

Vagotomy Pyloroplasty and Suture—A Safe and Effective Remedy for the Duodenal Ulcer that Bleeds *

A Progress Report on 100 Consecutive Cases

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IN 1946 we began using vagotomy as advocated by Dragstedt,⁵ along with pyloroplasty, as our procedure of choice for the surgical treatment of duodenal ulcer. As our experience and confidence with the procedure grew, the indications were gradually extended to include those patients with increasingly severe degrees of bleeding. Of course, the ulcer was cross-sewn wherever necessary to control active bleeding or to guard against recurrent bleeding during the immediate postoperative period. Since then, we have used it in the management of 256 patients with complicated duodenal ulcer, including 100 who had bled significantly shortly prior to, or who were bleeding at the time of operation. There have been no surgical deaths among those who had bled or were bleeding and only two deaths in the entire group of 256 patients. A satisfactory result has been obtained in over 93 per cent of these cases. The average follow-up time has been slightly over five years and the results have been essentially the same, regardless of whether or not bleeding had occurred.

In 1952, and again in 1958, we reported^{2,4} our growing satisfaction with the procedure and emphasized its safety, effectiveness, and simplicity in treating the

patient with bleeding duodenal ulcer. Others have been impressed with the good results to be obtained with this procedure. In 1958, Smith and Farris⁸ reported on 21 patients and Westland, Movius and Weinberg⁹ reported on 24 patients, all treated in this way without mortality.

Since 1947 we have accumulated data on 100 consecutive patients who had bled alarmingly in the fairly recent past or who were bleeding at the time of operation. The term "bleeding ulcer" has been used loosely in the literature to include all types and degrees of bleeding. In our experience relatively few so-called "bleeding ulcers" are actively bleeding at the time of operation, even though profound shock may be present and the stomach and bowel may be found to be stuffed with old and fresh blood. In only 14 of our patients was the bleeding point in the ulcer active at the moment of exposure. However, just prior to operation, 42 of these patients were either in critical condition from uncompensated blood loss or were continuing to show blood loss despite energetic replacement. In many instances, the bleeding point in the base of the ulcer was found to be controlled by a fresh, precariously attached clot. In others, the clot showed varying degrees of organization. Generally speaking, well organized, firmly adherent clots were not disturbed. Only those with active bleeding or questionably secure clot formation were subjected to suture

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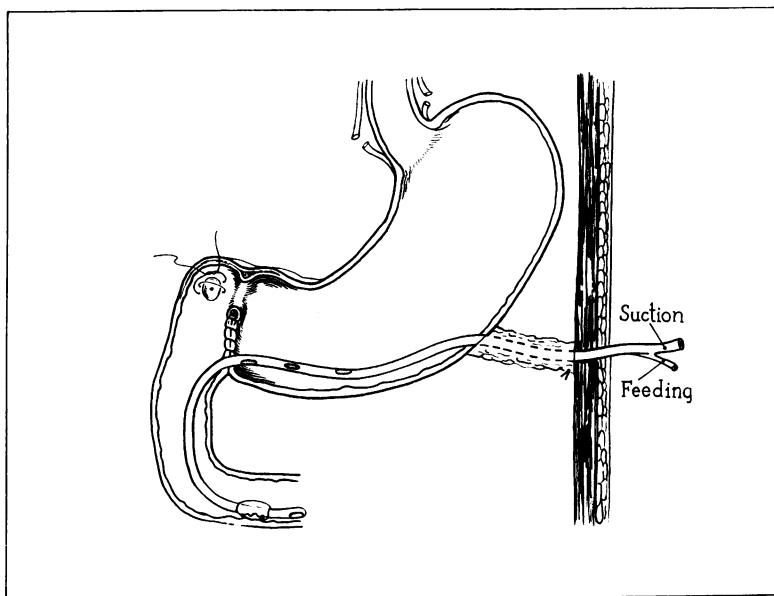


FIG. 1. Cut-away sketch showing completion of vagotomy, suture of bleeding ulcer, Finney pyloroplasty, and special tube gastrostomy. An ordinary No. 20 French Foley catheter is modified by opening the balloon. A slow continuous 5% Dextrose-Water drip is given through this lumen at the rate of 1,000 cc. every eight hours, starting 24 hours postoperatively. Several windows are cut into the main lumen to provide for gastric drainage. Suction is continued for five days. The tube is then clamped off, and finally removed on the 14th postoperative day. This tube obviates the need for nasogastric suction and intravenous feedings. It also serves as an easy avenue for sampling gastric secretion postoperatively to determine completeness of vagotomy.

ligature. Suture was considered necessary in 47 of our 100 patients.

