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Historical background of surgical treatment of lung cancer in the elderly

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Abstract

The history of treatment of lung metastases with surgical resection is over 120 years old. For many years it was believed That all attempts at surgical treatment were ineffective and even harmful. It took many years of research prove That is a surgical treatment is often the only way to give patients a chance to prolong this life and even permanent cure. Lobectomy together with pneumonectomy is the most commonly performed procedures in lung cancer.

Admission

Lung cancer is a malignant neoplasm of the lung epithelial cells. Etiology of cancer is not known, but there is a lot of evidence that this is induced tumor syndrome exogenous carcinogens under the specific conditions of the system. The factors giving rise to lung cancer among [1, 2]:

• cultural habits, which include smoking,

• occupational exposure to asbestos, chromium, nickel,

• exposure to ionizing radiation,

• the diet low in nutritional supplements (vitamin A, beta-carotene, selenium)

• atmospheric pollution, such: gases from engines of automobiles, exhaust gas atoms, polycyclic aromatic compounds.

Genetic predisposition plays a large role in the pathogenesis of lung cancer. The development of lung cancer occurs in 10 - 20% of the long-term smokers. There is also a major part of disease in relatives of cancer patients płuca- considered the theory of etiopathogenesis of the disease.

It is suggested that the effects of mutations in three groups of genes [1, 3]:

Proto-oncogenes are responsible for cell proliferative processes. Relay encode proteins and nuclear receptors, and cell growth factors.

The tumor suppressor genes involved in cell cycle regulation to affect cell differentiation, inhibit the growth and induce apoptosis.

Mutator genes encode proteins involved in the removal of DNA damage. The disorder in the correct encoding these proteins as a result of mutation, can cause accumulation of errors in the genetic information, and this may be the cause, and consequently leads to unrestrained growth, which is characteristic of malignant transformation.

Lung cancer is a malignant tumor that originates from the bronchial epithelium. We can distinguish the following types of histopathological lung cancer [3]:

- squamous
- glandular,
- mixed,
- bronchial carcinoid,
- small cell.

Almost 48% of the patient population are operated with squamous cell lung cancer. Squamous cell carcinoma accounts for 30% of all cancers. It is generally centrally within the lobar and segmental bronchi. At the beginning of the development of the disease often it is not visible in radiological imaging. Adenocarcinoma accounts for about 35%, and its incidence is increasing. In the case of women, adenocarcinoma is more common than the squamous cell.

Small cell cancer is characterized by the presence of microscopic or macroscopic metastases in the majority of patients at the time of diagnosis. Surgical treatment of this cancer is completely ineffective. Small cell cancer is the most frequently metastasize to the bone, bone marrow central nervous system, liver [3].

The clinical symptoms of lung cancer

Initially, the lung cancer is frequently asymptomatic, or to nonspecific symptoms of the disease. Symptoms depend on the location of the tumor of the first type holistic it's biological properties or severity.

The symptoms induced by the primary tumor are a cough (present in about 50 - 70% of patients) or change its character, coughing mucous or mucous - purulent discharge, fever, hemoptysis, effort dyspnea, pain in the chest (a symptom leading in about 40 - 50% of people), repeated or not treatable pneumonia [4, 5, 6].

Symptoms caused by the propagation of the tumor are: dysphagia, hoarseness, superior vena cava syndrome (swelling of the arms, face, and the occurrence of collateral circulation in the chest area). General symptoms of cancer include weight loss, fever having no specific cause, weakness, joint pain, sensory disturbances of the surface, the symptoms of thrombotic pulmonary inflammation [3, 4]. Symptoms depend on the metastases lymph nodes, mainly supraclavicular, superior vena cava syndrome - swelling in the face, enlarged neck

circumference, extending vein in the neck and chest, swelling of the upper limbs, bruising face and mucous membranes, reduced ripple follicular, wheezing the busy bronchi , ripple bronchial (in the case of obstruction or narrowing of the bronchi), no voice tremor, weakened diminished or absent breath sound.

