Diffuse axonal injury MRI

Lindell Gentry from the Department of Radiology, University of Wisconsin Hospital and Clinics, Madison translated the histopathologic Diffuse Axonal Injury Classification to imaging in the following manner in a review article in 1994 published in Radiology [1]:

Stage 1 (lobar): diffuse axonal injury lesions confined to the lobar white matter, especially grey-white matter junction most common sites: parasagittal regions of frontal lobes, periventricular temporal lobes less common sites: parietal and occipital lobes, internal and external capsules, cerebellum

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Diffuse axonal injury MRI Stage 2 (callosal): diffuse axonal injury lesions in the corpus callosum, almost invariably in addition to the lobar white matter most common sites: posterior body and splenium of corpus callosum less common sites: anterior body and rostrum of corpus callosum (usually in conjunction with posterior involvement) usually unilateral and eccentric but may be bilateral and symmetric

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Stage 3 (brainstem): diffuse axonal injury lesions in the brainstem, almost invariably in addition to the lobar white matter and corpus callosum most common sites: dorsolateral midbrain, upper pons, and superior cerebellar peduncles Diffuse axonal injury lesions were not clearly defined in this article by their MR appearance aside from being multiple, small, elliptical “lesions” located in characteristic areas of white matter. Small petechial hemorrhages, which appear hypointense on T2*-weighted images, are characteristic but represent a minority of true diffuse axonal injury lesions.

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Gentry LR. Imaging of closed head injury. Radiology. 1994 Apr;191(1):1-17. doi: 10.1148/radiology.191.1.8134551. PMID: 8134551.