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Reconstructive-plastic surgery for lung cancer

Relevance. Lung cancer ranks first all over the world as a cause of cancer morbidity and mortality. According to the cancer registry, about 1.2 mln. new cases of this disease are detected annually. Despite the improvements in diagnostics and treatment, the treatment results are still unsatisfactory. Reconstructive-plastic surgery for lung cancer is recently developing in the technical aspect and is being successfully introduced into thoracic surgery.

Purpose of the study: the analysis of outcome of reconstructive-plastic surgery with lymph dissection.

Results. The long-term results of reconstructive-plastic surgery in lung cancer showed an improvement in overall survival rates. The five-year survival rate after reconstructive lobectomy with no metastases in the intraoperatively removed lymph nodes was 47.5% vs. 31.6% after pneumonectomy. The five-year survival rate after lobectomy and pneumonectomy with metastases in regional lymph nodes was 21.3% and 17.0%, respectively.

Conclusions. The analyzes of own observations allows increasing the level of lung resection in particular when the process is extended to the tracheal bifurcation area and expanding the extent of operation in the form of lymph dissection without an increase in the frequency of post-surgery complications. Reconstructive-plastic surgery on the bronchi allows performing fractional resections instead of pneumonectomy.

Keywords: lung cancer, tracheobronchial surgery, lymph dissection.

Relevance. Malignant pulmonary tumours are among the most common malignant tumours. According to the Cancer Research Agency, 1.2 mln. of new cases of malignant pulmonary tumours are registered annually all over the world. In spite of a range of modern achievements in diagnostics and treatment, the treatment of malignant pulmonary tumours still remains a topical issue.

Over recent years, reconstructive-plastic surgery of malignant pulmonary tumours is developing stably and intensively. Advanced methods of surgery make it pos-

sible to extend the boundaries of bronchi and trachea resection. The conduct of extended reconstructive-plastic surgery at malignant pulmonary tumours may represent a certain step in solving the problems of surgical treatment of malignant pulmonary tumours. Currently, the resection of bifurcation section of trachea and plastic surgery of this area are related to very "difficult" types of tracheobronchial surgery due to the difficulties of anaesthetic management and the technical complexity [1-3].

Table 1 – Age and gender of the study cohort

Gender	No. of patients	Age				
		30-39	40-49	50-59	60-69	70 and over
Male	190	5	48	89	44	4
Female	15	2	4	4	5	-
Total	190 (100%)	7 (3,4%)	52(27,6%)	93 (44,7%)	49(25,8%)	4 (2,1%)

The reconstructive-plastic surgery can be conducted in elderly patients with expansion of the tumour process to bifurcation of trachea with additional disorders. The treatment outcome in this group may be improved by addition of broncho-plastic surgery.

According to TNM international classification, malignant pulmonary tumours refer to stages II-III. 68 patients (35.8%) who underwent surgery had stage II, 122 patients (64.2%) had stage III. The staging corresponded to the results of examinations before and after surgery (the condition of lung tissues, bronchi and blood vessels, interpectoral lymph nodes, expansion of the tumour process to neighbouring organs).

The new widely implemented types of surgical operations take into consideration the lymphogenic metastasis and expansion of the malignant tumours to neighbouring organs.

Purpose of the study is the analysis of the nearest results of reconstructive-plastic surgery of bronchi in patients with malignant pulmonary tumours.

Materials and methods. 190 patients with malignant pulmonary tumours stage II-III underwent reconstructive-plastic surgery in the Chest Surgery Department of Kazakh Institute of Oncology and Radiology, the Almaty Regional Oncological Dispensary and the Almaty Oncology Centre. The diagnosis was confirmed morphologically in all patients. The scopes and different methods of plastic surgery of bronchi and trachea were analysed. 175 (92.1%) patients were male, and 15 (7.9%) - female; 49 patients (25.8%) were aged 60 to 69 years, 4 patients (2.1%) were over 70 years (Table 1).

In 34 patients (17.8%), the tumour process affected not only main bronchi but also the neighbouring organs

(pericardium, diaphragm, upper extremity vein, sternum, nervus vagus, semi-single vein).

In 133 (70%) of the studied patients, the malignant pulmonary tumour was localized in the right breast (Table 2).

Table 2 – Localization of the malignant pulmonary tumours processes in patients

Expansion of the tumour processes to bronchi	Right lung						Left lung			
	Upper section		Central section		Lower section		Upper section		Lower section	
	Abs	%	Abs	%	Abs	%	Abs	%	Abs	%
Proximal section of bronchi	22	34.9	1	1.6	-	-	22	57.9	-	-
Distal section of bronchi	31	49.2	2	3.2	7	11.1	13	34.2	3	7.9
Total	53	84.1	3	4.8	7	11.1	35	92.1	3	7.9
Total	63 (62.4%)						38 (37.6%)			

According to the above table, in most of the patients (84.1%) the malignant process was localized in the upper section of the right lung. The most common histologic type of tumour – wide-cell tumour – was found in 154 patients (81.0%) in the course of analysis of histological structure of malignant tumours after reconstructive-plastic surgery of bronchi and trachea. Histologic

types of other tumours included: adenocarcinoma – in 24 patients (12.6%), broncho-alveolar tumour - in 8 patients (4.2%), small-cell tumour – in 2 patients (1.0%), angiosarcoma – in 1 patient (0.5%) and large-cell tumour – in 1 patient (0.5%).

