VIDEOLAPAROSCOPIC SURGICAL TREATMENT OF STRANGULATED PARAESOPHAGEAL HERNIA (CLINICAL OBSERVATION)

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ABSTRACT

Background. *Paraesophageal hernias are much less common than other types of diaphragmatic hernias. The risk of strangulation in this pathology is about 21 %. It is often very difficult to establish the correct diagnosis in time, because patients are admitted with an atypical clinic of acute cardiological or pulmonary pathology. Usually, the correct diagnosis is established only on the 4th day. Due to late diagnosis, necrosis and perforation of the strangulated organ occur, which causes high mortality; sometimes the correct diagnosis is established only at autopsy.*

Clinical observation. *The patient was admitted to the surgical department on an emergency basis with complaints of intense pain in the lower chest and epigastric region, vomiting of eaten food. From the anamnesis it is known that about a year ago, periodic nausea and vomiting of food eaten began to bother. The patient had been experiencing increased chest and epigastric pain and vomiting for the last 12 hours before admission to the hospital. X-ray diagnosed strangulated paraesophageal hernia of the esophageal opening of the diaphragm. During esophagogastroduodenoscopy it was impossible to pass into the distal parts of the stomach; hyperemia and petechial hemorrhages were detected in the zone of strangulation. Video-laparoscopic reduction of the hernial contents, resection of the hernial sac and anterior diaphragm crurorrhaphy were urgently performed. The early postoperative period was uneventful. The presented clinical observation indicates the promise of using video-endoscopic technologies for diagnosis and treatment of strangulated diaphragmatic hernias. The key to success is the timely establishment of the correct diagnosis. We consider it impractical to perform an antireflux intervention simultaneously in conditions of an acute inflammatory process.*

Key words: *strangulated paraesophageal hernia, video-laparoscopic surgery, gastroesophageal hernia, diaphragm cruraphy*

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ВИДЕОЛАПАРОСКОПИЧЕСКОЕ ОПЕРАТИВНОЕ ЛЕЧЕНИЕ УЩЕМЛЁННОЙ ПАРАЭЗОФАГЕАЛЬНОЙ ГРЫЖИ ПИЩЕВОДНОГО ОТВЕРСТИЯ ДИАФРАГМЫ (КЛИНИЧЕСКОЕ НАБЛЮДЕНИЕ)

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РЕЗЮМЕ

Актуальность. *Параэзофагеальные грыжи пищеводного отверстия диафрагмы встречаются значительно реже других типов диафрагмальных грыж. Риск ущемления при этой патологии составляет около 21 %. Зачастую очень сложно своевременно установить верный диагноз, поскольку пациенты поступают с нетипичной клиникой острой кардиологической или пульмонологической патологии. Как правило верный диагноз устанавливается только на 4-е сутки. Из-за поздней диагностики возникают некрозы и перфорации ущемлённого органа, что вызывает высокую летальность. Иногда правильный диагноз устанавливается только при патологоанатомическом вскрытии.*

Клиническое наблюдение. *Пациентка поступила в хирургическое отделение в экстренном порядке с жалобами на интенсивные боли в нижних отделах грудной клетки и эпигастральной области, рвоту съеденной пищей. Из анамнеза известно, что около года назад стали беспокоить периодические тошнота и рвота съеденной пищей. Последние 12 часов до поступления в стационар усилились боли в грудной клетке и эпигастрии, вся съеденная пища вышла со рвотой. Рентгенологически диагностирована ущемлённая параэзофагеальная грыжа пищеводного отверстия диафрагмы. При фиброэзогастродуоденоскопии пройти в дистальные отделы желудка невозможно, в зоне ущемления определяется гиперемия и петехиальные кровоизлияния. В экстренном порядке выполнено видеолапароскопическое вправление грыжевого содержимого, резекция грыжевого мешка и передняя диафрагмокрурорафия. Ранний послеоперационный период протекал без осложнений. Представленное клиническое наблюдение указывает на перспективность использования видеоэндоскопических технологий в диагностике и лечении ущемлённых диафрагмальных грыж. Ключевым моментом успеха является своевременная постановка верного диагноза. Считаем нецелесообразным одномоментное выполнение антирефлюксного вмешательства в условиях острого воспалительного перипроцесса.*

