Case Report

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An Unusual Case of a Patient with a Chemical Burn of the Esophagus and Gastric Perforation

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Abstract Treatment of patients with chemical burns of the esophagus and stomach is a difficult task.

Perforation of the stomach or the formation of strictures of the esophagus, stomach, duodenum, and even the initial parts of the jejunum can be the outcome of chemical burns.

Patients with concomitant esophageal and gastric strictures are the most difficult to treat, which often requires multi-stage operations.

This article describes a clinical case of surgical treatment of a patient with a combined chemical burn of the esophagus and stomach with hydrochloric acid. One week after hospitalization, the patient had gastric perforation. The patient was urgently operated in the course of peritonitis. The peculiarity of the operation was that the surgeons, having made a gastrectomy, removed the esophageal stump to the anterior abdominal wall in the epigastrium and applied an enterostomy. In such a state with significant alimentary depletion (body mass index — BMI 15) on 11.10.02 the patient was taken to a Moscow clinic. A year later, the main surgical reconstructive treatment was performed — retrosternal bypass esophagoplasty of the right half of the large intestine and the terminal ileum in the isoperistaltic position, as well as extirpation of the esophagus. As a result of long-term treatment and several surgical interventions, a good short-term and long-term result was obtained.

Keywords: colon esophagoplasty, chemical burns, esophagus, stomach, complications.

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BMI - body mass index
USG – Ultrasound imaging

INTRODUCTION

There are a large number of surgical interventions performed for cicatricial narrowing of the esophagus. With a short stricture (up to 4 cm), bougienage or dilatation of the esophagus is performed, or local esophagoplasty: resection of the stricture with end-to-end anastomosis or longitudinal dissection of the esophagus with transverse suturing. With extended and total strictures, as a rule, bougienage and dilatation are ineffective; in such cases, plastic surgery of the esophagus is performed. In this case, an artificial esophagus is formed from the stomach or large intestine [1].

It is known that in the affected esophagus, excluded from the passage of food, the risk of developing malignant neoplasms increases significantly, therefore, esophagoplasty with simultaneous extirpation or resection is preferable to bypass surgery. Sometimes it is not possible to use the stomach due to damage to it or previous surgical interventions, for example, gastrectomy. In such cases, the optimal graft choice is the colon. The decision to select a specific area of the intestine for transplantation is made intraoperatively, based on a trial clamping of the supply vessels for the most accurate assessment of the viability of the future graft [1, 2].

Despite the complexity of colonic esophagoplasty, these interventions are able to restore the physiological diet and achieve a sufficiently high quality of life for the patient [2].

Clinical case

Patient S., 37 years old, on 10/11/2002, was enrolled in a planned manner in the Central Clinical Hospital No. 2 named after N.A. Semashko of the Ministry of Railways of Russia to perform a reconstructive operation. From the anamnesis it is known that on March 21, 2002, the patient was operated on at the Chelyabinsk road hospital for gastric perforation due to a chemical burn with hydrochloric acid; gastrectomy, esophagostomy, enterostomy on the Roux-enabled loop were performed (Fig.1). Esophagoenteroanastomosis was not formed due to fibrinous-purulent peritonitis, but fortunately, surgeons managed to bring the stump of the esophagus with a probe installed in its lumen to the anterior abdominal wall. A laparostomy was formed, and on April 18, 2002, secondary sutures were placed on the wound of the abdominal wall.

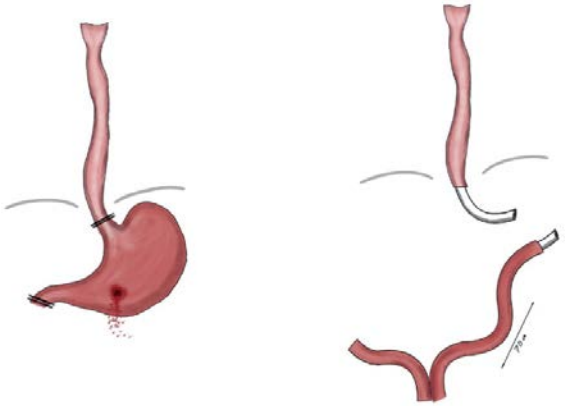

Fig. 1. Gastrectomy, esophagostomy, enterostomy on the Roux loop.

At the time of admission to the Semashko's Central Clinical Hospital the patient's body weight deficit was 30 kg. Feeding was carried out through an enterostomy.

Esophagoscopy revealed that the mucosa of the esophagus was hyperemic, at a distance of 40 cm – a cicatricial narrowing up to 0.3 cm.