Tables 3-4 show the extent of surgery conducted and the types of bronchi and trachea resection and plastics.

Table 3 – Extent of reconstructive-plastic surgery of bronchi and trachea

Extent of surgery	Patients number	Stage of development			
		II a	II b	III a	III b
Lobectomy with wedge-like resection of bronchi	51	9	16	22	4
Lobectomy with full resection of bronchi	35	7	12	15	1
Bilobectomy with wedge-like resection of bronchi	17	4	7	4	2
Bilobectomy with full resection of bronchi	14	3	8	3	-
Pneumonectomy with partial resection of trachea bifurcation	40	5	7	23	5
Pneumonectomy with wedge-like resection of trachea bifurcation	19		5	10	4
Pneumonectomy with full resection of trachea bifurcation	5			3	2
Resection and plastics of trachea	9	1	5	3	-
Total	190	29	60	83	18

Table 4 – Types of resection and plastics of bronchi and trachea

Types of resection and plastics	Trachea	Bronchi
Partial	51	9
Wedge-like	35	7
Full	17	4
Edge	14	3
Trapezoidal	40	5
Total	19	

Excessive requirements are set to reconstructive-plastic surgery. Enhanced preparation to the surgery. Anaesthetic control and post-operation intensive therapy serve as the reserve in decreasing the frequency of complications and mortality rate. According to the

scientific literature data, complications after reconstructive-plastic surgeries in chest surgery hospitals average to 21,7% with the mortality of 9,9% (4). The results of our studies are close to these figures; the results are provided in Table 5.

Table 5 – Post-surgery complications and mortality

Types of complications	Number of complications	Mortality
Anastomotic breakdown	8	8
Bleeding in chest	2	-
Chylothorax	1	-
Cardiovascular inefficiency, thromboembolia	12	6
Pneumonia, tracheobronchitis, difficulty in breathing	19	2
Pleural empyema	5	-
Total	47 (24,7%)	16 (8,4%)

The most dangerous complication which in many cases leads to death after reconstructive-plastic surgery of bronchi and trachea is sutural deficiency of anastomo-

sis. The conservative measures usually applied in this case are not sufficient. Such complications as post-operation pneumonia, atelectasis, accumulation of liquid in

the chest cavity are also quite often. Expanded removal of intrathoracic lymphatic nodes in plastic surgery of trachea and bronchi has never lead to a growth of post-surgery complications.

Chylothorax was found in one patient; the conducted conservative treatment was efficient. The long-term results of reconstructive-plastic surgery showed an increase of patients survival index. In the absence of metastases in the removed lymph nodes, the 5-year survival index was 47.5% after reconstructive lobectomy and 31.6% - after usual pneumonectomy. In the presence of metastases in the peripheral lymph nodes, the index was 21.3% after lobectomy, and 17.0% - after pneumonectomy. The following also may be concluded after individual observation.

Conclusion. The results of our studies have shown that broncho-plastic surgeries of bronchi and trachea allow expanding and increasing the possibilities of surgical treatment of malignant pulmonary tumours, in particular, the tumours in trachea bifurcation. This surgery provides essential recovery of the patients with low func-

tional stock and significantly improve their quality of life and longevity. The results of lobectomy by wedge-like or full resection of bronchi are as good as the results of radical pneumonectomy.

References

1. Beysebaev A. A., Arzykulov ZH. A., Karasaev M. I. *Rasshirennye rekonstruktivno-plasticheskie operatsii kak variant sovremenogo podkhoda k khirurgicheskomu lecheniyu raka legkogo* [Extended reconstructive-plastic surgery as a variant of the modern approach to surgical treatment of lung cancer] // *Onkologiya i radiologiya Kazakhstana* [Oncology and Radiology of Kazakhstan]. – 2005. – № 3. – С. 15-18.
2. Davydov M. I., Polotskiy B. E. *Rak legkogo* [Lung cancer]. – М.: Radiks, 1994. – 209 с.
3. Kolesnikov I. S., Shcherba B. V., Mezhevikin N. I., Shalaev S. A. *Operativnye vmeshatel'stva pri rake* [Operative interventions in cancer]. – L.: Meditsina, 1975.
4. KHarchenko V. P., Galil-ogly G. L., CHkhikvadze V. D. *i dr. Primenenie rekonstruktivno-plasticheskikh operatsiy v lechenii raka legkogo* [The use of reconstructive-plastic surgery in the treatment of lung cancer] // *Vestnik khirurgii* [Bulletin of surgery] – 1982. – № 7. – С. 3-8.