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"HEMOTHORAX, ATELECTASIS OF THE LEFT LUNG, AND HYDROPERICARDIUM OBSERVED ON DAY 15 FOLLOWING A THORACIC TRAUMA (CLINICAL CASE)."

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Annotation: Penetrating chest wound is a complex pathology in terms of its clinical course diversity, when the range varies from partial pneumothorax and small hemothorax to massive bleeding associated with damage to large vessels or the heart.
This observation presents a case from the practice of a specialized department: subtotal hemothorax and tense hydropericardium on the 15th day after a stab wound in the area of the manubrium of the sternum.
It is noteworthy that the patient went to the hospital at her place of residence in the first hours after receiving the wound and was observed for a short time.
Within 15 days, subtotal hemothorax and tense hydropericardium developed, which were accompanied by severe respiratory and cardiac failure, which entailed the need for two-stage surgical treatment. The first stage involved drainage of the left pleural cavity with decompression of the pleural cavity and the second stage involved thoracotomy with pericardiotomy, lung decortication and partial pleurectomy.
Hospitalization and dynamic observation of patients with this nosology allows for timely detection of developing complications and their prevention at the initial stages with less extensive manipulations.

Keywords: Chest injury, penetrating thoracic trauma, hemothorax, hydropericardium, lung atelectasis, thoracotomy, decortication, pericardiotomy, pleurectomy, emergency surgery, postoperative care.

Introduction

A case from practice is presented: subtotal hemothorax and tension hydropericardium on the 15th day following a stab wound to the manubrium of the sternum.

According to global and domestic statistics, trauma consistently ranks fourth among causes of mortality, after cardiovascular diseases, oncological pathology, and diseases of the bronchopulmonary system. In the works of E.A. Wagner, it is noted that chest injuries are predominant among most traumas and account for half of all fatal outcomes, which maintains the high relevance of issues related to the diagnosis and treatment of chest injuries.

According to various sources, penetrating chest injuries constitute approximately 1:9–1:10 relative to blunt chest trauma and may be accompanied by injuries to the lungs, diaphragm, mediastinal organs, as well as the aorta, trachea, bronchi, and esophagus.

Clinically, penetrating chest injuries are associated with respiratory failure, tension pneumothorax, hemothorax of varying volume, combinations thereof, and acute cardiovascular insufficiency related to cardiac tamponade.

In the outcomes of treatment for stab (mostly knife) wounds of the chest, besides the nature of the injury itself, decisive factors include the time elapsed from injury to hospital admission,

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availability of qualified personnel—ideally thoracic surgeons—the ability to promptly deploy an operating room, and the provision of adequate anesthetic care.

This report presents a case of subtotal hemothorax, left lung atelectasis, and tension hydropericardium on the 15th day after a penetrating stab wound of the chest.

Patient N., 37 years old, was admitted to the Andijan Branch of the Republican Scientific Center for Emergency Medical Care (AF RNCEMP) with complaints of dyspnea, dry cough, moderate pain in the left hemithorax, general malaise, and weakness.

From the anamnesis, it was established that 15 days ago, she sustained an accidental kitchen knife injury (the patient slipped and fell at home), for which she was observed for one day in the surgical department of the district medical center (discharge summary unavailable) and discharged at her husband's insistence. She reported a gradual onset of complaints, for which a chest MSCT was performed. After that, she presented to AF RNCEMP and was admitted to the thoracic and cardiovascular surgery department.

On admission, the patient's general condition was severe, with a forced posture. Skin was pale-pink. At the manubrium of the sternum, at the junction of the manubrium with the sternal body, there was a post-traumatic, sutured scar up to 1.0 cm long, without signs of inflammation. Jugular venous distension was noted. Moderate cyanosis of visible mucous membranes. Breathing through the nose, respiratory rate up to 24 per minute. Chest of normal shape; during respiration, the left hemithorax lagged behind. No subcutaneous emphysema or crepitation of bone fragments on the chest.

Percussion: right lung – normal resonance; left lung – dullness in the middle and lower fields.
Auscultation: right – vesicular breathing; left – diminished vesicular breathing in the middle and lower fields.
Palpation: painless.

Heart sounds rhythmic, muffled. Pulse 106 bpm, Blood Pressure 110/60 mmHg.

On the day of admission, a chest MSCT revealed a large left-sided hydrothorax, hydropericardium, and left lung atelectasis.

Considering the severity of the patient's condition and the presence of fluid in the left pleural cavity, it was decided as the first step to perform drainage of the left pleural cavity. Under local anesthesia with 0.5% procaine solution – 50.0 ml, after control puncture of the left pleural cavity, a 1.0 cm skin incision was made in the 7th intercostal space along the left posterior axillary line. A trocar was inserted into the pleural cavity, through the sleeve of which a disposable sterile drainage tube was introduced into the pleural cavity – hemorrhagic fluid entered under pressure – Rouvillou-Gregoire test negative. The drainage tube was fixed to the skin with a P-shaped interrupted suture and connected to an underwater seal system. The procedure was well tolerated by the patient, without complications. Up to 2000 ml of fluid was drained, vacuum stable.

Subsequently, the patient's condition significantly improved; jugular veins flattened, tachycardia decreased somewhat, but on follow-up chest radiography, left lung atelectasis persisted and the shadow of the lower mediastinum was increased.

Under general endotracheal anesthesia (see anesthesia protocol), with the patient positioned on her right side, a lateral thoracotomy was performed through the 5th intercostal space, with a skin

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incision length up to 20 cm. The left pleural cavity was opened layer by layer. Attention was drawn to the narrowing of the intercostal spaces, multiple membranous and trabecular adhesions between the lung and the chest wall, as well as the diaphragm and mediastinum. Up to 200 ml of old, dark, fibrin-covered blood clots were present in the pleural cavity. Complete pneumolysis was performed using blunt and sharp dissection; blood clots were removed.

Revision: The lung was reduced in volume due to a fibrinous "shell" covering both the upper and lower lobes. The mediastinal pleura was thickened and dull. The pericardium was tense, with weakly perceptible cardiac pulsation. A longitudinal pericardiotomy, 3.0 cm in length, was performed – under pressure, saturated serous fluid (~200 ml) was evacuated. The pericardial cavity was aspirated with an electrocautery aspirator and washed with furacillin solution; no blood clots were detected. Sparse sutures were placed on the pericardium.

Decortication of the left lung was performed. A Z-shaped suture was placed on the denuded area of the lower lobe, and a partial pleurectomy of the costal pleura was carried out.

Upon reinflation, the lung completely filled the left hemithorax, appearing pink with moderate coal pigment content. Hemostasis during surgery was achieved via electrocautery – dry. The pleural cavity was repeatedly irrigated with antiseptic solutions. Double lower drainage was installed, and the wound was closed layer by layer. Alcohol and an aseptic dressing were applied.

The postoperative period was uneventful. The patient was discharged from the thoracic and cardiovascular surgery department on the 7th postoperative day in satisfactory condition.

Thus, in chest injuries localized in the Grekov zone but without obvious signs of cardiac or major vascular damage, patients should be hospitalized in a specialized department and undergo dynamic monitoring, including monitoring of the red blood cell count and repeated X-ray and ultrasound examinations. The appearance of mediastinal organ compression symptoms or intrathoracic bleeding constitutes an absolute indication for emergency surgical intervention.

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