Isolated bitemporal hemianopsia due to traumatic chiasmal syndrome

Bulent Yazici, M.D., Sertac Argun Kivanc, M.D.
Department of Ophthalmology, Uludağ University Faculty of Medicine, Bursa, Turkey

ABSTRACT
A 20-year-old man presented with complaints of inability to see the outer half of objects and blurred near vision while reading. His complaints began one year ago after a motor vehicle accident that caused cranio-orbital fractures. Ocular examination revealed complete bitemporal hemianopsia and slight exotropia. Central visual acuity was 20/20 in both eyes. Radiologic studies demonstrated fractures in the fronto-ethmoid and sphenoid bones and thinning of the optic chiasm. No hypothalamic-pituitary abnormality was detected. Clinical findings remained unchanged during follow-up. Although rare, blunt head trauma may cause an isolated damage to the chiasmal crossing nerve fibers, resulting in a complete, bitemporal hemianopsia associated with normal visual acuity. Traumatic chismal syndrome should be considered in the differential diagnosis of patients presenting with bitemporal hemianopsia.

Keywords: Bitemporal hemianopsia; head trauma; optic chiasmal injury; traumatic chiasmal syndrome.

INTRODUCTION
Bitemporal hemianopsia is a sign that typically indicates an optic chiasmal involvement, mostly caused by a compressive tumor.[1] Traumatic chiasmal injury, also called traumatic chiasmal syndrome (TCS), is a rare phenomenon and can manifest with a variety of visual defects.[2] Herein, it was aimed to report a case of TCS with an isolated, complete bitemporal hemianopsia following a traffic accident and review the relevant literature. To the best of our knowledge, this is the first case report of TCS from Turkey.

CASE REPORT
A 20-year-old man presented with complaints of inability to see the outer half of the objects when looking with only one eye and blurred vision while reading. His complaints had started one year ago after an automobile accident. On admission to an emergency clinic, he was conscious and complained of blurred vision, and bilateral periorbital ecchymosis was noted. Computed tomography showed frontal, ethmoid, and maxillary fractures in the right orbit, fractures in the sellar region of the sphenoid bone, and air in the orbit and cranium (Fig. 1a). Thirteen days later, frontal craniotomy and cerebrospinal fluid fistula repair were performed for prolonged rhinorrhea and pneumocephalus. After he was discharged from the hospital, the patient underwent an automated 30–2 visual field test because of his visual complaints, and a bitemporal hemianopsia was found.

On examination in our clinic, visual acuities in both eyes were 20/20. A 10-prism diopter exotropia with predominantly right eye fixation was noted. Computed tomography showed frontal, ethmoid, and maxillary fractures in the right orbit, fractures in the sellar region of the sphenoid bone, and air in the orbit and cranium (Fig. 1a). Thirteen days later, frontal craniotomy and cerebrospinal fluid fistula repair were performed for prolonged rhinorrhea and pneumocephalus. After he was discharged from the hospital, the patient underwent an automated 30–2 visual field test because of his visual complaints, and a bitemporal hemianopsia was found.

Address for correspondence: Bulent Yazici, M.D.
Uludağ Üniversitesi Tip Fakültesi, Göz Hastalıkları Anabilim Dalı,
Görükle, 16059 Bursa, Turkey
Tel: +90 224 - 295 24 15   E-mail: byazici@uludag.edu.tr

Quick Response Code
doi: 10.5505/tjtes.2015.90540
Copyright 2016
TJTES
DISCUSSION

Bitemporal hemianopsia, depending on the site and extent of chiasmal damage, may be complete or partial, central or peripheral, and absolute or relative. The temporal visual loss may spare or split the central macular field. Moreover, central visual acuity may remain stable or decrease. The most frequent cause of bitemporal hemianopsia is tumors. One study has reported pituitary adenoma (60%) or parasellar tumors (29%) in 89% of 149 patients with bitemporal hemianopsia.\(^1\)

Head traumas frequently affect the intracanalicular segment of the optic nerve in the retrobulbar optic pathways. Traumatic chiasmal injury is rare, and usually occurs in young men and in association with traffic accidents or falls.\(^3\) Frontal and/or basilar fracture is seen in about 70% of the patients and closed head trauma in 30%.\(^4\) In the latter group, TCS is frequently associated with an intracranial hematoma. Other accompanying disorders may include cranial nerve palsies (anosmia, hearing loss, optic neuropathy, ocular motor palsy), cerebrospinal fluid leakage, pneumocephalus, meningitis, carotid aneurysm, carotid-cavernous fistula, nystagmus, and hormonal deficiencies.\(^2\)

Traumatic chiasmal syndrome is usually diagnosed, as in our patient, after neurologic rehabilitation, when the patient is
A bitemporal hemianopsia can occur in the case of damage involving only the crossing of nasal nerve fibers through the midline of the chiasm. It is unclear why compressive lesions show a predilection for damage to the crossing fibers. Vascular theory suggests that a bitemporal hemianopsia results from compression of the inferior group of vessels supplying the crossing fibers of the chiasm. According to a mechanical theory, an expanding mass below the optic chiasm exerts a higher intrinsic pressure in the central aspect of the chiasm than the temporal aspect.[7] It is more surprising that a sudden, blunt trauma may also produce a preferential and precise damage within the chiasm, as in tumoral compression. Several mechanisms have been suggested to explain TCS, such as direct tearing, external compression by brain tissue or hematoma, traumatic thrombosis of supplying arteries, or contusion necrosis.[2] Infrequently, magnetic resonance imaging may display a rupture of the optic chiasm.[48] Radiologic findings did not show macroscopic disruption or external compression in the current case. When the optic nerve is displaced posteriorly by the impact, the crossing fibers may be subject to relatively greater pressures and microscopic tears.[9]

Currently, there is no management guideline for TCS. Although systemic corticosteroids have been used in some cases, its benefit has not been shown.[4,4] In patients who have received long-term follow-up care, progressive loss or improvement of vision has not developed. Although rare, blunt head trauma may cause an isolated damage to the crossing nerve fibers in the optic chiasm, producing a complete, bitemporal hemianopsia without central visual acuity loss. Traumatic chiasmal syndrome should be considered in the differential diagnosis in patients presenting with bitemporal hemianopsia.

Conflict of interest: None declared.

REFERENCES