MEDICINE AND PHARMACY

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NON-STANDARD SOLUTIONS FOR SURGICAL TREATMENT OF COMPLICATED TRAUMATIC LARGE SIZES HERNIAS

Abstract. *Is analyzed 12 clinical cases of surgical treatment of large diaphragmatic hernias, which were diagnosed in the period from 1 to 5 years after the injury. Features of the most frequent complications of traumatic hernias in the late stages of their occurrence are noted: gastrointestinal, cardiorespiratory syndromes, perforations of hollow organs and related diagnostic methods; the algorithm of actions and techniques of surgical treatment, features of the postoperative period management of the specified patients are given.*
Keywords: *traumatic diaphragmatic hernia, pleural empyema, gastrointestinal syndrome, cardiorespiratory syndrome.*

Traumatic hernias of the diaphragm of large sizes, in particular, in the long term of establishing evidentiary diagnoses - 1 year or more after the injury, which are manifested by various complications, represent a significant threat to the life of patients and refer to complex clinical cases that often require quick non-standard solutions [1,2,3 ,4,5,6].

According to literature data [7,8,9,10,] damage to the diaphragm with the formation of hernias is 0.8-3% in closed trauma of the chest and abdominal organs; manifested mainly by gastrointestinal syndrome [11,12,13], which is due to compression and kinking of some organs of the abdominal cavity in the hernial gates, and cardiorespiratory syndrome, which is associated with lung compression and displacement of the interstitium, in particular, kinking of the superior vena cava [14,15].

The following should be noted as clinically significant features of this pathology: with long-term existence of a diaphragmatic hernia, the edges of the hernial gate often grow together with tissues adjacent to the defect, causing the connection of the upper and lower serous leaves of the diaphragm [16]. As a result, pronounced fibrosis of the compressed lung develops, and in the case of damage to the branches of the phrenic nerve - relaxation and atrophy of the diaphragm, which, against the background of complications, significantly complicates surgical interventions, reducing the chances of complete expansion of the lung and reliable closure of the diaphragm defect [17,18].

A logical recommendation, in connection with the above, will be the need to use control CT, X-ray contrast and ultrasonographic examinations of the thoracic and abdominal organs in patients for several years after receiving complex injuries [19], due to the possibility of the development of diaphragmatic hernias in the long term, and as well as advanced visual examinations, including video laparoscopy and video thoracoscopy to clarify diaphragm injuries in the acute period of trauma [20].

In the departments of thoracic surgery and surgery of the regional clinical hospital on the basis of the Department of Surgery No. 1 of the BSMU for the period 2019-2022, 12 patients with large diaphragmatic hernias, who were hospitalized in the late stages - from 1 to 5 years after receiving injuries, were treated. As planned, 2 patients were hospitalized - discovered during X-ray endoscopic examinations; 10 (83%) patients were urgently hospitalized due to complications.

We present a clinical case of complicated traumatic diaphragmatic hernia of large sizes, which appeared late - 5 years after the injury.

Patient R., 66 years old, 06/05/21, was hospitalized in a District Hospital with

complaints of pain in the left half of the chest, shortness of breath, and an increase in body temperature up to 38C, which appeared after physical exertion.

From the anamnesis of the patient's life, it is known that 5 years ago, he was treated for a closed injury of the chest, and an operation for metal-osteosynthesis of the left clavicle was performed. After discharge, moderate pains in the left half of the chest, which worsened with physical exertion, periodically disturbed. Over the past six months, the patient began to notice shortness of breath, of a moderately increasing nature, however, he did not seek medical help during this period.

After a series of examinations conducted at the District Hospital (examination X-ray of chest, ultrasound of the abdominal and pleural cavities), a preliminary diagnosis was established: non-hospital pneumonia of the left lung, complicated by pyopneumothorax. A puncture of the pleural cavity was performed, up to 200 ml of fibrinous and hemorrhagic content was obtained. It should be noted that during the three days of treatment in the District Hospital, the patient was noted to have a formal stool every day.

In connection with the sharp deterioration of the condition, 06.08.2021. in urgent order with signs of partial intestinal obstruction, intoxication syndrome on the background of pronounced cardiopulmonary insufficiency. the patient was transferred to the cardiothoracic surgery clinic of the regional clinical hospital.

Upon admission: the patient's condition is extremely serious, SpO2 on oxygen supplementation 70%, pale skin, cold sticky sweat, cyanosis of the mucous membranes, blood pressure 70/20 mmHg, severe shortness of breath, pain in the left half of the chest. Auscultative: breathing on the left - sharply weakened, percussively - displacement of interstitial organs to the right. The abdomen is slightly inflated, peristalsis is weak, moderate pain in the left hypochondrium, symptoms of peritoneal irritation are negative.

Clinical tests: Erythrocytes 3.8 g/l, Hemoglobin 114 g/l, Leukocytes 12.6 g/l, ESR 58 mm/h; Total protein 52.2 g/l, Blood sugar, Total bilirubin 31.5 g/l, Urea 6.7 mmol/l, Creatinine 91.2 μmol/l.

