Methodical instructions  
for independent work of students for preparation  
to a practical class and during the class  

<table>
<thead>
<tr>
<th>Subject</th>
<th>Mini-invasive technologies in medicine (elective course)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module №</td>
<td>1</td>
</tr>
<tr>
<td>Class theme</td>
<td>Endoscopic thoracic surgery.</td>
</tr>
<tr>
<td>Course</td>
<td>VI</td>
</tr>
<tr>
<td>Faculty</td>
<td>Faculty of Foreign Students Training</td>
</tr>
</tbody>
</table>
1. Relevance of a subject:

For last 30 years in thoracic surgery and pulmonology there were essential changes connected with development of a bronchoskopiya, thoracoscopy, mediastinoskopiya and are caused by emergence of video equipment, the new sewing, high-energy medical lasers, etc. Implementation of video equipment in practice of endoscopy allowed to create the new direction - teleendoscopy which significantly increased diagnostic and medical opportunities of endoscopic diagnostic methods and treatment. Teleendoscopy and new endoscopic staplers (staplers) made performance practically of all options of operative measures on lungs and mediastinums under control of a thoracoscopy. These operations carry out through several troakar or through small torakotomny access (minithoracotomy) with video maintenance. Today indications to thoracoscopyc interventions and operations with video maintenance are peripheral formations of lungs, spontaneous pneumothorax, pleurisy of not clear etiology, a tumor and a cyst of a mediastinum. Widespread introduction of thoracoscopyc operational technologies substantially changed surgical tactics at the closed and getting breast injury. Even more often there are data on a possibility of adequate performance under control of a thoracoscopy - lobectomies or pneumonectomies at lung cancer. Considerably possibilities of thoracoscopyc operations in treatment of an empyema of a pleura extended that was promoted by implementation of new laser and plasma technologies. Considerable decrease in injury of thoracoscopyc operations on comparison from a standard thoracotomy led to reduction of number of complications and lethal cases and improvements of quality of life of patients.

2. Specific goals:

- To set knowledge of anatomo-physiological features of bodies of a pleural cavity.
- To reveal various clinical displays of urgent surgical diseases of bodies of a pleural cavity and their complications.
- To treat etiological and pathogenetic factors of the most widespread surgical bodies of a pleural cavity.
- To define the plan of inspection of the patient, to interpret results of laboratory and tool researches at the typical course of surgical diseases of bodies of a pleural cavity and their complications.
- To study the principles of differential diagnosis, justification and the formulation of the preliminary clinical diagnosis of surgical diseases of bodies of a pleural cavity.
- To treat the general principles of treatment, rehabilitation, prevention at surgical diseases of bodies of a pleural cavity.
- To treat an etiology, a pathogeny and classification, the main clinical manifestations of new growths of soft tissues, tumors of bodies of a pleural cavity.
To treat the principles of complex surgical endoscopic treatment of diseases of bodies of a pleural cavity.

3. **Basic knowledge, abilities, skills necessary for studying of a subject (cross-disciplinary integration)**

<table>
<thead>
<tr>
<th>Names of the previous disciplines</th>
<th>The received skills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anatomy</td>
<td>Anatomic structure of a chest cavity and its bodies: lungs, bronchial tubes. Anatomic structure of arteries and veins, absorbent vessels, nerve fibrils. Blood supply, lymph drainage of these bodies and innervation.</td>
</tr>
<tr>
<td>Histology, cytology and embryology</td>
<td>Embryogenesis of organ of a chest cavity. Morphological characteristic and histologic structure of lungs and bronchial tubes.</td>
</tr>
<tr>
<td>Pathological physiology</td>
<td>Bases of pathological processes in bodies of a chest cavity. Pathological processes of lungs, bronchial tubes, in walls of vessels, breath dysfunction.</td>
</tr>
<tr>
<td>Operational surgery and topographical anatomy</td>
<td>Topographical anatomy of a chest cavity: interposition of lungs, bronchial tubes, hearts, mediastinums. Topography of arteries, veins, absorbent vessels and nerves. Typical quick accesses at operative measures. Elements of the operational equipment.</td>
</tr>
</tbody>
</table>
### Surgery

Pathogeny, clinical manifestations, diagnosis and treatment of surgical diseases of bodies of a chest cavity. The principles of diagnosis, treatment, operational and conservative maintaining patients with acute surgical diseases. Presurgical and postoperative maintaining patients.