Historical background of treatment of lung cancer

The history of the treatment of metastasis to the lung by surgical resection is more than 120 years. For many years it was believed that all attempts at surgical treatment are ineffective or even harmful. It took many years of research to prove that surgery is often the only way of giving patients a chance of life extension, or even permanent cure. In 1888. He published in the German literature work Gevulanosa, who described 38 cases the surgical treatment of tumors of the chest wall. Among them was a description of cases each simultaneous removal of tumor tissue from the lungs, the oldest of which was from 1855. Its author was a French surgeon Sédillot [5, 8].

First resection of pulmonary metastases made in 1882. Weinlechner. This took place during a huge operation sarcoma ribs. After removal of the tumor, the surgeon opened the pleural cavity and found the presence of two metastases in the upper lobe, which simultaneously removed. The next day due to cardiopulmonary failure - respiratory patient died. The next step was operated on in 1883. In a young woman by Kronieina. During surgery removed lung metastasis - the patient suffered up to seven years after surgery [6, 8].

The first elective surgery to remove the metastasis Divis introduced in 1927. It was an anterior resection of metastatic sarcoma located in the lower lobe of the right lung. In the same year, A. Tudor Edwards Brompton Hospital performed (published in 1934). Lobectomy due to metastatic sarcoma arrows. In 1930. Torek removed uterine sarcoma metastasis detected in the lower lobe of the left lung. In 1947. It appeared the work of John Alexander and Cameron Hight from the University of Michigan. They described 24 cases of surgical treatment of lung metastases. Noteworthy example, 22 - year old woman with whom in 1938. Resection of the lower lobe of the right, and then after 2 years after the disclosure of the next metastasis - left upper lobectomy. The patient lived 14 years after the second operation.

Worldwide conducted statistical research on survival after surgery. It was believed that patients with metastatic both sides or more than three or demanding to make a few thoracotomy should not be operated because of very poor long-term prognosis. An important moment in the history of surgical treatment of metastases was 1970, which revealed that none of the 83% of patients who develop metastases in the lungs, survived 5 years. It was not until after the enlargement of the eligibility criteria for surgical treatment achieved 32% 5 - years survival in patients treated with resection. This was the turning point that made resection of the clinical method of choice in the treatment of lung metastasis of many types of cancer [8].

Definition lobectomy

Lobectomy (ang. Lobectomy) - surgery involving lobectomy organ (eg. Lung). The treatment notches lobe, comprising a common supply anatomical structures bay was described by

Howard Lilienthal in 1922. It was initially performed only in the treatment of non-malignant lung diseases. Lobectomy gradually gained recognition in the treatment of peripheral lung tumors, and eventually became a common procedure. Dr. Bross together with his teacher prof. Ostrowski started to perform pioneering lung surgery in Poland in 1935. They carried out the first in Poland lobectomy in bronchiectasis, and a year later the whole lung resection for cancer. At the turn of the twentieth century 60 and 70. Predominated convinced of the need for radical surgery. Mainly anatomical resections were performed: lobectomy,

Surgical treatment

Indications and contraindications for surgery small cell lung cancer

The eligibility of patients with lung cancer surgery needs to take account of their general condition, the severity of disease and the presence of comorbidities. Stage I and II according to lung cancer TNM classification is considered the early phase of cancer and is qualified for surgery. If we deal with locally advanced disease, as, for example. As in stage IIIA and IIIB indications for surgery must be carefully defined. In stage IIIA and IIIB, some situations (without the N3 characteristics and the presence of tumor effusions) are most commonly used combination therapy - chemotherapy before surgery, resection of lung tissue, supplementary radiotherapy, and chemotherapy at times [1, 2].

