5. General thoracic surgery II

P4320
Long-term results of surgically treated non-small cell lung cancer patients depending on the protocol of preoperative N-staging
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Preoperative N-staging is one of the most important aspects in management of non-small cell lung cancer (NSCLC) patients because it has a crucial impact on prognosis of patients and helps to choose the optimal treatment plan. The aim of our study was to evaluate and compare long-term results of operated NSCLC patients with different preoperative N-staging protocols.

Material and methods: 319 patients with resectable NSCLC were operated in our center in 2003-2008. In group 1 all patients preoperatively underwent mediastinoscopy in addition to non-invasive staging procedures (CT and PET), whereas in group 2 N-staging protocol included only CT and PET. Final TNM stage was verified based on intraoperative findings including mediastinal lymph nodes dissection. Long-term survival was assessed by Kaplan-Meier method.

Results: In group 1 significantly less unforeseen N2 were revealed during intraoperative lymph nodes dissection in comparison to group 2 (10% vs 27%, respectively, p<0.05), the rate of uncertain resections was also lower in group 1 than in group 2 (5% vs 14%, respectively, p<0.05). Analysis of long-term results showed better survival in group 1 than in group 2 (5-yr survival 61% vs 43%, respectively, p<0.05). This difference was more prominent in patients with central NSCLC (5-yr survival 65% vs 39%, respectively, p<0.01).

Conclusion: Our findings suggest that including mediastinoscopy in preoperative N-staging protocol of potentially operable NSCLC patients improves the selection of surgical candidates by excluding patients with extended disease, that results in better long-term survival of operated patients.

P4321
The evaluation of surgical results in pT0-pT1 non-small cell lung carcinoma after induction therapy
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There are good results in locally advanced non-small cell lung carcinoma (NSCLC)
thoracic surgery. We aimed to determine the efficiency of PET/CT in mediastinal node staging of lung cancer in our clinic. There were 91 patients (82 male, 9 female) with lung carcinoma who underwent operation for treatment or staging. Patients with PET/CT positive lymph node involvement underwent mediastinoscopy. Thoracotomy was performed in patients with operable disease. Age, sex, preoperative diagnosis, diameter of tumor, localization of tumor, mediastinal lymph nodes, surgical procedure, postoperative pathologic examinations, SUV max values in PET/CT were reviewed. Clinical and post-surgery staging were compared. The sensitivity and specificity of thorax CT in determining the pathological lymph nodes were found 39% and 63% respectively. Positive predictive value (PPV) was 32%, negative predictive value (NPV) was found as 70%. For PET/CT examination, sensitivity was 67%, specificity was 73%, whereas PPV and NPV were 50% and 80% respectively. PET/CT had 80% sensitivity, 91% specificity, 36% and NPV%98 for detecting distant metastasis. Regarding satellite nodules PET/CT had 54% sensitivity, 91% specificity, 50% PPV and 93% NPV. When clinical staging was compared with surgical staging results, PPV was lower for detecting N2 N3 metastasis. That’s why biopsy was definitely needed. NPV of PET/CT was higher, the need of invasive staging methods was getting decreased. For unsuspected N2 and M1 disease PET/CT was very useful. PET/CT was found superior in detecting lung node metastasis, more sensitive in distant metastasis and similar to find patients without metastasis when compared with CT alone.

P4326
Pseudotumoral lung tuberculosis – A controversial clinical and imagistic
doctrine
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Objectives: Our aim is to signal the frequent existence of a clinical and imagistic entity inside the thoracic surgical pathology, easily mistaken preop for lung cancer – the pseudotumoral lung TB.
Method: Our clinic’s experience in the surgery of tuberculosis is limited by the existence of an outside compartment, specialized in these types of surgeries. Between 2001–2010 we had 196 cases with postoperative diagnosis of TB. From these 196 cases we selected only 64 cases of tuberculosis, that had imagistic and clinical aspect of a lung malignant tumor.

All of these patients were admitted with a symptomatology unlike lung TB – weight loss, fatigue, hemoptysis, no fever, no previous infections or contact with TB patients, negative bronchoscopy, sputum cultures and Quantiferon test (3 patients). The CT images showed round tumoral formations, with poor limits and pathological mediastinal lymph nodes.

Results: From the 64 cases we had 9 lobectomies, 1 bilobectomy and 54 wedge resections. We had complications in 5 cases, one postoperative clot, 4 cases with prolonged air leaks that were treated by connecting to a water seal. The mortality was 0.

Conclusions: Lung TB resembles more frequently to lung cancer, both by localization in the lung and by clinical and imagistic aspect of the lesions, making a preoperative diagnosis extremely difficult. Wedge resections are very efficient in the surgical treatment of lung TB.

P4328
The comparison of exercise test in patients with lung resection candidates

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Aim: It has been aimed to investigating the consistency of the maximal cardiopulmonary exercise test (CPET), 6-minute walking test (6MWT), and stair climbing test (SCT) results with each other and discussing the applicability of these sub maximal field tests in patients with lung resection surgery indication.