### Oncology


### Anesthesiology and resuscitation


### 4. Tasks for independent work by preparation for class and on class.

4.1. The list of the main terms, parameters, characteristics which the student has to acquire by preparation for class

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thoracoscopy</td>
<td>Technique of survey of a thoracic cavity by means of the video endoscopic equipment.</td>
</tr>
<tr>
<td>Manually assisted thoracoscopy</td>
<td>The type of an operative measure when the main phase of operation is completed by the surgeon's hands under observation by means of the thoracoscope.</td>
</tr>
<tr>
<td>Pneumothorax</td>
<td>Accumulation of air in a pleural cavity</td>
</tr>
<tr>
<td>Hydrothorax</td>
<td>Accumulation of liquid in a pleural cavity</td>
</tr>
<tr>
<td>Pleura empyema</td>
<td>Purulent inflammation of a pleura which is followed by accumulation of a purulent exudate in a pleural cavity</td>
</tr>
</tbody>
</table>

4.2 Theoretical questions to class:

- What place is taken by a thoracoscopy among other types of operative measures of bodies of a thorax.
• Supply of bodies of a thorax.
• Zones of a lymph drainage of bodies of a thorax.
• Indications and contraindications for carrying out thoracoscopyc operations on bodies of a thorax.
• Features of training of the patient to thoracoscopyc operations.
• Types and tactics of laparoscopic thoracoscopyc operations on bodies of a thorax.
• The material equipment for carrying out thoracoscopyc operations on bodies of a thorax.
• Differential and diagnostic symptoms of various diseases of bodies of a thorax.
• Features of a current of the postoperative period at thoracoscopyc operations.
• Types of conservative treatment in to - and the postoperative period.

4.3 Practical works (tasks) which are performed on class:
• Inspection and kuration of thematic patients,
• Working off of skills on the laparoscopic exercise machine;
• Viewing of the video record on an class subject.

5. Maintenance of a subject:

**Equipment and tools for videothoracoscopyc interventions**

The modern endoscopic surgery of a thorax is impossible without the high-quality, reliable and adapted equipment and tools. With development of laparoscopic surgery in an arsenal of the surgeon telescopes of small diameter, video systems of high resolution allowing to visualize bodies and fabrics with big increase appeared.

**Optical system**

Optical endoscopic system (telescope) - system of the lenses united in a chain which transfer the image to an eyepiece. The telescope is equipped with a lock for connection of a flexible fiber optic cable on which it transfers a light flux, and an adapter for a video camera head. Telescopes differ from each other in diameter of a working tube and the direction of an axis of sight. So, in surgery optical systems with a diameter of 5 and 10 mm are applied. Here sight of the thoracoscope can make 0, 30, 45, 75 degrees. The main videothoracoscopyc operations are performed by direct optics, but at some interventions preference should be given to slanting optics (30, 45) that allows to visualize hardly accessible sites.

**Light source and fiber optic cable**

This device is intended for illumination of an internal surgery field. Distinguish light sources with galogenovy and xenon lamps. At videothoracoscopyc operations it is better to apply a xenon light source, creates a light flux of a white radiation spectrum of bigger power. The fiber optic cable on
which light is transferred to the telescope can be equipped with special adapters for different light sources.

**Video system**

The era endoscopic surgery, undoubtedly, came with emergence in the operating room of the video camera. The video camera is intended for transformation of an optical signal in electronic by means of the semiconductor crystal located in a camera head. As transfer of video signal distinguish one - and video camera tryokhchipov which create and transfer to the image monitor with different quality. To monitors, applied at videothoracoscopyc operations, high requirements are also imposed. Use of household TVs is in certain cases possible, however at long operative measures there is big load of eyes of surgeons.

