The Prognosis of Gastric Outlet Obstruction

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A retrospective study was undertaken to examine the prognosis of gastric outlet obstruction with specific reference to patients with obstruction due to peptic ulcer. During the 10-year period 1970–1979, 68 patients with gastric outlet obstruction were admitted to our hospital. Obstruction was caused by peptic ulceration in 55 of these patients, all of whom initially were managed conservatively. Thirty-four, however, required surgical decompression during their first admission for obstruction, and 11 needed surgery for a subsequent episode of obstruction. Of the ten patients who have not undergone surgery, six died within 3 years of their first episode of obstruction and three of the four survivors continue to have recurrent obstructive symptoms. Overall, 92% (45/49) of patients who have lived for more than 3 years after their presentation with gastric outlet obstruction due to peptic ulcer have required surgery for relief of obstruction.

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WHEN SHOULD MEDICAL TREATMENT yield to surgical decompression? This question arises quite frequently in the management of patients with gastric outlet obstruction due to peptic ulcer disease. Specific guidelines for management are lacking, in part because of the dearth of information concerning the natural history of this problem. Moreover, there are striking disparities in the sparse literature available. For example, a 15% recurrence rate within the first year after an initial episode of obstruction and an additional 10% recurrence rate within the next 8 years for those patients treated medically has been reported.[1,2] Weiland,[3] in contrast, found that more than 90% of patients treated medically ultimately required surgery.

We report a 10-year retrospective study (1970–1979 inclusive) of patients with gastric outlet obstruction, with particular reference to those whose obstruction was due to peptic ulcer disease. Almost all of these patients eventually came to surgery.

Materials and Methods

Using the Professional Activity Study (PAS) medical coding system, a computer list was generated for the diagnosis of pyloric stenosis (537.0) for the 10-year period, 1970–1979 inclusive, at the Medical Center Hospital of Vermont. One hundred and fourteen patients were identified. Twenty-six were immediately rejected since they were children with hypertrophic pyloric stenosis. Another 20 patients who had undergone gastrointestinal surgery before the development of gastric outlet obstruction were excluded. Three patients who had had simple oversewing of ulcers without vagotomy, antrectomy, or gastroenterostomy were not excluded. The causes of gastric outlet obstruction in the remaining 68 patients were ulcer adjacent to the gastric outlet in 55 (33 duodenal, 13 pyloric channel, and nine prepyloric), cancer in five, pancreatitis in two, gastritis in two, and inflammatory bowel disease, gastric ulcer, lye stricture, and mucosal web in one each.

In order to determine the incidence of gastric outlet obstruction in our hospital population of patients with peptic ulcer disease, a list was generated using the PAS codes of 531.0 (ulcer of the stomach), 532.0 (ulcer of duodenum), 533.0 (peptic ulcer disease site unspecified), and 534.0 (gastrojejunal ulcer). Each patient over the 10-year period was given only one number per year. Eleven-hundred and thirty patients fulfilled these criteria. This number does not include patients who were admitted with gastric outlet obstruction. It may be artificially inflated since a few patients may have been admitted more than once.

Patients were considered to have gastric outlet obstruction if they fulfilled any of the following criteria: (1) markedly abnormal gastric retention of barium, (2) positive saline load test (retention of more than 400 ml of normal saline 30 minutes after administration of 750 ml); (3) positive endoscopy (fixed stenosis of the gastric outlet which prevented passage of a fiberoptic endoscope; and (4) an overnight gastric residual of more than 200 cc. All patients in this study had an Upper GI series that documented gastric retention. An additional 36% underwent a saline load test, 20% were evaluated endoscopically, and 16% had an overnight gastric residual measurement.

Since surgical decompression was taken as the endpoint in treatment of gastric outlet obstruction in this

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TABLE 1. *Clinical Data in Patients Who Presented with Gastric Outlet Obstruction Due to Peptic Ulceration*

