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IMPROVING THE METHODS OF SPONTANEOUS PNEUMOTHORAX TREATMENT BY VIDEOTHORACOSCOPIC OPERATIONS

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СОВЕРШЕНСТВОВАНИЕ МЕТОДОВ ЛЕЧЕНИЯ СПОНТАННОГО ПНЕВМОТОРАКСА С ПОМОЩЬЮ ВИДЕОТОРАКОСКОПИЧЕСКИХ ОПЕРАЦИЙ
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В статье обобщен 15-летний опыт применения видеоторакоскопических операций при лечении 616 больных со спонтанным пневмотораксом. Описаны методики различных видеоторакоскопических операций в зависимости от объема и локализации патологического процесса в легочной ткани. Рассмотрены этапы развития методик эндоскопического хирургического лечения спонтанного пневмоторакса. Проведен анализ выполненных видеоторакоскопических операций при этом заболевании. Рецидивы заболевания при использовании данного метода хирургического лечения составили 3,6 %. Летальных исходов не было.
Ключевые слова: спонтанный пневмоторакс, видеоторакоскопические операции, плевродез.

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Introduction. The evolution of treatment of spontaneous pneumothorax (SP) has gone from conservative and punctures treatments to the use of modern videothoracoscopic technologies. Proposed in 1910 by Jacobeus thoracoscopy has been actively used for SP treatment in 70-s of XX century.

Objective. To show the possibility of videothoracoscopic operations in the treatment of patients with spontaneous pneumothorax at the example of the Odessa Regional Hospital.

Materials and methods. In our clinic over the past 15 years (1997–2011) videothoracoscopic operations at SP were conducted in 616 patients. Among them 532 men and 84 women. The average age of patients was 39 years and ranged from 18 to 80 years. All VTO lung resection should be divided into closed VTO lung resection (CVTLR) and videoassisted lung resection (VALR), when the operations are complemented by minithoracotomy (4–5 cm) access.

Discussion. CVTRL and VARL were performed at sufficiently massive defeat of lung tissue by bullas with a defect of the latter. The absence of visible perforation, isolated small bullas were an indication for other method of treatment: ligation, laser or electrocoagulation, pleurodesis. Conversion at the VTO was absent. Terms of drains removing after surgery ranged from 4–5 days at the VTO with resection of lung to 7–8 days — with coagulation or laser pleurodesis. Bed-day at the VTO totaled (5.2±0.2) days. Relapses of the disease using this method of surgical treatment were 3.6%. There were no lethal outcomes for all run-time of the VTO at SP in our hospital.

Conclusions. Videothoracoscopic operations are more effective than standard open surgery. The number of recurrences of spontaneous pneumothorax after videothoracoscopic operations were 3.6%, and after open surgery — 2.6%. Method of choice for surgical treatment of spontaneous pneumothorax is videothoracoscopic operations. Videoassisted operations are more efficient and allow to perform low-impact operations using multiple-cross-linking domestic vehicles apparatuses.
Key words: spontaneous pneumothorax, videothoracoscopic operations, videoassisted operations, pleurodesis.

Introduction

The evolution of treatment of spontaneous pneumothorax (SP) has gone from conservative and punctures treatments to the use of modern videothoracoscopic technologies. Proposed in 1910 by Jacobeus thoracoscopy has been actively used for the treatment of SP in 70-s of XX century [1; 3]. At the same time, the technical capabilities of this method were not allowed to perform endoscopic resection of bullous lung sections. Only the appearance of videothoracoscopic operations and endoscopic suturing devices allowed implementing a methodology to lung resection SP in clinical practice, which has become an alternative to conventional resection [10]. However, the high cost of equipment hampered the development of this method in our country, which led to a certain lag domestic sur-

geons from world standards. Experience in our clinic of modern methods of minimally invasive treatment of SP [4; 5; 8] allowed them in this work.

Materials and Methods

In our clinic over the past 15 years (1997–2011) videothoracoscopic operations (VTO) at SP were made in 616 patients. Among them 532 men, 84 women. The average age of patients was 39 years and ranged from 18 to 80 years.