When using two monitors necessary surgical skills of work with the inversion (mirror) image.

The videorecorder is an obligatory component of a modern endosurgical complex and necessary for operation video documentation.

Electrothermic coagulation is applied to a safe hemostasis and a section of fabrics in endoscopic surgery. The devices used at a videothoracoscopy, working in mono - and the bipolar modes also do not differ from those at a laparoscopy. The cutting coagulation mode is possible, is often necessary when opening dense pleural шварт. Coagulative devices are equipped with a passive electrode for the monopolar mode.

**Aspiration and irrigational system**

It is an important component of the endosurgical operating room. The device is intended for removal from a pleural cavity of various liquids, and also irrigation of a surgery field. Distinctive feature of an aspirator irrigator from usual surgical the suction machine is the increased power of the soaking-up part of the device. It is completed with a set of tubes.

**Tools**

Endokhirgichny tools for videothoracoscopyc operations have to be reliable, simple in use, are economic.

Tools for access. Troakara, applied in thoracic endosurgery and called торакопорт, consist of a cannula and blunt-pointed a stylet. Cannulas, as a rule, have an external carving by means of which it contains in a mezhreberye. For work in the conditions of a tension pneumothorax of a torakoporta are equipped with rubber cuffs. Diameter торакопорт, offered by manufacturing firms - 5, 10,5, 12 mm.

Tools for capture, dissection and a section of fabrics. For dissection of tissue of lung and anatomic formations of a thorax the standard tools applied in laparoscopic surgery - surgical, anatomic, fixing a grasper with various types of handles, and also clips like Alies are used. In surgery 5-millimeter tools are most often used. Opening of fabrics is carried out by electrodes and scissors. Electrodes have a different appearance of a working part - a sphere, a shovel, L-and J-shaped hooks. Scissors also have various form of the cutting part. Almost all these tools have the socket for connection of an electrocoagulator and the mechanism rotating a working part on an axis.
There are special tools used at operations in a pleural cavity. Special attention should be paid Atraumatic to clips for lungs with a soft working part - the type Endo, Lung, Babcock. In set at least two or three such tools are necessary for videothoracoscopyc operations. Besides, endoretraktor, released in the form of a shamrock, the framework allowing not traumatic to take away and hold a lung diversely are necessary.

Tools for an alloying and sewing together of fabrics. Distinguish tools for a manual and automatic seam. The manual stitch is put by the assistant by means of the endoscopic needle holder. For lowering of a node at an extracorporal seam there is a special stick. Use of a standard suture material, and also special needles - a straight line or the ski type is possible. The manual mechanical seam is carried out by means of the device Endo Stitch which allows to impose different types of a seam.

Endoklipatora, released by various firms, can be one - and multiply charged and allow to alloy small vessels in a pleural cavity.

The automatic staplers (the ENDO-GIA 30, 60 type of mm or Endopath EZ 30, 45 of mm, etc.) Called linear endostaplers allow to stitch and cross instantly fabric, a vessel and other formations of a pleural cavity. Use several types of endostaplers which differ only with length and thickness of an insertion section. They are supplied with the rotary mechanism, and some models and a working part, is bent. The stapler is charged with the special cartridge with six rows of titanic clips. Most often linear endostepler are applied at a pneumonectomy, a pneumonectomy, segmented biopsies.

**General principles of thoracoscopyc operations**

Two types of thoracoscopyc operations - videothoracoscopyc and a videoasistovana thoracoscopyc were so far created. The first are carried out only from trocar accesses through a thorax, others - with a minithoracotomy. Videotorakoskopicheskaya operations are less traumatic, give the best cosmetic effect, but are carried out only with use of special endosurgical tools. Videoasistovani thoracoscopyc operations also belong to low-invasive surgery, though are more traumatic, but at their carrying out, except obtaining the video image of the operated object, direct vision behind manipulations is provided. Besides, use in - surgical instruments and a suture material is possible, reduces the cost of operations. Two are specified types of thoracoscopyc operations do not exclude, and significantly supplement each other.

