer is *vagotomy with hemigastrectomy*. This procedure combines the greatest chance of curing the ulcer, with the least possibility of producing disabling symptoms or nutritional disturbances. When the performance of *any* type of gastric resection, whether extensive or limited, is going to increase the risk to the patient's life, a *vagotomy with gastroenterostomy* may be performed as a less hazardous procedure that still offers a high probability of cure.

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