Varieties of the VTO, held at SP, are shown in table 1. Their diversity is associated with both improved endoscopic equipment and techniques, and different amounts of damage to lung tissue. 61% of them performed under local anesthesia and 39% — under general anesthesia.

All operations at SP can be divided into two groups: radical and suspended palliative. By radical operations at SP can be attributed VTO and videoassisted lung resection, the technique of which was described in previous publications [2; 6; 9–11].

All VTO lung resection should be divided into closed VTO lung resection (CVTLR) and videoassisted lung resection (VALR), when the operations are complemented by minithoracotomy (4–5 cm) access. Implementation of both types of interventions required general anesthesia with one-lung ventilation and breathing off of the operated lung. At CVTRL the installation of three 10–12 mm thoracic ports (TP) was required in the form of a triangle on a "face-to-purpose" than to remove the effect of "fencing" of the endoscopic instruments. With this method of operation after a visual inspection was carried out the seizure of land bullous by endoscopic clips and then stitching it endostaplers Endopath Echelon-60 or Endopath Flex-45, introduced through the wound of one of the extended TP. To perform a radical resection is usually required from one to four cartridges. Resected portion of lung was easily extracted through the wound of one of the TP.

At VARL resection of the pathological area was carried out using the apparatus UO-40 and US-30. At the same suturing device, or immersed into a miniaccess or the area of lung output through its chest wall, where it made its resection.

All kinds of endoscopic resection to prevent recurrence of the disease ended in the creation of pleurodesis by electrocoagulation of the parietal pleura spot and process it with a solution of iodine.

To the respect of palliative operations which do not eliminate the pathological focus, include the following: endoscopic ligation of individual bulls and electro- or laser coagulation of bullae and pathological lung area with the creation of pleurodesis. With regard of palliative operations, these are called conditional because they are not satisfied with lung resection, however, this amount is enough for a small lesion of the lung tissue. At the ligation bullas performing, TP were installed in standard locations. Then bullas localized and under endoscopic control imposed on them Roeder loop. The latest delay endoscopically and tie. In this bull may remain or be cut off ligated [4; 5]. Surgeries using electro- and laser pleurodesis performed using electrocoagulators various capacities and designs, as well as using lasers: neodymium-YAG laser, "Raduga-1" with a wavelength of 1.064 nm and a power of 30–40 W, the energy of radiation 5000–7000 J and CO2 laser "Scalpel-3". At the same time visceral and parietal pleurodesis was running to form a crust of gray colour. All surgical interventions, regardless of the amount must come to an end thoracostomy drains by two large-diameter connecting them to a system of active aspiration. The final stage of operations is the creation of additional parietal physical and chemical pleurodesis to prevent recurrence of the disease [4; 8]. Chemical pleurodesis is performed with a solution of 5% iodine, and in exceptional cases — suspension of tetracycline.

Table 1

Types of Endoscopic Operations for Spontaneous Pneumothorax

Type of endoscopic operation	Number
Videothoracoscopic closed lung resection	180 (29.2%)
Videoassisted lung resection	58 (9.4%)
Videothoracoscopy + bullas electrocoagulation	118 (19.2%)
Videothoracoscopy + laser bullas coagulation	42 (6.8%)
Videothoracoscopic revision, drainage	216 (35.1%)
Ligation of bullas	2 (0.3%)
Total	**616 (100%)**

Results and Discussion

VTO at SP are continuously improved and are the method of choice for this pathology. The main advantages of endoscopic surgery to open interventions are low invasiveness and good cosmetic effect. But we should not think that this is the only method of surgical intervention at SP, and all the other forgotten and do not apply. Open interventions at SP also have the right to life, not less effective, but evidence for them is limited [5; 7].

CVTRL and VARL were performed at sufficiently massive defeat of lung tissue by bullas with a defect of the latter. The absence of visible perforation, isolated small bullas were an indication for other methods of treatment: ligation, laser or electrocoagulation, pleurodesis.

Contraindications to the VTO at SP consider severe comorbidity, did not allow for general anesthesia, polycystic lung with the presence of large bullas and cysts in various parts of the lung.

