Five-to-Ten-Year Follow up of 162 Cases of Duodenal Ulcer Treated by Vagotomy With and Without Associated Gastric Operations *

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ON SEVERAL previous occasions my colleagues and I [1, 5-12] have reported the results of vagotomy with and without gastroenterostomy in the treatment of various types of peptic ulcer. Our earlier reports were on small groups of cases in which only short periods had elapsed subsequent to operation. The present study is a follow up study on the group of 209 cases of duodenal ulcer in which vagotomy was performed between January 1, 1945, and January 1, 1950. We are limiting this report to those cases in which these procedures were used in the treatment of duodenal ulcer during this period. The indications for operation were intractability, hemorrhage, perforation and pyloric obstruction. Vagotomy alone was performed 39 times, vagotomy and gastroenterostomy 150 times, vagotomy and pyloroplasty nine times, and vagotomy and gastric resection 11 times.

By repeated follow up examinations and letters, we have been able to determine the course of 162 (78 per cent) of these patients for five to ten years after operation. Eighty-nine per cent of the traced patients were men, and 11 per cent were women. The ages ranged from 19 to 72 years.

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RESULTS

Results were classified as excellent when the patient was completely relieved of symptoms of ulcer and had no symptoms relating to vagotomy, such as diarrhea, gastric retention or bloating; satisfactory when the patient was improved over preoperative condition but still had one or more of his symptoms to a minor degree; poor when the patient was worse than before operation or had a proved recurrence. In this paper the proved recurrence and the other poor results will be given separately.

Recurrences in the Whole Group. Recurrences proved by x-ray examination or at operation have been found in 23 (14 per cent) of the 162 patients. Fifteen had had insulin tests, 10 of which gave negative results. Fifteen of the 23 recurrent ulcers were jejunal ulcers at the site of the gastroenterostomy. Eight were reactivated duodenal ulcers, seven of which followed vagotomy alone. Subtotal gastric resections of the Billroth II type have been performed on 15 of these 23 patients. Results since reoperation have been excellent in 12, satisfactory in two, and poor in one.

Deaths in the Whole Group. Fourteen (9 per cent) of the 162 patients on whom follow up information was available five to ten years after operation have died since operation. Ten of these are known to have died of causes unrelated to duodenal ulcer

or the operation. Causes of death of the other four are unknown.

Four of the 209 patients operated on died in the immediate postoperative period: one from myocardial infarction; one from subdiaphragmatic abscess; one from renal insufficiency, and one from unknown cause, presumably myocardial infarction.

Functional Results in the Whole Group. Let us look at the results for the remaining patients. When the patients who have died and who have had recurrences are excluded, 53 patients (33 per cent of the 162) are asymptomatic, 67 (41 per cent) are improved, and five (3 per cent) are worse or unimproved at present. The symptoms of 95 patients persisted after operation. Included in the group are those who had recurrences and poor results and those who had satisfactory results. Symptoms were as follows: 41 (43 per cent) had ulcerlike pain; 38 (40 per cent) diarrhea; 21 (22 per cent) vomiting; 12 (13 per cent) bleeding; 11 (12 per cent) loss of weight, and four (4 per cent) dumping.

Acidity Studies and Insulin Tests in the Whole Group. Of the 135 traced patients on whom complete preoperative and postoperative studies of gastric acidity were available, 125 (93 per cent) had definite hyperacidity preoperatively. In 99 patients (73 per cent) gastric acidity was reduced significantly after operation, and in 53 (39 per cent) relative achlorhydria was found after a test meal. Insulin tests (Hollander) were performed on 77 patients. Negative results were found in 63 (82 per cent) and positive in 14 (18 per cent). For 52 of the 53 patients who are now asymptomatic complete studies of acidity were available. In 46 (88 per cent) gastric acidity was reduced significantly after operation. Twenty-six (50 per cent) of these patients had relative achlorhydria after a test meal. Six patients (12 per cent) had no reduction of the gastric acidity. Complete studies of acidity were available on 22 of the 23 patients known to have had recurrences. A significant reduction of gastric acidity was found postoperatively in 15 patients (68 per cent) of this group. Achlorhydria was present in four (18 per cent). Insulin tests gave negative results on eight patients (36 per cent) known to have had recurrences.

A study of the various operative procedures employed yielded the following results:

Vagotomy Alone. This procedure was carried out on 28 traced patients. Seven patients (25 per cent) are known to have had recurrences. On two of the seven, results of insulin tests were negative, on two positive and on one unsatisfactory; they were not done on two. After the development of the recurrent ulcer five of the seven patients later underwent subtotal gastric resection; results were excellent in three, satisfactory in one, and poor in one. Four patients required gastroenterostomy one to three years after the vagotomy because of persistent gastric retention. The final result has been satisfactory in all four of these patients for eight to ten and one-half years.

When the patients who have died and those who have had proved recurrences are excluded, 11 patients (39 per cent) of the 28 in this group were found to be asymptomatic with an excellent result; seven (25 per cent) were improved with a satisfactory result and one patient (4 per cent) was unimproved with a poor result. Of the 15 living patients in this group who still have persisting symptoms or had them until reoperation, nine had pain, six vomiting and nine diarrhea.

Vagotomy and Gastroenterostomy. Of the 123 patients who had a gastroenterostomy at the time of vagotomy, 16 (13 per cent) are known to have had recurrences. Results of insulin tests were negative on eight, unsatisfactory on two and not done on six of these 16 patients. Subtotal gastric resections have been performed on ten of the 16 patients with recurrences. Results have been excellent in nine and satisfactory

in one for nine months to nine years since reoperation.