Ultrasound performing: free fluid in the abdominal cavity is not determined, in the pleural cavity - fluid content, signs of translocation of abdominal organs into the

pleural cavity.

CHES CT: signs of translocation of the large cap, spleen, loops of the small and large intestine into the pleural cavity with a violation of its integrity, pleurisy, a sharp shift of the interstitial organs to the right; level of darkening - to the II rib on the left, deformation of the chest due to the consolidated II-VI ribs with displacement, metal-osteosynthesis of the left clavicle (Fig. 1).

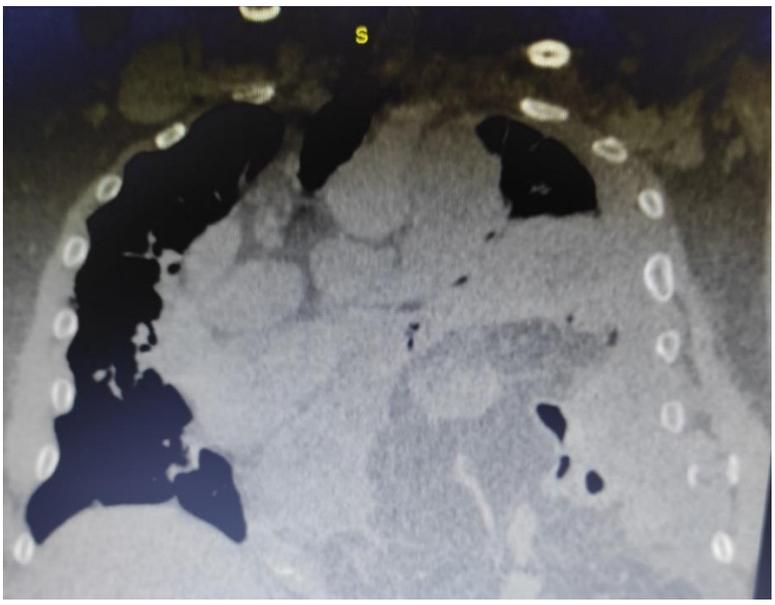

Fig. 1. **CHEST CT of patient R. – traumatic hernia of the left dome of the diaphragm with translocation of organs into the pleural cavity**

ECG: Sinus tachycardia - 100 beats per minute, polytopic extrasystole, changes in the myocardium of all departments.

As a result of the examinations, taking into account the anamnesis, a clinical diagnosis was established: Traumatic hernia of large sizes of the left dome of the diaphragm, complicated by entrapment with violation of the integrity of the translocated organs, cardiorespiratory syndrome due to displacement of interstitial organs, lung compression; intoxication syndrome, partial intestinal obstruction.

Taking into account the seriousness of the patient's condition and the nature of the pathology, the council made the following decision: not to expand the scope of examinations, after a short infusion preparation of the patient, to apply emergency surgical intervention according to vital signs.

Based on our own previous experience of similar cases, we consider it appropriate to share our observations on interstitial decompression techniques: pneumothorax, as a rule, occurs as a result of destructive changes in the walls of parenchymal organs, occasionally - in the lung parenchyma, it is partial, which is why it does not play a major role in the pathogenesis of respiratory and heart failure. In connection with this, preliminary drainage of the pleural cavity, taking into account the risk of additional damage to "swollen", translocated organs of the abdominal cavity, is ineffective.

It is clear that complete decompression of the lung and interstitial is possible after moving the organs into the abdominal cavity suboperative, active inflation of the lung and remedial bronchoscopy. At the same time, during tracheal intubation, during preoperative intensive oxygen therapy with positive expiratory pressure, anesthesiologists, based on objective monitoring indicators, may ask about emergency drainage of the pleural cavity with partial decompression of the lung and interstitial.

In such cases, we performed drainage of the pleural cavity under ultrasound control using the following method: after dissection and layering of soft tissues in the place of planned drainage, to reduce the risk of injury to pathologically changed organs, the entrance to the pleural cavity was carried out only with a tupperware with a gauze ball. Also, this can be done with a drain on a string with a soldered end and side holes, or with a finger followed by the installation of a drain in the pleural cavity.

Patient R. did not need preoperative decompression of the lung and interstitium. Scope of the surgical intervention: upper-middle laparotomy, diaphragmotomy, mobilization and descent of the loops of the small and large intestines, spleen, large intestine into the abdominal cavity; resection of the small intestine with entero-enteroanastomosis, resection of the large intestine (Hartmann’s procedure) with the formation of a terminal colostomy, resection of the strand of the large cap, plastic of the hernial gate of the left dome of the diaphragm, double drainage of the left pleural cavity, subdiaphragmatic space, small pelvis.

