

Laparoscopic Pyloroplasty in Idiopathic Hypertrophic Pyloric Stenosis in an Adult

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ABSTRACT

Background and Objectives: Idiopathic hypertrophic pyloric stenosis, in adults, is a rare disease. Partial gastrectomy, gastroenterostomy, pyloromyotomy, pyloroplasty and endoscopic dilatation have all been recommended with variable results. A 54-year-old white female is presented with the onset of symptoms of idiopathic hypertrophic pyloric stenosis one year prior to operation. Two endoscopic pyloric sphincter balloon dilatations provided only temporary relief.

Method: A laparoscopic pyloroplasty was performed.

Result: The patient tolerated a solid diet on postoperative day three. The patient was symptom-free at a 13 month follow-up.

Conclusions: Idiopathic hypertrophic pyloric stenosis in adults can be treated with laparoscopic pyloroplasty, offering a minimally invasive alternative to open repair.

Key Words: Laparoscopic pyloroplasty, Adult, Idiopathic pyloric stenosis.

INTRODUCTION

Adult idiopathic hypertrophic pyloric stenosis (AIHPS) was first described by Jean Cruveilhier in 1835.¹ It is a rare disease and presents in adult life as pyloric obstruction, without a history of vomiting in infancy or other gastrointestinal symptoms. Abdominal distention relieved by vomiting is usually the only physical sign. All patients experience weight loss.² Diagnosis is made with barium contrast upper GI series and upper endoscopy.^{3,4} Malignancy has to be ruled out. Optimal treatment should provide relief of obstruction, low recurrence and low operative morbidity, since AIHPS is a benign disease. Pyloromyotomy, pyloroplasty, gastrojejunostomy, endoscopic dilatation and gastrectomy have all been recommended for AIHPS.⁵ We diagnosed AIHPS in a patient who presented with postprandial vomiting and weight loss. Laparoscopic pyloroplasty was performed after two failed attempts of pyloric sphincter balloon dilatation.

CASE REPORT

The patient is a 54-year-old white female with a history of postprandial pain and vomiting for one year. Upper endoscopy revealed a stenotic pyloric channel. Endoscopic pyloric sphincter dilatation was performed using a 45 French balloon. Her symptoms returned one month later. Computerized tomography was negative for masses or adenopathy. A second endoscopy revealed recurrent pyloric stenosis. Biopsies were negative for malignancy, and balloon dilatation was repeated. Symptoms of fullness and meal intolerance returned after two months. Laparoscopic pyloroplasty was then performed for symptom relief.

The patient was placed in a modified lithotomy position with the surgeon at the foot of the operating table and an assistant at each side. A Veress needle was inserted, and the abdomen was insufflated with CO₂ gas up to a pressure of 14 cm H₂O. Laparoscopic pyloroplasty requires five ports arranged similar to that used in Nissen fundoplication: one 12-mm port for the laparoscope, three 5-mm working ports, and one additional working port for retraction of the liver and falciform ligament. The 12-mm port was placed in the midline, 4 cm above

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the umbilicus. Two 5-mm ports were placed in the right upper and left upper quadrant at the anterior axillary line. The two remaining 5-mm ports were placed at the left and right midclavicular line, both at the level of the umbilicus. Alternatively, the ports may be placed lower in the abdomen, or a sixth port may be used. The duodenum was mobilized with a modified Kocher maneuver to avoid tension on the anastomotic line. This mobilization was achieved using two atraumatic babcock clamps and the harmonic scalpel. The harmonic scalpel was also used to perform a longitudinal pyloromyotomy. A nasogastric tube was required for decompression of the stomach, and suction was available to avoid spillage of duodenal contents. The pyloric opening was then approximated in a transverse fashion with one layer of full thickness, 2-0 Ethibond interrupted sutures (Weinberg pyloroplasty). The first approximating sutures were tied extracorporeally to relieve tension, and the remaining were tied intracorporeally. The operative time was two hours, and there were no intraoperative complications.

Radiographic study with gastrografin on the first postoperative day showed no leak of contrast and no evidence of obstruction. The nasogastric tube was removed, and the patient was placed on a clear liquid diet. The diet was advanced to full liquids on the following day. On postoperative day three, a soft diet was introduced, and the patient was discharged home. Thirteen months after surgery, the patient is tolerating a regular diet and is completely symptom free.

