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# SEPTIC COMPLICATIONS IN PATIENTS WITH NECK WOUNDS

Nowadays, we have been a steady increase in injuries as the social conditions of life and have changed. Statistically found that 54.0 % of people of car accidents have injuries to the head and neck. According to the literature, mortality in patients with neck injury which is complicating by pyoinflammatory persists up to 30.0–76.0 %. The management of neck trauma can be challenging and sometimes overwhelming, as this anatomical region contains many vital structures. These structures may pose a diagnostic and therapeutic dilemma. Our research based on the results of diagnosis and treatment of 124 patients with a purulent mediastinitis, complicating traumatic injuries of the neck organs. Among these men – 92 (74.2 %), women – 32 (25.8 %). The results of treatment depend on timely diagnosis, hospitalization in a specialized compartment and conducting active surgical tactics.

***Keywords:*** *damage to the organs of the neck, diagnosis, mediastinitis treatment.*

**Introduction**

The problem of diagnosing purulent mediastinitis and its complications is still relevant. According to the literature, mortality persists up to 30.0–76.0 % [1]. One of the reasons for high mortality is late diagnosis and delayed treatment [2, 3].

Complications of purulent mediastinitis (pleural empyema, lung abscess, fistula of the hollow organs, pericarditis) significantly aggravate the course of the disease and in some cases cause repeated surgical interventions. This lengthens the duration of treatment of patients and often leads to death [4, 5].

Acute inflammation of the adipose tissue of the mediastinum, in which there are a large number of blood and lymph vessels, lymph nodes and nerve conductors – is a formidable complication of various purulent diseases, including against the background of early neck organs [6, 7].

The mediastinum is an anatomically and functionally complex of vital intrathoracic organs surrounded by extensive layers that determine the rapid spread of the infectious process in them with a pronounced general reaction of the body against severe endogenous intoxication [5, 8].

Without diagnosis and delayed surgical care, the sepsis is beginning and quickly increase mortality, since the constant dynamic mobility of the mediastinum (heart contraction, vascular pulsation, peristalsis of the esophagus, tracheal movement during coughing, speaking and swallowing) does not contribute to resting and inflammatory processes are progressing [1, 9].

The recognition of mediastinitis which complicating a wound of the neck organs is a difficult task, the successful of which is determined, first of all, the examination of the neck organs and the immediate elimination of the revealed injuries. The outcome of treatment with this complication is always directly dependent on timely diagnosis and early surgical intervention. Treatment of purulent mediastinitis is one of the complex problems of modern medicine [4].

The complexity of early diagnosis, the severity of the development and course of desease, the rapid evolution of septic complications determines a high mortality rate, which according to specialized centers reaches from 12.0 to 22.0 %, but if treatment is started later than 24 hours, it increases to 38.0–44.0 % [9].

**Aim of research** – investigate the problem of early diagnosis of developing of mediastinitis in patients with neck injuries and improve the tactics for prevention generalization of the

infection and decrease the high mortality rate of the patients.

**Materials and methods**

From 2000 to 2017 in the clinic were investigating 124 patients (aged 18 to 62 years) with purulent mediastinitis. Among them, men – 92 (74.2 %), women – 32 (25.8 %). Primary mediastinitis due to an esophageal wound was in 53 (42.7 %) cases. Secondary mediastinitis was noted in 71 (57.2 %) cases (as a result of post-traumatic phlegmon of soft tissues of the neck). Upper mediastinitis occurred in 82 (66.1 %) patients; anterior, posterior or total was diagnosed in 42 (33.8 %) mediastinitis. The average continuance from the moment of injury to the development of clinical manifestations was 4–6 days.

A polyradiographic x-ray examination of the neck and chest with contrast of the esophagus in cases of suspected perforation was performed in 100 % of cases, which made it possible to differentiate the stages of inflammatory infiltration, the phase of abscess formation, and the pathway of purulent sagging. Computed tomography to clarify the diagnosis of mediastinitis required in 13.2 % of patients. We were doing esophagogastroduodenoscopy was required for 50.8 % patients to confirm esophageal perforations and their localization. If esophageal-bronchial fistula was suspected in 12 patients, we were doing a combined video endoscopic examination: esophago- and bronchoscopy.

**Results and discussion**

The clinical picture of mediastinitis was characterized by a combination of general and local symptoms. All patients had two or more signs of a systemic inflammatory response. The changes caused are due to the transience and progression of the purulent-inflammatory process in the mediastinum. This is facilitated by the anatomical and physiological features of the mediastinal structure, which determine the high absorption capacity of the mediastinal fiber, which is the reason for the rapid increase in intoxication with mediastinitis.

