

or GCCI, co-registration method and accuracy of PET CT co-registration were not consistently reported. The majority of these studies had 30 patients or less (15/21) with a range of patient numbers from 11 to 153. The impact of PET or GCCI on radiation treatment planning was also inconsistently reported. PET significantly altered the gross target volume (GTV) from 20%-100%, and the planning target volume (PTV) from 12%-67% in the 9 trials reporting on these outcomes. As well, the detection of distant metastases due to PET resulted in the upstaging of a substantial number of patients. Limited data were available on the effect of PET CT in sparing of normal tissues, especially lung (V20) and esophagus (V55). The studies varied in the criteria used to define the tumor edge on PET (e.g. thresholding, SUV values). Limited clinico-pathological correlative data exists for the accuracy of PET CT induced changes in the GTV and PTV.

**Conclusion:** PET CT simulation alters radiation treatment volume significantly in terms of its changes on GTV and PTV. However, clinical outcomes regarding the accuracy of PET CT changes in radiation treatment planning are lacking.

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### Can endoesophageal ultrasound-guided fine-needle aspiration (EUS-FNA) replace mediastinoscopy in mediastinal staging of thoracic malignancies?

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**Objective:** to determine the impact of EUS-FNA on management of thoracic malignancies.

**Methods:** 120 tumour patients referred for invasive diagnostic and resection were studied prospectively. Negative and unconvincing EUS-FNA findings were assessed by videoassisted mediastinoscopy or open lymphadenectomy.

**Results:** 120 Patients, aged 64,1 years (range 38-85) underwent 120 EUS-FNA, 53 videoassisted mediastinoscopic and 48 open lymphadenectomies for diagnosis and treatment of 99 lung carcinoma, 6 lung metastases, 5 mesothelioma, 2 lymphoma, and 8 other conditions. Overall incidence of mediastinal lymph node metastases was 50%, detected by EUS-FNA in 41/60 patients. EUS-FNA sensitivity was 91,7%, 75,0% and 43,8% for bulky disease, enlarged mediastinal nodes or normal nodes on CT scan, and 50% resp 96,6% for right- resp left-sided tumours. EUS-FNA showed T4 in 15/120 and adrenal or hepatic metastases in 9/120 cases.

**Conclusions:** EUS-FNA sensitivity depends on the localisation of the primary, and extent of mediastinal disease. Exclusion of mediastinal involvement requires mediastinoscopy or open lymphadenectomy. For left-sided tumours, EUS-FNA improves mediastinal staging by assessing stations 5 & 6 inaccessible to mediastinoscopy. For extended mediastinal disease, mediastinoscopy can be avoided or spared for restaging after neoadjuvant therapy. Beyond mediastinal nodal staging, EUS-FNA may detect T4 and M1 situations. Thus, EUS-FNA is an useful supplement to mediastinoscopy.

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### Video-assisted mediastinoscopic lymphadenectomy (VAMLA) versus open lymphadenectomy

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**Objective:** To compare feasibility and accuracy of video-assisted mediastinoscopic lymphadenectomy (VAMLA), a minimally invasive technique for systematic mediastinal lymph node dissection, to standard open lymphadenectomy.

**Methods:** In a case-control study of 40 patients, VAMLA technique was standardized and evaluated against open lymphadenectomy. A prospective study investigated 130 patients with resectable lung cancer and radiologically normal mediastinum who underwent VAMLA, and consecutive lung resection with mediastinal reexploration.

**Results:** VAMLA harvested significantly more lymph nodes than open lymphadenectomy (20,7 vs. 14,3,  $p < 0,0001$ ). Mean duration was 54 (30-150) min, and the complication rate 4,6%. The incidence of mediastinal lymph node metastases was 17,6%. We noted a sensitivity of 93,8%, a specificity of 100%, and a false negative rate of 0,9%.

**Conclusions:** In our experience, VAMLA is a feasible, highly accurate method of mediastinal staging. Its radicality can equal open lymphadenectomy. However, VAMLA is minimally invasive and therefore pretherapeutically available. We suggest the following indications: neoadjuvant strategies, trials, involved field radiation, VATS lobectomy, and left-sided tumours.

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### The role of PET-CT in mediastinal staging in NSCLC

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**Background:** To determine the value of PET-CT in mediastinal lymph node staging in NSCLC.

**Methods:** 44 NSCLC cases who were considered to be operable are taken for our study. Fiberoptic bronchoscopy, thorax CT and PET-CT were applied in all cases. All cases went through mediastinoscopy. Two of the cases underwent an additional mediastinotomy. Of the 10 cases who were confirmed to have N2 mediastinoscopically, 3 were referred to surgery after neoadjuvant chemotherapy. Thoracotomy and systematic mediastinal sampling was performed to a total of 37 cases.

**Results:**

	CT	PET-CT	Mediastinoscopy
Sensitivity	66.7	80.0	76.9
Spesifitsity	62.1	62.1	100
Accuracy	63.6	68.2	93.2
PPV	47.6	52.2	100
NPV	78.3	85.6	91.2

**Conclusions:** We have concluded that PET-CT and thorax CT have similar diagnostic values in mediastinal lymph node staging and that there is no statistical significance between the two methods ( $p > 0.05$ ). However PET-CT has a high NPV of 85.6%. In our study, false positivity rate of PET-CT was found to be 47.8%. For this reason, surgical

staging must be performed in cases considered for surgical treatment even when positive mediastinal lymph nodes are detected in PET-CT.

