73. Pleural diseases and pneumothorax

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Value of the video assisted thoracoscopy in the diagnosis of the pleural effusions – Our experience

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Introduction: Pleural effusions are a common and significant clinical problem.

The diagnosis required sometimes the practice of the thoracoscopy to biopsy the pathological pleura. Also, this method is utilized in treatment of different effusions like debridement of the empyema, pleurodesis in the malignant effusions. Also, it permets to etablish if an effusion pleural is neoplasic or paraneoplasic, with consequence of the surgical traitement.

Material and method: The work presents our experience with this method in the last two years. We retrospectively reviewed 131 patients (82 males, 49 females, mean rage: 62 years). The indications of videoassisted thoracoscopy are presented in table no.1 and 2.

Table 1. Malignant pleural effusion 71,75% (94 cases)

Lung cancer	31	32,97%
Breast cancer	15	15,95%
Colonic cancer	7	7.44%
Lymphoma	16	17.02%
Mesothelioma	15	15.95%
Other	5	5,31%

Table 2. Benign pleural effusion 28,24%

Solitary fibrous tumor of the pleura	2	5.40%
Pleural tuberculosis	19	51.35
Bacterial infection	11	29.72%
Associated atelectasis	3	8.01%
Idiopatic	2	5.40%

Aditionaly, we performed a minithoracotomy or thoracotomy for 26 cases. Mean period of hospitalisation was 4,2 days.

Results: The benefits of this method are obvious, with hospitalization cost smaller and with discharge of the patient faster.

Conclusions: The videoassited thoracoscopy is an indispensable method of diagnosis of pleural effusions.

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WITHDRAWN

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Significance of computed tomography in diagnostic of pleural content and the choice of the method of surgical treatment

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Introduction: The authors have aimed at stating more precisely the value of Haunsfields units using computed tomography in case of acute, subacute and chronic empyema, comparing these data with the results of morphologic investigation of operation material.

Goal of work: To evaluate the possibility of beam diagnostics for determining the degree of chronic pleural effusions and the choice of the optimal method of surgical treatment.

Methods: Case histories of 40 patients with pleural effusions treated at the thoracic department of Vitebsk Regional Hospital. All patients were divided into two groups.

Results: On the scans of the first group patients there was the content of the pleural cavity with slightly irregular contours, areas of gas, pleural thickening (mesh structure), the mean attenuation of effusion ranged from +13 HU up to + 27HU due to the liquid, gas and organized components.

Patients of the second group had tomograms with described jagged contours of the pleural content, pleural thickening, the higher number and bigger size of air inclusions (flushing gas bubbles). The value of the mean of pleural content increased to +35 HU.

All patients of the first group had thoracoscopic surgical treatment.

The patients of the second group were operated on by open decortication.

Conclusions: 1. Computer tomography provides the opportunity to differentiate accurately enough the density of the pleural content and evaluate it in Hounsfield units.

2. Preoperative assessment of the nature of pleural content gives the opportunity of choice of surgical intervention, adequate to the nature of the inflammatory process.

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Tuberculous empyema thoracis surgical perspective. A tertiary care center experience

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Background: Tuberculosis is an infectious disease caused by Mycobacterium tuberculosis but other species of Mycobacteria are also present which may produce similar change. A granulomatous response associated with intense tissue inflammation and damage, and is a leading pulmonary disease whereas pleural tuberculosis is the most common form of extra-pulmonary Tuberculosis. 90% originates from primary infection, while 10% due to reactivation of cavitated or fibrocaseous lesion.

Patients and methods: Between June 2008 to June 2009, 85 patients of 20-50 years of age underwent Thoracotomy and decortication for Tuberculous Empyema Thoracis were included in this study. Age less than 20yrs and above 50yrs, poor functional and nutritionally status, underlying parenchymal disease, A.T.T. Defaulters and MDR T.B were excluded.