Patients with mediastinitis of traumatic origin require a very thorough examination. This applies, first of all, to patients with neck injuries, especially with puncture wounds to early detect damage to the hollow organs of the neck. With neck injuries complicated by damage to the hollow organs, the appearance and gradual increase in the symptoms of mediastinitis are important for diagnosis. In this regard, contrast x-ray of the esophagus and bronchoscopy are importance to exclude damage to the trachea, larynx and pharynx. With a verified diagnosis, we were making operation urgently performed for patients. The tasks of the surgical treatment of mediastinitis is the choice of optimal surgical access to the mediastinum, adequate opening and drainage. Given the manifestations of severe purulent intoxication with hemodynamic and respiratory disorders and pleura-pulmonary complications, patients were prescribed short-term preoperative preparations for stabilization of hemodynamic, adequate ventilation of the lungs, and prevention of toxic shock. The treatment was carried out with the general principles of intensive care, simultaneously with diagnostic measures.

In primary mediastinitis, was performed mediastinotomy or thoracotomy and the method was depending on the level of defect in the esophagus, the presence of pleural complications at the time of surgery. In secondary mediastinitis due to post-traumatic phlegmon of the neck of various origins in 71 (100 %) cases, drainage was performed by means of a polar mediastinotomy. With the prevalence of the process on the lower floor of the mediastinum we were making the thoracotomy. Surgical tactics – a wide opening of the cellular spaces of the neck and mediastinum, maximal excision of necrotic fiber, adequate drainage of the mediastinum and pleural cavity. In the postoperative period was carry out clinical and radiological dynamic monitoring. Negative radiological dynamics became an indication for thoracotomy in 5 patients on 3th day and in 2 on 5$^{th}$ day after cervical mediastinotomy. For 24 patients underwent additional drainage of the pleural cavity in the postoperative period in connection with the examination of exudate. Active surgery tackticks for mediastinitis is only a stage of complex treatment. It is effective only in combination with modern intensive care on the background of ongoing flow-aspiration rehabilitation of the mediastinum.

The comprehensive treatment included infusion-transfusion therapy, providing support for water-electrolyte balance, energy and plastic needs of the body. The spectrum of antibacterial drugs at the beginning of treatment was determined by the principles of de-escalation and after antibacterial agents were prescribed taking into account the sensitivity of microflora. In order to enhance intercellular metabolism and improve microcirculation we were added to protease inhibitors and vitamins to improve the body's energy resources.

**Conclusions**

General clinical and laboratory research methods suggest the purulent lesion of the deep cellular spaces of the neck and mediastinum. An X-ray of the neck in a lateral projection helps us to diagnose deep phlegmon of the neck. The most accurate way to verify it is an expert ultrasound scan (sensitivity and specificity were 70.6 % and

80.3 %, respectively) – performed in 32.1 % of patients. In the clinical picture of the progression of the inflammatory process after the initial opening of the purulent foci on the neck – making revision of the wound under general anesthesia. The only method for the treatment of mediastintes is surgical – early adequate opening and drainage of the purulent focus. The spread of the process to the lower floor of the mediastinum is an indication for thoracotomy.

The basic principle of the surgical guide is a broad mediastinotomy with the provision of an outflow of purulent exudate. The results of treatment depend on timely diagnosis, hospitalization of patients in a specialized department, active surgical tactics. The use of extracorporeal detoxification technologies in the postoperative period improves treatment outcomes. An integrated approach to diagnosis, preoperative preparation and postoperative management reduced mortality to (12.1 %), in comparison with the literature even for patients who arrived later than 48 hours after neck injury and reduced the time of postoperative treatment by 1.5 times.

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**СЕПТИЧЕСКИЕ ОСЛОЖНЕНИЯ У ПАЦИЕНТОВ С РАНЕНИЯМИ ШЕИ**

Представлены результаты диагностики и лечения 124 пациентов с гнойным медиастинитом, как осложнение травматического повреждения органов шеи. Среди них мужчин – 92 (74,2 %), женщин – 32 (25,8 %). Результаты лечения зависели от своевременной диагностики, госпитализации больных в специализированное отделение и проведения активной хирургической тактики.

***Ключевые слова:*** *повреждения органов шеи, диагностика, медиастинит, лечение.*

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**СЕПТИЧНІ УСКЛАДНЕННЯ У ПАЦІЄНТІВ З ПОРАНЕННЯМИ ШИЇ**

Представлені результати діагностики і лікування 124 пацієнтів з гнійним медіастинітом, як ускладнення травматичного ушкодження органів шиї. Серед них чоловіків – 92 (74,2 %), жінок – 32 (25,8 %). Результати лікування залежали від своєчасної діагностики, госпіталізації хворих в спеціалізоване відділення і проведення активної хірургічної тактики.

***Ключові слова:*** *пошкодження органів шиї, діагностика, медіастиніт, лікування.*

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