In those situations when carrying out videothoracoscopyc operation is impossible because of technical complexity and insufficient security with special tools, intrathoracic operational treatment with respect for the principle of a malooinvazivnost allows to carry out carrying out videoasistovany intervention.

Videotorakoskopicheskaya and videoasistovan of operation are difficult methods, demanding special preparation according to the section of traditional chest surgery today, it is combined with development of endokhirurgichny operating-technical receptions.

**Technique thoracoscopyc interventions**
Position of the patient on the operating table does not differ from what is recommended at classical thoracic surgery. The patient have on the left or right side, stack a gomolateralny hand up and slightly back. Under a waist conclude the roller of such height that the wing of an ileal bone was located at the level of a thorax. The anesthesiology arch is located at the level of the head of the patient and as low as possible to it. The last two moments very important as being highly a wing of an ileal bone and an anesthesiology arch can disturb a free manipulation tools and optical system. Besides, such position of the patient on the operating table strengthens an expense of edges and facilitates installation of the торакопорт. Such laying of the patient can be used for all videothoracoscopyc operations, but depending on the carried-out intervention and for ensuring optimum access to the operated sites of a chest cavity it is necessary to change a trunk inclination. At operation in front departments of a thorax (a front mediastinum) the patient has to be rejected back on 20-30 °, and at pathology in back departments of a thorax of the patient stack on 20-30 ° forward.

The arrangement of operational crew can change depending on the planned intervention, however it is necessary to observe situation at which the main surgeon is on one line with the camera and sees the image on the monitor screen in a direct projection. For convenience of work it is necessary to install two monitors at videothoracoscopyc operation that the surgeon and the assistant had an opportunity to watch the operation course without difficulties. Monitors establish at the patient's head at an angle 45 ° in relation to an axis of the operating table.

Introduction of the first torakoport always is one of the most responsible moments of a thoracoscopy because it occurs blindly. The surgeon on the basis of the preliminary clinical and tool equipment at videothoracoscopyc operation has to have an idea of a condition of a chest cavity at this disease and to be ready to possible difficulties of entry into a pleural cavity and emergence of complications.

S. Rothenberg suggests to begin operation on insufflation in a chest cavity of C02 with a low flow (1 l/min.) and low pressure (4 mm of mercury.), Using Veresh's needle. It helps to kollabirovat a lung and to prevent inadvertent damage of a torakoport. For carrying out operation use torakoporta with valves, allows to carry out long insufflation of C02 and to hold a lung in kolabovany a state. Such technique can be used in intolerance cases the patient of one-lung ventilation.

The standard point for input of the first torakoport in a thorax is a point in the field of a shovel corner at the hand which is taken away up, it is at the level of the fourth - the fifth a mezhreberye on the back axillary line. This point is the most remote from anatomically important formations of a thorax (from below - a diaphragm, medial - a mediastinum, from above - mediastinum vessels). Probable body damage can be a lung, however, first, it is much more elastic than the specified educations and, secondly, at correctly carried out one-lung ventilation will be kolabovany that considerably reduces a possibility of its damage. Besides, the standard point of the first access allows to minimize endoscopic visual problems which can arise during development of a technique of videothoracoscopyc interventions because of unusually enlarged two-dimensional
image on the monitor, and also considering features of perception of the image at various distance of the telescope from a research object.

The following technique of installation of a torakoport is often applied. Carry out the skin section corresponding to diameter топракопорт entered further a clip like Billroth stupidly layer-by-layer separate hypodermic cellulose, thorax muscles, intercostal to penetration into a pleural cavity. Via the channel formed enter топракопорт. Such access safe and малотравматичен, does not take a lot of time.

