

UDC 616.24-007.63:617-089:617-7

THE RESULTS OF VIDEO-ASSISTED THORACOSCOPIC INTERVENTIONS FOR BULLOUS LUNG DISEASE USING VARIOUS METHODS OF PLEURODESIS

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Abstract. The latest guidelines from the British Society of Thoracic Surgeons for the management of primary spontaneous pneumothorax indicated that after the first recurrence, treatment should include surgery (bullectomy followed by a pleural adhesion induction procedure). Thus, a surgical approach is considered the best treatment to minimize the risk of recurrence in patients who have experienced primary spontaneous pneumothorax. The aim of the study was to improve the results of video-assisted thoracoscopic surgical interventions for bullous lung disease based on a clinical and experimental evaluation of the effectiveness of optimized combined pleurodesis techniques. Clinical studies were carried out at the RSSPMCS named after acad. V.Vakhidov and the Bukhara Regional Diversified Medical Center for 2015-2021. The comparison group consisted of 92 patients operated on at the Bukhara Regional Multidisciplinary Medical Center (2015-2021). The main group consisted of 26 patients operated on at the RSSPMCS named after Acad. V.Vakhidov (2018-2021) and 92 patients operated on in the Bukhara Regional Multidisciplinary Medical Center (2018-2021). In both groups, patients aged 20-44 years prevailed. The incidence among men was also higher than among women and was representative between groups. The clinical efficacy of the proposed method of chemical pleurodesis in bullous lung disease complicated by rupture has been proven in terms of improving and accelerating postoperative rehabilitation, reducing the incidence of specific complications and relapses of the disease. Also, the technical advantages of carrying out the developed technique of video-assisted thoracoscopic pleurodesis in terms of simplifying and reducing the operation time, as well as the clinical significance of the drug effect on the pleural cavity in terms of manifestations of the inflammatory process and antibacterial effect are determined.

Key words: *pleurodesis, videothoracoscopic, bullous lung disease, FarGALS*

РЕЗУЛЬТАТОВ ВИДЕОТОРАКОСКОПИЧЕСКИХ ВМЕШАТЕЛЬСТВ ПРИ БУЛЛЕЗНОЙ БОЛЕЗНИ ЛЕГКИХ С ПРИМЕНЕНИЕМ РАЗЛИЧНЫХ МЕТОДОВ ПЛЕВРОДЕЗА

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Аннотация. В последнем руководстве Британского общества торакальных хирургов по лечению первичного спонтанного пневмоторакса было указано, что после первого рецидива лечение должно предусматривать хирургическое вмешательство (буллэктомия, сопровождаемая процедурой индукции плевральных спаек). Таким образом, хирургический подход считается лучшим лечением, чтобы минимизировать риск рецидива у пациентов, которые испытали первичный спонтанный пневмоторакс. Цель исследования улучшить результаты

видеоторакоскопических хирургических вмешательств при буллезной болезни легких на основе клинико-экспериментальной оценки эффективности оптимизированных методик комбинированного плевродеза. Клинические исследования выполнены в РСНПМЦХ им.акад. В.Вахидова и Бухарской областной многопрофильной медицинском центре за 2015-2021 гг. Группу сравнения составили 62 пациент, оперированный в Бухарской областной многопрофильной медицинском центре (2015-2021 гг). Основную группу – составили 26 пациентов, оперированных в РСНПМЦХ им.акад. В.Вахидова (2018-2021 гг) и 92 пациентов оперированных в Бухарской областной многопрофильной медицинском центре (2018-2021 гг). В обеих группах превалировали пациенты в возрасте 20-44 года. Заболеваемость среди мужчин также была выше, чем у женщин и репрезентативна между группами. Доказана клиническая эффективность применения предложенной методики химического плевродеза при буллезной болезни легких, осложненной разрывом, в плане улучшения и ускорения послеоперационной реабилитации, снижения частоты развития специфических осложнений и рецидивов заболевания. Также, определены технические преимущества проведения разработанной методики видеоторакоскопического плевродеза в плане упрощения и сокращения времени операции, а также клиническое значение лекарственного воздействия на плевральную полость в плане проявлений воспалительного процесса и антибактериального эффекта.

