THORACIC SURGERY OF YAKUTIA: VIEW THROUGH THE PRISM OF PHTHISIATRY

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Thoracic surgery as a specialty had been developed in Russia since the postwar years, but was officially established as a specialty in 1996. Absolute majority of thoracic surgical operations in the USSR were performed in anti-tuberculosis institutions. In Yakutia, thoracic surgery developed in three stages: start-up, assimilation of new techniques, development and introduction of in-house original methods of surgery.

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Medical specialty of “thoracic surgery” was officially established as specialty in 1996, although its development had been ongoing in Russia since the postwar years, owing to such seasoned scientists with world-wide reputation as B.V. Petrovskiy, I.S. Kolesnikov, M.I. Perel’man, F.G. Uglov. “Chest Surgery” was the branch of general surgery at that time. N.M. Amosov, an internationally renowned cardiosurgeon and the Head of the Kiev Cardiovascular Surgery Clinic was awarded the USSR State Prize for developing the surgical procedure of pneumonectomy in patients with tuberculosis (TB). M.I. Perel’man’s monograph on pulmonary resections was published in 1963 and from that time on, thoracic surgery started to develop quickly.

A.A. Priymak observes that until “perestroika”, 85% of all thoracic surgical operations in the USSR were performed in anti-tuberculosis institutions. Consequently, by improving and developing new approaches to pulmonary surgical procedures, TB surgeons made a huge contribution to advancements in thoracic surgery.

In view of the above, it looks interesting that the pace of progress in thoracic surgery in Yakutia can be conveniently divided to 3 phases:

Ist : establishment and formation (until 1970s);

IInd: adoption of new techniques (until 2000s);

III^{d} : development and adoption of original surgical methods (since 2000s).

In 1952 during the formative period, Jacobaeus operation and phrenicotomy with nerve alcoholization were first performed by D.A. Guriev and G.M. Koksharskiy, who undoubtedly were the founders of chest (thoracic) surgery in Yakutia. In 1953 the first upper posterior thoracoplasty

for TB was performed (D.A. Guriev) under local narcosis; this surgical operation was actively practiced in the USSR at that time. Year later G.M. Koksharskiy performed extrapleural pneumolysis in combination with oleothorax, which in the following years became the "hallmark" of the established Yakutsk Branch of Tuberculosis Institute of the USSR Academy of Medical Science, now renamed to Central Research Institute for Tuberculosis RAMS (fig.1).

At that time in the era of mask anesthesia, D.A. Guriev was performing thoracoplasty in Pulmonary Surgical Department of the Yakutsk City Anti-TB Dispensary. With the adoption of intubation anesthesia technique, Guriev performed in consecutive order lobectomy (1957), pneumonectomy (1960), one-stage pulmonary lobe resection with thoracoplasty (1961), and finally wedge resection of the lung.

Today all these surgical procedures are among the basic repertoire of thoracic surgery in clinical and general practice, both for TB and cancer. Bearing in mind the period and conditions, when these surgical techniques had been mastered and then practiced, D.A. Guriev, Honoured Doctor of YASSR and RSFSR, Cavalier of the two Orders of Lenin, Order of the October Revolution, Order of the Badge of Honour, Deputy of the two Congresses of the Supreme Soviet of YASSR, can easily be named the patriarch of Yakut thoracic surgery.

One of the newer technology-intensive surgical techniques introduced to Yakutia were the surgical operations by A.I. Borovinskiy (performed in Yakutia by Stepanov K.N., Afanasiev N.Kh.), i.e. staged extrapleural pneumolysis with extrapleural thoracoplasty, cavernotomy (cavernostomy) followed by cavernoplasty (1982). At this time, Linev N.I. received his authorship certificate for accelerated epithelialization of the "open cavity" that allowed substantial reduction of treatment duration. A.G. Malitskiy's method on formation of a "small" lung was introduced in 1987. Precision pulmonary (tuberculoma) resection (A.A. Kornilov, N.Kh. Afanasiev), electroanesthesia in combination with pharmacological agents (S.M. Kolesov, S.K. Kononov), and administration of anti-TB agents to internal thoracic vein (I.I. Vinokurov) were introduced in 1988.