At some diseases when on a chest wall there are drainage openings, the first топракопорт needs to be entered through them as around a drainage, as a rule, a cavity which can be examined, expanded, having separated commissures and by that to create minimum necessary optical space

In this situation introduction of the first trocar will be non-standard that is connected with the nature of surgery.

Introduction of tool torakoport needs to be carried out under direct vision. The number, diameter of torakoport and a point of their installation are defined by a type of surgical treatment. It is necessary to follow rules of a pyramid. Its top is subject to operation in a thorax, sides - entered tools and optical system, and the basis - points of installation of torakoport.

Main stage of operation. Performance of the main stage of endoscopic intervention should not break the classical principles of thoracic surgery. Videothoracoscopy changes only access and a way of a surgical intrathoracic manipulation. Creation of new tools allows to carry out the main stage of operation malotravmatichno and safely, and also to reduce quantity of complications.

Postoperative treatment does not differ from that at classical operations, however it should be noted that line of injury of videothoracoscopic operations allows to activate early the patient, to considerably reduce amount of the applied anesthetics, less for a long time to hold a drainage tube, to reduce terms of stay of patients in a hospital.

So, having appeared at the beginning of the last century as diagnostic manipulation, the thoracoscopy went a long way of improvement. Thanks to the modern equipment, video systems and special tools it turned into a highly effective qualitative method of surgical treatment of thoracic patients.

**Thoracoscopy pneumonectomy**

Development of the endosurgical technology of operation, improvement of the equipment and creation of specific tools allowed to implement in clinical practice a technique videothoracoscopy pneumonectomies.

Indications to a videothoracoscopy pneumonectomy:
1. Existence of indications to traditional operation for this disease.
2. An opportunity to execute operation videothoracoscopyc access.

Existence of the high-quality equipment and specific endosurgical tools, and also high extent of training of operational crew for carrying out these operations means the last.

**Contraindications to videothoracoscopyc pneumonectomies:**
1. The same that at torakotomichesky access.
2. Anatomic not expressiveness of an interparticle furrow.
3. Obliteration of a pleural cavity.
4. Anomalies of vessels of a lung lobe, is removed.

Position of the patient on the operating table. The patient is located on a healthy side with the hand which is freely lying bent and taken away for the head.

Arrangement of surgical crew and equipment. When performing videothoracoscopy lung lobe resections the surgeon is located from the patient's back, in this situation he sees a surgery field on the monitor screen in the direct, but not mirror image. Besides, it is the most convenient point for a manipulation with vessels. The first assistant holds position ahead of the patient and carries out a number of important manipulations; besides, it is a convenient position for imposing of a linear endostepler on a vein of the lower share and a bronchial tube. The second assistant is located near the surgeon and controls optical system. The instrument nurse with a tool little table is near the second surgeon.

Monitors and endosurgical the equipment are located on both sides of the operating table at the head end. A necessary condition of coordinate actions of crew is existence of two monitors. The anesthesiology crew holds standard position at the patient's headboard. Operation is performed under the general anesthesia with one-lung ventilation. At videothoracoscopy share resections, as well as at classical surgical intervention, carry out separate processing of elements.

Stages videothoracoscopy lobectomies:
1. Introduction of the first торакопорт, visual audit of a pleural cavity.
2. Establishment of workers торакопорт.
3. The main stage - a share resection.
4. Removal of a share deleted check aero - and a hemostasis.
5. Installation of a drainage tube, sewing up of trocar accesses.

Postoperative treatment includes infusional therapy for the purpose of elimination of deficit of liquid, improvement of rheological properties of blood, correction of water and electrolytic exchange and an acid-base state, and also for the purpose of power providing; antibacterial therapy and cardiotonic therapy for the purpose of prevention of an overload of a risky circle of blood circulation of a measure, the pneumonia directed to improvement and stimulation of drainage function of bronchial tubes for the purpose of prevention hypostatic.

