



## HEMOTHORAX, ATELECTASIS OF THE LEFT LUNG, AND HYDROPERICARDIUM 15 DAYS AFTER A CHEST WOUND

### (CASE REPORT)

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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.

**Аннотация:** Проникающее ранение грудной клетки, является сложным по своему многообразию клинического течения патологией, когда диапазон колеблется от частичного пневмоторакса и малого гемоторакса до массивных кровотечений связанных с повреждением крупных сосудов или же сердца.

В данном наблюдении представлен случай из практики специализированного отделения: субтотальный гемоторакс и напряженный гидроперикард на 15-е сутки после колото-резаного ранения в области рукоятки грудины.

Обращает внимание то, что пациентка обращалась в стационар по месту жительства на первые часы после получения раны и наблюдалась в течение короткого времени.

В течение 15 дней развился субтотальный гемоторакс и напряженный гидроперикард, которые сопровождалась выраженной дыхательной и сердечной недостаточностью, что повлекло за собой необходимость двухэтапного оперативного лечения.

Первым этапом проведено дренирование левой плевральной полости с декомпрессией плевральной полости и вторым этапом торакотомия с перикардотомией, декортикацией легкого и частичной плеврэктомией.



Госпитализация в стационар и динамическое наблюдение за пациентами с данной нозологией позволяет своевременно выявить развивающиеся осложнения и предотвратить их на начальных этапах с меньшими по объему манипуляциями.

**Аннотация:** Кўкрак қасасига тешиб ўтувчи жароҳатлар клиник кўриниши кўплигидан мураккаб патология бўлиб, қисман пневмоторакс ва кичик гемотораксдан йирик қон томирларидан ёки юракнинг жароҳати билан боғлиқ массив қон кетишгача бўлган диапазонга эга.

Ушбу кузатув ихтисослашган бўлим амалиётидан олинган ҳолатни тақдим этади: тўш суяги дастаги соҳасидаги тигли жароҳатдан кейин 15 кунда субтотал гемоторакс ва таранглашган гидроперикард мавжуд бўлиб, кескин нафас ва юрак етишмовчилиги билан кузатилган.

Шуниси эътиборга лойиқки, бемор жароҳат олгандан кейин биринчи соатларда ўзи яшаш жойидаги шифохонага борган ва қисқа вақт мобайнида кузатув остида бўлган.

15 кун ичида субтотал гемоторакс ва таранглашган гидроперикард ривожланган, улар оғир нафас ва юрак етишмовчилигига олиб келган ва икки босқич оператив амалиёт бажарилишига сабаб бўлган.

Биринчи босқичда чап плевра бўшлиғи дренажланган, яъни декомпрессия қилинган, иккинчи босқичда торакотомия, перикардиотомия, чап ўпка декортикацияси ва қисман плеврэктомиялар бажарилган.

Ушбу турдаги жароҳатланиш билан боғлиқ беморларни шифохонага ётказиб, динамик мониторинги олиб борилса ривожланиши мумкин бўлган асоратлар олди олинади ёки вақтида аниқланади ва ҳажм бўйича кичикроқ амалиётлар билан бартараф этас бўлади.

A case report is presented: subtotal hemothorax and tense hydropericardium on the 15th day after a stab wound to the manubrium of the sternum.

According to global and domestic statistics, trauma consistently ranks fourth in the mortality rate, behind cardiovascular disease, cancer, and bronchopulmonary diseases. E.A. Wagner's work notes that chest wounds are the leading cause of most injuries and account for half of all deaths, making the diagnosis and treatment of chest wounds highly relevant.

According to various sources, the ratio of penetrating chest wounds to closed chest injuries is 1:9-1:10 and can be accompanied by damage to the lungs, diaphragm, mediastinal organs, as well as the aorta, trachea, bronchi, and esophagus.

Clinically, penetrating chest wounds are accompanied by respiratory failure, tension pneumothorax, hemothorax of varying degrees, or a combination of these, as well as acute cardiovascular failure associated with cardiac tamponade.

In addition to the wound site, the time elapsed between the injury and the patient's arrival at the hospital, the availability of qualified personnel—ideally thoracic surgeons—the ability to quickly establish an operating room, and adequate anesthesia are crucial factors in the treatment outcome of stab wounds (mostly knife wounds) to the chest.



This report presents a case of subtotal hemothorax, atelectasis of the left lung, and tense hydropericardium 15 days after a penetrating stab wound to the chest.