In 1989 I.I. Vinokurov performed one-stage surgery on two lungs via L.K. Bogush's transsternal approach; in 1994 two surgical teams at once performed one-stage surgery on two lungs by anterolateral approach (I.I. Vinokurov, Yu.S. Ivanov). Intrapericardial ligation of pulmonary artery was performed in 1998-1999; retrograde pleuropneumonectomy was performed some time later. One-stage surgery on two lungs accessed via unilateral intercostal mediastinal approach through anterior mediastinum was performed in 2001 (A.F. Kravchenko).

Overall, these surgical interventions allowed the surgeons significantly enhance their skills,

and determined the performance level of Pulmonary Surgical Department.

The 2000s have marked a new leap in the advancements in thoracic surgery. Starting in 2001-2003, new methods of collapse surgery have been developed and practically adopted, which later were protected by patents for inventions: extrapleural method for pulling down the lung apex and then securing it with the hammock-like mesh; two-stage "cascade" thoracoplasty preceded by preliminary pleurodesis; extrapleural plombage of the lung apex using latex balloon (A.F. Kravchenko et al.). The following devices were developed to perform the above surgical interventions: net weaving device; plombage latex balloon; distributing switchboard for analgesics. The devices were later patented by Russian Federation utility model patents (A.F. Kravchenko, N.S. Byutyaeva, A.I. Obutova, E.N. O-Zhi-Kho) [1, 4, 7, 8] (fig.2).

In 2010 the method of costoclavicular thoracoplasty was developed and patented by the team of authors (I.I. Vinokurov, A.F. Kravchenko, Yu.S. Ivanov et al.). The difference of this method is that, unlike in standard thoracoplasty, certain clavicle length (derived by calculation) is removed also, to achieve maximum collapse of the hemithorax [6].

Patented new method of analgesia intended for use in thoracoplastic surgery is somewhat unconventional technique among all the above newly developed collapse surgical interventions (A.F. Kravchenko) [3]. The method is an equivalent of S.S. Yudin's technique (1960) for paravertebral anesthesia; the difference is that catheters for postoperative administration of analgesic agents are placed as near to the spine as possible, along the beds of removed ribs (fig.3).

Increased number of surgical interventions performed, including organ-removal operations, and hence increased frequency of postoperative complications have lead us to search for ways to resolve such complications as bronchial fistulas, or the failure of main bronchial stump. In view of this, we have adopted the technique for reamputation of the primary bronchus (I.I. Vinokurov, A.F. Kravchenko). Starting in 2005, the procedure of mainstem bronchus occlusion via transsternal and transpericardial approaches has been mastered and adopted for practice, with no outside guidance (Fig.4). Our other methods that have been likewise developed and patented are: reinforcement of the mainstem bronchial stump with malpighian layer; airtight closure of the mainstem bronchial stump by stump reduplication using the proper membranous part of the bronchus (I.I. Vinokurov, A.F. Kravchenko, Yu.S. Ivanov) [2, 5] (fig. 5).

Nearest targets for further development of thoracic surgery are:

To certify thoracic surgeons in specialties of general surgery, oncology, and endoscopic surgery.

To master the surgical skills to perform mainstem bronchus occlusion (resection) via retropericardial approach in patients reoperated for bronchial fistula.

To expand the use of video-assisted endoscopic thoracic interventions for tuberculosis and other thoracic diseases.

To determine the applicability and prerequisites for the anastomosis of trachea to the main bronchus of contralateral lung after the removal of the lung with its main bronchus and the carina due to extensive cancer of the respiratory organs.

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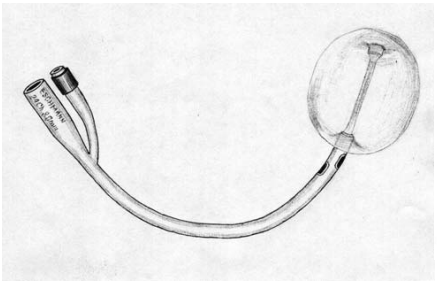
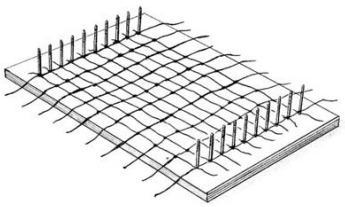
Fig.1 Guriev D.A. Koksharskiy G.M.