Most often at a bronchietasia the lower part at the left and on the right, and also lingular segments therefore in this section operating-technical methods of intervention on these departments of a lung are considered are surprised.

First stage. In all cases the first торакопорт (10 mm) is established after a section of skin about 10 mm long in the field of a shovel corner at the hand which is taken away up, corresponds to the point located in the fourth or fifth mezhrereberye on the back inguinal line. Because of it торакопорт by means of the 10-millimeter probe-palpatora the lung is slightly pressed for removal of the air remains from it; this manipulation allows to judge existence of commissural process in a pleural cavity indirectly. In the presence of commissures it is necessary to separate either a palpator, or a finger commissures and to create
optical the space necessary for primary survey. The expressed commissural process is a relative contraindication to a videotorakoskopichnoi operation therefore it is necessary to resolve individually an issue of an opportunity and need of further carrying out operation in this way.

Great value we give conditions of interparticle furrows. In the absence of the last or its insufficient expressiveness the videothoracoscopic lobectomy heavy for performance, and more often in general is impracticable as access to a lung root is complicated.

Second stage. The second торакопорт (10 mm) establish under control of optical system in the seventh mezhrereberye on the back inguinal line. Being located (in a phrenic sine) it is far from a lung root, it, on the one hand, gives the chance of the panoramic review of a pleural cavity, and with another - allows to approach the place of a manipulation, enlarging the image and not creating obstacles for action by other tools.

The third and fourth torakoporta (12 mm) establish respectively in the seventh mezhrereberye on the sredneklyuchichny line and in the sixth mezhrereberye on the juxtaspinal line. The installation site of the third торакопорт to the middle of distance between a costal arch and a nipple speaks not only functionality and cosmetic effect.

Prevention of damage and growth disorder of a mammary gland at girls is provided to these, often observed at a traditional thoracotomy that is carried out to lobbies and perednebokovy by access.

It should be noted that convenience of surgical manipulations depends on correctness of an installation site торакопорт. Some authors recommend to establish torakoporta on one mezhrereberye, or to apply the scheme of an arrangement in the form of a rhombus

Advantage of a similar arrangement is an opportunity:
1. To bring steplerny the device to anatomic educations (vessels, a bronchial tube, lung tissue) under a different corner that significantly facilitates this important stage of operation.
2. To examine intrathoracic educations from different positions that provides their best visualization.
3. To perform traction lungs diversely, facilitates manipulations on a lung root.

Third stage. This stage is the most responsible dangerous. An upper part through the first torakoport a clip like Babcock is taken and taken away up. The lower part through the third torakoport also a clip of Babcock is taken away in an opposite direction. Interlobar unions through the fourth torakoport separate an electrode and bent the dissector in the coagulative mode, at the same time the root of the lower part then begin allocation of arterial vessels is bared. For this purpose it is more convenient to use the curved dissector and the endoretractor.

For further free passing of branches of a linear endostepler it is necessary to mobilize a vascular trunk within 10 mm. At allocation of an artery of a basal pyramid depending on anatomic features carry out or permission mobilization of an artery of the VI segment and lower part, or allocate the general trunk of a basal pyramid. Underrunning and opening of all arterial vessels of a basal pyramid of a
lung lobe, as a rule, carry out in one step by imposing of a linear endostepler of Auto Suture Ethicon.

After crossing of arteries of the lower part change an arrangement of clips like Babcock. Through three torakoport take the lower part and carry out its traction up. At the same time it is well visualized cardial bonds. Using endoscissors or an endogachok in the monopolar coagulative mode, it is crossed to a nizhnedolevy vein. Similar to allocation of arteries will mobilize a vein of the lower share

Underrunning, crossing of a vein carry out by a linear endostepler who in this case is more convenient to enter through the fourth torakoport

