

Neuroimaging Highlight

Tentorial Coup Injury to the Brain Stem

Submitted by: Young-Do Kim, Tae-Won Kim

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A 38-year-old man, with a history of a closed head injury from a motor vehicle collision one month prior, presented with sustained headache and dizziness. Neurologic examination was unremarkable except for provoked rotational nystagmus beating towards the left during Dix-Hallpike test on the left side. Post-traumatic benign paroxysmal positional vertigo was diagnosed. T2-weighted magnetic resonance imaging (MRI) demonstrated abnormal bright signal intensities involving the right lateral midbrain (Figure). On T2-weighted coronal MRI, this lesion was closely relating to or touching the tentorial notch at the level of the midbrain. Based on the images, the mechanism of midbrain injury in our patient was speculated to be due to tentorial coup injury.

Tentorial coup injury is known to be caused by lateral displacement of the brain stem against the tentorium. The clinical manifestations are variable, depending on the anatomical location of injury. Sensory deficits, long tract signs as well as cerebellar and cranial nerve palsy have been reported.¹ It is also suggested that brief loss of consciousness in concussion could be possibly explained by tentorial coup injury through the transmission of kinetic energy to the median raphe and reticular core in midbrain.²

The distance between tentorial notch and brain stem ranges from zero to five mm. The short distance between them makes the lateral brainstem vulnerable to injury from even minor closed head injuries in some cases.³ Therefore, tentorial coup injury is not rare in patients with severe head injury⁴ and it can also occur in patients with minor head trauma in whom the distance between them is relatively short.^{1,3}

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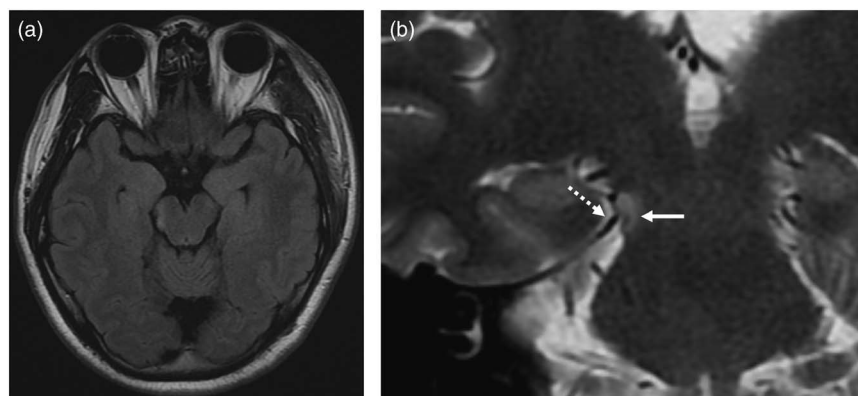


Figure: Axial fluid-attenuated inversion recovery image. (a) demonstrates abnormal bright signal involving the right lateral midbrain. Coronal T2-weighted images (b) demonstrates the corresponding bright signal lesion (arrow) at the level of the midbrain closely relating to or touching the tentorial notch (dashed arrow).

From the Department of Neurology, Catholic University of Korea, Incheon St's Mary's Hospital, Incheon, Korea

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Correspondence to: Tae-Won Kim, Department of Neurology, Incheon St's Mary's Hospital, Catholic University of Korea, 665 Bupyeong-6-dong, Bupyeong-gu, Incheon, 403-720, Korea. Email: kimtaewon79@gmail.com