

Comparison of the dual energy-computed tomography (DECT) with PET-CT for tissue characterisation in lung cancer

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Aims and objectives

To study the correlation between the standard uptake values (SUVmax) according to results of 18-FDG PET-CT and iodine concentration (IC) obtained with DECT measured in primary lung cancer lesions and metastatic lymph nodes.

Images for this section:

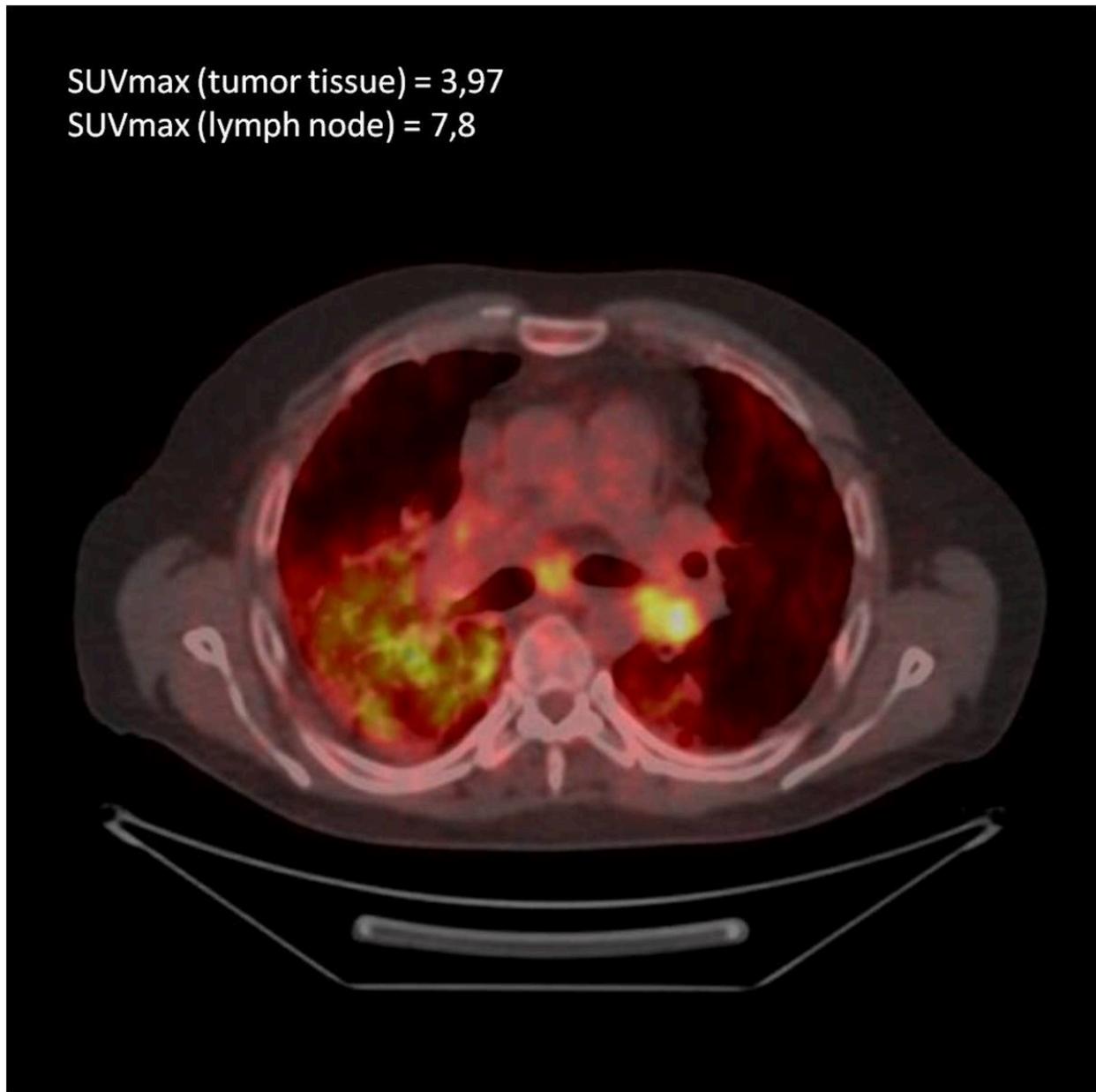


Fig. 1: PET-CT of a patient with lung adenocarcinoma. The values of SUVmax in the regional lymph nodes are higher than in the tumor tissue.

