

Mascara: A Cause of Thermal Burn after Cautery for Eye Lid Lesion Excision; A Case Report

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Abstract

Introduction: Surgical fires are rare in ophthalmic surgery. Occurrence poses disastrous risks on the eye and the patient. Mascara can play a role in the occurrence of flash fires in the vicinity of surgical fields by acting as a fuel source.

Purpose: We report a case of thermal burn of eye lashes, eyelid skin and eye brow hair in a patient who was wearing mascara while cautery was applied to her eyelid lesion after excision.

Results: Mascara had caused a spark fire when applying cautery after eyelid lesion excision in a young patient.

Conclusion: Surgeons as well as the entire ophthalmic care team should be aware of this incident to try to minimize the risk of thermal injury by working in a make-up free ophthalmic field.

Introduction

A surgical fire is a rare but potential risk in surgical practice. Fire has been recognised as a potential complication of surgery for many years [1]. Fire occurs when the three elements of the fire triad, fuel, oxidiser and ignition coincide. Surgical fires are unusual in the absence of an oxygen-enriched atmosphere. The ignition source is most commonly diathermy but lasers carry a relatively greater risk. The factors that may initiate these fires are many and include alcohol based surgical prep solutions, electrosurgical equipment, and flammable drapes [2-4,6,10].

The majority of fires occur during head and neck surgery. In ophthalmic practice the incidence of surgical fires reported is very rare despite the presence of oxygen and the use of electrocautery [12].

Purpose

We describe a case of surgical flash fire causing thermal burn of eye lashes, eyelid skin and eye brow hair in a patient who had some residual mascara on her lashes while cautery was applied for an eyelid lesion after excision in clinical setting and in the absence of oxygen rich environment.

Case report

We report a 38 year old lady who had a small papilloma on the right upper eyelid skin for which she underwent excision.

Surgical technique

The area was exposed and cleaned with povidine iodine. After the iodine was wiped off the area was left to dry for a minute and a small forceps was used to lift the papilloma. A 15 degree blade was then used to cut it from its base. Disposable pencil cautery was used to stop the bleeding by applying it onto the base of the lesion. A sudden blue flame of fire then caught the eyelashes, swept through the skin and burnt the eye brow hair successively. It also caused the surgical gloves used by the surgeon to be burnt and to scald his finger tips underneath. Cautery was abandoned immediately.

Cold water was applied to the area, antibiotic ointment was given and the patient was examined at the slit-lamp. No conjunctival, corneal or any other ocular injury was noted and the patient was reviewed after one week and then after one month. By then the burns had recovered and all lashes and brown hair had re-grown.

Discussion

Cautery can be applied in several clinical settings in order to ensure haemostasis after excision of small lesions. Surgical fires have been described in several occasions within the operating room and in an oxygen-rich environment. Several igniting factors have been described and review of surgical flammable materials and safety issues in the operating room can be found in literature [2].

Discussion

The fire triangle is a useful construct that describes the three elements necessary for initiation of a fire i.e. heat, fuel and an oxidizer [5,6,8,9,11]. spark from electrosurgical unit usually acts as the heat source. Experimental studies have shown that hot wire cautery or diathermy generates enough heat to ignite all alcohol based antiseptics even if these contain as little as 20% alcohol [3]. Fuels are abundant in the operative field that include prep solutions, drapes, sponges, endotracheal tubes, petroleum based ointments, tinctures, as well as many others [12]. In the presence of a high oxygen environment, all of these substances can burst into flames and burn intensely. Although there is no direct evidence to suggest that mascara acted as the fuel source, there was no other element in the surgical field that would suggest otherwise. As the lesion was at the lid margin, cautery to its base would touch or be very close to the lashes or mascara. Debate would have been made on lanugo acting as a fuel source in this case, but given that the patient is an adult it seemed unlikely that it represented a risk. The fact that the tips of the eyelashes that were coated with mascara were the first to

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catch fire supports our theory. We do not know the composition of the mascara or whether it contained any petroleum based material. Despite the fact that the patient's eyelid skin has been cleaned and prepped some residual mascara deposits still lined the bottom half of her eyelashes. We carried on with cautery as we didn't think it a reason to stop, something we now know differently.

We found no literature suggesting any correlation between eye make-up particularly mascara and the use of cautery in ophthalmological practice, although one article reported a thermal burn in a routine pterygium excision operation which was attributed to the high oxygen concentration in ophthalmic surgical vicinity [1,7].

Conclusion

Care should be taken in applying cautery to eyelid lesions or puncti to ensure the patient is not wearing mascara or any eye makeup that if ignited might cause a sudden thermal burn to the area. Surgeons and the entire ophthalmic care teams should be aware of this incident to try to minimize the risk of thermal burn by working in a make-up free ophthalmic field. It is important to make sure that prepping of the patient should be done properly to ensure removal of all residual parts of make up before the procedure. Every patient who comes for an ophthalmic procedure including punctual cautery, eyelid lesion removal or any other procedure that necessitates the use of thermal energy should be instructed as well to remove any eye makeup especially mascara before the procedure.

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