positive in 5 of 35 benign lesions. Sensitivity was 71%, specificity 86%, positive predictive value 67%, and negative predictive value 88%. Area under the curve in ROC analysis did not significantly differ among the three analytical methods (visual, 0.77; SUV, 0.81; and CR, 0.84; p = ns).
Conclusions: These results suggested that in pulmonary lesions with low FDG uptake, semi-quantitative methods did not improve the accuracy of FDG PET compared with visual analysis. Pulmonary lesions with visually absent uptake indicate a low probability of malignancies <10%. In contrast, any visually recognized lesions have a probability of malignancies of about 50%.

1116 POSTER

Induced tumor fluorescence using fluorophore-tagged anti-tumor antigen antibodies in the nude mouse model—an example for use in humans

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Background: Inducible tumor fluorescence is possible using fluorophore-tagged anti-tumor-antigen antibodies.
Method: Female athymic nude mice were subcutaneously or othotopically implanted with cells from either of 2 human tumor cell lines; (1) the colon cancer line (SW1116 (ATCC™)) known to express carcinoembryonic antigen (CEA) (11 mice) and (2) the breast cancer line, MDA 468 (ATCC™) known to express CA 15–3 (10 mice). Tumor nodules grew to 3–8 mm within 3–6 weeks after implantation. Commercially available anti-CEA and anti-CA 15–3 antibodies were tagged with a green fluorophore. Seven study mice with colon cancer nodules were injected intravenously with 100 μL of anti-CEA, and 6 study mice with breast cancer nodules were injected with 100 μL of anti-CA 15–3. Eight control mice were injected with fluorophore-tagged mouse IgG. Mice were observed and photographed using a CCD camera. Initial observations and photographs were done at 24–48 hours after injection and mice were euthanized between 1 to 7 days. All mice were euthanized and dissected to expose tumor nodules and again photographed. Mice were also examined using a simple pocket LED light source with a 470 nm band pass filter and goggles with a 519 nm band pass filter. Tumor tissue was then excised and fixed for histologic examination.
Results: Tumor nodules in all 13 study mice, injected with anti-CEA or anti-CA 15–3, demonstrated bright fluorescence. Fluorescence was as readily visible with the LED light source and goggles as that seen using the CCD camera. Tumor nodules in the 8 control mice did not fluoresce. Tumor fluorescence was readily visible from 24 hours up to 1 week. Several lymph node metastases 0.5 mm in diameter were distinguishable from surrounding normal tissue. Histologic examination of fluorescent tissue confirmed the presence of the malignant cells.
Conclusions: Induced tumor tissue fluorescence allows clear visualization of primary tumor margins and of very small metastases. When the tumor antigens are known and antibodies to the antigens are available, this methodology is clearly reproducible. Tumor fluorescence can be easily seen with a simple LED light source. This technique could be readily applied to oncologic surgery with significant potential benefits to the patient and the surgeon.

Publication
Imaging

1117 PUBLICATION

CT findings of gefitinib-related interstitial pneumonitis in 65 patients: Multi-institutional analysis of West Japan Thoracic Oncology Group

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Purpose: To clarify the image characteristics of interstitial pneunonitis (IP) induced by newly developed the molecular-targeting drug gefitinib.
Materials and Methods: In a total of 1,976 patients with non-small cell lung cancer who were administered gefitinib from August to December 2002, 102 were suspected to have IP. In these patients, 65 patients had undergone CT as well as chest roentgenogram at onset. Based on the findings of chest roentgenogram and CT reviewed and analyzed by three radiologists, the final definite diagnosis of gefitinib-related IP was determined, adding clinical data in the medical records. Moreover, CT findings were classified into four patterns; Pattern A: nonspecific areas with ground-glass attenuation, B: multifocal areas of airspace consolidations, C: patchy distribution of areas with ground-glass attenuation accompanied by interlobular septal thickening, such as acute eosinophilic pneumonia, and D: extensive bilateral areas with ground-glass attenuation or airspace consolidations with traction bronchiectasis, such as acute interstitial pneumonia.
Results: The diagnostic images were classified as pattern A in 29 patients, B in 3, C in 7, D in 20 and others in 11. 24 patients with pattern A, 1 with pattern B, 7 with C and 12 with D were classified into single pattern. The patients dying due to gefitinib-related IP were significantly more frequent in pattern D.
Conclusion: Gefitinib is considered to induce IP at a certain rate and the images are similar to drug induced pneumonitis of conventional anticancer agents.

1118 PUBLICATION

Preoperative staging by 18F-FDG-PET-CT-Scan in malignant pleural mesothelioma

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Background: Trimodal treatment in malignant pleural mesothelioma (MPM) is the combination of chemotherapy, surgery (extrepleural pneumonectomy) and irradiation. This is a treatment possibility with potentially severe morbidity and even mortality for few selected low-stage patients (pts). Staging is difficult in MPM and it is important to identify pts who may not be candidates for such extensive surgery. The purpose was accordingly to evaluate wether preoperative 18F-FDG-PET-CT-scan (PET-CT) identified MPM patients (pts) having non-resectable disease better than CT-scan alone.
Material and methods: Pts having epithelial subtype MPM in IMIG stages Ia-III MPM based on conventional CT-scan, with performance status 0–1, age <70 yrs and good organ function were candidates for trimodal treatment. They received 3–6 courses of neoadjuvant platinum-based combination chemotherapy before evaluation for extrapleural pneumonectomy. Preoperative staging included PET-CT and mediastinoscopy.
Results: 24 consecutive pts judged resectable by conventional CT-scan were included for PET-CT before extrapleural pneumonectomy. There were 22 males and 2 females with median age 60 yrs (range 30–70 yrs). The PET-CT revealed 12 pts (50%) to be non-resectable, due to either too high T-stage, N-stage, metastasis, or any combination of these (9 pts due to N2 gland, 5 pts had extensive T3 thoracic wall invasion, 4 pts had T4 direct mediastinal extension, and one patient had subdiaphragmatic metastasis). Among the remaining 12 pts considered further for resection, two had positive N2 glands by mediastinoscopy and were hence not amenable to surgery, while two other pts had N2 gland involvement by perioperative lymph-node dissection. Among resected pts, three could not be microscopically completely resected at the thoracic wall due to too extensive invasion, which was not detected preoperatively on the PET-CT. The sensitivity of PET-CT to detect N2 glands was 82% and to detect non-rectable T3 or T4 disease was 75%.
Conclusions: Preoperative PET-CT may detect cases of otherwise subclinical spread to N2 glands, distant metastasis, or extensive, non-resectable local disease, thereby avoiding major surgical procedures in such non-curable disease. There may however also be false negative PET-CT findings, and the use in the preoperative staging of MPM should be further explored.