Patient N., 37, was admitted to the Arkhipov Scientific Center for Emergency Medicine (RASCEM) with complaints of shortness of breath, a dry cough, moderate pain in the left side of the chest, general malaise, and weakness.

Her medical history revealed that 15 days earlier, she had been accidentally stabbed with a kitchen knife (she slipped and fell at home). She was observed for 24 hours in the surgical department of the district medical center (no discharge summary). She was discharged at her husband's insistence. She noted a gradual onset of complaints, for which she underwent a chest CT scan. She then presented to the Arkhipov Scientific Center for Emergency Medicine and was hospitalized in the thoracovascular surgery department.

The patient's general condition upon admission was serious, and she was in a forced-care position. The skin is pale pink, in the area of the manubrium of the sternum, in the projection of the transition of the manubrium of the sternum into the body of the sternum, there is a cross-sectional, sutured scar up to 1.0 long without signs of inflammation, there is swelling of the veins of the neck. Moderate cyanosis of the visible mucous membranes. Breathing through the nose, respiratory rate up to 24 per minute. The chest is of normal shape, during the act of breathing, the left half lags behind, there is no subcutaneous emphysema and crepitus of bone fragments on the chest. Percussion reveals pulmonary sound on the right, shortening of the percussion sound in the middle-lower sections on the left. Auscultation - vesicular breathing on the right, weakened vesicular breathing in the middle-lower sections on the left. Palpation is painless. Heart sounds are rhythmic, muffled. Pulse 106 beats per min., A/D - 110/60 mm Hg.

On the day of her presentation, the patient underwent a chest CT scan, which revealed a large left hydrothorax, hydropericardium, and atelectasis of the left lung.

Given the severity of the patient's condition and the presence of fluid in the left pleural cavity, the decision was made to drain the left pleural cavity first. Under local anesthesia with 0.5% Procaine solution (50.0 ml), after a 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. A disposable sterile drainage tube was inserted through the trocar sleeve. Hemorrhagic fluid was released under pressure; the Rouviere-Gregoire test was negative. The drainage tube was secured to the skin with a U-shaped interrupted suture and connected to a subsea system. The patient tolerated the procedure well, with no complications. Up to 2000 ml of fluid was drained through the drainage system, and the vacuum was stable.

Subsequently, the patient's condition significantly improved. The neck veins subsided, and the tachycardia decreased slightly. However, a chest X-ray revealed persistent atelectasis on the left and an enlarged lower mediastinal shadow.

Under general anesthesia (see anesthesia protocol), with the patient in the right lateral position, a lateral thoracotomy was performed along the 5th mediastinal line, with a skin incision of up to 20 cm. The left pleural cavity was opened layer by layer. Narrowing of the intercostal spaces,



multiple membranous and trabecular adhesions between the lung and the chest wall, as well as the diaphragm and mediastinum, are notable. Up to 200 ml of old, fibrin-coated, dark blood in the pleural cavity was present in clots. A complete pneumolysis was performed using blunt and sharp methods, and blood clots were removed.

Examination: the lung is reduced in volume due to a fibrinous shell covering both the upper and lower lobes. The mediastinal pleura is thickened and dull. The pericardium is tense, and cardiac pulsations are faint. A longitudinal pericardiotomy of up to 3.0 cm was performed. Rich serous fluid (approximately 200.0 ml) was evacuated under pressure. The pericardial cavity was drained with an electric aspirator and irrigated with furacilin solution. No blood clots were detected. The pericardium was sparsely sutured. Decortication of the left lung was performed, a Z-shaped suture was placed on the depleted area of the lower lobe, and a partial pleurectomy of the costal pleura was performed.

When inflated, the lung completely fills the left hemithorax and is pink with moderate carbon pigment content. During the surgery, hemostasis was maintained with electrocoagulation. Repeated debridement of the pleural cavity with antiseptic solutions was performed. Double inferior drainage and layered wound suturing were performed. Alcohol and an aseptic dressing were applied.

The postoperative period was uneventful, and the patient was discharged from the thoracovascular surgery department on the seventh postoperative day in satisfactory condition.

Therefore, with chest wounds localized in the Grekov zone but without obvious symptoms of damage to the heart or major vascular structures, patients should be hospitalized in a specialized department and undergo dynamic observation, including monitoring of the red blood cell count, and repeated X-rays and ultrasound examinations. The appearance of symptoms of mediastinal organ compression or intracavitary bleeding are absolute indications for emergency surgery.

#### References

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