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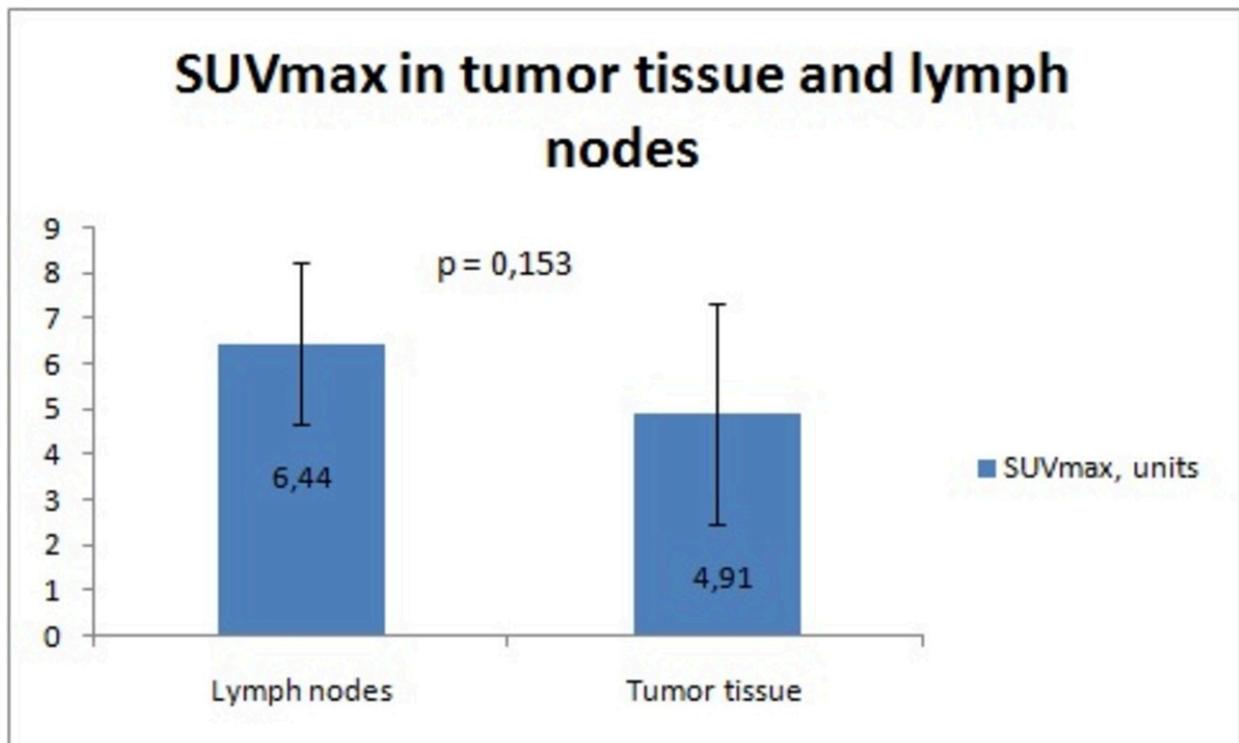