Classification and Criteria for Evaluation of Patients

In order to evaluate better the effectiveness of this procedure, we have classified our patients into four groups, depending upon their clinical condition when first seen and their response to restorative treatment.

Our Group I, or *Interval* patients, were those who had completely recovered from a massive hemorrhage which had occurred up to several weeks previously. There were 26 patients in this group.

Our Group II, or *Elective* patients, were those who were emergency admissions, but in whom shock was corrected and bleeding had stopped. There were 32 patients in this category.

Our Group III, or *Urgent* patients, were those in whom shock was corrected, but bleeding continued as evidenced by falling hematocrit despite continued transfusion. There were 17 patients in this classification.

Our Group IV, or *Emergency* patients, were those in which shock persisted despite energetic restorative measures. Twenty-five of our patients were in this group.

Clinical Information: Eighty per cent of these patients were men. Ninety-five per cent were white. Eleven per cent had had previous perforation and 19 per cent had significant symptoms of obstruction. The average duration of ulcer history was nearly ten years.

Analysis of Age Groups: Fifty-three per cent were over 45 years of age. Thirty-one patients were in the 45 to 54 year age group, 15 were in the 55 to 64 year age

TABLE 1. *Bleeding Duodenal Ulcer—100 Consecutive Patients; Admission Hemoglobin Levels—Blood Replacement*

	Ave. Hgb.—Gm.	Blood Replaced (500 cc. Units)	Ave. No. Units Received by Each Pt. Receiving Blood
I Interval (26 patients)	13.6	14	2.0
II Elective (32 patients)	10.6	75	3.4
III Urgent (17 patients)	9.3*	94	5.8
IV Emergency (25 patients)	8.2*	159	6.5

* 24 patients had an average of 6.2 Gm. Hgb. 6 patients had an average of 4.5 Gm. 2 patients had Hgb. levels of 3.5. One of these became temporarily hemiplegic from blood loss.

group, five patients were in the 64 to 74 year age group, and there were two patients who were 78 years of age.

Operative Technic: The methods of preliminary care and operative technic have been described in detail elsewhere.^{2, 4} Vagotomy was performed through the abdomen in all but one of these patients. In this patient, the esophageal hiatus region was inaccessible due to multiple large hemangiomas of the liver. In this case, transthoracic vagotomy was added several weeks later after a mild recurrence of bleeding.

In the beginning of our study, the bleeding point was secured first, but as more experience was gained, vagotomy became the initial procedure. With a little

experience we have found that the vagotomy can be completed within a very few minutes, thereby avoiding possible contamination of the subphrenic space after opening the stomach and duodenum. The bleeding point or the entire ulcer is then cross-sewn with 0 chromic catgut swaged on a stout full curved needle (general purpose closure suture). A strong needle is needed to transfix the densely scarred ulcer base. We have avoided the use of nonabsorbable sutures in all but a few early cases, since we felt this might tend to delay healing or lead to re-ulceration as a result of foreign body reaction. Pyloroplasty was the drainage operation used in 95 patients. Anterior gastroenterostomy was performed in five patients in whom the anatomic or pathologic situation precluded construction of a satisfactory pyloroplasty. Since 1957, we have virtually abandoned all other methods of pyloroplasty in favor of the easier-to-perform Finney operation. Our method³ of tube gastrostomy for simultaneous feeding and suction has been used routinely since 1956 and has greatly simplified postoperative care (Fig. 1).

Results in the Interval and Elective Groups

There were 58 patients in the *Interval* or *Elective* groups (Tables 1, 2). There

TABLE 2. *Bleeding Duodenal Ulcer—100 Consecutive Patients—1947–1960; Results of Treatment by Vagotomy, Drainage Procedure, and Suture of Ulcer Where Necessary. (Pyloroplasty—95 Patients, Suture of Ulcer—47 Patients, Gastroenterostomy—5 Patients)*

	Number Treated	Deaths	Treated and Traced	Number of Recurrences	% Recurrences of Bleeding	Ave. % Recurrences of Bleeding	Ave. Years of Follow up
Group I	26	0	25	1	4.0	9.4	7
Group II	32	0	28	4*	14		5.7
Group III	17	0	15	0	0	2.6	6.0
Group IV	25	0	24	1	4.2		4.3
Total	100	0	92	6	6.5**	6.5	5.13

* Two of these patients were chronic alcoholics.

