MR Imaging

All imaging was performed on a 1.5T Avanto scanner (Siemens Medical Solutions; Erlangen, Germany) with parallel imaging capability. All participants received an MRI scan according to our standard head trauma protocol. The protocol consists of both structural and functional scans. Structural images consisted of axial T2 using turbo spin echo (TE_{eff}/TR/ETL = 113/5900 msec/15, 5mm slices with 1mm inter-slice gap, 0.6mm×0.4mm in-plane resolution), FLAIR (TE_{eff}/TI/TR/ETL = 102/2500/8000/13 msec, 5mm slices with 1mm inter-slice gap, 1.2mm×0.9mm in-plane resolution), volumetric T1 (TE/TR = 4.76/11 msec with 20° flip angle, 1mm×1mm×2mm voxels), and SWI (TE/TR = 40/50 msec with 25° flip angle, 0.5mm×0.5mm×2mm voxels). DTI images were obtained using a double spin-echo echo-planar imaging technique over a 23cm (FOV), at an in-plane resolution of 1.79 mm x 1.79 mm and a slice thickness of 2mm (3 averages; TE/TR of 95/11,200 msec, parallel imaging acceleration factor of 2). A total of 68 axial images were acquired to cover the brain from the apex to the skull base. Diffusion gradients were sensitized in 6 or 12 collinear directions at an effective b-value of 1000 sec/mm².