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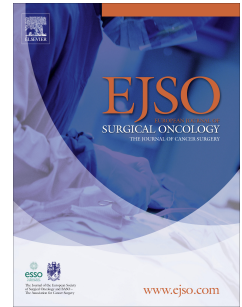
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Surgical management of medicamentous, uncontrollable biliary reflux after esophagectomy and gastric pull-up

¹ Carina Riediger, MD, ¹ Matthias Maak, MD, ² Bruno Sauter, MD, ¹ Helmut Friess, MD, ¹ Robert Rosenberg, MD

¹ Chirurgische Klinik und Poliklinik, Klinikum rechts der Isar, Technische Universität München, Munich, Germany

² II. Medizinische Klinik, Hegau-Klinikum GmbH, Singen

Corresponding author and requests for reprints:

Univ.-Prof. Dr. med. H. Friess

Chirurgische Klinik und Poliklinik

Klinikum rechts der Isar der Technischen Universität München

Ismaningerstr. 22

81675 Munich, Germany

Phone: 0049-89-4140-2121

Fax: 0049-89-4140-4870

E-mail: Friess@chir.med.tu-muenchen.de

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INTRODUCTION

Management of medicamentous uncontrollable biliary reflux after esophagectomy and gastric pull-up is a challenging surgical problem.[1] Although functional disorders after esophagectomy can usually be satisfactorily handled by dietary measures in combination with specific medications, functional disorders persist in rare cases despite extensive conservative treatment procedures. Surgical re-intervention is a rarely used, second-choice option. This case report describes successful surgical intervention due to medicamentous, uncontrollable biliary reflux after esophagectomy and gastric pull-up.

DESCRIPTION

We present the case of a 60-year-old male patient with severe, medicamentous, uncontrollable biliary reflux seven years after curative subtotal esophagectomy, which was performed at an external hospital in 2001 due to an infrabifurcal squamous cell carcinoma of the esophagus. Reconstruction of the intestinal passage had been performed with a total gastric pull-up in combination with a pyloroplasty to avoid gastric emptying problems. The postoperative histopathology had revealed a pT1N0M0R0 tumor.

The patient had suffered since the operation from biliary (alkaline) gastro-esophageal reflux, which was classified in 2006 as grade IV according to Savary and Miller, in 2007 as grade II and in 2008 as grade II–III under medicamentous treatment and before admission. At admission, the patient was suffering clinically from heartburn, regurgitation and daily vomiting at night-time. Conservative treatment with medication

including high-dose proton pump inhibitors (PPI), antacids, metoclopramide, domperidone and cholestyramine had been initially effective, but did not maintain a satisfactory state of health as documented by endoscopy and the symptoms had worsened again in the last year before admission. Although the patient had refrained from eating in the evening, he continued to suffer from severe biliary reflux, which worsened during the night and led to coughing due to silent aspiration and vomiting.

Flexible endoscopy at our department confirmed stage II reflux esophagitis. The esophageal anastomosis at 27 cm was wide and without evidence of tumor recurrence. The gastric pull-up showed signs of gastritis and 80 ml of biliary reflux was suctioned from the gastric pull-up. The pylorus was moderately distorted, but passable. The biliary reflux was confirmed by a Bilitec measurement and, in addition, acid reflux was detected by 24-h esophageal pH monitoring. Fraction time with pH < 4.0 was 10.4%. The DeMeester score in the pH channel was 140.4. pH monitoring showed under the PPI, in addition to the biliary reflux, reflux disease, especially in the horizontal position and postprandially. In addition, manometry and barium swallow were performed.

Based on the examinations performed and the long history of worsening symptoms, we decided to operate. We performed a postbulbar exclusion of the duodenum with preservation of the right gastroepiploic artery. The intestinal passage was reconstructed with a postpyloric end-to-side Roux-en-Y duodenojejunostomy and a side-to-side jejunostomy (Figure 1). The postoperative course was uneventful. Immediately after the operation the patient became asymptomatic. He was discharged from our department eight days after operation. The patient was completely asymptomatic in the 18-month follow-up. Postoperative pH monitoring 18

months after the operation revealed no biliary reflux, but the acid component remained in the pH monitoring (without PPI) with a fraction time pH<4.0 of 10.4% and a DeMeester score of 140.4. The patient and his gastroenterologist were contacted postoperatively several times and both reported that the patient was completely asymptomatic under PPI medication. All symptoms (vomiting, cough and inability to eat in the evening), which were caused by the alkaline reflux, were resolved.

