

Laparoscopic Duodenojejunostomy for Management of Superior Mesenteric Artery Syndrome: Two Cases Report and a Review of the Literature

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Superior mesenteric artery(SMA) syndrome is rare disorder, which is caused by a reduction in the aortomesenteric angle causing a duodenal obstruction. It is usually occurs after a period of weight loss, nausea, and vomiting by a partial obstruction of the third portion of the duodenum. If conservative management fails then a laparotomy with a duodenojejunostomy is indicated. Recently, a minimally invasive or laparoscopic approach to the retroperitoneum or duodenal detachment was introduced. Although the role of a laparoscopy in managing SMA syndrome is not clearly defined, a laparoscopic duodenojejunostomy may be an alternative approach to the surgical treatment of SMA syndrome cases.

Two cases of superior mesenteric artery syndrome that were treated laparoscopically after medical therapy failure are described. The 4-port procedure was performed. A dilated bowel on the third portion of the duodenum was observed below the transverse mesocolon and to right of the superior mesenteric artery. A proximal loop of the jejunum was anastomosed to the duodenum using an endoscopic GIA stapler. The surgery time and hospital length of stay were acceptable. No complications were encountered in this study.

A laparoscopic duodenojejunostomy is a feasible alternative option for treating SMA syndrome. It provides the benefits of being a definitive and minimally invasive surgical technique in a duodenal obstruction.

Key Words: Laparoscopy, superior mesenteric artery syndrome, duodenojejunostomy

INTRODUCTION

Superior mesenteric artery (SMA) syndrome is a rare clinical condition that needs to be considered in patients with abdominal complaints where the endoscopic and conventional radiological findings are nonspecific.^{1,2} SMA syndrome is caused by an obstruction of the third portion of the duodenum between the superior mesenteric artery and the mid abdominal aorta.^{3,4} If conservative management fails, a exploratory laparotomy with a duodenojejunal bypass or lysis of the ligament of Treitz is indicated. Previously, a laparoscopic division of the retroperitoneal attachments of the duodenum has been described.⁵ However, it is believed that the results of only lysis procedures are not acceptable and not definitive. Recently, a laparoscopic duodenojejunostomy is an option for treating SMA syndrome.⁶ It provides definitive treatment results while preserving the benefits of a minimally invasive surgical technique in a duodenal obstruction. However, there are very few cases reported in the literature.⁷ We report two cases of a laparoscopic duodenojejunostomy as a definitive treatment technique for SMA syndrome.

CASE REPORT

The first patient was a 27-year-old man, who was referred to our hospital with a 5 month history of intermittent postprandial abdominal pain, particularly in the epigastrium. He complained of nausea that developed after an 8 kg

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weight loss over 5 months. The second patient was a 36-year-old woman with bilious vomiting and severe abdominal pain after a regular diet with an irritable bowel. In addition, she had lost 6 kg in weight for 3 months. They had a nonspecific medical or surgical history. A physical examination revealed a slightly higher bowel sound on epigastrium. All the laboratory values were unremarkable.

In both cases, the esophgogastroduodenoscopy was nonspecific and showed no evidence of a gastric pyloric obstruction. The upper gastrointestinal series following the small bowel demonstrated a partial obstruction of the third portion of the duodenum with a marked proximal dilatation (Fig. 1A and B). The diagnosis was made by angiography and an abdomen computed tomography scan, which showed a compression of the duodenum between the aorta and SMA (Fig. 2).

In both cases, the aortomesenteric angle was lower. The symptoms did not improve after conservative management, and subsequent surgical consultation and surgery were requested.

Laparoscopic surgery was performed under general anesthesia with endotracheal intubation.



Fig. 1. A, B Preoperative UGI series with a hypotonic duodenography revealed a distended 2nd and 3rd portion of the duodenum.