Of the living patients without recurrence in the vagotomy and gastroenterostomy group, 40 (33 per cent) were asymptomatic (excellent result), 53 (43 per cent) were improved (satisfactory result), and three (2 per cent) were worse or unimproved (poor result). Seventy-two patients still have persisting symptoms or had them until reoperation. These consisted of pain in 29 (40 per cent); diarrhea in 25 (35 per cent); bleeding in 12 (17 per cent); vomiting in 11 (15 per cent); loss of weight in 10 (14 per cent), and dumping in two (3 per cent).

Vagotomy and Pyloroplasty. Seven patients had pyloroplasty combined with vagotomy. One patient has subsequently died. There have been no recurrences in this group. Two patients have had excellent results, and four have had satisfactory results. Five of the seven patients had significant reduction of gastric acidity after operation, two of these having relative achlorhydria. Four of the patients had insulin tests after operation; results for three were negative, and for one positive.

Vagotomy and Gastric Resection. Subtotal gastric resection of the Billroth II type was performed at the time of vagotomy on four of the traced patients. There have been no known recurrences. Three patients have had satisfactory results, and one patient has had a poor result. Three of the four patients had relative achlorhydria after operation. Results of the insulin test were negative on two of the four patients after operation and unsatisfactory on one. The gastric acidity of one patient was not studied after operation.

SUMMARY OF RESULTS

For the group as a whole then, recurrences were found in 14 per cent, and 33 per cent were completely asymptomatic. When the patients who were improved are added to those who were asymptomatic it can be said that excellent and satisfactory results were obtained in 74 per cent of the patients. Significant postoperative loss of weight occurred in 6.6 per cent and severe dumping symptoms in 2.4 per cent, making a total of 9 per cent. The recurrence rate in the 28 patients having vagotomy alone was 25 per cent. Only 39 per cent were asymptomatic (excellent results). Excellent and satisfactory results, however, were obtained in 63 per cent of the cases. When gastroenterostomy was done at the time of vagotomy, there was a 13 per cent recurrence, total excellent and satisfactory results rising to 76 per cent.

COMMENT

In 1950 before this association in a 1-to-4-year follow up Belding and I reported poor results or recurring ulcer in 8 per cent of the 25 cases in which vagotomy alone was performed and in 11.4 per cent of the 44 cases in which gastroenterostomy and vagotomy were employed. The poor results after vagotomy alone increased from the 8 per cent reported in 1950 to 16 per cent in our 1953 follow up.

In 1951 Dragstedt and Woodward [2] reported poor results of vagotomy alone in 15 per cent of 234 cases. They reported also poor results in 9 per cent of 219 cases of duodenal ulcer treated by vagotomy and gastroenterostomy. This percentage was 6 if deaths were excluded.

In 1953 Hoerr [3] reported a three-year follow up in 147 cases in which gastroenterostomy and vagotomy had been done at the Cleveland Clinic for duodenal ulcer. They considered 12 per cent of the operations as failures because of persisting or recurring ulcer symptoms. The previous year the follow up had only shown 7 per cent failures. These figures indicated an increasing percentage of recurrences with the passage of time.

Recently Slaney, Bevan and Brooke [4] in a study five years after operation reported a recurrence rate of 28.2 per cent in 85 pa-

tients after vagotomy alone or in combination with an operation on the stomach. Recurring ulcer developed in 27.7 per cent of the 65 cases in which a drainage procedure had not been done at the time of vagotomy or any gastric operation before it. The frequency of recurrence, therefore, appears to have been unaffected by the presence or absence of gastroenterostomy, pyloroplasty or partial gastrectomy done either before or at the time of vagotomy. They remarked "that the rate of recurrence doubtless would increase with the passage of time, because further recurrences had been observed after the five-year period."

Our studies of gastric acidity indicate that 88 per cent of the asymptomatic group of patients had significant reduction of gastric acidity and 50 per cent had achlorhydria. This is in sharp contrast to the group of patients who had recurrences. Among these only 68 per cent had reductions of acidity and only 18 per cent had achlorhydria. Reduction of acidity, even to achlorhydric levels after a test meal, however, does not necessarily mean that a recurring ulcer may not develop, for recurrence developed in four patients who had achlorhydria after operation, and in eight on whom results of insulin tests were negative. In other words, the presence of achlorhydria and negative results of insulin tests do not give exact assurance that there will be no recurrence, although the recurrences were considerably less frequent among patients with these findings.

The question of the difference in the recurrence rate in men and women with vagotomy has been raised since extensive gastric resections for duodenal ulcer on women may not be followed by as good functional results as the same type of operation on men. The question has been raised by some as to whether gastroenterostomy or gastroenterostomy and vagotomy is not a better operation for women since it has been said that women have recurrent ulcer less frequently after gastroenterostomy alone or combined with vagotomy than men, and since it has been thought that the nutritional state of the patient is better after gastroenterostomy than after gastric resection if ulcer does not develop and the loss of weight and dumping syndromes are eliminated. In our follow up study, 144 of the patients (89 per cent) were men and 18 (11 per cent) women. Four (22 per cent) of the 18 women had recurrent ulcers while 13 per cent of the men had them. The number of women operated on is small (only 11 per cent of the group) and so a comparison with the much larger group of men in this series is not highly significant. However, for the 18 women who had vagotomy or gastroenterostomy and vagotomy the recurrence rate was at least equal to that for men. Moreover, four (22 per cent) of the women had severe dumping symptoms and a significant loss of weight in the postoperative period.

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