Curation tactic of residual pleural cavity in the early aftercare period by patients with lung cancer

Abstract: Pneumonectomy operations are seriously transmitted by patients and often accompanied by complications aftercare period with a high mortality rate. This publication describes tactic of curation residual pleural cavity based on the laboratory parameters dynamic of pleural fluid. The proposed method aims to reduce the number of purulent-septic complications in the early postoperative period by patients after pneumonectomy. The article is prescribed for oncologists and thoracic surgeons.

Keywords: Pneumonectomy, residual pleural cavity, pleural fluid, bronchopleural fistula.

Radical surgical treatment of lung cancer (including extended pneumonectomy) can be carried out only for 10-20% of newly diagnosed patients [1]. According to the literature data, the average five-year survival period of patients who received complex treatment for non small cell lung cancer of different stages is in the range of 15-18% [2]. Thus, among hundred patients with lung cancer, the radical treatment can be carried out for not more than twenty patients while the five-year mark overlive only 3-4 people of them. Such a cruel statistics is dictated not only by the aggressiveness of tumor process but also by possible postoperative complications, which undoubtedly trouble the comprehensive therapy, postpone or even eliminate the possibility of conduct adjuvant chemoradiotherapy.

Goals and objectives: Most of curation residual pleural cavity methods described in literature to control the amount of liquid, velocity of its appearance, as well as mediastinum organs position and less attention is paid to the qualitative composition of the pleural fluid. The purpose of this article is to review recent indicator in the forecast of the early postpneumonectomy complications.

Materials and methods: Direct consequence of pneumonectomy is filling with exudate residual pleural cavity. Obviously that with intraoperative microbial contamination and the significant clotted hemothorax it becomes an area for severe infectious process development (F. I. Gorelov, 1998). The questions of tactic and way of doing postpneumonectomy cavity remain controversial (V. N. Efimov, 1989; T. M. Kariev, 1991; Kopec S. E. et al., 1998). It is known from clinical practicethat the continued existence of the residual cavity even through the years is a risk factor for development of septic complications (Zumbo, G. L. et al., 1973; Jadczuk E., 1998) [3]. One of the most serious complications after pneumonectomy is the failure of the stump of the main bronchus with development of empyema and bronchopleural fistula formation. It is believed that the primary cause of early insolvency is surgical defects of the stump formation (types of bronchial sutures, pleuroscica of stump, etc.). However, the study of healing of the amputated bronchus reveals that the reparative processes are affected by a range of factors, including the nature of the pleural exudate which performs a trophic function. Modeling of these factors represents the tactics of the residual pleural cavity.

Results: In 2011 and 2013 years in the thoracic surgery department of the Oncology clinic performed 55 extended pulmonate operations about lung cancer. In the early postoperative period (5-7 days) was carried out laboratory examination of the pleural exudate with the definition of the 3 indicators on the basis of which was formed a judgment about the course of the healing process.

1. Cellular composition of exudate (erythrocytes, leukocytes (lymphocytes/neutrofilny);
   - The concentration of protein in the exudate;
   - The ratio of blood glucose and exudate;
   - Favorable course can be considered a dynamic reduction of the total cell count in the exudate. In particular reduction of erythrocytes quantity with the change in the ratio of leukocytes: neutrophils/lymphocytes in the direction of increasing of the latter [4].

2. Exudate containing up to 20 leukocytes cells in field of view (70-90% lymphocytes) is considered to be serous and tells about a favorable course of healing process. A leukocytosis from 20 to 50 cells in field of view, by the proportion of lymphocytes less than 50% forces to take measures to prevent the development of maturate process in the pleural cavity. Exudate considered purulent with neutrophilic leukocytosis more than 50 cells in field of view and requires early active intervention from the surgeon.

   The decrease of protein in the pleural fluid also affects on the dynamics of the postoperative period, delaying the beginning of the fibrothoraxformation. Optimal concentration is 75-80g/l for the serous character of exudate.

3. The most sensitive control-test condition of pleural effusion was the level of glycemia. For the norm adopted the ratio of blood glucose = glucose exudate. When this ratio changing in the direction of reducing the concentration of glucose exudate < a glycemia of the blood, we can talk about inflammatory block of the glucose transport into pleural fluid. An alarming deviation is the decrease in glucose concentration of fluid below 3.0 mmol/l, and ratios below 0.5.

   The study of pleural exudate in the prognostic plan allowed in proper time to change, to intensify the management of patients and to reduce the frequency of purulent-septic complications.
So for the 3 years period we observed only the one case of early failure of sutures of the bronchial stump in the background of empyema.

**Conclusions:** For the postoperative management of patients with residual pleural cavity the certain prognostic significance has laboratory examination of the pleural exudate. Active, timely changed tactics of conducting such patients allows to reduce the risk of bronchopleural fistula and related septic complications.

**References**


**АННОТАЦИЯ**

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Тактика ведения остаточной плевральной полости в раннем послеоперационном периоде у больных раком легкого

Расширенные пульмонэктомии предпринятые для лечения рака легкого довольно тяжело переносятся больными и не редко сопровождаются осложненным послеоперационным периодом с высокой летальностью. Представленная публикация описывает тактику ведения остаточной полости на основе динамики лабораторных показателей плеврального экссудата. Предложенная методика призвана снизить число гнойно-септических осложнений в раннем послеоперационном периоде у больных перенесших пульмонэктомию. Статья рекомендована к ознакомлению онкологам и торакальным хирургам.

Ключевые слова: Пульмонэктомия, остаточная плевральная полость, плевральный экссудат, бронхоплевральный свищ.

**ТҰЖЫРЫМ**

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Ерте өкпе обыры плевралды қуысы операциясынан кейін науқасқа емдеу жүргізу тактикасы

Кеуде обырын емдеу ушін кенетілген пульмонэктомияны колданған кезде науқас оте қиын жағдайда болып орналасқан қамтамасыз етеді. Ерте өкпе обырынан ашықтықтық қуысы операциясы бойынша операция кейін жілі және жеміс көрсеткіш корпусында әрекет етеді. Бұл ақпараттық және дәлелді пациенттерге дайындады. Сол жағдайда аспирилді пульмонэктомияның басталуына өткен науқастарға арқылы айқын ерте өкпе кезінде әрекет етеді. Ерін айқын ерте өкпе және пульмонэктомияның саптауына қатыстырмалы болып, кеуде хирургия бөлімшесін өз іріңді-септикалық асқынулардың санын азайтуға бағытталған. Осы бап ортопедикалық, кеуде хирургиялық ана таныстыруға ұсынылған.

Тұйінді сөздер: Пульмонэктомия, қалдық плевра қуысы, плевралды қуысқа әшіру, бронхоплевралды свищ.