Material-method: The maximal cycle ergometry, 6MWT, and SCT tests were done in 22 lung cancer patients (416M) followed with lung resection surgery indication. maxVO2 value was calculated indirectly using indirect formulas for 6MWT and SCT. Peripheral oxygen saturation (SpO2) and heart rate values were recorded using pulse oxymetry during test.

Results: The mean maxVO2 values were 16.07±2.70ml/kg/min (for CPET), 24.44±4.09 ml/kg/min (for SCT), and 18.3±19.3 ml/kg/min (for 6MWT). It was determined that heart rate increased (heart rate difference; for CPET=58.20±14.67, 6MWT=90.48±19.90, SCT=90.86±11.56, p<0.05) and SpO2 reduced (SpO2 difference; for SCT=3.14±1.56 and 6MWT=1.48±0.52 %in p<0.05, CPET=3.95±10.30, p<0.0010) after these tests. It was found that CPET maxVO2 was correlated with 6MWT and SCT maxVO2 (between CPET and SCT, rho=0.59, p=0.01; between CPET and 6MWT, rho=0.53, p<0.02). In addition, it was determined that there were correlations only between CPET and SCT in respect to load and work values (rho=0.70, p<0.001).

Conclusion: Due to correlation between indirectly calculated maxVO2 value with SCT and CPET maxVO2 value, our results suggest that SCT and CPET maxVO2 values may be applicable during patient follow up and treatment. Also 6MWT can be used related to lower hemodynamical stres level in conditions the application of CPET and SCT are not possible.
second, patients had surgical resection after PET-CT evaluation. The postoperative histopathological and preoperative PET-CT findings were compared. There were 58 patients in group 1 and 159 patients in group 2. The sensitivity, positive predictive value (PPV) and accuracy of PET-CT for primary tumor were 92%, 92%, 86% in group 1 and 99%, 100%, 99% in group 2. In group 1, the specificity and negative predictive value (NPV) were 50% and 50%. For N2 disease, the sensitivity, specificity, PPV, NPV and accuracy were 44%, 88%, 58%, 80%, 76% in group 1 and 43%, 89%, 16%, 97%, 87% in group 2. The sensitivity, PPV and accuracy of primary tumor and NPV and accuracy of N2 disease were significantly lower at group 2. 

In patients with NSCLC those had had induction therapy, the negativity of PET-CT should be examined better than the patients those had not had preoperative therapy and it should not be avoided to perform invasive staging procedures. When PET-CT findings after induction therapy is used, NPV and accuracy is lower.

This paper presents a case of 12-year-old girl, who was admitted to the pulmonology department of the Clinic for children’s illness KC Banja Luka in February 2010th year, because of the x-ray verified large tumor change in the left hemithorax. Insight into previous medical documentation, patient previously had two surgeries in the department, in a differential diagnosis, we have done chest CT, GI passage, the serology of Echinococcus granulosus, ultrasonography and laboratory analyses, after which the patient was referred to the surgical treatment at the Institute for Mother and child in New Belgrade.

During the surgery a apscess cavity filled with green colored compress was found, which had been present for 2.5 years since spine surgery.

**Giant mediastinal atypical carcinoid tumor**

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Fifty-one years old male with shortness of breath increased by effort since one year. The patient was smoking 30 packs of cigarette per year. Inspiration sounds were decreased on the left hemithorax. Pulmonary function test results were: FEV1: 2.21 L (60%), FVC: 3.22 L (70%), PIF: 3.71 L (42%), PEV 1/EVC: 68.6%. The computerized thorax tomography, showed a 155x127 mm soft tissue mass on the left anterior mediastinal region, pressing vascular structures, and heart, and causing atelectasis on the upper lobe. Incisional biopsy was taken from the mass via mediastinotomy at a different hospital; the pathology result was malignant diffuse lymphoma. PET-CT was applied for staging. 2R mediastinum hypermetabolic lymph node station, with 14.5 mm diameter was detected (SUV max: 5.4). The mass SUV max: was 8.7. Chemotherapy was applied to the patient with diagnose of lymphoma. However, due to lack of regression of mass, biopsy slides were reexaminated; the diagnosis was changed to be carcinoid tumor. The mass was according to be surgically removed by median sternotomy. The mass was quite vascular, and had tight adhesions between the lung and pericardium. The result of frozen section of the mass was reported to be atypical carcinoid tumor. The PPV of the mass was placed instead of excised pericardium. The postoperative survival after surgery is 5 years.

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Tuesday, September 27th 2011

P4338
Surgery of relapsed hydatid disease of lungs
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The surgical treatment of hydatid disease of lungs is unique and the most radical, however and after operations the development of relapses is possible. On the data of the literature the relapse of hydatid disease after surgical treatment does not tend to decrease and changes from 3% up to 54%.

In the department of surgery of lungs and mediastinum Republican Specialized Center of Surgery named after acad. V.Valiyev from 1975 to 2009y there were on treatment 2600 patients with hydatid disease of lungs. From 2600 operated patients concerning the various forms of hydatid disease of lungs relapse of disease from 1 to 7 years we observed in 160 (6,5%) patients. From them men - 93 (58,1%), women - 67 (41,9%). The age of the patients varied from 10 to 70 years. From 360 patients 130 (81,25%) undergone operations, not operated 30 (18,7%) - the reason was disseminated process, wide distribution of hydatid cysts. 152 (95%) patients were performed organizing operation, 8 (5%) patients underwent resections.