When X-raying the esophagus, there was no violation of the act of swallowing, the lumen of the esophagus was passable for barium suspension throughout (Fig.2).

Fig. 2. X-ray of the esophagus and an intestine loop connected with it.

A biochemical blood test revealed severe dyslipidemia and dysproteinemia.

After correcting the nutritional status with the use of parenteral nutrition and enteral mixtures through the stoma, the patient gained 12 kg in weight and was operated on.

On October 29, 2002, an attempt was made to form an anastomosis between the loop of the jejunum carrying the enterostomy and the stump of the esophagus. However, due to a burn injury, the wall of the esophagus was thinned, which led to the eruption of the sutures. Taking into account the risk of failure of the esophago-intestinal anastomosis, it was decided to abandon this operation. Esophagostomy on the neck was carried out, a rubber probe was installed in the disconnected esophagus from the side of its abdominal part and brought out on to the abdominal wall. Since the lumen of the enterostomy was extremely small - about 5 mm, the enterostomy was reconstructed, the end enterostomy was removed on the Roux-enabled loop in the left mesogastrium to provide more complete nutrition for the patient (Fig. 3).

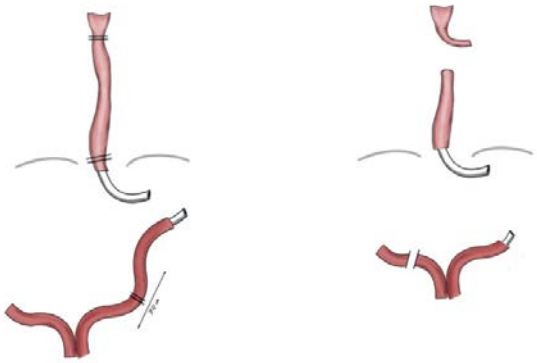

Fig. 3. Enterostomy reconstruction, exclusion of the esophagus.

The postoperative period passed without complications and on the 17th day the patient was discharged for outpatient observation and treatment.

Six months later, on May 5, 2003, the patient was admitted for further planned surgical treatment. He gained 4 kg in weight (body mass index (BMI) was 18). Feeding was carried out through the enterostomy. On May 21, 2003, under general anesthesia, the patient underwent to retrosternal shunt plasty of the esophagus with the right half of the colon and the terminal ileum in the isoperistaltic position while maintaining the graft blood supply due to the middle colonic artery and the Riolan arch; closing the esophagostomy and closing the enterostomy (Fig. 4). It should be noted that due to the pronounced adhesive process that arose as a result of peritonitis and a previously imposed enterostomy, it was not possible to use the left half of the colon for creation of the artificial esophagus.

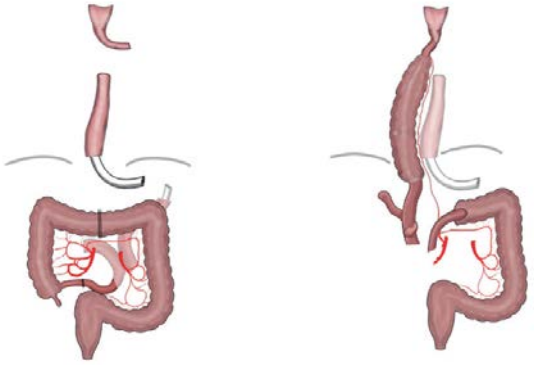

Fig. 4. Plastic replacement of the esophagus with the right half of the large intestine

The postoperative period proceeded without complications. At the control radiography on the 5th day of the postoperative period, the passage of contrast medium along the graft was free. The patient was discharged on 06/09/2003 with a recommendation to continue treatment after six months, it was supposed to remove the intrathoracic esophagus at this stage.

At the end of June of the same year, the patient began to complain of dysphagia, and a cicatricial stricture of the esophago-intestinal anastomosis was detected. A course of bougienage with bougiens No. 24-40 was carried out with a positive effect. The dysphagia was corrected and the patient was discharged.

After 2.5 weeks, again there were complaints of dysphagia. An x-ray of the esophagus revealed restenosis of the esophageal-intestinal anastomosis up to 0.7 cm. The patient underwent 4 procedures of bougienage with dilators No. 28-40 under X-ray control with radiopaque bougie along the conductor string. Two procedures of balloon hydrodilation along the conductor string were performed with a positive effect. The patient was discharged on August 21, 2003, he could eat any food without difficulty.

The patient was admitted again on 03.11.2003 with complaints of nausea, fever up to 38°C, and a tumor-like formation in the epigastric region. According to the patient, the esophageal fistula that had existed since the operation closed on its own by the time the body temperature rose.

