

## Post-Traumatic Blepharocoele in an Adult

\*Venkatesh Govindaraju<sup>1</sup> and Ravindra Bharathi<sup>2</sup>

### البليفروسيل الحاد بعد الأصابة في بالغ

فينكاتيش جوفينداراجو و رافيندرا باراثي ر

**المخلص:** البليفروسيل هو تجمع السائل النخاعي في جفن العين. هذه الحالة من النادر حدوثها في البالغين. هذا تقرير حالة يصف مريض ظهر عنده - بعد اصابة في الرأس - تورم غير مرتد في الجفن العلوي الأيسر وبالتالي حدوث ارتخاء ميكانيكي للجفن العلوي الأيسر. عانى المريض من كسور عدة في عظام الجمجمة في منطقة العين شملت حافة، سقف، والجداريين الجانبيين لعظمة مقلة العين اليسرى. وجد ايضا ضمور جيب الأنف الأمامي للمريض. اثبت الفحص السريري وتحاليل الدم والأشعات وجود البليفروسيل. تم إصلاح قطع الأم الجافية القاعدي الأيسر من خلال عظمة الجمجمة وتم شفاء المريض بصورة جيدة  
**مفتاح الكلمات:** السائل النخاعي؛ جفن العين؛ كسر عظام الجمجمة، قاعدي؛ تقرير حالة؛ الهند.

**ABSTRACT:** Cerebrospinal fluid (CSF) collection in the eyelid is known as blepharocoele. It is rarely reported in adults. In this report, we describe one such patient who developed a non-resolving swelling of the left upper eyelid associated with mechanical ptosis following a head injury. He had fractures involving the left orbital rim and roof, and the medial and lateral walls. His left frontal sinus was hypoplastic. The diagnosis of CSF blepharocoele was made based on clinical, biochemical and radiological findings. He underwent transcranial repair of the left frontobasal dural tear with a good recovery.

**Keywords:** Cerebrospinal Fluid; Eyelid; Basilar Skull Fracture; Case Report; India.

**C**EREBROSPINAL FLUID (CSF) rhinorrhoea and otorrhoea are well-known complications of head injuries.<sup>1</sup> Very rarely, CSF can enter the orbit and present as an orbitocele following a fracture of the orbital roof.<sup>2-5</sup> When the CSF collects in the eyelid it is known as blepharocoele. Only a few cases of blepharocoele have been reported so far in English medical literature.<sup>6-12</sup> Most of the cases were seen in children. In this report, the management of one such rare case of post-traumatic blepharocoele in an adult patient is discussed.

### Case Report

A 43-year-old adult male presented with a swelling of the eye and the inability to open the left upper eyelid following a head injury which he had sustained the previous week. He also had traumatic optic nerve injury with complete loss of vision in the left eye after the injury. An initial computed tomography (CT) scan of the brain showed a mild

left frontobasal contusion with fractures of the left frontal bone, the orbital rim and roof, and the medial and lateral walls. He was managed conservatively in a local health centre and later referred to Ganga Hospital, Coimbatore, India, a tertiary referral hospital for further management since the swelling of his left upper eyelid was not subsiding.

The patient was fully conscious and oriented. There was no CSF rhinorrhoea or excessive tear secretion. He had no perception of light in the left eye. There was mechanical ptosis due to a soft boggy swelling of the left eyelid and eyebrow. A transillumination test was negative. The periorbital skin colour was normal and there was no ecchymosis. The CT scan showed non-enhancing fluid collection in the left eyelid which was isodense with the brain [Figure 1]. The left frontal sinus was hypoplastic [Figure 2]. The glucose content of the fluid was 87 mg/dL, which was consistent with CSF. Magnetic resonance imaging (MRI) of the brain revealed a frontobasal dural defect with CSF collection in the left upper eyelid [Figure 3].

<sup>1</sup>Department of Surgery, Sultan Qaboos University Hospital, Muscat, Oman; <sup>2</sup>Department of Plastic Surgery, Ganga Hospital, Coimbatore, India

\*Corresponding Author e-mail: gvenkat73@gmail.com



**Figure 1:** Computed tomography scan showing fluid collection in the left eyelid.

The patient was referred for surgery. The bicoronal scalp flap was raised and a left frontal craniotomy was done. There was a comminuted fracture of the orbital rim with a depressed segment. A frontobasal dural defect was visualised and was repaired primarily with a pericranial graft. The orbital rim was reconstructed with a titanium plate and screws. Postoperatively, the patient recovered well and the swelling of his left eyelid resolved completely.