Ключевые слова: *ущемлённая параэзофагеальная грыжа, видеолапароскопическая хирургия, грыжа пищеводного отверстия диафрагмы, диафрагмокрурорафия*

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RELEVANCE

Paraesophageal hernia occurs when abdominal organs (stomach, small and large intestine loops, large omentum) moves up to the posterior mediastinum through the esophageal opening of the diaphragm next to the esophagus. Paraesophageal hernias are extremely rare compared with other types of diaphragmatic hernias. Their frequency varies from 0.4 to 1.4 % of cases [1]. The risk of strangulation in case of this pathology is about 21 % [2]. Due to the rarity and complexity of the diagnosis, the average time to determine the correct diagnosis is about 4 days [3]. Patients are often admitted to the emergency room with an atypical manifestation of acute cardiological or pulmonological pathology [4]. While the diagnosis is being made, such formidable complications as perforation and necrosis of the affected organ, acute posterior mediastinitis and pleural empyema can develop. According to different clinics, the mortality rate due to strangulated paraesophageal hernia ranges from 11.1 to 66 % [3–5]. Sometimes the diagnosis can be determined only during a pathoanatomic autopsy (Fig. 1).

FIG. 1.
Strangulated paraesophageal hernia, as the cause of death of the patient, revealed at postmortem autopsy (photo courtesy of the Bureau of Forensic Medical Examination of the Altai Territory): **1** *– strangulating ring;* **2** *– strangulated fundus and body of the stomach;* **3** *– left lung*

There are isolated observations of the successful use of video endoscopic and robot-assisted technologies in the surgical treatment of strangulated paraesophageal hernias [2, 4, 6, 7].

CASE STUDY

A 38-year-old female patient was taken by ambulance to the surgical department in an emergency with complaints of intense pain in the lower half of the chest and epigastrium, nausea and vomiting. It is known from the patient history that she has been in this condition for about a year, when recurrent nausea and vomiting of eaten food occurred. During the last week, the frequency of these manifestations has been increasing, moderate dull epigastric pain occurred. Previously, X-ray examination diagnosed a fixed paraesophageal hernia. The patient had been experiencing increased chest and epigastric pain and vomiting for the last 12 hours before admission to the hospital.

Physical examination data

The patient's condition on admission of moderate severity, conscious, oriented to person, time and place. Normosthenic body type. BMI – 28 kg/m^2 (overweight), body temperature – 36.6 °C. The skin is flesh-colored. The skin is normohydrated, turgor and elasticity are normal. Vesicular respiration during auscultation in all lung fields, no rale. The number of respiratory movements is 19 per minute. The arterial pressure in the brachial arteries is 120/80 mm Hg, same on the left and right. The pulse is 96 bpm. During auscultation of the heart – tones are clear, no murmurs. Status localis: the tongue is moist, covered with white plaque in the back area. When examined, the abdomen is of the correct shape, participates in the act of breathing, there are no deformities of the anterior abdominal wall. An atrophic scar is determined along the midline from the navel to the womb (after cesarean section). No hernia defects of the anterior abdominal wall detected. Deep palpation reveals moderate tenderness in the epigastric region. There is no muscular defense. According to the percussion of the liver (Kurlov's method), size of the liver is 9–8–7 cm. Rebound tenderness (Shyotkin – Blumberg sign) is negative. Auscultation: intestinal motility active. Per rectum: no space-occupying lesions (SOLs) in the rectum palpated, traces of brown stool on the glove.

Results of additional study methods

Laboratory parameters within the reference values (leukocytes – 5.9 × 10^9/L, hemoglobin – 158 g/L). ECG – sinus rhythm 90 per minute, increased cardiac electrical activity. X-ray examination of the oesophagus and stomach – upright position above the diaphragm reveals the cardiac, vault and body of the stomach with pronounced pneumatosis and fluid level above the diaphragm, contrast is administered in small portions to the antral area (Fig. 2).