Ключевые слова: плевродез, видеоторакоскопия, буллезной болезни легких, ФарГАЛС

ЎПКАНИНГ БУЛЛЁЗ КАСАЛЛИГИДА ТУРЛИ ПЛЕВРОДЕЗ УСУЛЛАРИДАН ФОЙДАЛАНГАН ҲОЛДА ВИДЕОТОРАКОСКОПИК ОПЕРАЦИЯЛАРНИНГ НАТИЖАЛАРИ

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Аннотация. Британия Торакал Жарроҳлар Жамиятининг бирламчи спонтан пневмотораксни бошқариш бўйича сўнгги кўрсатмалари биринчи такрорланишдан сўнг даволаш жарроҳлик аралашувни ўз ичига олиши кераклигини кўрсатди (буллэктомиядан сўнг плевра ёпишишини индукция қилиш процедураси). Шундай қилиб, бирламчи спонтан пневмотораксни бошдан кечирган беморларда такрорланиш хавфини минималлаштириш учун жарроҳлик ёндашув энг яхши даволаш ҳисобланади. Тадқиқотнинг мақсади оптималлаштирилган комбинацияланган плевродез усулларининг самарадорлигини клиник ва экспериментал баҳолаш асосида ўқанинг буллёз касаллиги учун видеоторакоскопик жарроҳлик аралашувлар натижаларини яхшилаш. Клиник тадқиқот 2015-2021 йиллар давомида Академик В.Воҳидов номидагии РИХИАТМ ва Бухоро вилоят кўп тармоқли тиббиёт марказида бажарилди. Назорат гуруҳига Бухоро вилоят кўп тармоқли тиббиёт марказида операция қилинган 62 нафар бемор (2015-2021 йиллар) кирди. Асосий гуруҳ Академик В.Воҳидов номидагии РИХИАТМда операция қилинган (2018-2021 йй.) 26 нафар бемор ва Бухоро вилоят кўп тармоқли тиббиёт марказида (2018-2021) операция қилинган 92 нафар бемордан иборат. Иккала гуруҳда ҳам беморлар ёши ўртача 20-44 ёшни ташкил этди. Эркақлар орасида касалланиш аёлларга қараганда юқори. Ёрилиш билан асоратланган ўпканинг буллёз

касаликлариди тавсия этилаётган кимёвий плевродез усулининг клиник самарадорлиги операциядан кейинги реабилитацияни яхшилаш ва тезлаштириш, касаликнинг ўзига хос асоратлари ва қайталаниш ҳолатларини камайтириш нуқтаи назаридан исботланди. Шунингдек, ишлаб чиқилган видеоассистирланган торакоскопик плевродез усули операцияни соддалаштириш ва вақтини қисқартириш каби техник афзалликлари, шунингдек, плевра бўшлиғига таъсир этилувчи дори воситасининг яллиғланиш жараёнининг намоён этиши ва антибактериал таъсири нуқтаи назаридан клиник аҳамияти аниқланди.

Калим сўзлар: *плевродез, видеоторакоскопия, ўпканинг буллёз касаллиги, ФарГАЛС*

Bullous emphysema is characterized by the progression of respiratory symptoms and involves the constant expansion of the airspace in the distal terminal bronchioles due to the destruction of the alveolar sacs, loss of elastic tissue, collapse of the airways and impaired gas exchange [2, 3, 5, 10]. The pathophysiology of bullous emphysema involves valvular bronchoblocking, which allows air to enter the cystic space but not exit it. [4, 5, 13].

The latest British Society of Thoracic Surgeons (2010) guideline for the treatment of primary spontaneous pneumothorax stated that after the first recurrence, treatment should include surgery (bullectomy followed by a pleural adhesion induction procedure). Thus, a surgical approach is considered the best treatment to minimize the risk of recurrence in patients who have experienced primary spontaneous pneumothorax. The video-assisted thoracic surgery approach has been shown to provide great benefits in terms of pain and patient respiratory function compared to thoracotomy incisions. As an alternative to the standard multiport VATS, a single port, single notch or uniportal approach has been developed. The uniportal technique has proven to be safe and effective not only for lung resection and biopsy, but also for lobectomy. From this perspective, evidence has shown that a minimally invasive approach should be preferred, confirming advantages over traditional methods [1, 6, 12].

According to Vanucci et al. (2019) Uniportal video-assisted thoracoscopy VATS is a feasible and safe method for performing bullectomy, the results of which are at least comparable to other methods, resulting in resolution of symptoms, improvement in lung function and improvement in quality of life [9].

According to the National Clinical Guidelines and the recommendations of the British Thoracic Society (British Thoracic Society), one of the most modern areas of surgical treatment in patients with damage to the pleura is chemical pleurodesis [2, 7, 11].

Pleurodesis aims to obliterate the pleural space by creating extensive adhesion of the visceral and parietal pleura, and thereby control the recurrence of a pleural effusion (mostly malignant) or pneumothorax.

Despite the development and widespread use of various adhesion formation technologies, and their diversity, detailed data on the mechanisms of action of sclerosing agents are very incomplete. This applies, for example, to iodopovidone, which still appears to be an interesting and promising sclerosant [4, 11]. The pro-inflammatory effect of this agent has only been tested in animal models [13]. Most of the research done to date has focused on the agents that have gained the most popularity at different times throughout the history of pleurodesis, such as talc, doxycycline, and silver nitrate [8].

As before, the actual problem of modern thoracic surgery is the development of adhesion formation technologies for minimally invasive surgical treatment of complications of bullous lung disease.

Purpose of the study: to improve the results of video-assisted thoracoscopic surgical interventions for bullous lung disease based on a clinical and experimental evaluation of the effectiveness of optimized combined pleurodesis techniques.

