Journal of Laparoendoscopic & Advanced Surgical Techniques
Volume 7, Number 3, 1997
Mary Ann Liebert, Inc.

Laparoscopic Highly Selective Vagotomy

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ABSTRACT

Laparoscopic highly selective (anterior and posterior) vagotomy was performed in 11 patients for duodenal ulcer (n = 10) and duodenal ulcer with prepyloric ulcer (n = 1). All patients were endoscoped both pre- and postoperatively. There were no perioperative complications. The average operating time was 3.2 ± 0.4 hours and the average hospital stay was 1.7 ± 0.2 day (range 1 to 3 days). None of the patients required parenteral narcotics postoperatively. The patients have been followed for 6 months to 5 years after operation. All ulcers healed as demonstrated by endoscopy. There was one recurrence at 9 months in a patient who had a prepyloric ulcer preoperatively. The recurrence was treated successfully with medication. There has been no other long-term morbidity. Laparoscopic highly selective vagotomy is feasible, safe, requires a brief hospital stay, and produces short-term results comparable with open surgery.

INTRODUCTION

It is an often observed trend that the number of elective operations on peptic ulcer disease (PUD) has diminished in the last 20 years. The cause of this trend has been attributed most commonly to the introduction of H_2 receptor antagonists in the late 1970s.[1] During the past 5 years, the implication of *Helicobacter pylori* in the pathogenesis of PUD has raised hopes for a medical cure for gastroduodenal ulcer.[2–4] With effective antiulcer medication, fewer and fewer patients are being referred for an antiulcer procedure.

Highly selective (parietal cell or proximal gastric) vagotomy is an accepted procedure for the elective treatment of duodenal ulcer.[5–8] The traditional (open) approach to this operation has all but disappeared for elective cases, as indicated above. In February 1992, we reported the first laparoscopic highly selective vagotomy (LHSV) in the United States.[9] It was our prediction at that time that the application of the laparoscopic approach to highly selective vagotomy would have revived interest in this operation because of all the patient-directed advantages that laparoscopy entails. However, because of several factors, which are presented in the *Discussion* section, the number of LHSVs performed in our institution are below our initial expectations. Here we report our results of LHSV in our first 11 patients.

PATIENTS AND METHODS

The operations were performed by a staff surgeon assisted by surgical residents in a medical-college-affiliated hospital. The indication for all operations was intractable PUD despite treatment with H_2 blocker

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and/or proton pump inhibitor. All patients had preoperative esophagogastroduodenoscopy (EGD) that demonstrated active PUD, and were *H. pylori* negative at the time of surgery. Detailed description of the surgical technique appears in our previous publications.[9,10] Briefly, the patient is placed in a modified lithotomy position with the surgeon standing between the legs. Five 10-mm trocars are used: 1) supraumbilical; 2) subxiphoid; 3) right subcostal in the midclavicular line; 4) left subcostal in the midclavicular line; and 5) left subcostal in the anterior axillary line. The laparoscope is inserted into the supraumbilical port. The left lobe of the liver is retracted with an inflatable retractor (Circon Corporation, Santa Barbara, CA) inserted through the subxiphoid port. The first assistant grasps the stomach with a laparoscopic Babcock clamp via the left lateral port. The surgeon also manipulates the stomach with a Babcock through the right subcostal port. The left medial trocar is the operative port, through which the surgeon uses the hook electrocautery, the right angle dissector, the right angle clip applier, and the harmonic scalpel (Ethicon Endo-Surgery, Cincinnati, OH).

The neurovascular bundles along the lesser curvature are dissected, doubly clipped, and divided. In our last three cases, we used the harmonic scalpel for the division of the neurovascular bundles. The use of this instrument expedites the procedure. The anterior and then posterior vagal branches are divided and the denervation is carried up to the distal 5 cm of the esophagus. The distal point of dissection is up to and including the first branch of the "crow's foot." The abdominal fascia of ports number 1, 4, and 5 is closed with a single suture with the use of a fascial closer.

Postoperative nasogastric decompression is not done. The patient is allowed clear liquids in the evening of the operation, and is given a general diet on postoperative day 1. For analgesia, 30 mg of ketorolac tromethamine is administered intramuscularly scheduled every 6 hours, with the first dose in the recovery room. The patient is discharged 1 to 2 days after the operation.

