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nodes will be found compared with obturator nodal dissection. With Ferumoxtran-10 enhanced MR imaging, additional MRI, in 52% of the patients these positive nodes would not have been fossa and six (19%) only inside. Without Ferumoxtran-10 enhanced positive lymph nodes only outside the normal surgical area (obturator fossa), eight (26%) had positive nodes inside and outside the obturator pre- and dynamic post-contrast T1-weighted MRI at 2.0 T (Bruker) was performed at short intervals for 40 min with region-of-interest analyses of whole tumor, tumor rim, tumor center and venous blood enhancement responses. These enhancement data were also post-processed using a two-compartment kinetic model to generate estimates of fractional plasma volumes (fpV) and the apparent coefficient of permeability–surface area product (Kps). After killing the animals, the tumors were examined microscopically and scored by a pathologist, blinded to the MRI data, for tumor type, degree of malignancy (Scarff–Bloom–Richardson score), plus degree and distribution of necrosis. Pathological data were correlated with MRI observations.

Results: So far 26 tumor-bearing rats have now been successfully examined by dynamic MRI, with another 8–10 animals to be added by the time of presentation. Accumulated data show an immediate strong but gradually increasing tumor enhancement, with the late enhancement being concentrated in the tumor center, a zone of relatively greater necrosis. Complete data analyses with calculation of fpV, Kps and paired tumor MRI–pathology correlations will be available at the time of presentation. Pathological data were correlated with MRI observations.

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.

Session 3: Targeting; Tumor

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MRI tumor characterization using Gd–GlyMe–DOTA-perfluoroctylmamnose 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-perfluoroctylmamnose 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.

Methods: Gadofluorine M, 0.1 mmol Gd/kg, was administered intravenously to 32 anesthetized rats that had developed mammary tumors of varying degrees of malignancy over the 6 months following intraperitoneal administration of N-ethylnitrosourea (ENU), 45–250 mg. These tumors ranged pathologically from benign fibroadenomas to highly undifferentiated adenocarcinomas. Pre- and dynamic post-contrast T1-weighted MRI at 2.0 T (Bruker) was performed at short intervals for 40 min with region-of-interest analyses of whole tumor, tumor rim, tumor center and venous blood enhancement responses. These enhancement data were also post-processed using a two-compartment kinetic model to generate estimates of fractional plasma volumes (fpV) and the apparent coefficient of permeability–surface area product (Kps). After killing the animals, the tumors were examined microscopically and scored by a pathologist, blinded to the MRI data, for tumor type, degree of malignancy (Scarff–Bloom–Richardson score), plus degree and distribution of necrosis. Pathological data were correlated with MRI observations.

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