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Traumatic Chiasmal Syndrome Following Traumatic Brain Injury

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Abstract : Traumatic brain injury (TBI) is one of the major causes of morbidity and mortality that leads to structural and functional damage in several parts of the brain, such as cranial nerves, optic nerve tract or other circuitry involved in vision and occipital lobe, depending on its location and severity. As a result, the function associated with vision processing and perception are significantly affected and cause blurred vision, double vision, decreased peripheral vision and blindness. Here two cases complaining of monocular vision loss (actually temporal hemianopia) due to traumatic chiasmal syndrome after frontal head injury were reported, and were compared the findings with individual case reports published in the literature. Reported cases of traumatic chiasmal syndrome appear to share some common features, such as injury to the frontal bone and fracture of the anterior skull base. The degree of bitemporal hemianopia and visual loss acuity have a variable presentation and was not necessarily related to the severity of the craniocerebral trauma. Chiasmal injury may occur even in the absence bony chip impingement. Isolated bitemporal hemianopia is rare and clinical improvement usually may not occur. Mechanisms of damage to the optic chiasm after trauma include direct tearing, contusion haemorrhage and contusion necrosis, and secondary mechanisms such as cell death, inflammation, edema, neurogenesis impairment and axonal damage associated with TBI. Beside visual field test, MRI evaluation of optic pathways seems to the strong objective evidence to demonstrate the impairment of the integrity of visual systems following TBI. Therefore, traumatic chiasmal syndrome should be considered as a differential diagnosis by both neurosurgeons and ophthalmologists in patients presenting with visual impairment, especially bitemporal hemianopia after head injury causing frontal and anterior skull base fracture.

Keywords : bitemporal hemianopia, brain injury, optic chiasma, traumatic chiasmal syndrome.
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