Results: There was no mortality, mean day of discharge was 6 post-operative date 5/85 had wound complications, 3 patients required upto 10 day of hospitalization due to air leaks and wound complications 1 patient required revision of procedure and ended with pleurocutaneous window. Operating patients early with T.B Empyema Thoracis carries equally good results if compared to those operated at a later stage.

Conclusion: Operating patients early with T.B Empyema Thoracis carries similar results if compared to those operated at a later stage.Patient selection are an important factor. Key to success is: Patients taking adequate dose of A.T.T. Observed Treatment with regular followup. Surgery remains the standard Treatment.

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Analysis of lung function test at patients with pleural empyema treated with thoracotomy and decortications

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Fibrinopurulent phase of the pleural empyema was very often treated with thoracotomy and decortications.

Material and methods: We analyze lung function at 18 patients surgically treated in last 3 years which was followed at least 6 months.

Results: -Expected mean VC was 4650 ml, and expected mean FEV1 was 3450 ml.

- Realized mean VC was2850 ml, and realized mean FEV1 was1750 ml.
- Mean VC after 3 months after surgery as 3430 ml, and mean FEV1 was 1700 ml.
- Mean VC after 6 months after surgery as 3830 ml, and mean FEV1 was 2430 ml.

Discusion: Early detection and treatment of empyema is essential in treatment of empyema, where use of thoracic drainage with or withought streptokinase or use of VATS decortications were methods of chose in treatment.

Later, thoracotomy with decortication is the only solution of treatment of fibrinopuurulent phase of empyema, where trapped lung was very often detected.

Conclusion: Thoracotomy with decortication is useful method of treatment of fibrinopurulent phase of empyema, which solving the problem, but also improve significantly lung function, especially on control after 6 months.

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Malignant pericardial effusion and pericardial-peritoneal window

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Background: The metastatic pericarditis is a rare complication of advanced cancer. Lung and breast cancers are the most common causes. Severe cases can present

with cardiac tamponade and shock, and pericardiocentesis is usually the initial approach. However the effusion may rapidly re-accumulate and a surgical decompression, as pericardial-peritoneal window (PPW), has proved to be effective with a consequent symptom relief and a better quality of life.
Objectives: Characterize patients with malignant pericardial effusion (PE). Evaluate the role that PPW plays in the management of PE. Determine median survival of patients after this procedure.
Material & methods: Retrospective review of the patients undergoing PPW from 1998 through 2010.
Results: Were performed 24 PPW, with a mean age of 52.2 years old, and 41.7% were male. Lung cancer was the cause in 75%. At the time of the cancer diagnosis PE was present in 38% of patients. In the other patients there was an average of 103 weeks (after the diagnosis) to occur PE of which 35% of cases were undergoing chemotherapy. The majority (70.8%) had also pleural effusion. In 70.6% of patients were performed at least one pericardiocentesis before the PPW, with a mean fluid volume of 740 ml. Two patients developed recurrent PE during follow-up.
The procedure was well tolerated, with a median survival after the procedure of 11 weeks. No patient developed peritoneal carcinomatosis and no deaths were related to the procedure.
Conclusion: Lung cancer was the most frequent cause undergoing PPW. This surgical decompression is a simple, safe, and an effective method of palliation patients with malignant PE. Median survival rate after performing the procedure was low.

