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A Case Report of an Expansive Mortar-Induced Ocular Injury

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ABSTRACT

We have described here a case of bilateral chemical injury (with an expansive mortar which is being used in recent times to cut the rocks). On examination limbal ischemia was more in the left eye (9 clock hours) than the right eye (2 clock hours). The case was managed by bilateral removal of foreign bodies, along with conjunctival resection and amniotic membrane transplantation in the left eye. At six-month follow-up, patient had best corrected visual acuity of 20/30 and 20/60 in the right and left eyes respectively. Since this being an occupational hazard, proper eye protection gear should be used by persons using this expansive mortar.

KEYWORDS : OCULAR TRAUMA

Introduction:

Chemical injuries are potentially devastating ocular injuries that may result in permanent unilateral or bilateral visual impairment. Most injuries are accidental and occur in workplaces particularly in an industrial setting.[1],[2] To the best of our knowledge, this is the first case of combined chemical, thermal and concussional injury to the eyes occurring due to use of an expansive mortar (SPLIT-AG), which is an occupational hazard and mandates proper eye protection.

Case report:

A 36-year-old male, laborer by occupation from Chattisgarh, India, presented to our emergency clinic with a history of bilateral chemical injury two days prior. The injury had occurred while he was breaking stones using expansive mortar. On presentation, patient was conscious and well oriented. He was photophobic and was unable to open either eye. His best-corrected visual acuity (BCVA) in the right eye was 20/200 whereas in the left eye it was perception of light with accurate projection of rays in all quadrants. Lids were edematous and conjunctiva was chemosed. Limbal ischemia was seen in the left eye in 9 clock hours and 2 clock hours in the right eye. According to Dua's classification,[3] it was Grade 3 with 75% conjunctival involvement in the left eye and Grade 2 with < 30% involvement in the right eye. There were multiple grayish white foreign bodies, which were firmly embedded in the conjunctiva in both eyes. The left cornea was edematous with a total epithelial defect and multiple embedded foreign bodies in the anterior stroma

(figure 1 comes here).

The right cornea was edematous with an epithelial defect in the superior 1/3rd and multiple foreign bodies in the anterior stroma. Lens and iris details were visible in the right eye but could not be seen in the left eye. Immediate saline wash was given for half an hour in both eyes keeping in mind the diagnosis of bilateral chemical injury. Post wash, the adherent material did not get dislodged, hence patient was posted for foreign body removal in both the eyes with amniotic membrane graft (AMG) in the left eye under local anesthesia. B scan ultrasonography was done in both eyes which showed echo-free vitreous cavity, attached retina, no gross choroidal thickening with no intraocular foreign body. Conjunctival foreign bodies were removed in both eyes. Left eye also underwent conjunctival resection with amniotic membrane grafting. Cryopreserved amniotic membrane was used with the epithelial side up over the entire ocular surface. It was secured with 10/0 nylon sutures at the limbus and 8/0 vicryl at the fornices. Since the foreign bodies were firmly adherent to the underlying conjunctiva, it had to be resected in order to remove the foreign bodies. The resected material was sent for histopathology, which revealed conjunctival epithelial and stromal necrosis along with homogenous eosinphilic material and few areas of calcium deposits. Blood vessels also showed ischemic necrosis. Scattered round cell infiltrates were noted. Features were consistent with ischemic necrosis of the conjunctiva. On postoperative day 1, AMG was in place in the left eye. Right eye BCVA was 20/30 and perception of light with accurate projection of rays in left eye. Patient was less photophobic. He was discharged with topical steroid drops and antibiotics along with lubricants and was followed up regularly at one week, two weeks, one, two, three and six months postoperatively. At last follow-up anterior stromal scarring was noted due to which his BCVA was 20/60 in the left eye and 20/30 in the right eye.

Discussion :

SPLIT-AG is a highly expansive mortar used to demolish and cut the rocks and concrete. When mixed with water and poured into a cavity it swells and the pressure rises (> 500Kb/cm[2]) causing explosion in the cavity. It is claimed to be environment friendly as it does not release any toxic substances. SPLIT-AG is a kind of inorganic material consisting of calcium, silicon, iron and aluminium in the form of powder. Nowadays SPLIT-AG is being used quite often for crushing and demolition of reinforced concrete, particularly in areas where cracking by means of explosive is not suitable. A PubMed search did not show any published literature on ocular injuries with SPLIT-AG Amniotic membrane transplantation has been reported in chemical injury with severe limbal ischemia and in severe thermal injury in acute phase.[4] In this report the eyes remained without inflammation and the surface was stable with no vascularization at six months follow-up after amniotic membrane transplantation. In our case also amniotic membrane transplantation might have enhanced epithelialization, reduced inflammation, which eventually led to a favorable outcome. Mandatory eye protection gear should be worn by the personnel handling explosive mortar. Eyewear may have prevented the injury reported in our case.

Figures:

Figure 1. Slit lamp photograph of the left eye showing edematous cornea with grayish white deposits of the expansive mortar over the conjunctiva

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