** Satisfactory results obtained in 93.5% of patients treated and traced.

was no mortality and no further bleeding during the immediate recovery period in these patients. Recurrence of bleeding has taken place in five of these; four were in Group II; and one patient was Group I. Two of these patients were subsequently proven to have had incomplete vagotomy; these two had massive recurrent bleeding at six and 11 months, respectively, and were treated by resection elsewhere. One has obtained a good result; the other bled again several months after resection and died following a third operative procedure. The other three failures in Groups I and II have done well on medical management. Two of these three latter cases have a history of alcoholism and bled two and eight years following operation. Basal gastric secretory studies were normal and x-ray studies were negative for duodenal ulcer in these two patients. They were presumed to have erosive gastritis. The third patient has not been available for study but reports by questionnaire, that he has had recurrence of ulcer pain and intermittent tarry stools since eight months after operation.

Findings and Results in the Urgent and Emergency Groups. There were 42 patients in the *Urgent* or *Emergency* groups (Tables 1, 2). These patients were in critical condition from exsanguinating hemorrhage. These are the patients in whom the reported mortality is from 5 per cent to 10 per cent in the best of hands, regardless of whether medical management or gastrectomy is employed. The average age of the 17 Group III patients was 54 years; the average age of the 25 Group IV patients was 48 years. Both of these averages are well above the 45-year level, beyond which the usual mortality figures are expected to double or triple. All of these patients had lost an alarming amount of blood. The average hemoglobin level (Table 1) of Group III patients was 9.3 Gm. The average hemoglobin level of Group IV patients was 8.2 Gm. However, in these

same two groups, there were 24 patients whose average hemoglobin level was 6.2 Gm. Of these, six patients averaged 4.5 Gm. and two patients had levels of 3.5 Gm. Of these one became temporarily hemiplegic from blood loss. Moderate to large amounts of blood were found in the gastro-intestinal tract in all 42 of these critically ill patients at the time of operation. Fourteen were actively bleeding at the time of operation. Recently it has been pointed out by Gardner and Baronofsky⁶ that patients with duodenal craters are the ones most likely to bleed and that the bleeding in these is more likely to be severe. Thirty-six of our 42 Group III and Group IV patients had posterior wall ulcers. Four had both anterior and posterior wall ulcers. There has been no mortality and no further bleeding in the immediate recovery period in this critical group. The one recurrence in the critical group of cases (Groups III and IV—42 patients) occurred in a Group IV patient at seven months postoperatively. His primary lesion was what has been described as giant posterior wall duodenal ulcer. Due to the extreme distortion of the duodenum, a pylorotomy and end-to-end anastomosis was done. Seven months later, at re-operation for massive bleeding, another giant duodenal ulcer was found in the same location. He has remained well for five years following the addition of a two-thirds sub-total resection and Polya anastomosis.

Complications

Morbidity has been minimal. Transient gastric retention occurred in three patients. One additional patient required anterior gastroenterostomy since his Mikulicz pyloroplasty absolutely failed to function postoperatively. Dysphagia and the dumping syndrome were transient and mild in three patients each. Diarrhea has occurred in some few cases but has not been a problem.

Discussion

This combination of procedures, in our hands, has provided a simple safe means of immediate control of exsanguinating duodenal ulcer hemorrhage. At the same time it usually controls the ulcer diathesis, which we believe is the same regardless of whether the ulcer has bled or not. It does this without sacrifice of reservoir function of the stomach, and in the case of pyloroplasty, without disturbance of the autoregulatory relationship between duodenum and antrum described by Wangensteen¹ and Harkins.⁷ We have been fortunate to have had no mortality in these patients, many of whom were desperately ill. We believe the proven safety, simplicity and effectiveness of this procedure would seem to justify a more aggressive surgical attitude rather than possibly disastrous procrastination in managing patients with severely bleeding duodenal ulcer.

Summary

1. One hundred consecutive patients with bleeding duodenal ulcer of varying degrees of severity treated by vagotomy, suture of the bleeding point where indicated and a drainage procedure, usually pyloroplasty, followed an average of five and one-eighth years are presented.

2. There has been no operative mortality, although 42 of these patients were in critical condition with presumed continuing hemorrhage at the time of surgery. Fourteen were actively bleeding at the time.

3. There has been no recurrence of bleeding in the immediate postoperative period.

4. Fifty-three mild to moderately bleeding patients treated and traced have had five recurrences of bleeding (9.4%). At least two of these were due to incomplete

vagotomy. Thirty-nine patients with exsanguinating hemorrhage treated and traced had only one recurrence of bleeding (2.6%).

5. The average recurrence rate in 92 patients treated and traced with all types of bleeding has been 6.5 per cent.

Conclusion

This favorable experience of ours and of others with vagotomy, simple suture of the bleeding point and pyloroplasty has persuaded us that this conservative approach should be strongly considered when surgically dealing with these critically-ill patients.

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