From the protocol of the operation: free fluid is not determined during the

revision in the abdominal cavity. There is a rupture of the left dome of the diaphragm up to 10 cm with fibrous changes of the hernial gate, fixation of the loops of the intestines, the strands of the big cap. Additional diaphragmotomy, mobilization of translocated organs in the pleural cavity using electroswelling techniques, lowering into the abdominal cavity.

In connection with the existing necrotic changes in the intestinal tissues, which led to perforation, resection of the small intestine was performed with the formation of a wide anastomosis of the "side-to-side" type, resection of the large intestine according to Hartmann with the formation of a terminal colostomy.

After rehabilitation of the pleural cavity, two drains were installed for flow lavage. Plastic surgery of the hernial gate was performed using own tissues with the formation of a duplicate. In cases of impossibility of mobilizing the organs moved into the pleural cavity, as well as, in case of doubts about sufficient rehabilitation of the pleural cavity, we use thoracoabdominal or additional thoracic access.

The postoperative period was difficult due to lung stiffness, post-traumatic chest deformation, pleural infection, which led to the formation of residual cavities and long-term empyema of the pleura (Fig. 2).

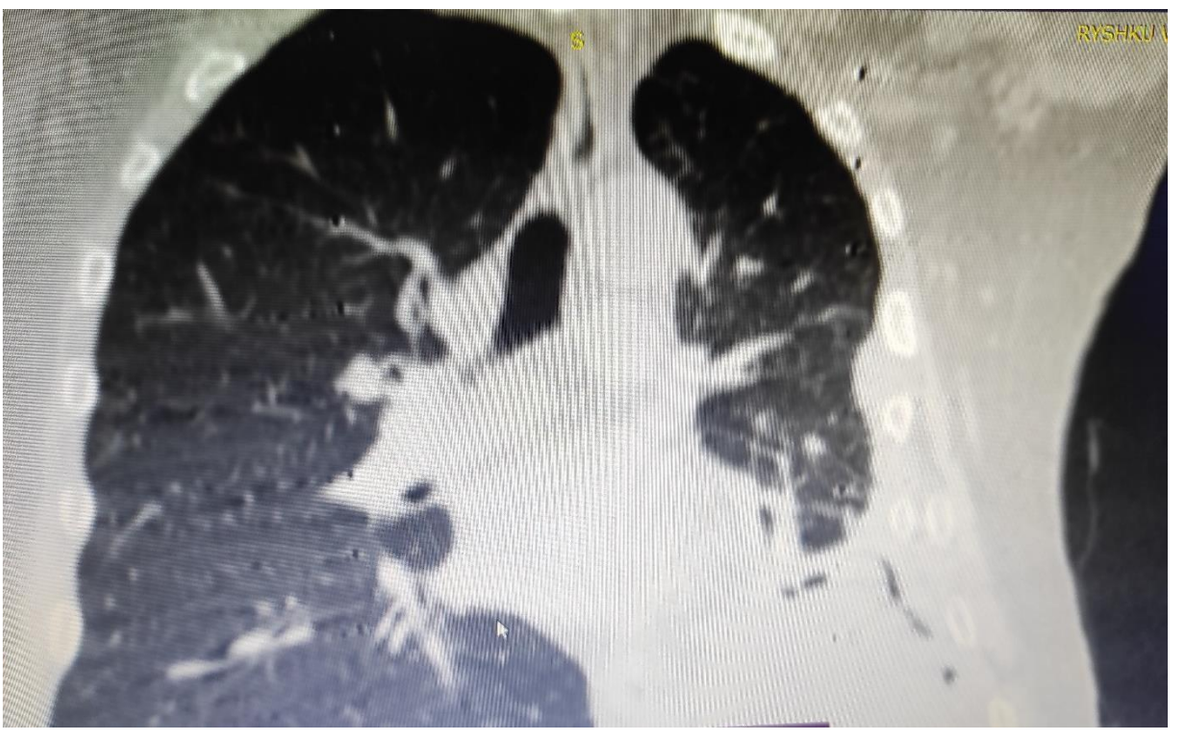

Fig. 2. **CHEST CT scan of patient R. – formation of residual pleural cavity in**

the postoperative period

After anti-inflammatory treatment with the use of flow lavage of the pleural cavities, active aspiration to straighten the lungs the patient's condition was stabilized.

Postoperative wounds have healed with primary tension, peristalsis is active, and the stoma is functioning. Discharged in relatively good condition with pleural drainage for outpatient follow-up at the resident surgeon, with subsequent planning for colostomy closure.

Conclusions. The given data confirm the complexity of diagnosis and surgical treatment of large traumatic diaphragmatic hernias in the long term after the injury. This requires focusing the attention of specialists on the probability of the occurrence of this pathology in the distant future, in patients with a history of trauma to the thoracic or abdominal organs.

The use of a wide arsenal of visual examination methods, both in the acute and remote periods of injury, makes it possible to timely diagnose the occurrence of traumatic diaphragmatic hernias of various locations and sizes, the presence of their complications, and improve the results of the treatment of this pathology.

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