	Group 1	Group 2A	Group 2B	Total
No. patients	34	11	10	55
Sex				
Male	24	8	3	35
Female	10	3	7	20
Age				
Total	62.1 ± 16.8	52.9 ± 15.6	66.9 ± 19.2	60.9 ± 17.2
Male	62.1 ± 16.7	52.3 ± 13.8	64.6 ± 21.9	59.9 ± 16.0
Female	62.0 ± 17.8	50.5 ± 24.7	67.9 ± 21.9	62.9 ± 19.5
Duration of peptic ulcer disease (years)				
Total	10.0 ± 8.3	13.6 ± 8.3	7.0 ± 6.5	9.9 ± 8.1
Male	10.7 ± 8.9	15.4 ± 8.4	11.6 ± 8.5	11.1 ± 9.0
Female	7.6 ± 6.1	6.5 ± 4.9	6.2 ± 3.8	7.0 ± 4.8
Days of medical treatment*				
Total	6.5 ± 3.2	4.9 ± 1.5	6.1 ± 3.1	6.1 ± 3.0
Male	6.6 ± 3.4	4.5 ± 1.4	5.3 ± 1.5	6.0 ± 3.1
Female	6.3 ± 2.9	6.0 ± 1.0	6.4 ± 3.7	6.3 ± 2.9

* Before surgery or discharge from hospital.

study, follow-up by telephone interview with either the patient or a relative was obtained for all patients who did not undergo surgery during the initial hospital admission. Information was obtained about any surgical procedure performed on the gastrointestinal tract for relief of obstruction and about persistent symptoms, either of abdominal pain or gastric outlet obstruction (nausea, postprandial bloating, and vomiting).

Results

One-thousand one-hundred and eighty-five patients were admitted to the Medical Center Hospital of Vermont for peptic ulcer disease over the 10-year period 1970–1979. Sixty-eight patients satisfied the criteria for gastric outlet obstruction. After exclusion of those whose obstruction was not due to peptic ulcer, 55 patients remained. This included two with both high intragastric neoplasm (gastric carcinoma in one, reticulum cell sarcoma in the other) and peptic ulcer disease in whom obstruction was judged to be due to the latter. Hence, approximately five per cent of admissions for peptic ulcer disease were primarily for obstruction.

Of the 55 patients admitted for obstruction due to peptic disease, 35 were men (average age 59.9) and 20 were women (average age 62.9). All initially were treated conservatively, 35 on the medical service and 20 on the surgical service. Treatment included intravenous fluids, nasogastric suction, and antacids. In 1977 cimetidine was incorporated into medical management. All patients on the medical service were concurrently followed either by the gastroenterology or the surgical consultation teams.

The 55 patients can be divided into three subsets (Table 1). *Group 1*, patients who underwent surgical decompression during the initial admission, included 34 patients (24 male, 10 female), 16 (47%) of whom were initially on the medical service and were later transferred to the surgical service. *Group 2* comprised those patients whose gastric outlet obstruction responded to medical therapy as documented by saline load test, barium x-ray, or the ability to tolerate a normal diet for several days at least without symptoms of nausea, vomiting, or bloating. Group 2 could be further subdivided into *Group 2a* (11 patients [eight male, three female] who subsequently required surgery for recurrent gastric outlet obstruction) and *Group 2b* (10 patients [three male, seven female] who did not require readmission to hospital for obstruction). Six of these 10 patients died within 3 years of discharge. Although patients in this group tended to be older than those in Groups 1 or 2a, differences between groups with respect to age and sex were not statistically significant.

The number of previous bleeding episodes and the number of days of conservative medical treatment in hospital were similar in Groups 1, 2a, and 2b. There was neither decrease in the number of days of conservative treatment nor improvement in outcome of medical management after the introduction of cimetidine.

The 21 patients in Group 2 (both a and b) were followed from 4 to 13 years after their initial admission to the hospital. In the 11 patients of Group 2a, the median interval between discharge and surgery was 17 weeks with a range of 1 to 416 weeks. Most of the remaining 10 patients (Group 2b) did not undergo initial surgical decompression because they were deemed poor surgical risks. Six of them (one male, five female) died within 3 years after discharge (range 1 week to 3 years with a mean of 1 year). The average age of these six patients at the time of admission was 76, significantly older than the four patients (two male, two female) who were alive at the time of writing. The average age of

these four patients, who have been followed for between 4 and 10 (mean 6.5) years, was 53.

In all, 45 patients underwent surgery, six patients died relatively soon after their initial admission, and only four of the patients have not had surgery. Hence, if one excludes the six patients in Group 2b who died, 45 out of the 49 (92%) patients with gastric outlet obstruction secondary to peptic ulcer disease have required surgery. Three of the four patients who did not have surgery continue to have recurrent symptoms of obstruction while once, aged 24, has no symptoms. The latter had no symptoms of peptic ulcer disease before her presentation with gastric outlet obstruction.

