Laparoscopic Esophagogastroplasty in Management of Megaesophagus with Axis Deviation

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Abstract The results of cardiomyotomy in patients of achalasic megaesophagus with axis deviation are not satisfactory. Usually, an esophagectomy is advocated. We describe the technical details and outcomes of laparoscopic esophagogastroplasty for end-stage achalasia. The patient had end-stage achalasia, characterized by tortuous megaesophagus with axis deviation. The surgery was performed in supine position using four abdominal ports. The steps included mobilization of the gastroesophageal junction and lower intrathoracic esophagus, straightening the pulled intrathoracic esophagus into the abdomen, and a side-side esophagogastroplasty using purple Endo GIA Articulating Tri-Staple load, two firings. Duration of surgery was 52 min. The patient was ambulated on the first postoperative day. Oral feeding was initiated by the third postoperative day. The patients had significant improvements of dysphagia. At 3 months of follow-up, the patient is euphagic without significant symptoms of gastroesophageal reflux. Laparoscopic esophagogastroplasty is an effective option for relieving dysphagia in megaesophagus due to achalasia with axis deviation. It is a reasonable alternative before subjecting to a major and

potentially morbid esophagectomy. It creates a large gastro-esophageal (GE) junction, which, with the help of gravity, helps food transit. By dividing the muscles of the GE junction completely, it also achieves a complete cardiomyotomy. Less operative time and blood loss, quicker recovery, and better cosmesis make it an attractive option. While potential reflux is a possibility, the reported case has not shown significant GERD symptoms.

Keywords Megaesophagus · Esophagogastroplasty · Achalasia cardia · Sigmoid esophagus

Introduction

Achalasia is an esophageal motility disorder characterized by decreased peristalsis and incomplete relaxation of lower esophageal sphincter (LES) due to loss of the myenteric plexus.

Laparoscopic myotomy with fundoplication is standard of care for achalasia, but in patients of megaesophagus, especially with axis deviation, this procedure is inadequate. Esophagectomy is an option, but with high morbidity and mortality. There is a need to look for alternatives. We describe an alternative technique, laparoscopic esophagogastroplasty, in the management of end-stage achalasia.

Materials and Surgical Technique

This procedure was performed under general anesthesia. The patient was positioned supine with a leg split, and the surgeon stood in between the legs. Standard four abdominal ports were used: one supraumbilical 10-mm port (for the laparoscope), a 12-mm port on the left midclavicular line 3 cm above the umbilicus, a 5-mm port on the right midclavicular line 2 cm

Key Message Laparoscopic esophagogastroplasty is an effective option for relieving dysphagia in megaesophagus due to achalasia with axis deviation

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Surgical Technique Laparoscopic esophagogastroplasty in management of megaesophagus with axis deviation.

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Fig. 1 Gastroesophageal junction mobilization in which anterior and posterior phrenoesophageal ligaments and short gastric ligaments were dissected

above the umbilicus, and a 5-mm epigastric port for retraction of the left lobe of the liver.

In gastroesophageal junction mobilization, anterior and posterior phrenoesophageal ligaments and short gastric ligaments were dissected (Fig. 1). Anterior and posterior vagus were preserved. Hiatal dissection was done, and intrathoracic esophagus was mobilized to straighten the lower intrathoracic esophagus to a length of 6–8 cm (Fig. 2a).

The position of a laparoscopic stapler (Tri-Staple purple load) introduced into the gastrostomy with one limb into the esophagus side and the other limb to the gastric side (near lesser curve) was checked with an endoscope and fired (Fig. 3a). Staple line was checked with an endoscope and laparoscope, and the second load was fired (Fig. 3b). Anterior gastrostomy was closed with intracorporeal running suture. Endoscope was passed to check that the anastomosis was wide with no leak.

Result

Duration of surgery was 52 min for this patient. Oral feeding was initiated by the second postoperative day. He had significant improvement of dysphagia. He was discharged by the fifth postoperative day.

At 3 and 6 months of follow-up, the patient was euphagic without significant symptoms of gastroesophageal reflux.

Discussion

Gottstein first defined cardiomyotomy in 1901. Heller, in 1913, defined the procedure for achalasia [1].

For achalasia, laparoscopic cardiomyotomy with a partial fundoplication is the procedure of choice for its simplicity and good result [2].

However, in patients with end-stage achalasia, i.e., megaesophagus and intrathoracic gastric fundus with axis deviation (grade IV), conventional cardiomyotomy fails to provide adequate drainage, relief of symptoms including aspiration, and improved quality of life [3]. Several types of esophagectomy are proposed in the literature believing that resection of the diseased esophagus leads to a marked functional improvement. However, for a benign disease, such a major procedure with associated significant morbidity (30 %) and mortality (2 %) is difficult to accept [4]. This subtype of achalasia still represents a surgical challenge.

We described an alternative technique, laparoscopic esophagogastroplasty, in the management of end-stage achalasia.

Fig. 2 **a** Intrathoracic esophagus mobilization and anterior gastrostomy made on the cardia of the stomach. **b** Anterior gastrostomy was made on the cardia of the stomach using a harmonic scalpel

Fig. 3 a, b Laparoscopic stapler (Tri-Staple purple load) introduced into the gastrostomy (one limb in the esophagus and one in the stomach) and fired. Staple line checked with an endoscope and laparoscope

Benefits This minimally invasive technique is easy to perform, with low morbidity and mortality. It essentially created a large opening at the gastroesophageal (GE) junction along with a complete division of muscle fibers. While complete muscular division ensures no narrowing or obstruction at GE junction, the wide anastomosis helps to utilize gravity for swallowing where there is a lack of forward propulsion.

Endoscopic stapler anastomosis (Tri-Stapler) in this region is easy, safe, and quick. Endoscopy before firing the stapler ensures correct position of the staple limbs (one limb in the esophagus and one limb in the stomach). The general principle of good intrathoracic and GE junction mobilization ensures enough intra-abdominal esophagus and fundus for adequate stapling. After stapler firing, repeat endoscopy ensures (1) adequacy of anastomosis, (2) hemostasis, and (3) airtight closure of gastrostomy.

Unlike other series, we did not perform the anti-reflux procedure as (1) such a wide anastomosis is unlikely to have peptic stricture, (2) there is no fundus available for fundoplication, and (3) different types of hitching procedure used in fixing the stomach with the diaphragm as performed in some reports (e.g., [5]) are still experimental without any documented benefit, and it increases procedural time and complexity [5]. However, regular endoscopic surveillance is recommended to monitor the development of reflux-related complications. Larger series can illuminate if, when, and what anti-reflux procedure is required.

Because of good results in terms of symptom relief, less operative time and blood loss, quicker recovery, and better cosmesis, laparoscopic esophagogastroplasty can be considered as a viable alternative in the management of end-stage achalasia. If this procedure fails, we can always go back to the

traditional procedure of esophagectomy, which is a major and potentially more morbid procedure.

Further studies with a long-term follow-up are required to reach more definitive conclusions, especially as to the occurrence of later complications.

Source(s) of Support None.

Conflict of Interest None.

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