

Hidden eyelid laceration following blunt trauma

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A paediatric case report of a hidden eyelid laceration following blunt trauma.

Blunt injury to the eyelid can result in a multitude of issues, such as damage to the eyelid margin, lacrimal system and surrounding orbit [1]. These can often be seen externally without the need to evert the eyelid. Hartstein and Fink recognise that the skin of the eyelid is thin and therefore susceptible to significant lacerations, however on reviewing the literature there is little mention of injury to the posterior lamella in the absence of full thickness involvement [2]. This gap in the literature may be due to low incidence rates, missed presentations or limited associated adverse outcomes. Our case report aims to bring attention to the possibility of tarso-conjunctival laceration caused by blunt trauma.

Presentation

A child of primary-school age who experienced blunt trauma to the upper eyelid was referred to the oculoplastic team. He had run into a dog cage wearing his glasses, resulting in two right upper eyelid (RUL) lacerations involving the eyelid margin (Figure 1). On external inspection of the eyelid the injury appeared to be minor. Preoperatively the eye was examined and a laceration inside the RUL measuring less than 0.5mm was reported. There was active bleeding from that point, which was resolved with gauze and pressure application. The RUL was swollen, however there was no sign of injury to the globe.

The child's visual acuity before surgery measured with a Snellen chart was 6/18 in the right eye and 6/7.5-4 in the left eye. Their right eye is amblyopic with astigmatism. He had previously been treated with occlusion therapy and Atropine 1% penalisation to manage his amblyopia. Eight months before the injury, their visual acuity was 6/12 in the right eye and 6/7.5 in the left eye. Immunisations including tetanus were up to date. The pupils were equal and reactive to light with no relative afferent pupillary defect (RAPD), the Seidel Test was negative and there were no retinal tears or detachment bilaterally. The intraocular pressure was 21.5 in the right and 10.3 in the left eye.

Examination under anaesthesia (EUA) was performed to further investigate the medial laceration which was then measured to be 7mm lateral to the superior punctum and involved the eyelid margin. The lateral laceration did not appear to involve the eyelid margin prior to EUA, on eversion of the eyelid, there was an extensive tarso-conjunctival laceration which extended beyond the eyelid margin and required surgery (Figure 2). The laceration involved almost the entire height of the tarso-conjunctiva. The injury occurred less than 24 hours before the surgery was performed on the emergency list. The tarsus was repaired with 6-0 vicryl sutures and the knot was buried so as not to abrade the

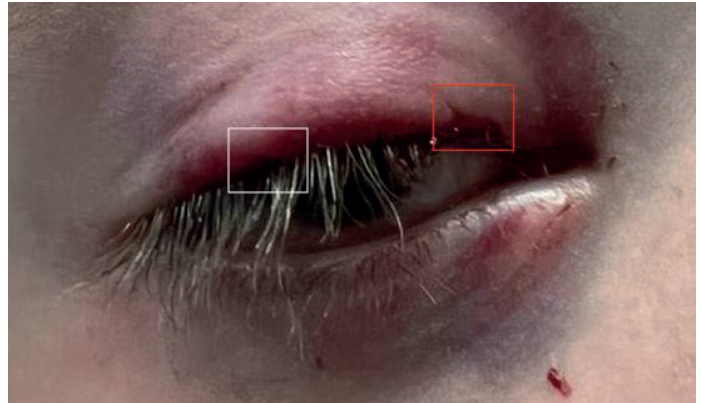


Figure 1: Preoperative photograph of the right upper eyelid showing two small lacerations to the eyelid margin highlighted by the boxes. The white box highlights the eyelid margin sparing laceration laterally and the red box highlights the eyelid margin involving laceration.