After several initial postoperative visits, the patient is seen in the surgical clinic every 3 to 6 months. In all of these first 11 cases, follow-up EGD was performed 2 to 3 months postoperatively, and in 6-month intervals.

RESULTS

There were 7 male patients and 4 female. The average age was 50 (range 33 to 69 years). Ten patients had a duodenal ulcer on preoperative EGD, and one had both prepyloric and a duodenal ulcer.

The average operation time was 3.2 ± 0.4 (range 2.3 to 4) hours. Blood loss was minimal. There were no perioperative complications. The hospital stay averaged 1.7 days (range 1 to 3 days). Parenteral narcotics were administered to only one of the patients. The rest of the patients had adequate analgesia with ketorolac tromethamine.

Patients were generally back to normal activities within 1 to 2 weeks. All patients were endoscoped within 2 to 3 months of their operation. All patients showed resolution of their ulcer(s). The patients were followed for an average of 34 months (range 6 to 56 months).

The patient with the prepyloric ulcer developed abdominal pain 9 months postoperatively, and was found to have a recurrent prepyloric ulcer on EGD. This was successfully treated with medication. The other patients have not had long-term morbidity from their operation, and are not taking antiulcer medication.

DISCUSSION

We have performed LHSV in 11 patients with minimal morbidity. The time required to perform the procedure is acceptable. Although we have not performed a formal comparison with a separate group of patients undergoing open HSV, it is easily appreciated that the hospital stay and recovery time to normal activity is shorter with LHSV. The short-term ulcer recurrence rate has reflected the observed rate with the open procedure.[6,11]

The one patient with a recurrent ulcer had both duodenal and prepyloric ulcers on preoperative EGD. Several authors have shown that in patients with PUD who undergo an HSV, the group with a pyloric or

prepyloric ulcer will have a higher recurrence rate than the group with a duodenal ulcer.[12,13] An accepted operation for pyloric/prepyloric ulcer is vagotomy and antrectomy.[12] The risks and benefits of the above procedures were explained to the patient, including the fact that HSV is not the procedure of choice for prepyloric ulcer, but the patient decided to have a LHSV. Her recurrence was easily managed medically. Recurrent ulcer after HSV has been noted to be medically manageable in the majority of cases.

Highly selective vagotomy in the treatment of duodenal ulcer is a proven treatment. It has been used now for almost 30 years. The recurrence rates at 10 to 20 years have been found from 7% to 21%[6,14–16]; this is higher than the often quoted rate of 1% to 2% for vagotomy and antrectomy (V&A). However, HSV is favored over V&A for primary surgical treatment of duodenal ulcer because of higher Visick scoring, which takes into account both recurrence rate and long-term operative morbidity. A patient with a V&A will have low risk for ulcer recurrence, but will have moderate risk for crippling side effects such as diarrhea and dumping syndrome, which are rare side effects of HSV.

The efficacy of open HSV was shown in numerous clinical trials and reviews with thousands of patients.[11,12,16] To conform rigidly to scientific principles, what is needed now is a randomized trial comparing open HSV, laparoscopic HSV, and standard medical treatment (including that for *H. pylori*) over a 10-year period. In addition to clinical outcome, such a trial would need to include a cost analysis. Considering that most PUD patients and their physicians would be reluctant to give up efficacious medical therapy in exchange for surgery, such a trial is unlikely. Currently there is an inadequate number of LHSV being performed to conduct such a trial.

One area of ulcer surgery that in general has not seen a decline in the number of procedures is that of the emergency ulcer operation, especially for perforation. An evolving approach to perforated duodenal ulcer is to perform ulcer closure and HSV (in the stable patient). Although the controversy behind this approach is beyond the scope of this discussion, HSV combined with ulcer closure for perforation could stimulate interest in the laparoscopic approach.[17]

The future of surgery for peptic ulcers is uncertain. The number of elective operations for PUD is down from two decades ago. There seems to be a decrease in the incidence of the disease, and the vast majority of the patients can be managed with medication. If it can be proven that PUD is in fact an infectious disease (ie, secondary to *H. pylori*), medical treatment will predominate further. Currently, the possibility of the average gastroenterologist referring a PUD patient for an elective open HSV is virtually nonexistent. However, we[9,10] and others[18–21] have shown that LHSV is feasible, safe, and produces short-term results comparable with open surgery, without the patient-related disadvantages of laparotomy. LHSV, therefore, should provide a reasonable surgical option in the elective treatment of duodenal ulcer.

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