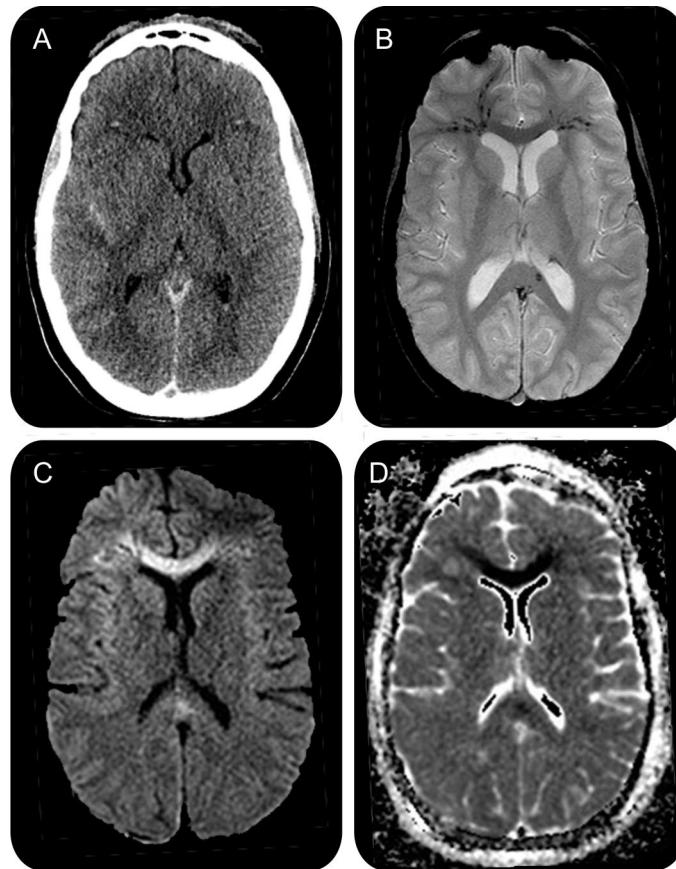


Teaching NeuroImages: Restricted diffusion in the corpus callosum after traumatic diffuse axonal injury

Brian L. Edlow, MD
Eli L. Diamond, MD,
MPhil

Address correspondence and
reprint requests to Dr. Brian L.
Edlow, Brigham and Women's
Hospital, Harvard Medical
School, Department of
Neurology, 75 Francis Street,
Boston, MA 02115
bedlow@partners.org

Figure Restricted diffusion associated with hemorrhagic diffuse axonal injury



Bifrontal traumatic microbleeds (TMBs) are identified on head CT (A). Gradient-echo MRI (B) reveals additional TMBs involving the forceps minor fibers and the splenium of the corpus callosum. Diffusion-weighted MRI (C) and apparent diffusion coefficient map (D) demonstrate restricted diffusion in the genu of the corpus callosum extending into the bifrontal white matter.

A 19-year-old woman was hit by a car and found to be somnolent and inattentive on neurologic examination. Head CT demonstrated bifrontal traumatic microbleeds (figure), suggesting hemorrhagic diffuse axonal injury (DAI). MRI performed 7 days later showed extensive diffusion restriction in the genu of the corpus callosum. Follow-up MRI on day 27 confirmed resolution of these signal changes. The time course for diffusion restriction in DAI is variable, persisting up to 18 days post-trauma.¹ Its pathogenesis has yet to be fully elucidated, with potential

etiologies including swelling of sheared axons, Wallerian degeneration of interhemispheric neurons, and microvascular injury causing ischemia.²

REFERENCES

1. Liu AY, Maldjian JA, Bagley LJ, Sinson GP, Grossman RI. Traumatic brain injury: diffusion-weighted MR imaging findings. *AM J Neuroradiol* 1999;20:1636–1641.
2. Maxwell WL, Irvine A, Adams JH, Graham DI, Gennarelli TA. Response of cerebral microvasculature to brain injury. *J Pathol* 1988;155:327–335.

From Brigham and Women's Hospital, Harvard Medical School, Boston, MA.

Disclosure: The authors report no disclosures.

Neurology[®]

Teaching *NeuroImages*: Restricted diffusion in the corpus callosum after traumatic diffuse axonal injury

Brian L. Edlow and Eli L. Diamond
Neurology 2010;75:e69
DOI 10.1212/WNL.0b013e3181f962d7

This information is current as of October 25, 2010

Updated Information & Services	including high resolution figures, can be found at: http://n.neurology.org/content/75/17/e69.full
References	This article cites 2 articles, 1 of which you can access for free at: http://n.neurology.org/content/75/17/e69.full#ref-list-1
Subspecialty Collections	This article, along with others on similar topics, appears in the following collection(s): Brain trauma http://n.neurology.org/cgi/collection/brain_trauma DWI http://n.neurology.org/cgi/collection/dwi Intracerebral hemorrhage http://n.neurology.org/cgi/collection/intracerebral_hemorrhage MRI http://n.neurology.org/cgi/collection/mri
Permissions & Licensing	Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at: http://www.neurology.org/about/about_the_journal#permissions
Reprints	Information about ordering reprints can be found online: http://n.neurology.org/subscribers/advertise

Neurology® is the official journal of the American Academy of Neurology. Published continuously since 1951, it is now a weekly with 48 issues per year. Copyright Copyright © 2010 by AAN Enterprises, Inc.. All rights reserved. Print ISSN: 0028-3878. Online ISSN: 1526-632X.