P456
Thoracic empyema: Medical and surgical treatment
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Introdution: Thoracic empyema is the presence of pus in the pleural cavity. Mostly it complicates cases of pneumonia, trauma or it is iatrogenic.
Initial approach includes chest drain and empirical antibiotic therapy. The use of fibrinolytics is controversial, according to the experience of each center. Current surgical options include thoracoscopy (VATS) or thoracotomy. Mortality rate is 6 to 24%.
Methods: Review of medical records of patients admitted from 2006 to 2010 with diagnosis of empyema.
Results: 44 patients had thoracic empyema, mean age 60.5 years, 70% male.75% had infectious causes (pneumonia-68%), chest trauma 7% and 18% iatrogenic. Microbial agent was isolated in 25%.
30 patients used medical therapy only; 6 died. Fibrinolytics were not used.
14 patients underwent surgical treatment (1 VATS and 13 thoracotomy), 78,6%men, mean age 53,5 years. 57% related to infection, 29% iatrogenic and 14% trauma. They had a shorter hospitalization period (26 vs 31 days) and a shorter period of chest drain tube (17 vs 20 days) but there were no differences between co-morbidities, pleural effusion volume, isolated bacteria or antibiotic therapy.
Conclusions: As expected, empyemas mainly complicate infections.
Patients were younger in the operated group, associated to more cases of trauma or iatrogenic empyemas, but there were no other differences between groups.
Thoracotomy was the principal method of surgical treatment. Since there was only 1 VATS we can't compare the efficacy and complications of both surgical approaches, although it's use is increasing in many centers. Surgical approach should be considered early to reduce hospitalization time and improve outcome.
Mortality rate was between expected values and related to patient's co-morbidities.

P457
Fibrous cavernous pulmonary tuberculosis (FCT) complicated by spontaneous pneumothorax (SP)
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We underwent the treatment of SP clinical course that complicate FCT to 233 patients. Men were 205, women were - 17 at the age 18-72 yr. 121 patients were referred by antituberculous dispensaries, 31 from other TB clinics, 18 from general medical network (GMN), 37 from penitentiary system, 15 went to clinics themselves. Duration of tuberculosis (TB) fluctuated from 1 year to 16 years. MBT were revealed in 90,6% patients. 33 patients were admitted to clinic within 1-7 days with onset of SP process, 190 patients in more late terms (from 15 days to more than 1 month). Before admitting to clinic 134 patients had been made punctures and drainage of pleural cavity (PC). 139 patients were admitted with complicated pleura empyema, 84 - had a mild favorable SP process. The treatment started with puncture and drainage of PC. Polychemotherapy was made in standard regime and by broad-spectrum antibiotics when indicated as well as correction of dysproteinemia and hypovitaminosis, oxygen-soda and ionic condition. Surgically approaches were used just in 5 patients with good effect. Segmental pulmonary resection was performed to 1, pneumectomy-1, bullectomy-1, and pleurectomy-2. Clinical convalescence was reached in 32, improvement in 86, no changes in 46, and impairment in 3. Lethality was in 25, 1% cases.
Conclusion: SP problem under FCT is urgent. The search of new ways for more effective diagnostics and treatment to this severe group of patients is needed. At present time, the causes of poor surgical activity are mostly related with large spread and TB process activity, of phthisysurgeons and anesthesiologists being overcareful and lack of qualification as well as good equipment of surgical services.

P458
Do we follow the national guidelines for ICD (intercostal chest drain) insertion: A study in a district general hospital (DGH) in East of England
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Aim: To determine the compliance of ICD insertion in accordance with 2003 British Thoracic Society (BTS) guidelines.
Methodology: Retrospective analysis of all the ICDs inserted from Oct 09 to Feb 10 at a DGH in Norfolk, UK. We analysed the indications, seniority of the person performing the procedure, consent obtained, analgesia and complications encountered.
Results: 28 Patients underwent ICD insertion.The indication for ICD insertion was non malignant effusion in 43% (12), pneumothorax in 32% (9) and malignant pleural effusion in 25% (7). The ICD was performed by SpR in 36% (10),SHO in 28% (8) and F1in 36% (10). Consent was obtained verbally in 47% (13), in writing in 32% (9) and not recorded in 21% (6). Ultrasound guidance was utilized in choosing the site of insertion in only 21% (6). All the patients 100% (28) had check CXR done following the ICD insertion. 75% (21) of the patients were given pre procedure analgesia.The ICDs were complicated by surgical emphysema in 11% (3) and pneumothorax in 11% (3). ICD was reinserted in 18% (5) as the tube fell out accidentally. No major complications of ICD were encountered.
Conclusion: BTS standards were achieved suboptimally in obtaining the written consent and poorly in utilization of ultrasound for ICD insertion. Most of the ICDs were inserted by the seniors or under their supervision therefore we proved the complication rate is lower and in accordance with the BTS standards. Education of the BTS guidelines to the junior staff and utilization of ultrasound will improve the safety of the procedure. We will reaudit after increasing the usage of the ultrasound for ICD insertion hoping to find better results.