Fibro-esogastroduodenoscopy – gastric contents were found to be thrown from the stomach into the oesophagus, there was a small amount of frothy fluid in the stomach, mucosa of the stomach fundus and body had diffuse hyperemia and petechial haemorrhages, it was impossible to go into the antral area as a result of the anatomic position of the stomach. In view of the intense pain syndrome, the clinical picture of high gastrointestinal obstruction and the radiological picture of a fixed paraesophageal hernia, the diagnosis has been established as a strangulated paraesophageal hernia.

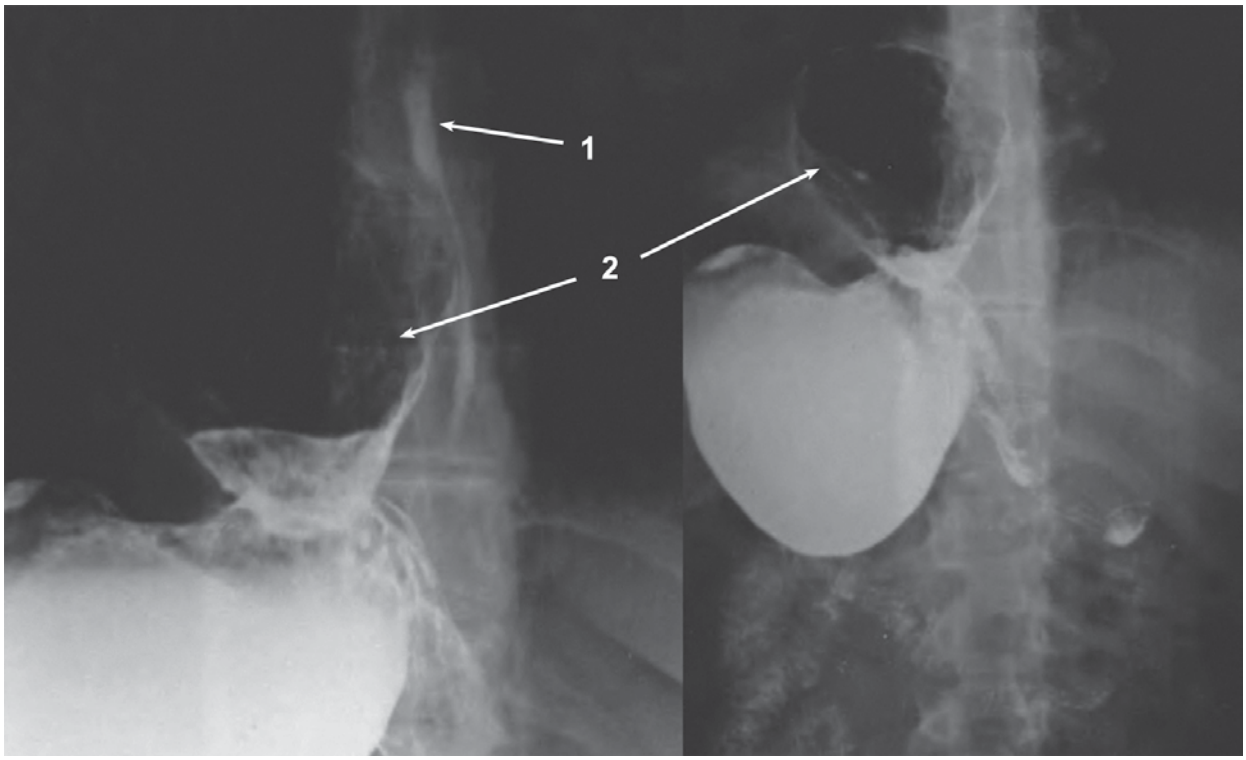

FIG. 2.
X-ray of the patient with a contrast examination of the esophagus and stomach after admission to the clinic (direct projection): **1** *– esophagus;* **2** *– strangulated part of the stomach*

