



**Fig. 1-1.** Example of subject-specific analysis of medical images in data from a subject with moderate traumatic brain injury (TBI) and intra-parenchymal bleeding. These results were created using preliminary versions of novel methodologies and tools proposed in this renewal, which upon further development, are expected to be used clinically to assess the extent of damage and to suggest viable treatment options in TBI patients. The image shows relevant structures from multiple modalities: **1** Surface of the white matter, **2** Surface of the gray matter, **3** Local U fibers, **4** Intraparenchymal bleed, **5** Part of the corticospinal tract. Specifically, the image processing used to generate this result included multi-modal image registration (T1, T1 postcontrast, T2, Flair, DTI); automated segmentation of brain tissue, CSF, lesions, and bleeding; user-guided tractography based on fiber clustering; and interactive integrated display. Analysis of diffusion tensor images allows identification of white matter tracts in the vicinity of one of the lesions.