P459
Outpatient management of primary spontaneous pneumothorax using small-bore catheter: A prospective study
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The various guidelines published about the management of primary spontaneous pneumothorax (PSP), have raised up discrepancies regarding indications and methods of air-removal.
We aimed to assess the feasibility of a single system small-bore drain based management. Primary end-point was 1-week success rate, secondary ones were the part of full outpatient management, the 1-year recurrence rate, the length of hospitalization stay, the cost and the side-effects.
All patients aged $\geq$ 16 years with 1st episode of PSP, were managed in the emergency room (ER) by observation alone or insertion of an 8.5 F "pigtail" drain, according to PSP volume and clinical tolerance. The drain was connected to a one-way Heimlich valve. Patients were re-assessed at the 4th hour for potential admission or discharge. Patients still having air leak at day-4 were referred for video-assisted thoracoscopy (VATS).
On the 60 patients recruited, 80% underwent drainage and 60% were discharged after 4 hours. Success rate was 83% at day-7, the 17% left underwent a VATS. Fifty per cent of the patients benefited from strict outpatient management and 2 procedure-related complications occurred. The mean length of hospitalization was 2.3±3.1 days, the 1-year recurrence rate was 17%. The financial gain of this PSP management was 1,791 to 3,940 Euros/patient/episode, compared with manual aspiration (MA) or conventional chest tube drainage (CTD).
This one-system management offers good efficacy, safety, comfort and aesthetics; it is time and cost-effective. Our results suggest its use in a larger population, but a randomised controlled study comparing it with MA and/or CTD is needed for validation.

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Primary spontaneous pneumothorax size: Comparison of international guidelines
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Background: Size estimation is central to decisions on management of Primary Spontaneous Pneumothorax (PSP). International guidelines exhibit a lack of consensus on PSP sizing. We aimed to study PSP size using established techniques (Rhea, Collins and Light method) and compare size classification and suggested management of American (ACCP), Belgian (BSP) and British (BTS) guidelines.
Methods: Retrospective cohort study of all patients admitted with PSP to two centres in our institution between January 2007 and July 2010. Initial inspiratory chest x-rays (digital images with size calibration) were reviewed to quantify PSP size using BTS, ACCP, BSP, Collins, Rhea and Light's methods. Data was analysed using descriptive statistics with kappa analysis for agreement between guidelines.
Results: 105 patients were studied, median age 27 years, 72% male. Median PSP size was 58% (Collins' method), 39% (Rhea) and 51% (Light). BTS classification

defined 56% PSPs as large compared to 72% (BSP) and 78% (ACCP). Agreement between all three guidelines was seen in 61/105 (58%).
Paired kappa agreement between ACCP and BTS guidelines was 0.2, ACCP and BSP 0.44 and BTS and BSP 0.46. 21% of patients with complete lung dehiscence (large PSP by BSP guidelines) had a small PSP by BTS guidelines. 5% with partial lung dehiscence (small PSP by BSP guidelines) had a large PSP by the BTS classification.
Conclusion: Most patients with PSP in this study present with a large pneumothorax according to all three guidelines. There remain marked discrepancies in suggested treatment strategies, with at best moderate agreement between BTS and BSP guidelines. International consensus is needed to unify treatment strategies in PSP management.