## Discussion

Head injuries can result in a CSF fistula, which commonly occurs at the frontal sinus, cribriform plate, sphenoid sinus, and petrous bone. Cranio-orbital fistulas occur very rarely after a head injury and can result in CSF leakage through the orbit (orbitorrhoea).<sup>4-5</sup> Rarely, CSF may collect in the upper eyelid (blepharocoele) or in the orbit (orbitocoele).<sup>2,6-13</sup> This results in a periorbital swelling and should be differentiated from a retrobulbar haematoma, orbital abscess, mucocele, or a foreign body cyst.<sup>4</sup> When the orbital rim is fractured along with the anterior skull base with an associated dural tear, CSF may enter the upper eyelid and present as blepharocoele. When there is only CSF collection in the eyelid, the swelling may be transilluminant.<sup>12</sup> Most cases of blepharocoele and orbitocoele have been reported in children. The patient in this report was an adult, which is rarely reported.<sup>8,12</sup> This condition must be thought of in a patient who has a head injury with associated orbital fracture presenting with non-resolving eyelid swelling.



**Figure 2:** Computed tomography scan with a bone window algorithm showing the hypoplastic left frontal sinus.

Galzio *et al.* described a cranial palpebral fistula that occurred in a patient with a fracture of the orbital roof.<sup>9</sup> This patient had frontal sinus agenesis and the researchers formed a hypothesis that the absence of the frontal sinuses allowed the direct passage of CSF into the upper eyelid after a head injury. The present case also had a hypoplastic frontal sinus which resulted in CSF blepharocoele instead of CSF rhinorrhoea after the trauma, confirming the hypothesis.



**Figure 3:** Magnetic resonance imaging brain scan (sagittal T2 weighted image) showing cerebral spinal fluid collection in the left upper eyelid.

A high-resolution CT scan of the orbit and anterior skull base is useful in demonstrating the fracture of the orbital walls and rim, and the intraorbital CSF collection. CT cisternography is the best investigation for localising the CSF fistula in cases of rhinorrhoea and otorrhoea,<sup>7</sup> but in the case of blepharocoele, an MRI is superior to CT cisternography in demonstrating the pathology and establishing the diagnosis. Bhatoe described MRI as the investigation of choice for diagnosing blepharocoele.<sup>8</sup>

In the present case, MRI clearly demonstrated the dural defect, and collection of CSF in the eyelid was essential in making the decision for surgery. During surgery, the dural defect was identified and could have been closed either primarily or with a graft. Postoperatively, the eyelid swelling resolved with a good cosmetic outcome.

## Conclusion

Patients with a head injury who sustain fractures of the anterior skull base involving the orbital rim can present with CSF blepharocoele if the frontal sinus is hypoplastic. Orbital ecchymosis is characterised by a discolouration of the eyelids. However, in CSF blepharocoele there is a swelling of the eyelid without discolouration. This should raise the suspicion of CSF blepharocoele in the appropriate clinical setting. A brain MRI is the investigation of choice in establishing a diagnosis. Conservative measures may not be helpful in managing this condition as they would be in cases of CSF rhinorrhoea or otorrhoea. Patients usually require surgical repair of the dural defect.

## References

1. Arslantas A, Vural M, Atasoy MA, Ozsandik A, Topbas S, Tel E. Post-traumatic cerebrospinal fluid accumulation within the eyelid: A case report and review of the literature. *Childs Nerv Syst* 2003; 19:54–6.
2. Bagolini B. Leakage of spinal fluid into the upper lid following trauma. *Arch Ophthalmol* 1957; 57:454–6.
3. Bergman TA, Rockswold GL. Cerebrospinal fluid fistulae. In: Youmans JR, Ed. *Neurological Surgery*. 4th ed. Philadelphia: WB Saunders, 1996. Pp. 1840–52.
4. Bhandari YS. Traumatic orbital pseudomeningocele. *J Neurosurg* 1969; 30:612–14.
5. Bhatoe HS. Blepharocoele following head injury. *Skull Base* 2002; 12:73–5.
6. Colquhoun IR. CT cisternography in the investigation of cerebrospinal fluid rhinorrhea. *Clin Radiol* 1993; 47:403–8.
7. Galzio RJ, Lucantoni D, Zinobii M, Grizzi LC. Traumatic craniopalpebral cerebrospinal fistula. *J Neurosurg Sci* 1981; 25:105–7.
8. Garza-Mercado R, Argon-Lomas J, Martinez Garza J, Hernandez L. Cerebrospinal blepharocoele. An unusual complication of head injuries. *Neurosurgery* 1982; 11:525–6.
9. Bhatoe HS. Blepharocoele following head injury in a child. *Indian J Neurotrauma* 2005; 2:51–3.
10. King AB. Traumatic encephalocoeles of the orbit. *Arch Ophthalmol* 1951; 46:49–56.
11. Mathew JM, Haren RP, Chandy MJ. Post traumatic blepharocoele. *Neurol India* 1997; 45:46–57.
12. Salame K, Segev Y, Fliss DM, Ouknine GE. Diagnosis and management of post traumatic oculorrhoea. *Neurosurg Focus* 2000; 9:1–4.
13. Sibony PA, Anand AK, Keuskamp PA, Zippen AG. Post-traumatic cerebrospinal fluid cyst of the orbit. *J Neurosurg* 1985; 62:922–4.
14. Till JS, Marion JR. Cerebrospinal fluid masquerading as tears. *South Med J* 1987; 80:639–40.