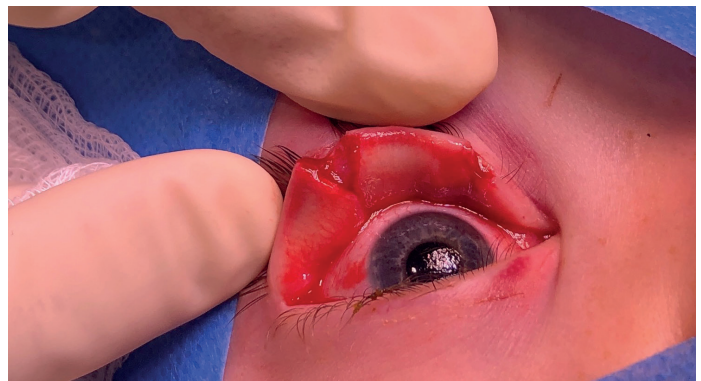


Figure 2: Intraoperative photograph of the everted right upper eyelid showing extensive laceration of the posterior lamella extending to the tarsal conjunctiva originating from the lateral laceration.

cornea. The eyelid margin itself was repaired with 7-0 vicryl to the grey line and the lash line.

Discussion

It is recognised that the natural blink reaction to incoming objects allows the eyelid to distribute the local stress across the ocular surface to protect the eye, which helps to explain the appearance of the laceration which appears to be tearing across the tarso-conjunctival surface of the eyelid [3]. In the case presented, we found that the posterior lamella of the upper eyelid is particularly susceptible to extensive laceration following blunt trauma to the eyelid margin.

There is limited information about blunt force trauma resulting in laceration of the posterior lamella, however other injuries resulting from eyelid trauma are more widely discussed [1,4]. For example, Hartstein and Fink discuss the importance of recognising the extent of the eyelid injury as a wide range of structures such as the canalicular system can be involved and necrotising fasciitis may develop [2]. Injury to conjunctival surfaces that are visible externally allows for a more hands-off assessment, but the conjunctival surfaces that require more invasive

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investigation are equally worth looking at to prevent poor healing of the posterior lamella.

This case demonstrates that one could easily be fooled into presuming that the injury is minimal from blunt force trauma. For this reason, we emphasise the need for EUA and eversion of the upper eyelid to exclude an extension of the laceration to the posterior lamella where a thorough bedside examination indicates that more extensive injury may be present. Most crucially, one needs to confirm that the globe and canalicular systems are intact while performing EUA. In doing this the hope is that surgical intervention will be offered consistently if required.

General anaesthesia in paediatric populations is not without its challenges. These include fear of needles for non-sedated cannulation and other risks including neurotoxicity, particularly if the child undergoes multiple general anaesthesia episodes [5]. Despite this, the risks of EUA are warranted if a thorough and systemic bedside exam indicate that more extensive injury is present or may require surgical repair.

References

1. Herzum H, Holle P, Hintschich C. Eyelid injuries: Epidemiological aspects. *Ophthalmologie* 2001;**98**(11):1079–82.
2. Hartstein E, Fink S. Traumatic Eyelid Injuries. *Int Ophthalmol Clin* 2002;**42**(2):123–34.
3. Liu X, Wang L, Ji J, Fan Y. The protective effect of the eyelid on ocular injuries in blunt trauma. In: Jaffary D (Ed). *World Congress on Medical Physics and Biomedical Engineering, June 7-12, 2015, Toronto, Canada*. IFMBE Proceedings, 51, Springer, Cham.
4. Comez AT, Ozbas M. Evaluation and Management of Ocular Traumas. In: Giudice GL (Ed). *Vision Correction and Eye Surgery*. Intech Open; 2022.
5. O'Connell A, Stephenson K, Flitcroft I. Risk of Neurotoxicity with Multiple General Anaesthetics for Examination Under Anaesthesia in Paediatric Ophthalmology – A Cause for Concern? *Clin Ophthalmol* 2023;**17**:291–302.

TAKE HOME MESSAGES

- Do not be fooled into presuming that because an injury looks minor externally that this is the case on the tarso-conjunctival surface of the eyelid.
- Clinicians should consider everting the eyelid using EUA to fully assess the injury following blunt force trauma when there is evidence of eyelid margin, canalicular or globe trauma.
- Lacerations of the tarso-conjunctival surface / posterior lamella of the eyelid may require surgical intervention.

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