A rare case of a direct ocular contact burn to the right eye

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ABSTRACT

Ocular thermal burns represent an oculoplastic emergency, with the potential for blindness owing to limbal ischaemia. We present a rare case of a 66-year-old man who sustained a direct thermal contact burn to the right eye.

KEYWORDS

Thermal contact – Burn – Ocular – Blindness

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Introduction

Facial burns involving the ocular surface are common and are typically caused by chemical (alkali and acid) and thermal (flame, explosion, hot liquid) burns.^{1,2,4–6,8–10} The amount of damage to the eye is dependent on the type and duration of contact of the thermal injury with severity graded by the Roper-Hall and Dua classification systems.⁷ Both severity scales reflect the extent of corneal involvement and limbal ischemia. These predictors of outcome can help to guide the optimal medical and surgical treatment strategy. In addition to the ophthalmic management, surrounding soft tissues including the upper and lower lids, play an important role in globe coverage, preventing further corneal insult.

Given the nature of these injuries, it is important that experienced ophthalmologists and burn and plastic surgeons assess patients early, to promote optimum outcomes.^{1,4,6,8–10}

We present a unique case of a direct ocular contact burn with significant corneal injury and limbal ischaemia, and extensive periorbital soft tissue injury. This ultimately required complex ophthalmic management and extensive soft tissue reconstruction.

Case history

A 66-year old man was admitted from a residential care home to the regional burns and plastic surgery unit with full-thickness burns to the right cheek, medial 80% of the lower right eyelid and medial 20% of the upper right eyelid (Fig 1). He had suffered an unwitnessed collapse on to a heating pipe in his room. The duration of contact with the heating source and temperature of the pipes were unknown.

No first aid was given. His past medical history was positive only for a schizoaffective disorder with absence seizures.

He was initially managed in an outlying hospital where a cerebrovascular accident (CVA) was deemed responsible for the collapse, with evidence of a right-sided facial droop.

Figure 1

Computed tomography and magnetic resonance imaging demonstrated no evidence of a CVA and, following medical stabilization, he was transferred to the regional burns and plastic surgery unit after 19 hours. Ophthalmological assessment on admission noted that he could see light in his right eye, but could not focus.

After initial debridement and assessment of his burn injuries, an ophthalmology consultant reassessed his right eye. The ophthalmologist concluded that he had suffered significant limbal ischaemia but the globe was salvageable. Surgical management focused on globe coverage of the right eye. He underwent a further wound debridement and initial raising of a delayed forehead flap to cover the lower lid and cheek defect. During the second-stage forehead flap reconstruction of the right cheek and lower eyelid, a vitreous leak became apparent (Fig 2). This was covered with the forehead flap. Further postoperative ophthalmology assessment noted a thin sclera, corneal opacification, loss of the posterior lamella of the lower lid and a scleral perforation.

An amniotic membrane graft was applied to the scleral perforation and the forehead flap was adjusted to allow for closure of both eyelids with a frost suture (Figs 3 and 4).

Ultimately, the globe of the right eye survived but the patient remains completely blind in this eye.

Figure 2

Figure 3

Figure 4

Discussion

Direct ocular thermal burns are rare but serious injuries. The more common chemical and thermal burns that occur to the ocular surface and surrounding soft tissues have been well documented.

In our unique case presentation of a direct ocular contact burn, earlier assessment by senior ophthalmic and plastic surgeons may have improved the outcome for the right eye. This type of injury represents an ophthalmic emergency and should be assessed early by a senior ophthalmologist with further, repeat assessments.^{1,4,6,8–10} Inhibition of the lid reflex is required for this injury to occur, commonly due to loss of consciousness,⁴ which means that duration of contact with the heat source and degree of thermal insult will often be unknown. This can lead to underestimation of the severity of the ocular surface injury, especially in the multiply injured trauma patient where other life-threatening injuries may take priority.

Subsequent periorbital soft tissue management often requires complex facial reconstruction to ensure adequate globe coverage. In this case, vitreous leak was managed by the soft tissue reconstruction with a delayed forehead flap.

Conclusion

Early expert ophthalmology and plastic surgery assessment is essential in the management of direct ocular surface burns, whereby the nature of the incident may be unclear. We must stress the importance of cautious continual reassessment of the ocular surface injury in order to optimise the treatment strategy. We believe this should take place in a hospital or treatment facility where these specialist doctors are available.

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