Further skeletirut nizhnedolevy a bronchial tube. At the same time it is necessary to watch carefully a hemostasis, to coagulate all education, are opened, for the prevention of bleeding from peribronchial vessels. Peribronchial lymph nodes whenever possible will mobilize in the lower part of the deleted air. This manipulation is necessary as lymph nodes at a chronic inflammation do not bear barrier function, and are only a source of infection of a stump and a pleural cavity. The resection and sewing up of a nizhnedolevy bronchial tube are carried out linear by an endostepler

Fourth stage. The share of deleted is taken through the first torakoportny access, expanding it in the acute way to 25-30 mm. For convenience of the conclusion of a share deleted from minitorakotomny access it stack in a plastic package, fragment and take from a chest cavity. Control aero - and a hemostasis carry out visually with introduction to a pleural cavity of liquid (Furacilin, 0,9% NaCl solution, aqueous solution of a hlorgeksidin) and increase in volume of breath (to age norm) the device IVL for what pass to two-lung ventilation.

Fifth stage. Operational treatment, as well as at a traditional thoracotomy, is finished with drainage of a pleural cavity. The drainage tube is established to the place of the fourth torakoport. Control of its installation is exercised endoscopic. Trocar wounds take in noose sutures.

Residual bronchiectasias of lingular segments arise more often after a resection of the left lower part in this connection operation - a resection of lingular segments - is complicated by existence of commissural process in a pleural cavity.

Operation there begin with installation 10-millimeter торакопорт also creations of optical space with the probe-palpatorm or optics. At formation of a cavity under video control establish the first worker торакопорт. Through it with the help the dissector, using coagulation, allocate a lung and lingular segments from commissures. Under video control establish the second (12 mm) торакопорт on the juxtaspinal line in the fourth - the fifth mezhreberye.

Pulmonary clip of Babcock lingular segments take and take away up. IV and V segments allocate the general trunk of bronchial tubes. Level of a resection of lingular segments is determined by trial imposing of a linear endostepler and the forced ventilation of the lungs. The resection and sewing up of a parenchyma of a lung on border of an upper share with lingular segments are carried out by linear endostaplers. Lingular segments, резекуютъ, delete from a pleural cavity through one of trocar accesses. Extraction of lingular segments, резекуютъ, does not cause
difficulties because of the small sizes. Use of plastic packages is reasonable. After check on aero - and a hemostasis operation is finished with drainage of a pleural cavity.

The Videothoracoscopy resection of the right lower part has the features. The most significant of them - the small extent of a vein of the lower part and complexity of determination of level of a resection nizhnedolevye a bronchial tube. It is necessary to mobilize a vein of the lower share on an extent to its branching. Opening and an insertion of a vein linear an endosteppler are carried out only at free passing of a branch of an endoretraktor under the mobilized vein. For the correct determination of level of a resection of a bronchial tube of the lower part it is necessary to skeletirovat carefully it to the place of an otkhozhdeniye of a bronchial tube of an average share and to carry out a trial perezhimaniye of a bronchial tube of the lower share with inflating of overlying departments of a lung. For prevention of a syndrome of a long stump it is necessary to watch correctness of imposing of a linear endosteppler carefully.

Undoubtedly advantages of videothoracoscopy access, improvement of the equipment and endoscopic tools allow surgeons to expand the volume of endoscopic operative measures on bodies of a chest cavity. The Videothoracoscopy lobectomy is one of the most difficult interventions. Despite technical complexity of performance of an operative measure, its big duration, all authors unanimously recognize indisputable advantages of these operations to a condition of the patient. Less postoperative pain and morbidity especially distinguish early activation of patients, low number of postoperative pulmonary complications, considerable reduction of terms of hospitalization from them. Videotorakoskopicheskaya the resection of the pathological center eliminates a defect of a traditional thoracotomy - discrepancy between traumatic access to subject to operation and small degree of injury of intervention on the body.

Transition to a traditional thoracotomy should not be considered a complication. It speaks rather about rationality of the operating surgeons and about their aspiration as much as possible to help the patient, but not to execute operation thoracoscopy access by all means. Unreasonable tightening of time of operational treatment complicates a current of the postoperative period, increases invasiveness of intervention, leads to discredit of a method, completely crosses out advantages of malooinvazivny techniques. In process of accumulation of experience of videothoracoscopy operations, undoubtedly, the frequency of transitions to open operation will decrease.

