Case Report

An Unusual Case of Surma (Eye Cosmetic) Induced Conjunctival and Scleral Ulceration

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Abstract *Surma is traditionally applied to conjunctiva and eyelids for cosmetic purpose in many centuries. It contains preservatives and additives like lead, nickel, mercury that can lead to dry eye , blepharitis, allergic conjunctivitis, iritis and periocular dermatitis. We report a case of "surma" induced conjunctival & partial thickness scleral ulceration in a 60 years old female. She presented with sudden swelling and burning sensation in right eye after applying 'surma' in her right eye. Conjunctival and scleral ulceration was noted subsequently. She was treated conservatively with topical and oral steroid. This unusual complication of surma is not documented in literature.*

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Introduction

Worldwide, from prehistoric time female population has been using various eye cosmetics due to various reasons, from improving appearance to increasing self-confidence, cultural practices.[1-3] There are reports of two kinds of surface application, first on periocular skin just external to lash line, second on muco-cutaneous junction along lid margin (called lightlining).[4] Various ocular side effects are lead toxicity, evaporative dry eye, reduced Ocular Surface Disease Index (OSDI), ocular inflammatory changes are well established [5-7] in literature specially in contact lens users. We report a rare case where conjunctival ulceration and scleral thining was noted after using surma.

Case Report: A 60- years -old female presented with sudden swelling and burning sensation in right eye after applying 'surma' in right eye. Patient had history of occasional use of 'surma' in past without any reactions. She was suffering from mild itching in right eye for 2 days prior to this incidence. As a part of prevalent therapy in her locality she applied 'surma' in her right eye to get relief from itching. This current episode occurred after applying a new bottle of 'surma' from her locality.

Her visual acuity was 20/40 in right eye and 20/20 in left eye. Right eye had periorbital swelling, severe chemosis, blackish pigmentation of lower fornix and lower tarsal conjunctiva (Figure 1a,1b), with a normal pupillary reaction. The pigmentation could not be removed with cotton pellet and saline irrigation .

She was started with topical Moxifloxacin+ Dexamethasone along with preservative free topical lubricant 6 times a day in right eye.

Inflammatory signs started reducing from 3rd day onward. As the pigmentation gradually started to fade away, conjunctival and scleral ulceration was revealed (Figure2). Swab from ulcer bed and lower fornix was sent for microbiological investigation and it was negative.
Patient was started on oral prednisolone 40mg (1mg/kg/day). The patient improved clinically after fifth day. Steroid was tapered over a period of 2 weeks. Her vision and IOP was stable. We thought of scleral patch graft, but the patient refused any surgical intervention. At 1 month follow up, a vascularized scar (Figure 3) was found covering the thinned sclera. Subsequently, the patient was lost in follow up.

The used surma bottle (Figure 1b) was sent to central forensic lab to look for the nature of the material. Report shows a heterogeneous mixture of Manganese and Potassium compounds, mainly in the form of oxides or carbonates. Elemental carbon, Fluorine, Molybdenum compounds (preferably oxides) were also present in trace amount.
We counseled the patient to discontinue the eye cosmetic to

Figure 1a: *Right eyelid swelling with conjunctival chemosis*

Figure 1b: *: Black colored pigmentation of lower fornix and lower tarsal conjunctiva of right eye with inset showing used bottle of surma*

Figure 2: *Ulceration of sclero-conjunctiva*

prevent further exposure to offending substance. We also advised her for regular follow up, seek proper advice from ophthalmologists in case of any ocular ailment (blepharitis in her case) and to avoid self medication.

Discussion

The ocular surface spread of externally applied cosmetic products are well documented in literature.[8] It may affect the lipid layer due to more debris or blockage in meibomian gland leading to dry eye.[9] It is also shown that deeper application (on muco-cutaneous junction) incites poorer OSDI than surface (periorbital skin).

Ocular dermatitis can occur in response to fragrances, preservatives, antioxidants, nickel, lead, mercury containing pigments, and various additives. Inflammatory mediators released in abundance in tears during the process lead to epithelial damage, goblet cell loss, and disturbed glycocalyx mucin expression exacerbating dry eye condition.[10]
We planned autologous lamellar sclera graft in this patient but for till 1 year of follow up the thinning area was non progressive and symptoms also improved. So we decided to wait and observe. Worldwide there is sufficient literature on over use of eye cosmetics but this large dose toxicity and grave consequence has never been reported. There is a need of creating awareness through education, via media, panel discussion etc regarding the correct method, side effects of continual and over use of ocular cosmetics. Many researchers have called for stricter governmental regulations of kohl trade and quality control and improved public education regarding its hazards and some governments have adopted import controls and educational campaigns to alert users to the hazards of using Pb-containing kohl.

In our case the sample of used surma was found to contain some unusual components that are not reported earlier. These components could be the cause of such serious ocular complications. As the microbiological report was negative so, we diagnosed our case as sterile ulceration. As the episode started immediately after application of the surma so, we can assume that the ulceration was surma induced.

Organic colourants fall into two classes: dyes and pigment. The differentiation point is that dyes are soluble in water or in organic solvent, while pigments are insoluble. Dyes can color substances for which they have affinity whereas pigments can be used to colour any substance that too surface-only colouration. The bottle also showed black colored particles which stained superficial layer of conjunctiva. The coloring could be removed after few days repeated washing and steroid combination. So surma can be considered as pigments and not chemical dye.

Worldwide, there is sufficient literature on use of eye cosmetics and its complications, but such grave consequence has never been reported. There is a need of creating public awareness through regarding the correct method and possible side effects of continual and over use of ocular cosmetics.

Figure 3: *Ulcer in various healing stages*

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