When examined in the epigastric region to the left of the postoperative scar, a tumor-like formation of a soft-elastic consistency 5x5 cm was determined. No discharge was detected from the fistulous tract located to the right.

Ultrasound examination (USG) in this area determined an anechoic formation measuring 10x7.6 cm with a heterogeneous liquid content. Due to the danger of a breakthrough of a liquid formation into the mediastinum or abdominal cavity, the patient was urgently operated on: the abscess was opened and drained, the source of the abscess was the stump of the esophagus. About 400 ml of purulent contents was removed (Fig. 5, 6).

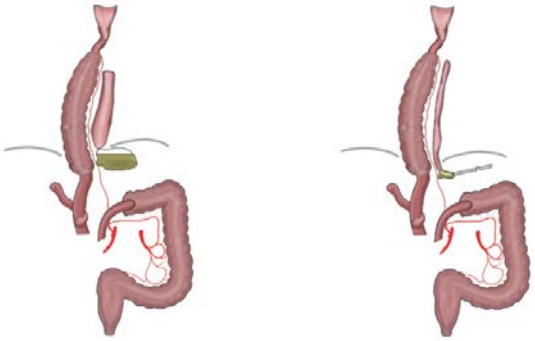

Fig. 5. Removal of accumulation of purulent fluid from under the diaphragm.

Fig. 6. Fluid removal and draining from under the diaphragm. An X-ray film.

The postoperative period proceeded without complications. The patient was discharged for further outpatient treatment at the place of residence.

In February 2004, the patient entered again for the next stage of treatment. In view of the presence of a non-healing external fistula on February 19, 2004, after an attempt at thoracoscopic removal of the esophagus, an operation was performed - thoracotomy on the right, removal of the disconnected esophagus. The postoperative period passed without complications (Fig. 7).

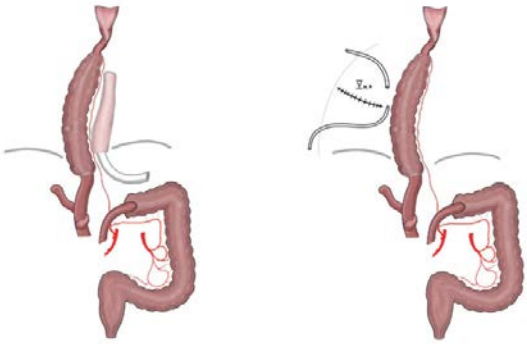

Fig. 7. Toracotomy on the right, removal of the nonfunctioning esophagus.

On the 12th day for obliteration of the fistula, a thrombovar 3% was introduced into it. On March 5, 2004, the patient was discharged in a satisfactory condition.

After 1.5 weeks, on April 15, 2004, the patient was admitted again with complaints of an increase in body temperature up to 38°C. USG revealed under the aponeurosis of the anterior abdominal wall a hypoechoic formation 3.5x2 cm with a capsule - an abscess of the abdominal cavity. The next day, an abscess was opened and drained.

On May 12, 2004, an operation was performed: removal of the stump of the abdominal esophagus, excision of the fistula. The postoperative period proceeded without complications.

After 13 years, the patient was examined. He had no complaints, ate normally, worked. On July 27, 2017, the act of swallowing was not disturbed by X-ray of the esophagus, there was no delay in the passage of barium suspension through the artificial esophagus, it immediately entered the small intestine (Fig. 8, 9).

Fig. 8. X-ray of the artificial esophagus (lateral projection).

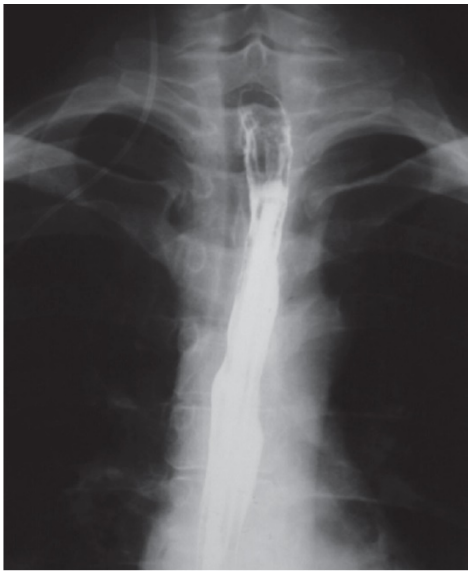

Fig. 9. X-ray of the artificial esophagus (direct projection).

CONCLUSION

Pronounced adhesive process, as well as a history of gastrectomy is not a contraindication to esophagoplasty using a colonic graft.

In case of severe malnutrition of the patient, the nutritional status should be carefully corrected prior to surgery.

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