Based on certain experience, we define the following indications to transition to an open traditional thoracotomy:
1. Anatomic not expressiveness of an interlobar furrow.
2. Obliteration of a pleural cavity.
3. Anomaly of vessels of the operated lung lobe.
4. Emergence uncontrollable bleedings.

Thus, the thoracoscopy lobectomy is the perspective direction in treatment of bronchiectasias and serves as a choice method at this disease. It is characterized
by small injury, decrease intra-and postoperative complications, bystry rehabilitation of the patient.

The easiest feasible a videothoracoscopyc way is the left lower lobectomy. Use at videothoracoscopyc resections of a linear endostepler allows to alloy and stitch safely and reliably lung root elements. Lack of the pain syndrome connected with a big section on a chest wall allows to provide the sufficient volume of breath and a full-fledged excursion of a thorax in the postoperative period. All this provides timely straightening of a part of the operated body, remained what is an important condition of the prevention of complications after a resection of lungs.

In conclusion it should be noted that the equipment of videothoracoscopyc lobectomies can be described it is successfully used also at other diseases which main method of treatment is removal of a lung lobe.

**Materials for self-checking:**

- How many anatomo-topographical departments the gullet has?
  - 3
  - 1
  - 2
  - 4
  - 5
- What anatomo-topographical department is not allocated in a gullet?
  - Pulmonary
  - Cervical
  - Chest
  - Abdominal
  - All answers incorrect
- What is not the indication for a medical thoracoscopy?
  - T4 lung cancer with metastasises
  - Spontaneous pheumothorax
  - Bronchoectatic disease
  - Benign diseases of a gullet
  - Benign tumors of a mediastinum
- Choose possible position of the patient on the operating table when performing thoracoscopyc operations:
  - Edgewise position of the healthy party
  - Edgewise position of the party of pathological process
  - Trendelenburga
  - Fowler
  - On spin
- Choose possible position of the patient on the operating table when performing thoracoscopyc operations:
- Semi-side on the wedge-shaped roller
- Edgewise position of the party of pathological process
- Trendelenburga
- Fowler
- On spin

- What pressure of gas is required for carrying out thoracoscopic operations?
  - Pressure of gas is not required
  - 12-15 мм.рт.ст
  - 8-10 мм.рт.ст
  - 5-8 мм.рт.ст
  - 16-20 мм.рт.ст

- What visual angles of the thoracoscope the most convenient for a diagnostic thoracoscopy?
  - 0, 30
  - 15, 45
  - 30, 60
  - 60, 90
  - 90, 110

- State the conversion reason at thoracoscopic operation which is not connected with the operational equipment?
  - Obliteration of a pleural cavity
  - Damage of blood vessels
  - Injury of a gullet
  - Injury of trunk bronchial tubes
  - The excessive duration of operation in the absence of progress

- State the conversion reason at thoracoscopic operation connected with the operational equipment?
  - Injury of trunk bronchial tubes
  - Intolerance of one-lung ventilation
  - Obliteration of a pleural cavity
  - Anatomic features
  - Impossibility to visualize intra pulmonary the pathological center

- Specify an injection site of the 1st trocar at a thoracoscopy concerning spontaneous pneumothorax:
  - The V-VI mezherebery on the average axillary line
  - V-VI mezherebery of the sredneklyuchichny line
  - The II-III mezherebery on the average axillary line
  - VII-VIII mezherebery of the sredneklyuchichny line
  - The IX-X mezherebery on the average axillary line

- What operational reception at a thoracoscopy is most reasonable in the presence of bulls to 2 cm in the diameter?
- Electrothermic coagulation
- Imposing of an endoloop
- Underrunning by the stapler
- Sewing up vikrily
- Tamponade

**Literature:**
