SUPPLEMENTAL DIGITAL CONTENT 2

Preoperative MRI Imaging Sequence Characteristics

Preoperative magnetic resonance imaging (MRI) studies were obtained using a 3 Tesla scanner (Magnetom Tim Trio, Siemens, Erlangen, Germany). Routine sequences acquired included axial 3-D - (T_1-weighted 3-D magnetization prepared rapid acquisition gradient echo or MP-RAGE): matrix 192 × 256 × 192, resolution 0.98 × 0.98 × 1.00 mm^3, repetition time (TR in ms): 1760, echo time (TE in ms) = 3.1; T_2 (T_2-weighted): matrix 208 × 256 × 64, resolution 0.94 × 0.94 × 3.00, TR/TE 4680/85; Diffusion tensor imaging (DTI): matrix 128 × 128 × 40, resolution 1.72 × 1.72 × 3.00 mm^3, 30 gradient directions with b value 1000 s/mm^2 plus baseline b = 0 s/mm^2; Dynamic susceptibility contrast MRI (DSC-MRI): matrix 128 × 128 × 20, resolution 1.72 × 1.72 × 3 mm^3, TR/TE = 2000/45, 45 time points with at least 10 baseline volumes preceding bolus arrival; T_2-fluid-attenuated inversion recovery (T_2-FLAIR): matrix 192 × 256 × 60, resolution 0.94 × 0.94 × 3.00 mm^3, inversion time (TI in ms) = 2500, TR/TE = 9420/141; and axial 3-D T_1-Gad (T_1-weighted 3-D MP-RAGE post contrast): matrix 192 × 256 × 192, resolution 0.98 × 0.98 × 1.00 mm^3, TR/TE = 1760/3.1. For the DSC-MRI acquisition, an initial loading dose of 0.15mL/kg of MultiHance (gadobenate dimeglumine) was administered first to help minimize errors due to potential contrast leakage out of intravascular space, and DSC-MRI data were acquired during a second bolus injection after a 5 minute delay (total of 0.3mL/kg or 1.5 times single dose). Post-processed relative blood volume (rCBV) maps were created automatically on a DynaSuite workstation (www.invivocorp.com; Invivo, Gainesville, FL), including correction for leakage effects (reference Boxerman et al, *AJNR*, 2006). Note that FLAIR images were acquired between loading dose and DSC-MRI acquisitions and were thus a post-contrast acquisition as well. All imaging series utilized for this study were acquired in the axial plane, with total time for the imaging protocol less than 30 minutes.