

THE FIRST EXPERIENCE OF USING INTRAPARENCHYMASE SUTURE SEALING TECHNIQUE IN LUNG SURGERY**Abdullajanov B.R., Khudaybergenov S.N., Tursunov N.T., Isakov P.M.**

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Abstract. Postoperative air leakage - alveolo-pleural fistula, is one of the most frequent and insidious complications in thoracic surgery and the main limiting factor in early discharge of patients from the hospital. The aim of this study was to increase the efficiency and reliability of aero- and hemostasis in traumatic or surgical damage to the lung parenchyma. A total of 275 patients with various lung pathologies requiring surgical treatment were included in the study. All patients were divided into two groups. The introduction of a new technique to strengthen the tightness of sutures on the lungs allowed to reduce the overall incidence of early clinically significant postoperative complications (grade II-V according to Clavien-Dindo) in the groups as a whole from 13.2% to 3.1%. The development of complications from the pulmonary parenchyma (failure of aero- and (or) hemostasis) necessitates a longer postoperative pleural drainage, in turn, the introduction of a new technique for sealing the suture line made it possible to reduce the average drainage time after all types of interventions from 5.0 ± 2.1 .

Keywords: postoperative air leakage; frequent and insidious complications; thoracic surgery; Clavien-Dindo; introduction of a biological implant.

Postoperative air leakage - alveolo-pleural fistula, is one of the most frequent and insidious complications in thoracic surgery and the main limiting factor in early discharge of patients from the hospital. The aim of this study was to increase the efficiency and reliability of aero- and hemostasis in traumatic or surgical damage to the lung parenchyma. In the proposed method, after performing the main stage of the operation, intraparenchymal puncturing with a gel substance is performed to achieve local aero- and hemostasis in the area of damaged or sutured lung tissue.

The proposed method has no analogues, since the biological implant is not applied superficially on top of the damaged lung tissue, but is injected directly into the lung parenchyma in the area of damage. A total of 275 patients with various lung pathologies requiring surgical treatment were included in the study. All patients were divided into two groups. In the main group, 131 patients in 2022-2023 had a new method of sealing sutures after performing the main stage of lung surgery. The comparison group included 144 patients with lung pathology comparable to the main group, operated on from 2019 to 2021, in whom additional measures were taken during intraoperative verification to eliminate the insolvency of aero- and (or) hemostasis by traditional methods.

The largest number of operations were performed for echinococcosis of the lungs, in the comparison group 60 (41.7%), in the main group 73 (55.7%). Next in number were patients with pulmonary bullous emphysema – 43 (29.9%) and 26 (19.8%) patients, respectively. Pancyric

pleurisy was verified in 16 (11.1%) and 6 (4.6%) patients. In other cases, patients with focal lesions such as tuberculosis, hamartoma, fibrochondroma, lung abscess, cases of complicated residual cavities after echinococcectomy (hemoptysis, bronchial fistula, suppuration), as well as patients who underwent lobectomy for cystic hypoplasia of the lung lobe or bronchiectasis complicated by pneumofibrosis, were operated on.

The new technology of introducing a biological implant into the area of damaged lung parenchyma provides increased tightness of sutures, which is justified by a reduction in the frequency of postoperative significant air leakage from 5.6% to 0.8% and parenchymal bleeding from 4.9% to 0.8% (significant bleeding is usually not a consequence of parenchymal, but vascular genesis, the use of wound coatings in these situations is ineffective) At the same time, a significant advantage is a reduction in the risk of developing empyema against the background of aerostasis failure (2.1% in the comparison group), while the incidence of complications decreased from 21.5% to 6.1% ($\chi^2=13.403$; $df=1$; $p<0.001$).

The introduction of a new technique for strengthening the tightness of sutures on the lungs allowed to reduce the overall incidence of early clinically significant postoperative complications (grade II-V according to Clavien-Dindo) in general groups from 13.2% to 3.1% ($\chi^2=9.205$; $df=1$; $p=0.003$), including open interventions – from 14% to 3.4% ($\chi^2=6,154$; $df=1$; $p=0.014$) and MTC operations – from 11.8% to 2.3%, in turn, in the structure of these complications, grade II severity accounted for 9% in the comparison group and 1.5% in the main group, and grade III-V was 4.2% versus 1.5% ($\chi^2=14.241$; $df=5$; $p<0.05$), while it is the development of prolonged air leakage that is the main risk factor for the formation of menacing specific purulent-inflammatory complications.

In the early period after surgical treatment of focal lung pathology, especially after resection interventions, the development of aero- and (or) hemostasis insolvency are the main factors of prolonged postoperative rehabilitation, while the probability of their elimination by conservative measures was only 3.5%, chemical pleurodesis was performed in 5.6% (out of 13.2% of complications in the comparison group), In the remaining (4.2%) cases, it became necessary to carry out invasive methods, including drainage (2.1%), videothoracoscopy, sanitation (1.4%) and retoracotomy (0.7%). In turn, the use of a new sealing method made it possible to change both the frequency of these complications and the need for additional therapeutic manipulations (3.1%), which were limited to conservative measures, pleurodesis, drainage or video thoracoscopy intervention.

The development of complications from the pulmonary parenchyma (failure of aero- and (or) hemostasis) necessitates a longer postoperative pleural drainage, in turn, the introduction of a new technique for sealing the suture line made it possible to reduce the average drainage time after all types of interventions from 5.0 ± 2.1 to 3.8 ± 1.4 days ($t=4.63$; $p<0.05$), including a decrease in this indicator after open operations from 5.5 ± 2.1 to 4.4 ± 1.0 days ($t=4.63$; $p<0.05$), video thoracoscopy of operations from 4.0 ± 2.9 to 2.8 ± 1.5 days ($t=2.60$; $p<0.05$), while the duration of the postoperative hospital period decreased in general from 7.3 ± 2.4 to 6.4 ± 1.4 days ($t=3.91$; $p<0.05$), and, respectively, subgroups with 7.9 ± 1.9 and 7.1 ± 0.7 days ($t=3.92$; $p<0.05$) and 6.3 ± 2.7 and 5.2 ± 1.5 days ($t=2.51$; $p<0.05$).

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