Stage IV is distant metastatic disease, where the indications for surgery are unique. We are dealing here with a situation to remove a single metastasis to the central nervous system. A very important part of qualification for surgical treatment is the result of functional respiratory tests. The maximum expiratory volume in one second (FEV1) below 1.5 liters of a contraindication for lung resection, and FEV1 of less than 1.0 liters contraindication lobe resection. Contraindication for lung resection is also hypertrophy of the left ventricle with impaired contractility and decrease its ejection fraction less than 40%. Generally, there is no upper age limit, above which the patient does not qualify for surgery, but you should keep the boundaries of common sense when deciding the extent to which the operation [2, 9].

Anatomic- excision is the most effective form of treatment for patients with small cell lung cancer (NSCLC), in its early stages is anatomical resection of lung parenchyma with the tumor. The aim of the surgical treatment of lung cancer is complete removal of the primary tumor and regional lymph nodes: intrapulmonary, wardrobes, or mediastinal. Sometimes it happens that in addition to the lung parenchyma also removes the adjacent tissue, due to their infiltrative tumor (eg. the pericardium, chest wall, diaphragm) - such an operation is called the extended resection. Most operations notch pulmonary parenchyma it is anatomical nature of the operation. This means that the removed portion of the pulmonary parenchyma, which is a separate unit anatomically. This unit has its own separate supply blood circulation with a small, separate venous drainage and own bronchus. Anatomical units are: lung lobe and segment [2, 10].

Cuneiform excision - small nodules located circumferentially been eliminated in not anatomical ie. Omitting is isolated and ligation of the appropriate parts of the cavity of the lung. Cut the flesh in the shape of a wedge, and in its center is a lump. Then using staplers (automatic staplers) sutured flesh. Carcinoma of the lung resection procedure final wedge as used at high respiratory limitations when it is necessary to save the maximum of the pulmonary parenchyma [1, 2, 11].

Invasive treatment using thoracoscopy - using thoracoscopy can be made very much limited surgical procedures, such as removal of small cysts, bullae like. In the treatment of tumors, the primary purpose is to eliminate small under pleural lumps, both for diagnostic and therapeutic, including removal of metastases cancer.

Thoracoscopy allows evaluation of biopsy and possible nodes in the "window" aortic or recess lungs. In recent years, several operations were performed lobectomy (left, top and middle) thoracoscopy under control. In all cases, it involved a small peripheral nodules. Also collected under control thoracoscopy lymph nodes of the cavity, and tested spot frozen preparations.

In thoracic surgery under the control, videothoracoscopy have their good utility in the removal of small under pleural nodules [1, 2].

Depending on the extent of lung resection distinguish [1, 2, 11, 12, 13, 14]:

1. Pneumonectomy (cut entire lung) During this procedure, extract the corresponding branch of the pulmonary artery and bronchus of both pulmonary venous and equip them properly. It is performed only if there is a tumor in the right stage.

2. Lobectomy cuffed / tubular

Lobectomy glands are to remove the panel, wherein the lobar bronchus is not cut off from the mouth of the main bronchus, but the panel is removed together with the section of the main bronchus in a periphery thereof. Cuffed lobectomy is performed if the tumor is located in the mouth of the bronchi. This technique is most commonly applied to the right upper lobe.

3. Lobectomy (cut lobe)

Excision lobe lung cancer surgery is the most indicated, as is generally well tolerated by the patient. The space after the lobe usually readily fill. In most cases, the external lobes are not differentiated from each other is difficult, because they are separated by between the slits lobe well developed.

4. Bilobectomy (excision of the two lobes)

Bilobectomy relates to the need to remove two panels at the same time, the right lower lobe and intermediate lobe. Removing the right upper lobe with the middle is rare and most often results from direct tumor passing through the slit of the lower lobe of the flap.

5. Segmentectomy (cut section)

Is performed when the cancer is small change - stage T1. This shall be done when lung function parameters are not satisfactory execution and a broader procedure entails an increased risk for the patient. Most frequently excision of segment 1 and 2 on the left side and 4 and 5 on the left side.