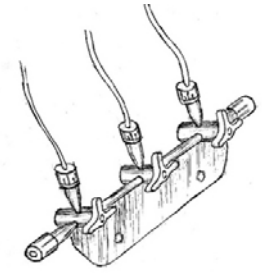


Fig.2. Devices for use in collapse surgery (Device for compressing the lung by means of latex balloon; Net weaving device; Distributing switchboard for postoperative analgesia)

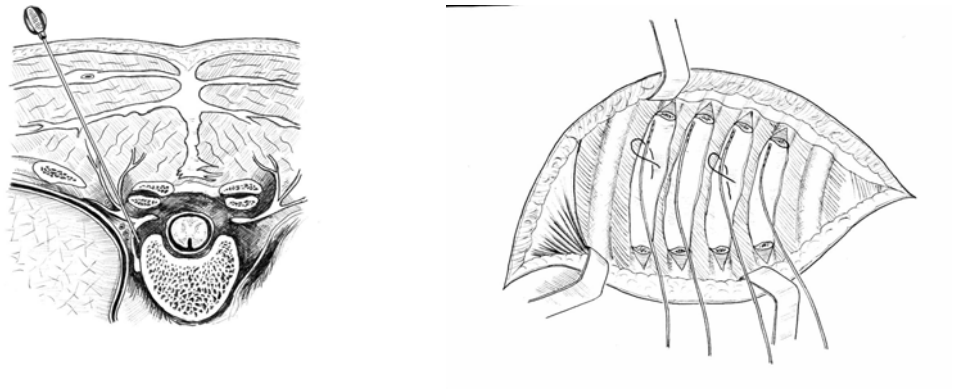


Fig. 3. Paravertebral anesthesia methods (Yudin's paravertebral anesthesia; Conduction post-thoracoplasty analgesia)

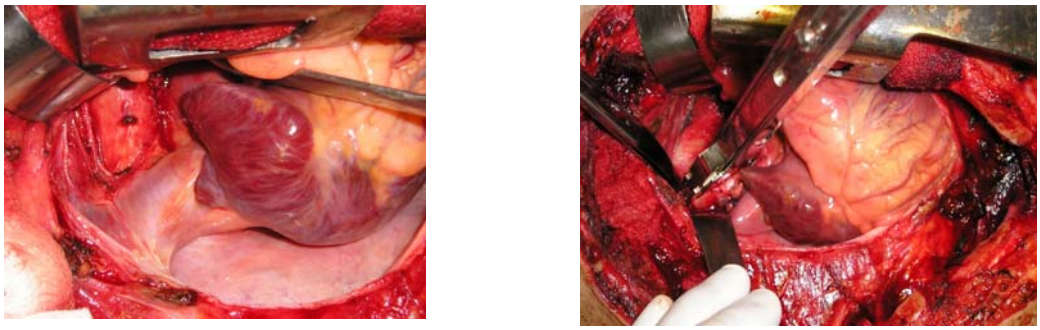


Fig. 4. Transpericardial approach; Right mainstem bronchus occlusion

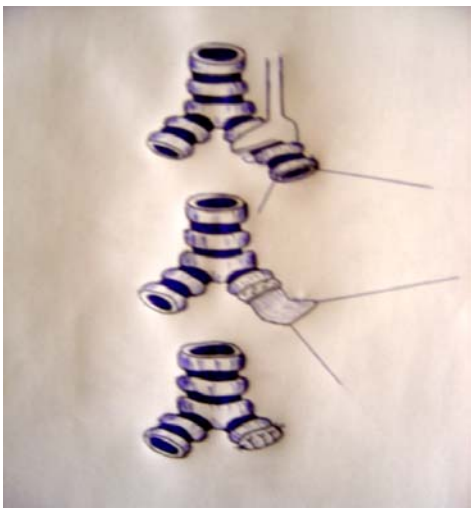


Fig. 5. Airtight closure of bronchial stump using proper membranous part of the bronchus