DISCUSSION

Reflux of duodenal and/or gastric contents after esophagectomy and gastric pull-up is a recognized problem and occurs in 60–80% of patients.[2] Patients often report after esophagectomy clinical signs of gastro-esophageal reflux such as heartburn, regurgitation, and coughing, all of which can alter quality of life. Reflux—particularly at night—causes the risk of aspiration pneumonia. Biliary and/or acid reflux can usually be well managed and controlled conservatively through dietary measures in combination with specific medications such as prokinetics (metoclopramide or erythromycin), antacids, and bile acid binders such as cholestyramine.[1,3]

Conservative therapeutic approaches to avoid or control functional conduit disorders are usually successful. In addition, eating four to six small meals per day and staying upright for at least one hour after the meal are helpful. If symptoms persist even after all dietary and medical options have been applied, reoperation remains the ultimate therapy.

The patient presented in our case underwent an unusual reconstruction of the intestinal passage after esophagectomy, which may explain the severity of his

symptoms. We and other large esophageal centers believe that the operation of choice, offering the best functional outcome for infrabifurcal esophageal cancer, is an abdomino-thoracic esophagectomy with gastric tube pull-up and intrathoracic anastomosis [4-6] (Figure 1). We would not perform a total gastric pull-up or a pyloroplasty. Nevertheless, although several surgical techniques of reconstruction after esophagectomy are described in the literature, no randomized controlled data have been published on the reconstruction of choice.[7-8]

Some centers prefer a gastric pull-up; others prefer a colon interposition. Most groups that prefer the stomach for reconstruction use a gastric tube pull-up, while a few prefer a total stomach pull-up. Advantages and disadvantages have been published for each of these techniques.[7-8] Gastric pull-up for esophageal reconstruction has the advantages of reliable perfusion from the right gastroepiploic artery, the relative simplicity of the operation compared with the colon interposition, the need for only one anastomosis (esophagogastrostomy), and the functional preservation of the gastrointestinal passage. Disadvantages are the loss of gastric reservoir function after tube reconstruction, the danger of anastomotic leakage due to intrathoracic gastric secretion, and early or late reflux complications combined with silent pulmonary aspiration.

Although no randomized controlled data have been published, most high-volume centers favor the stomach and form a gastric tube as reconstruction after esophagectomy.[9-10] For better functionality it seems to be important for the gastric tube to have a diameter of about 5 cm, and the esophago-gastric anastomosis should be located above the azygos vein. In addition, the interposition should be

located in the posterior mediastinum. The reconstruction with a whole stomach as a conduit leads to more gastric emptying problems.

The need for a gastric drainage procedure such as pyloroplasty or mechanical endoluminal dilatation of the pylorus after pull-up of the stomach is also a controversial topic of discussion. No data have been published that have shown any advantages of pylorus dilatation procedures. Donington state that a drainage procedure seems to be helpful, especially when the whole stomach is used as a conduit.[11] We occasionally perform an endoluminal dilatation of the pylorus using a clamp, and believe that an operative pyloroplasty intensifies reflux symptoms, as demonstrated in the case presented here, and represents overtreatment to avoid gastric emptying problems.

Palmes et al. analyzed the advantages of pyloric drainage in 198 patients with gastric conduit reconstruction after esophagectomy. They compared pyloroplasty, pylorotomy and no pyloric drainage operation. There was no improvement in delayed gastric emptying problems, which were found in one third of all patients, but there was increased bile reflux and reflux esophagitis in patients undergoing pyloric drainage.[11]

Another group tried to reduce duodenal and biliary reflux after esophagectomy by performing 360° fundoplication around the anastomosis and the remnant esophagus. They observed less reflux after this modification of the operation.[12]

CONCLUSION

Although no evidence-based recommendations are available, we recommend that reconstruction after esophagectomy includes creation of a gastric tube pull-up instead of using the full-sized stomach and the abdication of pyloroplasty to avoid problems with reflux. We present the case of a patient with medicamentous, uncontrollable biliary reflux after esophagectomy, which was successfully managed by the exclusion of the duodenum and a Roux-en-Y reconstruction. We recommend this technique as a potential surgical option in patients with severe gastro-esophageal reflux after esophagectomy.

Conflict of interest statement

None to declare.

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ACCEPTED MANUSCRIPT

Figure 1: Illustration of reconstruction techniques after esophagectomy. A: normal anatomy. B: total gastric pull-up with end-to-side esophagogastrostomy and pyloroplasty. C: exclusion of the duodenum with end-to-side Roux-en-Y duodenojejunostomy and side-to-side jejuno-jejunostomy. D: tube gastric pull-up with end-to-side esophagogastrostomy.

