Session 3: Targeting; Tumor

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Ferumoxtran-10 enhanced MR imaging in detection of metastases outside the normal surgical area in prostate cancer
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Rationale and Objectives: To evaluate whether, in prostate cancer patients, with Ferumoxtran-10 enhanced MR imaging lymph node metastases outside the normal surgical area (that is, the obturator fossa) will be detected.

Methods: A total of 150 consecutive patients with prostate cancer and at intermediate to high risk for nodal metastases (PSA >10 or Gleason <6 or at DRE stage T3) were enrolled in this study. At 1.5 T, T1- and T2*-weighted MR images of the pelvis were obtained, 24 h after administration of Ferumoxtran-10. The MR examinations were evaluated by one experienced reader.

Lymph node metastases were confirmed by lymph node dissection or CT-guided lymph node biopsy.

Results: Thirty-one out of 150 patients (21%) had positive lymph nodes confirmed by histopathology. Of these 31 patients, 16 (52%) had positive lymph nodes only outside the normal surgical area (obturator fossa), eight (26%) had positive nodes inside and outside the obturator fossa and six (19%) only inside. Without Ferumoxtran-10 enhanced MRI, in 52% of the patients these positive nodes would not have been detected.

Conclusion: With Ferumoxtran-10 enhanced MR imaging, additional nodes will be found compared with obturator nodal dissection.

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The stromal mechanism: an inherent link between necrosis-avid contrast agents and photodynamic therapy
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Rationale and Objectives: Necrosis-avid contrast agents (NACAs) were discovered initially among porphyrin derivatives including gadolinium-2 that were intended to target neoplastic cells with the same principle adopted from cancer photodynamic therapy (PDT). Later, the NACAs of non-porphyrin chemicals including ECIII-60 and ECIV-7 were developed with demonstrated multifunctional features such as striking T1 and T2 dual-contrast enhancement of acute myocardial infarction, therapeutic assessment after tumor ablation, blood-pool effect for MR angiography and hepatobiliary tumor detection. Here we sought to investigate the underlying mechanisms of NACAs and to formulate consequent new diagnostic and therapeutic strategies.

Methods: 1. Summarizing experimental results derived from MRI, SPECT, autoradiography, radioactivity counting and fluorescent and optical microscopy studies in animal models of induced tumors and necroses

Session 3: Targeting; Tumor

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MRI tumor characterization using Gd–GlyMe–DOTA–perfluoroctylmannose conjugate (Gadofluorine M), a novel protein-avid contrast agent
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Rationale and Objectives: The aim was to define the pharmacokinetics and MRI tumor-enhancing characteristics of a new protein-avid contrast agent, Gd–GlyMe–DOTA–perfluoroctylmannose conjugate (Gadofluorine M, Schering, Berlin, Germany) in a chemically induced tumor model of varying malignancy. Because of the unique properties of this agent, including a large effective in vivo hydrodynamic radius (5.5 nm) and strong binding to hydrophobic sites on extracellular proteins, it was hypothesized that patterns of dynamic enhancement in tumors could be used to measure abnormal tumor microvascular permeabilities and also could aid in the differentiation of viable and necrotic tumor components.