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WITHDRAWN

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Pulmonary emphysematous dysplasia in young adults

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Objective: Therapeutic approach to the treatment of young patients with severe pulmonary emphysema is not specified.
Method: From 2004 to 2010 eight patients of young age (24 to 33 years old) with pulmonary emphysema and respiratory failure were observed. All patients were heavy smokers with over a seven pack-years smoking history. All patients were diagnosed with florid irreversible respiratory system changes (average FEV1 23% predicted) with significant hyperinflation (average RV 380% predicted), sharp reduction of diffusing capacity (average DLCO 32% predicted) and blood gases disorder. No alpha 1-antitrypsin deficiency revealed.
Results: Unilateral LVRS was performed via standard thoracotomy in five patients. Four of the patients had no postoperative complications. One patient suffered postoperative respiratory failure caused by bronchitis exacerbation which required extended use of artificial respiration in postoperative period. A year after the surgery all patients noticed surgical treatment's positive effect on exercise tolerance and clinical disease progression. None of the patients who undergone surgery had any bacterial exacerbation of the disease, was hospitalized and underwent antibacterial therapy. Dyspnea evaluation tests revealed significant improvements among all operated patients persisting during three years follow-up.
Conclusion: LVRS performed in young adults has same functional effect as in COPD patients but clinical progression in early postoperative period is more favorable. Because of patients' young age, in case of impossibility of lung transplantation LVRS is medically justified.

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Change in perfusion patterns and its correlation to clinical outcomes following lung volume reduction surgery (LVRS) in COPD as assessed by single photon emission computer tomography (SPECT)

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Background: It is unknown whether SPECT adds to the assessment in LVRS. We evaluated the change in perfusion patterns and it's correlation to clinical outcome in COPD patients undergoing LVRS.
Methods: 26 COPD patients (GOLD III-IV) meeting criteria for LVRS were evaluated by lung function, 6 MWD test, and SPECT preoperatively and 6 months after LVRS. CT scans with 8mm sections were performed with following 3D picture fusion. We calculated the perfusion pattern (low, intermediate, high) in% and the heterogeneity index, which was defined as the number of areas of high or intermediate perfusion in each of the 20 cuts added to 20 and divided by 20.
Results: Mean age was 63.6±8.5 years, 19 male. FEV1% pred was 32.3±16.3, DLCO 31% ± 11, and the mean 6 MWD 328 m ± 120. As compared to the pre-operative values, post-operative, bilateral perfusion patterns improved (low 86.6%±7.6 vs. 78.6±11.9, $p<0.0001$; intermediate 12.7%±7.2 vs. 20.1±22.0,$p<0.0001$; high 0.8%±0.6 vs. 1.4±1.1, $p=0.005$) as did the bilateral heterogeneity index (2.1±0.3 vs. 2.3±0.4, $p<0.0001$). There was a significant correlation between the bilateral preoperative heterogeneity index and the post-operative 6 MWD (rho 0.440, $p=0.028$). Patients showing an improvement in 6 MWD (n=13) had significantly higher post-operative heterogeneity index as the ones failing to shown functional improvement in 6 MWD (2.33±0.28 vs. 2.25±0.55, $p=0.025$).
Conclusion: Lung SPECT perfusions pattern correlates with the clinical improvement and warrants evaluation as a pre-operative assessment tool in patients with COPD undergoing LVRS.

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Does lung volume reduction surgery improve chronotropic incompetence in chronic obstructive pulmonary disease (COPD) patients?

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Introduction: Chronotropic Incompetence (CI), or an attenuated heart rate (HR) response to exercise, has been widely established as a predictor of mortality. CI is reduced in patients with Chronic Obstructive Pulmonary Disease (COPD), and Lung Volume Reduction Surgery (LVRS) is known to improve morbidity and mortality in patients with COPD.
Objectives: We aimed to see if LVRS improves CI in patients with COPD by evaluating CI in maximal exercise testing before and after LVRS.
Methods: A retrospective chart review was performed on 82 patients who had undergone LVRS at Columbia University Medical Center (CUMC) between January 1998 to October 2009. Patients had CPET within 2 months before LVRS after completion of rehabilitation and repeat testing 6 months after LVRS. PFTs and other analyses were concurrent with CPET. Comparisons were made with paired samples t-test.
Results: The mean PFT and CPET variables for the 84 patients analyzed improved following LVRS. CI was markedly reduced in patients before LVRS, and showed improvement following LVRS. After LVRS, the resting HR decreased by 4±12 beats per minute (bpm) ($p=0.007$), the HR at peak exercise increased 5±14bpm ($p=0.003$), and the heart rate reserve increased 9±13bpm ($p<.001$).
Conclusions: CI is very abnormal in patients with severe COPD before LVRS and is improved after surgery. This improvement is in agreement with the observed increase in exercise capacity and improvement in PFT. The mechanism of the improvement in CI is not clear, but may be related to the improvement in pulmonary mechanics seen after successful LVRS. Further investigation into the implications of this change in CI is needed.

