Supplemental file HEPAR 2 - Imaging protocols

SPECT/CT

SPECT/CT imaging was performed on a Siemens Symbia T16 (Siemens Healthcare, Erlangen, Germany).

For ^{99m}TC-MAA, low-energy high-resolution collimators were used. Planar scintigraphy was performed during 300 s with a photopeak window of 140 keV ±7.5% (matrix 256 x 256, zoom 1.0, pixel 2.4 x 2.4 mm). A ^{57}Co flood source was used to delineate the lungs.

For ^{166}Ho, medium-energy collimators were used. SPECT was performed during 60 min (120 angles, 30 s per projection) with a photopeak window of 81 keV ±7.5% over a 360° orbit (noncircular). A low-dose CT was acquired on the same scanner for attenuation correction and fusion (16-slice, 110 kVp, adaptive dose modulation, effective mAs: 30). In-house developed Monte Carlo software (UMCS) was used to reconstruct SPECT images (isotropic voxels, 4.8 mm).

For more information regarding ^{166}Ho-SPECT/CT, see:

- *Elschot et al. "^{99m}Tc-MAA overestimates the absorbed dose to the lungs in radioembolization: a quantitative evaluation in patients treated with ^{166}Ho-microspheres" in Eur J Nucl Med Mol Imaging (2014) 41:1965–1975.*
- *Elschot et al. "Quantitative Monte Carlo-based holmium-166 SPECT reconstruction" in Med Phys (2013) 40:112502.*

MR Imaging

Imaging was performed using a 1.5-T whole body system (Achieva, Philips Healthcare, Best, The Netherlands) equipped with a 16-element torso coil. For detection and quantification of Ho-PLLA-MS, a multi-slice multi-gradient echo (MGE) sequence was used, sampling both the Free Induction Decay (FID) as well as the Spin Echo Envelope. For the data presented in this paper, only the FID readout was used for quantification. The Spin echo data was acquired for testing a new quantification method that is not included in this paper. 11 gradient echoes of the FID were acquired during breath hold with an in-plane resolution of 2×2 mm2 and a slice thickness of 6 mm. Imaging parameters included: FOV: 344×384 mm2, number of slices: 45, TR/TE1/ΔTE: 360 ms/3.08 ms/0.83 ms, flip angle: 90°. Sensitivity encoding (SENSE) with a factor of 4.3 was used for acceleration resulting in an imaging time of 5x20s during breath hold.

For more information regarding ^{166}Ho-SPECT/CT, see:

- *Elschot et al. "^{99m}Tc-MAA overestimates the absorbed dose to the lungs in radioembolization: a quantitative evaluation in patients treated with ^{166}Ho-microspheres" in Eur J Nucl Med Mol Imaging (2014) 41:1965–1975.*
- *Van de Maat et al. "MRI-based biodistribution assessment of holmium-166 poly(L-lactic acid) microspheres after radioembolisation" in Eur Radiol (2013) 23:827-35.*