In the postoperative period albendazole was administered in a dose 10-12 mg/kg/day, quantity of courses depended on the form of a defeat.

P4339
Transthoracic approach in adult Morgagni hernias: 30 years experience
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Background: Morgagni hernia is a rare congenital disorder. Numerous approaches have been described and, particularly the significance of laparotomy has been emphasized as an operative technique.

Aims and objectives: To present our experience on adult patients with Morgagni hernia operated on via transthoracic approach in our department.

Methods: Between 1980 and 2010, 33 patients with Morgagni hernia were operated in our department. Their ages ranged from 17 to 77 years (mean 53.17). There were 17 females. Chest x-rays, thorax computed tomography, magnetic resonance imaging, barium enema, and pneumoperitoneum were used as diagnostic utilities. Thoracotomy was performed in all cases. In only one case, laparotomy was applied in addition to thoracotomy.

Results: Twenty-five hernias (76%) were right-sided and eight (24%) were left-sided. Hernia sac was present in all cases. Exploration revealed only omentum in 11 patients (33,3%), colon and omentum in 13 patients (39,3%), stomach and colon in 3 patients (9%), stomach, colon and omentum in two patients (6%), small bowel in two patients (6%), stomach and omentum in one patient (3%), and only stomach in one patient (3%). There were no complications and no mortalities. There was no recurrence or symptoms related to the operation. The mean follow-up was 11 years.

Conclusions: We advocate transthoracic approach for surgical exposure as it provides wide exposure and repair of Morgagni hernia.

P4336
Surgical treatment of combination of tuberculosis and pulmonary echinococcosis
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Results of surgical treatment of combination of TB and pulmonary echinococcosis were studied in 19 patients (males=11, females = 8) in ages 7-49 years old. Fibrous-cavernous TB was diagnosed in 4, infiltrative with lytic in 3, tuberculous in 8, focal in 3, TB of intrathoracic lymph nodes in 1. 9 patients echinococcus cysts located within the zone of tubercular affect, in 10 in other lobes of lung. In 9 on the right, in 10 on the left. Cyst dimensions were 2 to 9 cm in diameter. In 4 with location of echinococcus cyst in the zone of tubercular affect were operated - segmental resection was performed in 1, lobectomy in 2, lobectomy and pleurectomy in 1. In 7 who had TB and echinococcosis in cyst in different lobes of lung, single-stage segmental resection and echinococcosis were performed in 5, lobectomy and echinococcosis in 1, combined resection and echinococcosis in 1. After effective chemotherapy and repair of pulmonary destruction, an organ-saving operation - echinococcectomy was performed in 8 patients with firstly diagnosed fibrous-cavernous tuberculosis (1), infiltrative (3), focal (3), intrathoracic lymph node tuberculosis (1) and pulmonary TB. Good clinical effect was achieved in 10 operated patients.

Conclusion: Partial resections are surgical indication at TB and echinococcosis both located in one lobe of lung, in different lung lobes – partial resection on account of TB and echinococcosis are the surgical indication. At firstly found TB and echinococcus cyst, an organ-saving operation – echinococcectomy is necessary after effective chemotherapy and repair of pulmonary destruction. These operations are highly effective and heal patients from TB and pulmonary echinococcosis.

P4337
Pulmonary hydatid cyst: Analysis of 1024 cases
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Objective: Pulmonary hydatid cyst is a parasitic disease and health care problem in developing countries. In this study we evaluated treatment outcomes of pulmonary hydatid disease in our Department.

Methods: Patients admitted with pulmonary hydatid cyst from 1981 to 2008 enrolled in this study and demographic data, site and number of cysts, diagnostic methods, type of operations, outcomes and rate of recurrence were statistically analyzed.

Results: In 1024 patients, mean age was 30.6 (±16.1) years and M/F=1.09. The most common symptom was cough (55.1%). Only 1% was asymptomatic. 53.8% had right side involvement, 40% had left side involvement and 6.2% had bilateral disease. Inferior lobe was the most common involved lobe. The cyst was intact in 539 (52.6%) patients and other, were complicated or perforated. The most common surgical technique was removing the cyst membrane without resection of pericyst and closure of orifice of air ways (67.2%). The cyst was encapsulated in 21.2% and parenchymal resection was performed in 10.3%. The mortality rate was (0.2%) and morbidity occurred in 8.4% of patients. The most common complications were residual spaces with prolonged air leak and wound infection. The recurrence rate was 2.5% mostly managed by surgery (82.6%).

Conclusion: The best treatment for pulmonary hydatid cyst disease is surgery with low mortality and morbidity. The most common and acceptable treatment is extraction of cyst membrane without manipulation of pericyst and closure of small air ways. Pulmonary resection should be reserved for complicated forms of disease.