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Ultrasound guided pleural aspiration and chest drain insertion – A prospective study

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Pleural aspiration and chest drain insertion are important procedures required in the management of pleural disease. Small bore chest drain insertion using the Seldinger technique is assumed to be safer and better tolerated. However, there is no data to support this and incidents of serious complications have been reported. As a result, the British Thoracic Society recommend thoracic ultrasound (TUS) for pleural procedures. Currently, TUS is commonly being used by respiratory physicians to identify a safe site for various interventional procedures. The aim of this study was to review the complications of ultrasound guided pleural aspiration and chest drain insertion.
Method: Data from TUS guided pleural aspirations and chest drains was collected prospectively. Complications and pain perceived by the patient was recorded on a 100mm Visual Analogue Scale (VAS, 0=no pain, 100=worst pain ever).
Results: 58 pleural procedures were performed-34 (59%) pleural aspirations, 20 (34%) chest drains. 3 (5%) showed a small pleural effusion on TUS and were not suitable for a pleural procedure. Other than 1 patient having a vasovagal episode during the ultrasound procedure, there were no immediate and direct complications associated with the pleural aspirations and chest drain insertion. All chest drains inserted were 12F and all required one attempt. Mean VAS for pain during chest drain insertion was 20 (range 0–80).
Conclusion: Complications from pleural aspiration and chest drain insertion which may result in serious harm and even death is reduced by TUS guidance. TUS is

a relatively simple procedure to perform. It is able to identify a safe and suitable site and also improves the ease and tolerability of pleural procedures.

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Health-related quality of life and pulmonary function in patients after segmentectomy and lobectomy for tuberculosis

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In 2008 in Russia 12275 patients were submitted to thoracic surgery for pulmonary tuberculosis. The aim of this study was long-term results of lung resection for pulmonary tuberculosis.

Methods: We investigated quality of life (QoL) and pulmonary function in 67 patients after lung resection. Of these 67 patients, 33 underwent single lobectomy (group L) and 34 underwent segmentectomy (group S). All postoperative examinations were performed more than one year after surgery. QoL was studied with St. George's Respiratory Questionnaire (SGRQ). Pulmonary function was studied with spirometry and plethysmography.

Results: Symptoms SGRQ scores were 16,5 and 34% (group S and group L, respectively, $p<0,05$). Activity SGRQ score was also better in patients after segmentectomy then after lobectomy (16,2 and 31,8%, respectively, $p<0,001$). Impact SGRQ scores were 8,6 and 18,2% (group S and group L, respectively, $p<0,05$). Total SGRQ score was also better in group S then in group L (12 and 24,8%, respectively, $p<0,05$). In patients in group S and group L, respectively, FVC were 103,5±13,0 and 104,4±15,5%; FEV_1 - 91,0±17,0 and 84,8±17,4%; TLC - 99,7±10,5 and 99,1±13,2%; FRC - 111,5±27,3 and 110,5±29,2%; IC - 88,7±18,2 and 91,0±19,5% ($p>0,05$ for all cases). In group S airway obstruction (FEV_1/FVC <70%) was 26,5% and in group L airway obstruction was 45,5% ($p>0,05$).

Conclusions: QoL in patients after lobectomy was significantly worse than in patients after segmentectomy, although the results of pulmonary function were the same. So the patients after lobectomy need more active treatment including pulmonary rehabilitation.