Material and methods. Clinical studies were carried out at the State Institution “RSNPMTSH named after acad. V.Vakhidov” and the Bukhara Regional Diversified Medical Center for 2015-2021. The comparison group consisted of 62 patients operated on at the Bukhara Regional Multidisciplinary Medical Center (2015-2021). The main group consisted of 26 patients operated on at the Government agencies “RSSPMCS named after acad. V.Vakhidov” (2018-2021) and 92 patients operated on in the Bukhara Regional Multidisciplinary Medical Center (2018-2021). In both groups, patients aged 20-44 years prevailed (64.3% in the main group versus 67.7% in the comparison group). The incidence among men was also higher than among women and was representative between the groups (64.3% in the main group versus 61.3% in the comparison group).

The prevailing factors in both groups were: increased physical activity (46.4% in the main group versus 38.7% in the comparison group) and exacerbation of bronchopulmonary pathology (35.7% in the main group versus 38.7% in the comparison group). At rest, bulla rupture occurred in only 11.9% of patients (10.7% in the main group versus 12.9% in the comparison group). Chest trauma as a causative factor was noted in 8.5% of patients (7.1% in the main group versus 9.7% in the comparison group).

Today, two main methods can be used to achieve pleurodesis: 1) direct damage to the pleura by mechanical or physical methods (eg, mechanical abrasion, laser or argon coagulation) with VATS; 2) intrapleural administration of various agents (eg, bleomycin, tetracycline, iodopovidone, *Corynebacterium parvum*), which cause the formation of pleural adhesions.

The method of combined pleurodesis developed by us includes the use of electrocoagulation of the parietal pleura and the application of the FarGALS solution on the visceral and parietal pleura. This method of pleurodesis induction, which is cheap and easy to use, involves the use of the drug “FarGALS” of domestic production to create pleural adhesions that can cause adhesions at the site of its application. The method is quite efficient [13].

The survey results were entered into the electronic matrix of the MS Excel-XP software. Statistical methods included the calculation of mean values (M) and their variational characteristics (standard error - SE, standard deviation - SD). Based on the principles of evidence, the reliability of all calculated statistical indicators was from $p < 0.050$ to $p < 0.001$. All statistical indicators below $p > 0.050$ were considered unreliable.

Results of the study: A comparative analysis was carried out on the condition of conditional separation between the main group, whose patients underwent pleurodesis according to the proposed method, and the comparison group, whose patients underwent pleurodesis according to the most common methods used in modern thoracic surgery.

The assessment of the immediate results of surgical intervention in the compared groups was carried out on the basis of factors that could affect the course of the immediate period (duration of the operation,

discharge from the drainage) and the course of this period itself (complication rate, nature of complications, duration of early rehabilitation of patients).

The average duration of the main parameters for assessing the quality of VTS interventions showed that the duration of the operation in the main group corresponded to 76.4 ± 4.2 minutes, while in the comparison group this indicator corresponded to 96.3 ± 4.7 .

The main complications and their frequency in the immediate postoperative period. In total, there were 18 patients with complications, including 8 patients in the main group and 22 patients from the comparison group. One or more complications may have occurred in one patient. Thus, violation of hemostasis was noted only in 4 (6.5%) patients in the comparison group; prolonged air release was observed in 4 (7.1%) patients in the main group and in 8 (12.9%) patients in the comparison group. An incompletely expanded lung was diagnosed in 2 (3.6%) patients in the main group and in 4 (6.5%) patients in the comparison group; exudative pleurisy was also observed in 2 (3.6%) patients in the main group and in 4 (6.5%) patients in the comparison group; pleural empyema was noted only in 2 patients (3.2%) in the comparison group. Rethoracoscopy for hemothorax - 2 (3.2%) in the comparison group for hemothorax.

Another important factor that determines the severity of the course of the postoperative period and affects the quality of life of patients is the duration of discharge from the drainage.

Improving the tactical and technical aspects of VTS interventions for bullous lung disease, taking into account the use of single-port access and the proposed method of chemical pleurodesis, made it possible, by reducing the traumatic factor (without mechanical pleurodesis), to provide a significant reduction in the severity of the manifestation of the local inflammatory process, the overall incidence of complications and the timing of drainage from 5.8 ± 0.4 to 4.4 ± 0.2 days and hospital period from 8.1 ± 0.3 to 6.8 ± 0.3 days.

Of interest is the frequency of relapses of bullae rupture in the compared groups. Up to 3 months, there was no recurrence of bullae rupture in any of the compared groups; up to 6 months in 2 (3.6%) patients from the main group and in 2 (3.2%) patients from the comparison group; up to 12 months, relapse was noted only in 2 (3.2%) patients from the comparison group.

Conclusion: The clinical efficacy of the proposed method of chemical pleurodesis in bullous lung disease complicated by rupture has been proven in terms of improving and accelerating postoperative rehabilitation, reducing the incidence of specific complications and relapses of the disease. Also, the technical advantages of carrying out the developed technique of videothoroscopic pleurodesis in terms of simplifying and reducing the operation time, as well as the clinical significance of the drug effect on the pleural cavity in terms of manifestations of the inflammatory process and antibacterial effect are determined.

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