Treatment policy

An emergency operation was performed under general anaesthesia 2 hours and 30 minutes after admission to the hospital. A 10 mm trocar is implanted in the mesogastric area (8 cm above the umbilicus). CO_2 insufflation up to 12 mmHg. There is no effusion in the abdominal cavity, the hypogastrium has omental adhesions to the anterior abdominal wall, the parietal and visceral peritoneum is smooth and shiny. The liver is enlarged due to the left lobe, its surface is smooth, red-brown in color, the edge is rounded. The stomach is not enlarged and the visible part of the anterior wall is unchanged. Visible loops of the small and large intestine without organic pathology. The oesophageal opening of the diaphragm is dilated to 5 cm. The fundus, the body of the stomach and the strand of the large omentum are located in the posterior mediastinum (Fig. 3).

The subcostal areas have 10 mm (left) and 5 mm (right) trocars for introducing the operating surgeon's instruments; two 5 mm trocars are implanted subxiphoidally and along the left lateral abdominal wall for the first surgical assistant. The stomach is grasped by an atraumatic grasper and is lowered into the abdominal cavity in a pendulum-like, stepwise movements with a slight tension. The omentum and the strangulated part of the stomach are moderately hyperemic, viable. Tissues in the area of the esophageal hiatus with signs of inflammatory process with scarring (Fig. 4).

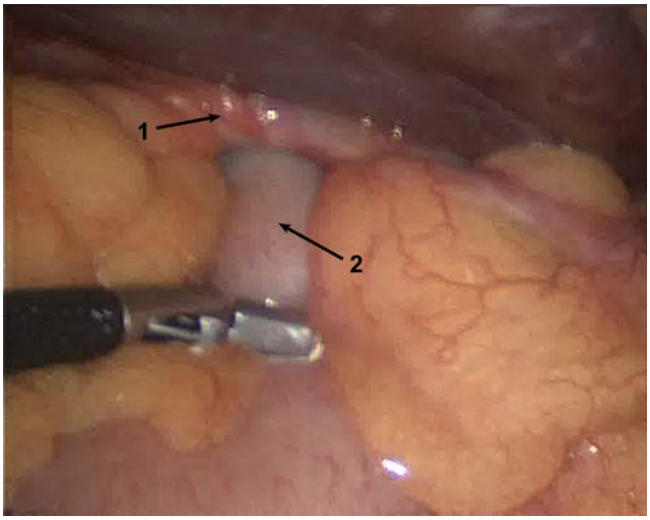

FIG. 3.
Intraoperative photography during video-laparoscopy of the patient: **1** *– the esophageal opening of the diaphragm;* **2** *– the stomach strangled in the posterior mediastinum*

There is up to 20 ml of hernial water of brown color in the hernial sac; the walls are also hyperemic (Fig. 5). A 32 F gastric tube has been inserted into the stomach through the mouth. The gastric contents on the tube are scanty and have no blood in them. Using an ultrasound dissector,

the herniated sac was dissected laterally and medially around the circumference of the oesophageal opening, bluntly isolated in the posterior mediastinum, and dissected off. The crura of diaphragm are highlighted anterior to the oesophagus (Fig. 6). The cardia area is 2 cm below the oesophageal opening. The crura are sutured in front of the oesophagus with a Z-shaped stitch (Fig. 7). The esophageal opening of the diaphragm is narrowed to 2 cm. Hemostasis – no bleeding.

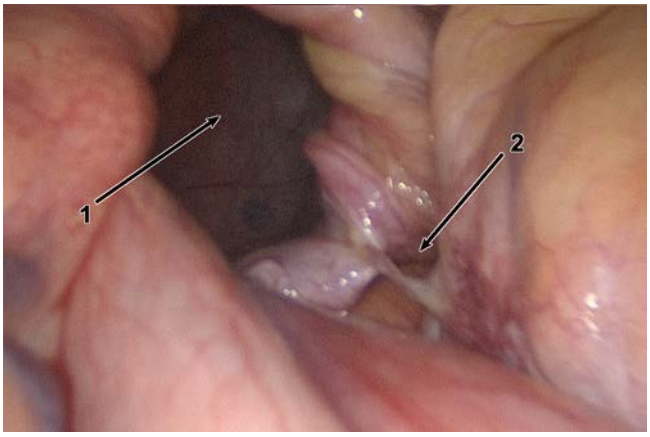

FIG. 4.
Intraoperative photography during video-laparoscopy of the patient after repositioning the hernial contents into the abdominal cavity: **1** *– esophageal opening of the diaphragm;* **2** *– scar-inflammatory process*