The patient was placed in the supine position. A nasogastric tube and urinary catheter were positioned. Four trocars were used in both cases. A 10 mm trocar was inserted through the umbilicus using an open technique. A carbon dioxide pneumoperitoneum of 12 mmHg was established, and a zero degree telescope was inserted. Two 5 mm trocars were placed lateral to the rectus sheath on the right lower and left upper quadrant of the abdomen, and one 12 mm port was made on the left lower quadrant abdomen under direct laparoscopic vision. The patient was tilted to the left side in the reverse Trendelenburg position. An abdominal exploration was performed. The transverse mesocolon was lifted upward and the small bowel was cleared from the field. In both cases, the duodenum could easily be seen, and there was a dilated third portion of the duodenum immediately to the right of the superior mesenteric artery, suggesting a distal obstruction. The rest of the small bowel or colon was decompressed. The ligament of Treitz was identified, and a portion of the proximal jejunum, approximately 30 cm distal to the ligament of Treitz, was easily moved to the dilated duodenum. A vicryl stay suture was placed between the duodenum and the jejunum, whilst holding these two portions of the bowel in apposition. An enterotomy was performed on each part of the duodenum and the jejunum. A 45 mm Endo GIA (Ethicon Endosurgery, Cincinnati, Ohio, USA) was introduced into both lumens through the 12 mm trocar and fired on the antemesenteric border, and a



Fig. 2. Case 2. 36-year-old woman. Contrast-enhanced Abdomen CT scan showing a compression of the duodenum between the aorta and superior mesenteric artery.



Fig. 3. Hypotonic duodenography a patient who underwent a duodenojejunostomy with a flow of contrast past the stapled anastomosis.

duodenojejunostomy was then created. The remaining enterostomy was closed using a running 2-0 vicryl suture. The abdomen was irrigated and the trochar were removed. The surgery time was 180 minutes including a laparoscopic appendectomy for the first case and 165 minutes for the second. The patients recovered well postoperatively, and were discharged on the fifth and sixth postoperative day, respectively. A gastrograffin contrast study revealed no leak with a patency of the duodenojejunal anastomosis (Fig. 3). They were discharged without complications. Both patients are tolerating a normal diet. The first patient gained 5 kg in body weight during first 3 months and the second gained 6 kg 6 month after the operation. A 12 month follow-up study was conducted in both cases and they are tolerating a regular diet well.

DISCUSSION

Superior mesenteric artery syndrome is recognized by weight loss, nausea, vomiting, and post-prandial pain due to a compression and partial obstruction of the third portion of the duo-

denum between the superior mesenteric artery, the spine and the aorta.^{1,2,8} It is a rare clinical condition that should be considered in patients with long-standing abdominal complaints where the endoscopic and conventional radiological findings are often negative. The actual incidence is unknown since the diagnosis is not frequently pursued in chronically ill patients.³ A diagnosis of SMA syndrome should be considered in adults with bilious vomiting. Endoscopy can rule out an intrinsic lesion of the stomach and the duodenum. The disease can be confirmed with a barium meal and arteriography, which can be performed simultaneously. This tool shows the compressed portion of the duodenum by SMA, and the aortomesenteric angle can be measured on the lateral view.⁴

Non-surgical treatments are recommended as an initial therapy of SMA syndrome. Surgery is indicated if non-surgical treatment fails. Historically, open surgical management has included a gastrojejunostomy, dissection and cutting of the ligament of Treitz with a repositioning of the duodenum, and a duodenojejunostomy.⁸ Some authors have suggested other procedures but have reported poor results. Most surgeons agree that the most successful procedure for management of SMA syndrome is a duodenojejunostomy. Mas-soud reported the laparoscopic management of 4 cases of documented SMA syndrome after the failure of medical treatment.⁵ The authors reported that a laparoscopic severing of the ligament of Treitz is a feasible and safe technique. It resulted in the total relief of symptoms in 3 out of the 4 patients. Gersin and Heniford reported first successful laparoscopic duodenojejunostomy case.⁶ Recently, Richardson and Surowiec also reported two cases of laparoscopic duodenojejunostomy with both patients doing well after surgery.⁷ However, the patients had a previous abdominal surgery history. Therefore, the cause of the SMA syndrome may be different from our cases.

One of the advantages of a laparoscopic procedure is that the operative time is much lower with the acquaintance of the field. The visualization is quite satisfactory. The technique offers added precision and accuracy to the dissection maneuvers. Recovery was uneventful and rapid

with minimal need for postoperative analgesia. The psychological impact of a minimal invasive approach together with symptom relief was quite rewarding.

In conclusion, SMA syndrome can be successfully treated laparoscopically. A laparoscopic duodenojejunostomy is a safe and feasible technique with the benefits of reduced pain, hospital stay, and postoperative disability. It provides a good treatment whilst being a minimally invasive surgical technique in a duodenal obstruction.

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