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### Nodular lymphoid hyperplasia of the lung: the role of PET on diagnosis

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**Background:** Nodular lymphoid hyperplasia (NLH) is one of the rare pulmonary lymphoproliferative disorders which may appear as a solitary or multiple lesions.

**Method:** A 61-year-old immunocompetent patient was admitted to our hospital with cough and hemoptysis. He was a heavy smoker without a history of tuberculosis. Physical examination was unremarkable. Chest X-ray demonstrated a mass located in the right middle zone. Thorax CT revealed a cavitary pulmonary mass (3x6 cm) and a satellite nodule localized to the superior segment of right lower lobe. In further evaluation of the patient with bronchoscopy, endobronchial lesion could not be detected. The histopathological assessment of bronchoalveolar lavage, brush and aspiration fluid were benign, and the smear was negative for tuberculosis. A second bronchoscopy to reach the diagnosis was uneventful and transthoracic needle aspiration revealed lymphocytes and leucocytes without an evidence of malignancy. Anti-tuberculosis therapy was initiated although the smear was negative for tuberculosis due to the high incidence of tuberculosis in our country. Four months later, he was referred from the local tuberculosis dispensary to our clinic with massive hemoptysis. Thorax CT showed that there was not any change of the lesion. Anti-tuberculosis therapy was stopped for the cultures for sputum and bronchoscopic materials were negative. Vasculitic syndromes, ie. Wegener's granulomatosis were suspected in the presence of unidentified cavitary lesions. Myeloperoxidase and antiproteinase ANCA were negative.

**Result:** FDG-PET standard uptake value was positive (SUV: 4.1), indicating malignancy. There was not any pathological FDG uptake in the other parts of the body. An open lung biopsy revealed the final diagnosis of NLH, of which the histologic examination was positive for CD3, CD20 and LCA and negative for keratin.

**Conclusion:** nodular lymphoid hyperplasia should be kept in mind in the differential diagnosis of the cavitary mass lesions with positive FDG uptake.

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### Correlation of [18F]FDG PET/CT imaging with Glut-1 and Glut-3 expression in non-small cell lung cancer

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**Background:** To correlate FDG uptake on PET/CT images with the expression of Glut-1 and Glut-3 glucose transporters in patients with non-small cell lung cancer (NSCLC).

**Methods:** Preoperative 18F-FDG PET/CT images were performed in 68 patients with non-small cell lung cancer. Final diagnoses were confirmed by operative histology (37 adenocarcinoma, 28 squamous cell carcinoma, 2 large cell carcinoma and 1 pleomorphic carcinoma). The peak standardized uptake value (pSUV) of the lung cancer FDG uptake was measured and correlated to immunohistochemistry results for Glut-1 and Glut-3. In the immunohistochemical studies, (1) the intensity of the immunoreactivity (grade 0 to 3) and (2) percentage of the area testing positive (<25%; 26~50%; 51%~75%; <100%) for Glut-1 and Glut-3 were reviewed.

**Results:** The mean pSUV was 9.26±3.85 in squamous cell carcinoma, and 6.03±4.20 in adenocarcinoma. Intense FDG uptake of pSUV above 8.0 was seen in 2 large cell carcinoma and one pleomorphic carcinoma cases. Squamous cell carcinoma had significantly higher mean pSUV than adenocarcinoma (p=0.002). The expression of Glut-1 was also significantly higher in squamous cell carcinoma than in adenocarcinoma for both the grade of intensity (p=0.000) and the percentage of positive area (p=0.000), whereas the expression of Glut-3 was not significantly different between adenocarcinoma and squamous cell carcinoma. The degree of pSUVs demonstrated significant correlation with the intensity (p=0.000) and percentage of positive area of Glut-1 (p=0.003), and with the intensity of Glut-3 (p=0.002). However, the percentage of Glut-3 positive area and pSUV had no significant correlation (p=0.064).

**Conclusions:** This study indicates that squamous cell carcinomas have higher FDG uptake and Glut-1 expression than adenocarcinomas. The FDG uptake in NSCLC correlates with the intensity and percentage of positive area of Glut-1, and intensity of Glut-3, but not with the percentage of Glut-3 positive area.

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### Clinical value of computed tomography and fluorine-18 fluorodeoxyglucose positron remission tomography in diagnosis of mediastinal metastasis of non-small cell lung cancer

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**Background:** TO compare the clinical value of computed tomography (CT) and fluorine-18 fluorodeoxyglucose positron remission tomography (FDG-PET) in diagnosis of mediastinal metastasis of non-small cell lung cancer (NSCLC).

**Methods:** From 2004 to 2006 75 patients with respectable NSCLC underwent CT and FDG-PET with an interval of 2 weeks and then underwent thoracotomy for clearance of mediastinal lymph nodes or biopsy of the mediastinal lymph nodes via mediastinoscopy. The specimens of mediastinal lymph nodes underwent HE staining and PCNA/Ki67 immunohistochemical staining. The sensitivity, specificity, accuracy, positive prediction value, and negative prediction value in diagnosis of metastasis of mediastinal lymph nodes of these 2 procedures were compared.

**Results:** The sensitivity, specificity, accuracy, positive prediction value, and negative prediction value in diagnosis of metastasis of mediastinal lymph nodes were 91.2%, 85.5%, 94.2%, 93.1%, 73.1% respectively