It would like to mention a certain evolution in the algorithm and the approach to the VTO that has occurred over the past 15 years. It can be divided into two periods: mostly conservative and operative. During the first period from 1997 to 2005, the management was as follows: when you receive a patient with SP in emergency procedure was performed videothoracoscopy (VTS) and the detection of small defects in lung bullas and perform them electro- or laser coagulation with subsequent drainage of the pleural cavity. Upon detection of large-diameter bullas finishing operation by draining the pleural cavity. After a diagnostic VTS open lung resection under general anesthesia were performed at 35% of patients [4; 7]. The second period (2006–2011) is characterized by more frequent use of primary lung resections even with a small lesion of the lung tissue. All patients with SP were performed on admission diagnostic VTS, in which the detected size of bullas and areas of lung destruction, which is subsequently determined the amount of resection and the use of necessary equipment. Patients, even with a small lung lesion the endoscopic resection of the latter by means of devices Endopath ETS Flex-45 and Echelon EC-60 Ethicon considered more radical method of surgical treatment. As cross-linking devices are quite expensive to the patient and cost savings at the same time preserve the principles of low-impact intervention techniques have been developed VARL, described above [2; 6; 9; 11].

Conversion at the VTO was absent. Terms of drains removing after surgery ranged from 4–5 days at the VTO with resection of lung to 7–8 days — with coagulation or laser pleurodesis. Bed-day at the VTO totaled (5.2±0.2) days.

Among the complications are the following: residual cavity — 18 (3.0%), abscesses at the TP injection site — 12 (2.0%), pleural empyema — 3 (0.5%) cases. Recurrence of disease was 3.6% (22 patients). 17 cases required additional drainage of the pleural cavity, 3 cases — with the drainage of the pleural cavity readjustment antiseptic solutions, 2 — lobectomy.

For all run-time of the VTO at SP in our hospital deaths were not observed.

We don't want to create impression that the VTO at SP is the panacea, and solves all questions of surgical treatment of this pathology. Open surgery keeps its place and value. Moreover, it is necessary to remember that endoscopic intervention can be performed only in specialized centers with the necessary equipment. We should not exaggerate the indications for endoscopic surgery. Such enthusiasm can lead to adverse consequences for the patient and the discrediting of this surgical technique. Under no circumstances should one try by all means no matter what the operation endoscopically, in the event of technical difficulties, you must immediately go to the open intervention of the (conversion), following the economical thoracotomy and removing them. Conversion in any case is not an error and does not detract from the merits of a specialist performing surgery. Attempts at any cost to complete the operation endoscopically can cost a patient's life or contribute to serious complications in the postoperative period, which will be commensurate with the excessive use of minimally invasive surgery.

Conclusions

1. Videothoracoscopic operations are more effective as standard open surgery. The number of recurrences of spontaneous pneumothorax after videothoracoscopic operations was 3.6%, and after open surgery — 2.6%.

2. Method of choice for surgical treatment of spontaneous pneumothorax is videothoracoscopic operations.

3. Videoassisted operations are more efficient and allow to perform low-impact operations using multiple-cross-linking domestic vehicles apparates.

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DETERMINATION OF ORGANOCHLORINE PESTICIDES RESIDUES IN BROKEN RICE FOR PHARMACEUTICAL GLUCOSE BY GC

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Objective. To examine rice organochlorine pesticides in several districts in Hunan so as to provide security reference for production of pharmaceutical glucose which was made with broken rice and a reasonable range for the application of organic pesticides.

Method. A modified method of Chinese Pharmacopoeia was used to extract and prepare the samples which were analyzed by gas chromatography equipped with SE-54 fused silica capillary column (3.0 m × 0.25 mm × 0.32 mm) and electronic capture detector, the nine organic chlorine pesticides were separated by column temperature program and their contents could be measured and calculated by external standard method.

Result. The results showed that the nine organic chlorine pesticides could be accurately determined by the proposed method. The content of organic chlorine conformed to Chinese Government Standards for rice.

Conclusion. The proposed method was so fast, simple and accurate that it could be used to determine organic chlorine pesticide in rice. The rice in these districts can be used for rice glucose production.

Key words: organic chlorine pesticides, residue, rice, gas chromatography.