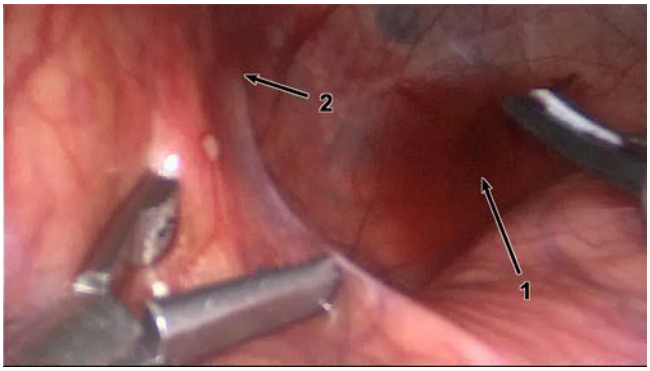

FIG. 5.
Intraoperative photography with video-laparoscopy of the hernial sac: **1** *– hernial water with a hemorrhagic component;* **2** *– catarrhal inflammation of the walls of the hernial sac*

A latex drainage tube is implanted in the left subhepatic space. Histological conclusion – hernial sac with signs of acute inflammation. Post-operative diagnosis – para-esophageal hemigastric gastroesophageal hernia of the oesophageal diaphragm opening type II, grade 3, complicated by impingement.

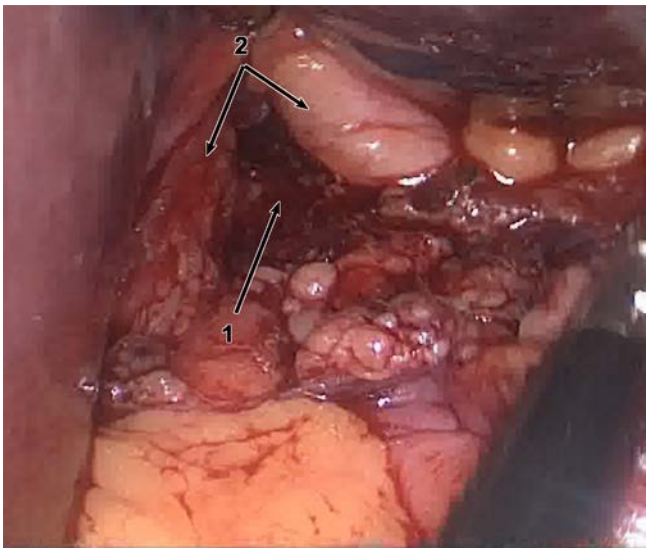

FIG. 6.
Intraoperative photography during video-laparoscopy of the patient after exposure of the diaphragm crus: **1** *– the esophagus;* **2** *– the crus of the diaphragm*

