

Delayed Gastric Emptying after Laparoscopic Anterior Highly Selective and Posterior Truncal Vagotomy

Martin Tobi, M.B. Ch.B., Todd Holtz, M.D., John Carethers, M.D., and Chung Owyang, M.D.

Department of Medicine, Wayne State University School of Medicine, Detroit, and University of Michigan Medical Center, Ann Arbor, Michigan

We describe a case of gastroparesis after laparoscopic highly selective anterior and posterior truncal vagotomy in a 30-yr-old male with gastric ulcer disease. Motility studies confirmed the diagnosis, and a pancreatic polypeptide sham feeding study suggested that a complete vagotomy may have been inadvertently performed. The experience with this procedure in gastric ulcer disease is extremely limited; review of the literature of laparoscopic highly selective vagotomy describes only two cases with delayed gastric emptying as defined by radiological examination. In view of the paucity of reports, caution is warranted, and this procedure should be undertaken only in the setting of a controlled trial.

INTRODUCTION

Highly selective vagotomy (HSV) is the surgical procedure of choice in the treatment of intractable duodenal ulcer (DU) disease (1), and although not necessarily the procedure of choice, the technique has also been used successfully for a gastric ulcer (GU) located at the incisura (2), usually combined with ulcer excision. The ability to heal even intractable peptic ulcer disease with the newer potent gastric acid antagonists and treatment of *Helicobacter pylori* has reduced the number of candidates for surgical intervention, and the opportunity for surgeons to acquire experience with these procedures has become limited (1). Despite the reduction in experience with the open laparotomy procedure, HSV has been adapted to the laparoscopic technique for intractable DU disease, and the results in 90 patients were recently reviewed; recurrent ulceration (5%) was the only noted complication (3). Complications of laparoscopic HSV in GU have not been documented, and the potential long-term complications of this procedure are unknown. We describe a patient who developed gastroparesis after undergoing laparoscopic anterior HSV and posterior truncal vagotomy for GU.

CASE REPORT

A 30-yr-old male presented to the outpatient clinic with a 5-month history of nausea, bloating, and regurgitation of foul-smelling material after undergoing laparoscopic surgery for abdominal pain unresponsive to anti-ulcer medications and a history of GU. Eight months before the procedure, an endoscopic evaluation for epigastric pain revealed a linear distal esophageal ulcer, antral erosions, and an ulcer on the greater curvature of the stomach. The patient did not respond symptomatically to treatment with H₂-blockers and omeprazole. Because of the persistent pain, a repeat endoscopic examination was performed that reportedly showed diffuse antral erythema. Surgical consultation resulted in a recommendation for surgery, and a preoperative evaluation revealed a serum gastrin of 37 pg/ml and a normal upper gastrointestinal barium study. The patient underwent a laparoscopic anterior HSV and posterior truncal vagotomy. Postoperatively, he felt well for 1 wk and then developed nausea and abdominal distention with belching unresponsive to metoclopramide treatment. A repeat upper gastrointestinal barium series showed retained gastric contents and decreased peristalsis confirmed by gastroscopy. A solid-phase gastric scintiscan showed delayed gastric emptying ($T_{1/2} > 2$ h). On referral, the patient's physical examination was unremarkable except for the scars of the laparoscopic surgery. A fasting gastrin level was 79 pg/ml; serum sodium, potassium, and calcium were normal. A glucose tolerance test was normal. Gastroscopy showed retained gastric contents with decreased visible peristalsis in the gastric body contrasting with increased activity at the pylorus. A urease test for *H. pylori* was negative. A pentagastrin gastric secretion study showed a basal acid output of 3 mmol H⁺/h and a normal response to pentagastrin of 48 mmol H⁺/h with a BAO:MAO ratio of <0.1. Pancreatic polypeptide levels after sham feeding showed no increment after 90 min. Liquid and solid gastric scintiscan showed delayed emptying for both phases (44% for solid at 2 h and 35% for liquid at 30 min). A trial of cisapride for 2 months failed to alleviate his symptoms. A trial of erythromycin was not attempted. The patient did not receive anticholinergic medication during the period of evaluation.

The diagnostic work-up confirmed the diagnosis of gas-

troparesis, and the secretion profile is compatible with a complete vagotomy leading to disruption of prepyloric vagal innervation and inactivation of the physiological gastric electrical pacemaker. We concluded that the delayed gastric emptying in this patient was secondary to an inadvertent complete vagotomy which is a recognized complication in 5% of open surgery leading to gastric dysmotility (1).

DISCUSSION

The experience with laparoscopic anterior HSV and posterior truncal vagotomy is still relatively limited (3) and is confined to patients with DU disease. We believe that this is the first case report of gastroparesis in a patient who had surgery for GU disease. Inasmuch as the operation is identical for both DU and GU disease, we sought evidence for this complication in patients undergoing the procedure for DU. No such complication was noted in a recent review (3) nor in a previous report which appeared at the time the patient was first seen before surgery. The latter report noted an "explosion of interest in laparoscopic surgery" and cautioned that most applications were anecdotal and subject to little or no follow-up (4). Studies reported to date generally document success in ulcer healing and minimal ulcer recurrence rates after this procedure (5, 6). This approach has been criticized because of the failure to document success by comparison to the open technique (7), and at least two groups have abandoned the procedure as too technically demanding (8) in favor of seromyotomy. The Belgium Group for Endoscopic Surgery reported in abstract form (9) their experience with laparoscopic HSV without posterior truncal vagotomy. There were 17 patients with chronic DU, whereas four patients had esophagitis, and their procedure was combined with a Nissen fundoplication. On "barium swallow," gastroparesis was identified in two of 18 cases.

Because of the extremely limited experience with HSV with or without posterior truncal vagotomy, the combined experience of complications with posterior truncal vagotomy and anterior gastric seromyotomy should be considered together. In reporting their initial experience with anterior seromyotomy and posterior truncal vagotomy, French surgeons noted two patients with "a sensation of abdominal bloating due to delayed gastric emptying at the second postoperative month." No other ancillary studies are reported, but endoscopy revealed bezoars in both patients which were successfully treated (10). They suggest that in the event of this complication, endoscopic pyloric dilation may be effective. It is not surprising that cisapride did not control our patient's symptoms, in that a recent review concluded that efficacy in this condition has not been demonstrated (11). Although two reports have demonstrated successful results with erythromycin (12, 13), both dealt

with patients after esophagectomy and vagotomy and may not be relevant to our patient. The first was a case report of a patient on long-term treatment that gave symptomatic relief, and the second (13), a study comparing the results of pyloroplasty and short-term cisapride and erythromycin. In this study, no data were given regarding symptomatic relief, and results were judged by improvement in gastric emptying scintigraphy. On this basis, erythromycin alone was effective, but, on scrutiny, significant improvement in scans could be demonstrated in only half of the patients (3/6). The long-term efficacy of erythromycin in the setting of post-vagotomy gastroparesis has yet to be established (11). Based on these limited data, it is possible that subclinical delayed gastric emptying may result after HSV alone in approximately one patient out of 10. Given the morbidity observed in our patient and the relatively short duration of disease, we endorse the suggestion (14) that patients who may be candidates for this type of procedure be evaluated in centers specializing in motility disorders to allow for appropriate selection of candidates with careful follow-up, preferably in the setting of a prospective randomized controlled study.

Reprint requests and correspondence: M. Tobi, M.D., Division of Gastroenterology, Harper Hospital, 2WS, 3990 John R, Detroit, MI 48201.

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