Fig. 2

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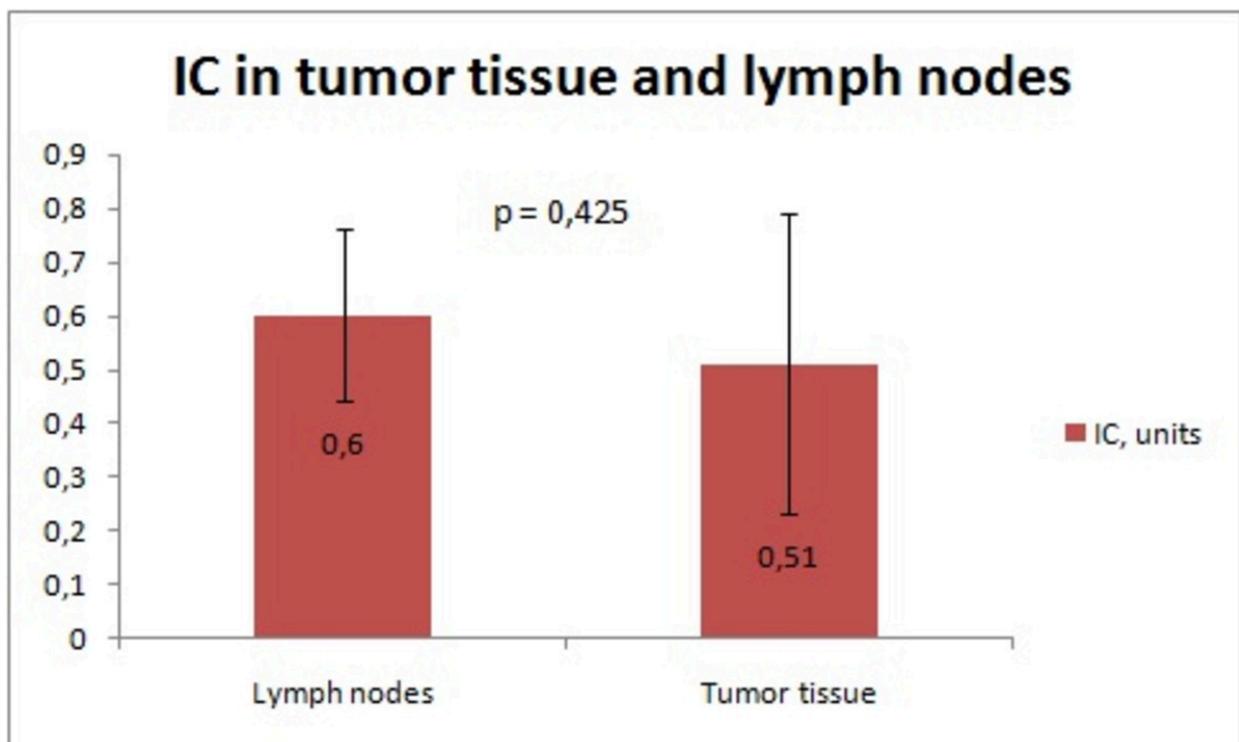


Fig. 3

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Methods and materials

10 patients (f/m - 4/6 mean age - 61,4+/-7,5) with morphologically proven lung adenocarcinoma were included in the study. All patients were studied with PET-CT and DECT with IV iodine enhancement in the venous phase. IC values were measured in the tumor tissue and lymph nodes, normalized using IC values in the thoracic aorta as a reference. Results of DECT were also presented as approximated spectral curves (ASC). SUVmax was compared with normalized IC and ASC.

Results

The values of SUVmax in the lymph nodes were higher than in the tumor tissue ($p=0,153$). The values of normalized IC in the lymph nodes were higher than in the tumor tissue ($p=0,425$). The values of ASC in the lymph nodes were lower than in the tumor tissue ($p=0,114$). There was no significant correlation between SUVmax and normalized IC. A moderate negative correlation between the values of SUVmax and ASC was found ($r=-0,61$; $p=0,007$). There was negative correlation between SUVmax and IC in the tumor tissue ($r=-0,56$; $p=0,017$).

Conclusion

We found that the level of 18-FDG accumulation and IC in the metastatic lymph nodes were greater than in the tumor tissue. However, because of the small sample size, it is difficult to conclude whether DECT is as informative as PET-CT in the detection of lung cancer.

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