DISCUSSION

Adult hypertrophic pyloric stenosis is classified into three types.^{2,3} The first type is the late stage of infantile hypertrophic pyloric stenosis, which is easily diagnosed from the history of symptoms during infancy. The second type is hypertrophic pyloric stenosis commencing in adult life but secondary to other disease in the upper gastrointestinal tract. This can be a hiatal hernia, duodenal ulcer, gastric ulcer, tumors or inflammatory diseases. This type is the most common and is recognized by a long-standing history of gastrointestinal complaints recently complicated by obstructive symptoms. Primary "idiopathic" hypertrophic pyloric stenosis presenting in adult life without any apparent cause is the third type. In this entity, there is no history of vomiting during infancy or other gastrointestinal symptoms. AIHPS is further divided into two groups. In one group, there are no complications from

the stenosis. In the complicated variety, there is gastritis or peptic ulcer. The sequence of events can differentiate this type from the secondary type of hypertrophic pyloric stenosis.²

Diagnosis is based upon history, clinical and radiological findings and endoscopic appearance. The main symptom in every patient is postprandial upper abdominal distension. The discomfort is relieved by vomiting. Nausea and pain are minimal during vomiting. Anorexia and early satiety can be present. All patients experience weight loss. The absence of pain at the onset of symptoms is a significant diagnostic point. The duration of symptoms can range from 5 weeks to 16 years.²

Several radiological signs have been described related to AIHPS. The length of a normal pyloric canal is no more than 1 cm. In AIHPS, the length may extend up to 4 cm. A convex indentation at the base of the duodenal bulb, known as Kirklin's sign, is another indication of AIHPS. An eccentric or concentric narrowing of the pyloric region is the "string sign." The "Twining's" sign is a barium filling defect, which can project to either or both sides of the pylorus. It is located 4 to 6 cm proximal to the base of the duodenal bulb.^{2,3,6} Some or all these findings can distinguish AIHPS from other diseases. In contrast, there are reports that "typical" cases are rare, and the radiological picture is highly variable. Some patients with AIHPS have repeatedly normal radiographs. In addition, patients with pyloric carcinoma have had x-rays similar to those seen in AIHPS.⁷

Endoscopically, the pylorus is fixed, markedly narrow and has a smooth border. Its appearance has been described as the "cervix sign," or even as a "donut." The pylorus fails to close completely even though the peristaltic waves appear to culminate in some degree of contraction in the pyloric area. The main advantage of endoscopy is that it can easily differentiate AIHPS from other diseases that cause gastric outlet obstruction.^{3,6} Biopsy should always be taken to exclude malignancy.^{4,5}

Surgical exploration has been advised to establish diagnosis and provide treatment. Gastrectomy, gastrojejunostomy, pyloromyotomy and pyloroplasty have been recommended for AIHPS. Full-thickness biopsy is proposed for the exclusion of malignancy.^{2,5} Most reports in the literature have advocated subtotal distal gastric resection. Pyloromyotomy is undesirable because of possible mucosal laceration and late diverticula. Pyloroplasty is

considered technically difficult if the pylorus is grossly thickened and is reserved for the debilitated patient.⁸ Brahos and Meck have performed a double pyloroplasty in one patient. The closure was completed without tension, and a wide pyloric channel was produced.⁹ The benign nature of the disease prompted Levine et al to suggest non-operative diagnosis and treatment. The authors have concluded that laparotomy is not required for the diagnosis and that gastroscopic findings are more important than radiographic findings.⁴ Dye et al treated a poor operative candidate with endoscopic dilatation. Examination with barium on the following day showed only a slightly wider pyloric channel. The patient subsequently was placed on a solid diet but had occasional vomiting.³ Endoscopic balloon dilatation performed for benign pyloric stenosis from other causes resulted in a high recurrent obstruction rate. In two separate studies, the authors suggested that endoscopic dilatation may palliate symptoms but should be reserved only for patients with high operative risk.^{10,11} The patient we are presenting had only temporary relief after two balloon dilatations.

The first laparoscopic pyloromyotomy for infantile hypertrophic pyloric stenosis was performed in 1990.¹² Since then, many series have shown that the laparoscopic approach is safe, efficient, offers improved cosmesis, earlier postoperative recovery and shorter hospitalization.¹³

The benign nature of the disease in adults mandates a surgical treatment that can be performed safely and effectively with low morbidity and mortality rate. It is reasonable to relieve the pyloric obstruction as directly and atraumatically as possible. A major operation like gastric resection seems unnecessary for a benign process. The diagnosis can be performed more safely with endoscopy, and pyloroplasty has less morbidity than gastrectomy. Laparoscopic pyloroplasty is a technically feasible operation requiring laparoscopic suturing skills. It can be safely performed in AIHPS. It provides treatment while preserving the benefits of a minimally invasive surgical technique in the debilitated patient. Laparoscopic pyloroplasty is safe, effective and offers decreased pain, hospital stay and postoperative disability. Larger studies and longer follow-up are required for its establishment as the treatment of choice.

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