Six patients, all women, had no prior history of peptic ulcer disease and presented with so-called "acute" gastric outlet obstruction. Three required immediate surgery (Group 1), one eventually required surgery (Group 2a), and two have not had surgery. One of these, aged 24, is asymptomatic. The other, aged 91, has intermittent obstructive symptoms. Interestingly, three of these six patients were taking steroids for other illnesses (*i.e.*, inflammatory bowel disease and arthritis) at the time of presentation, in contrast to only two of the 43 patients with histories of chronic peptic ulcer disease.

The average duration of peptic ulcer disease before the onset of obstruction was 10.4 years. There was no significant difference among groups with respect to this duration. There did appear to be a difference with respect to gender, in that men had longer histories of ulcer disease than women in all groups, but the differences were not statistically significant ($p > 0.05$, Table 1).

There were no significant differences between Groups 2a and 2b with respect to age, duration of peptic ulcer disease, or number of days of medical treatment before either discharge or surgical decompression. Operative procedures on patients in Group 1 (34 patients) were vagotomy and gastroenterostomy in 30 and vagotomy and pyloroplasty in four. In Group 2a, 10 patients underwent the former operation, one the latter. Early postoperative complications included respiratory failure requiring intubation in two patients, delirium in one, and wound infection in one. Incidental splenectomy was done in two patients and incidental appendectomy in one. One patient died during the first postoperative week of variceal bleeding with associated coagulopathy and hepatic encephalopathy. Unfortunately, information regarding late complications was not available in over half of the surgically treated patients.

Discussion

The decision whether or not to operate for gastric outlet obstruction caused by peptic disease is generally based upon the patient's previous history, an estimate of the surgical risk, and the response to initial conservative management. Satisfactory assessment of that response is marred by the fact that all tests used for measurement of gastric emptying have some drawbacks. Introduction of the saline load test[4] provided a simple measure of gastric emptying and led to objective criteria for definition of gastric outlet obstruction and to a rationale for surgical treatment. However, both the saline load test and the standard barium x-ray measure emptying of liquids only and may be normal when a barium-burger test demonstrates clinically important impairment of solid food emptying.[5,6] The barium-burger test, however, is not widely used. Endoscopy allows quite accurate assessment of the anatomical state of the gastric outlet, but does not provide reliable information about gastric emptying. Radioisotopic scanning methods show considerable promise but have not yet been generally adopted.

Application of different methods for assessment of emptying and differing criteria for interpretation of the results render comparisons between the few reported studies difficult. Moreover, all retrospective studies, including our own, are open to the criticism that a standard protocol was not applied to all patients.

In a large series of 8451 patients with peptic ulcer disease, 10% had gastric outlet obstruction.[7] The reported incidence of obstruction in populations of patients with peptic ulcer disease ranges between 2 and 30%.[1,8–10] In our group it was five per cent. The etiological factors that contribute to gastric outlet obstruction include spasm, edema, cicatricial scarring, and gastric atony. The relative contributions of these different factors will presumably determine whether or not medical treatment is successful. It is likely that differing frequencies of these variables and variation in methods for assessment of obstruction account for the discrepant success rates for conservative treatment reported in different series. Rafsky[11] claimed a 76% success rate for medical therapy in patients followed for 2 to 8 years after their initial obstruction. The success rate in other series varies between 25 and 75%.[1,7,8,12]

Recently, Weiland[3] reported that 98% of patients with gastric outlet obstruction due to chronic peptic ulcer disease and 68% of those with acute gastric outlet obstruction required surgery. Our findings are similar in that 90% of patients with chronic disease and 67% (four out of six) of those with acute disease required surgical intervention. Of the 21 patients discharged after medical therapy and followed for up to 13 years, 75% (11 out of 15) eventually reobstructed and required surgery, six initially deemed poor surgical risks died within 3 years and three of the remaining four living patients have had recurrent obstructive symptoms.

Based upon our observations and those of Weiland et al.,[3] a strong case can be made for early surgery in the patient who presents with obstruction due to chronic peptic ulcer disease, provided that he is a good surgical candidate. Without surgery, the likelihood of recurrent obstruction is very high and the patient remains at risk for hemorrhage, perforation, and the morbidity attendant upon recurrent episodes of ulceration. Clearly, a more conservative approach is reasonable in the elderly and infirm and in those who present with "acute" obstruction—that is to say without previous symptoms of peptic ulceration—though even in this group the probability that surgery will ultimately be done is high.

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