6. Complementary pneumonectomy

It is performed when for various reasons it is decided to remove the remainder of the lung. The reason why such an action may be, for example. Determining the presence of tumor foci in the bronchial stump do not cut out intraoperative histology or fistula formation of bronchial stump flap or bronchial anastomosis (the sleeve resection) or recurrence of cancer in the lung or bronchi stump.

Lobectomy and pneumonectomy are the most commonly performed procedures in lung cancer. The use of other surgical techniques is possible only in selected cases of lung cancer depend on its location, size, limitations resulting from the efficiency of the respiratory system.

At every stage of the planning of surgical treatment (particularly in patients with low respiratory reserve) should be carefully considered the possibility of a minimum level of pulmonary resection [1, 11].

Prognosis after lobectomy

The prognosis for patients operated on for lung cancer depends on the classification of postoperative pathological and oncological surgery completeness.

For radical treatment is assumed that following conditions are met: there is a histologic tumor-free margin cut off, there is total removal of the regional lymphatic system (6 groups recess node 3 intrapulmonary mediastinal and 3); unknown cyst node invasion and metastases in node farthest removed [1, 14].

Summary

The progress of medical science and science gives great hope to patients and medical staff on the use of different techniques and equipment to perform operations lung cancer. This hope for the longest survival also depends on the physicists and engineers who invent such methods and techniques of action to effectively diagnose and operate on patients with lung cancer.

References

1. Jeziorski A, Szawłowski AW, Towpik E. Surgical Oncology. PZWL Medical Publishing, Warsaw 2009.
2. Kosacka M, Jankowska R. Epidemiology of lung cancer. Pneumonol. Alergol. Pol. 2007; 75: 76-80.
3. Noszczyk W. Surgery. Volume I. PZWL Medical Publishing House, Warsaw 2009.

4. Chmielewska E. Lung tumors. In: Oncology textbook for medical students, ed. A. Kułakowski, Skowrońska - Gargas A. PZWL Medical Publishing House, Warsaw 2003, 122– 144.
5. Papliński Z, Jassem J. Lung cancer. PZWL Medical Publishing, Warsaw 1994.
6. Kvale PA. Chronic cough is a large lung tumors: ACCP evidence-practice guidelines. Chest 2006; 129: 147-153.
7. Jezierski A. Oncology, a handbook for nurses. PZWL Medical Publishing, Warsaw 2016.
8. Grace P, Dyszkiewicz W. Surgical treatment of pulmonary metastases - historical. Cardio-Thoracic Surgery Poland. , 2005; 4; 88–89.
9. Świniarska J, Kowalewski J, Żekanowska E, Góralczyk K. Small cell lung cancer: patients after pneumonectomy prevention antithrombotic require longer than patients underwent lobectomy. Cardio-Thoracic Surgery Poland. 2008, 5 (1); 31-37.
10. Jassem J, Biernat W, Bryl M et al. The role of systemic therapies in patients with small cell lung cancer and malignant pleural mesothelioma: updated recommendations of experts. Pneumonol. Alergol. Pol 2014, 82 (2); 133-149.
11. Kowalewski J, Dancewicz M. Lung cancer; surgery patients with limited pulmonary reserve. Cardio-Thoracic Surgery Poland 2008, 5 (4): 2008; 413 – 417.
12. Kowalewski J, Brocki M, Kutwin L et al. Thoracoscopy in the diagnosis of tumors of the mediastinum and the lung. Videosurgery 1997; 2: 9-11.
13. Jabłonka A. Videothoracoscopy diagnostic procedures in anesthesia miejsco dim. Videochirurgia 1997; 2: 22-24.
14. Chmieliński A, Przystasz T, Stanowski E et al. Videothoracoscopy - own experience. Wideochirurgia 2000; 5: 34-36.