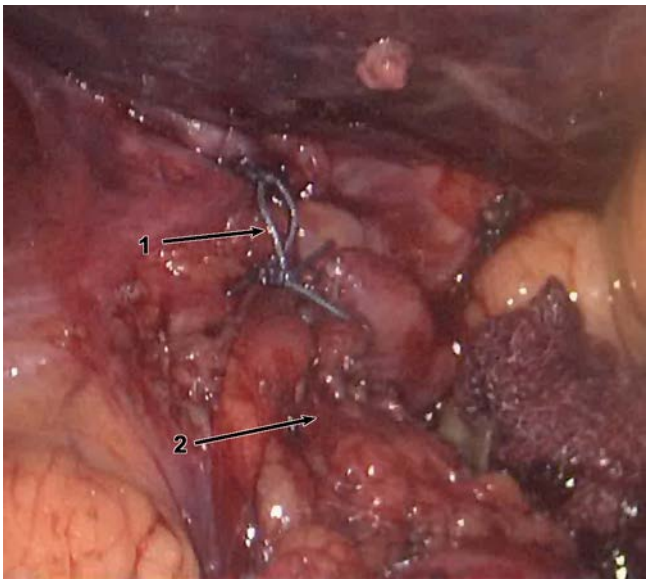

FIG. 7.
Intraoperative photography during video-laparoscopy of the patient after anterior diaphragm cruraphy: **1** *– esophagus;* **2** *– sutured crus of the diaphragm*

Treatment outcome

After the surgery the patient received injections of analgesics (ketoprofen), antibiotics (ceftriaxone) and anticoagulants (heparin). No complications were diagnosed in the early postoperative period. Postoperative complete blood count without inflammatory changes (leukocytes 6.4 × 10^9/l), slight increase in liver enzymes (AST – 136.3 U/l; ALT – 76.8 U/l) and mild hyperbilirubinemia (total – 22.5 μmol/l, indirect – 14.2 μmol/l).

Other laboratory parameters – without pathological changes. On the 4th day after the surgery, the esophagus and stomach were radiographed: the stomach is located below the diaphragm, the cardia is freely passable, no contrast agent was detected outside the oesophagus and stomach contour (Fig. 8). At the 10th day, the patient was discharged from hospital, with a recommendation for a follow-up examination in the surgical department to decide whether esophagofundoplasty should be performed as a routine procedure.

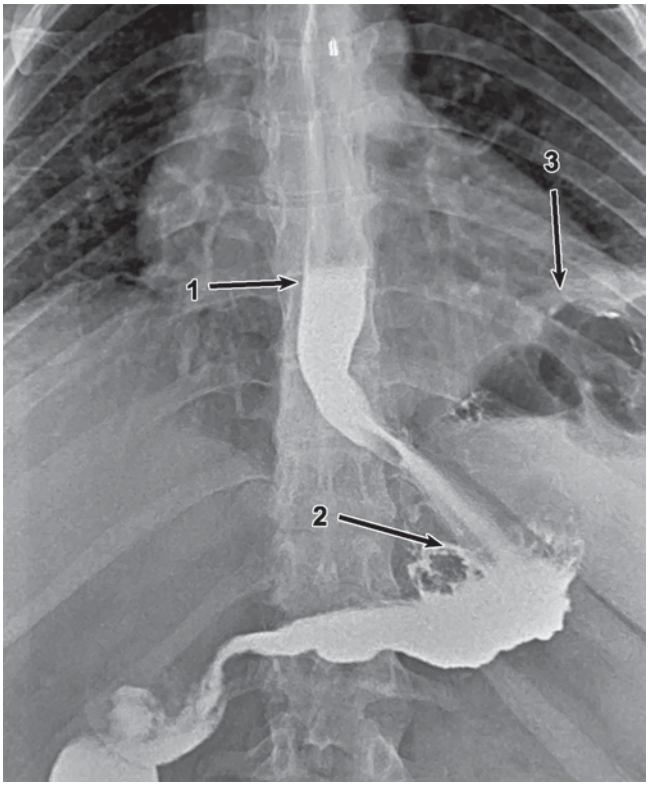

FIG. 8.
X-ray of the patient with contrast examination of the esophagus and stomach on the 4th day after surgery (direct projection): 1 – esophagus; 2 – stomach; 3 – diaphragm

CONCLUSION

The case study demonstrates the possibility of effective use of video endoscopic technologies in treatment of strangulated paraesophageal hernias of the esophageal opening of the diaphragm. The key element of success, in our opinion, was the timely diagnosis based on the patient's medical history. The limitation of the surgical volume by performing the reduction of hernial contents with resection of the sac and anterior cruroraphy is due to the inflammatory changes in the stomach wall and, accordingly, an increased risk of complications.

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Conflict of interest
The authors declare the absence of apparent and potential conflicts of interest related to the publication of this article.

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