

Grease gun injury of the orbit: A rare case report

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We report a case of intraconal grease gun injury along with traumatic optic neuropathy in a 20-year-old male. He presented with dimness of vision and proptosis of the left eye (LE) following an accidental injury at work place. The computer tomography of orbit revealed hypodense grease orbit. Cream colored grease was continually exuding from the conjunctival wound. Patient improved rapidly after the surgical removal of the grease by anterior orbitotomy. Grease gun injuries to the orbit have rarely been reported. The present case is the eighth report throughout the world, and the first in India as per our knowledge.

Key words: Grease gun injury, intraconal grease, traumatic optic neuropathy

Grease is a thixotropic lubricant agent containing calcium, sodium, or lithium-soap jelly emulsified with mineral oil. It liquefies when agitated and solidifies when at rest. Grease guns are commonly used in factory workshop to apply grease under pressure to lubricate the parts of machines. The pressure increases up to 621–1034 kPa and ejects grease (a velocity comparable to the muzzle velocity of a rifle bullet).

Grease gun injuries can cause mechanical and chemical damage of tissue. Chemical damage is less than those of other chemical substances due to its high viscosity and low tissue toxicity. However, the high pressure of grease gun can lead to focal penetration and blunt dissection along the tissue planes. Any part of the body can be injured, but the commonest sites are the fingers and hands. Grease gun injuries of the orbit are

very rare, and only seven cases have been published in the literature so far.^[1-5]

Case Report

A 20-year-old male presented with chief complaints of dimness of vision, pain, and swelling of the left eye since morning following a trauma at his work place. He gave a history of an accidental injury in LE due to escape of grease with high velocity from a JCB machine while working on it. Immediately he consulted a local ophthalmologist; some amount of grease material was removed there and was referred to our center.

On examination, his presenting visual acuity was finger count at 1 meter in the left eye with accurate PR and 20/20 in the right eye. In the LE, there was swelling of the eye lids and the globe was tensed and chemosed. There was proptosis of 5 mm (measured with plastic scale) with restriction of movements in adduction and elevation. The conjunctiva was congested and chemosed, but no gross laceration was detected. Yellowish colored grease material was found underneath the medial and lower fornix. On mild pressure over the lower lid yellowish grease material was found to be coming out through the lower fornix [Fig. 1].

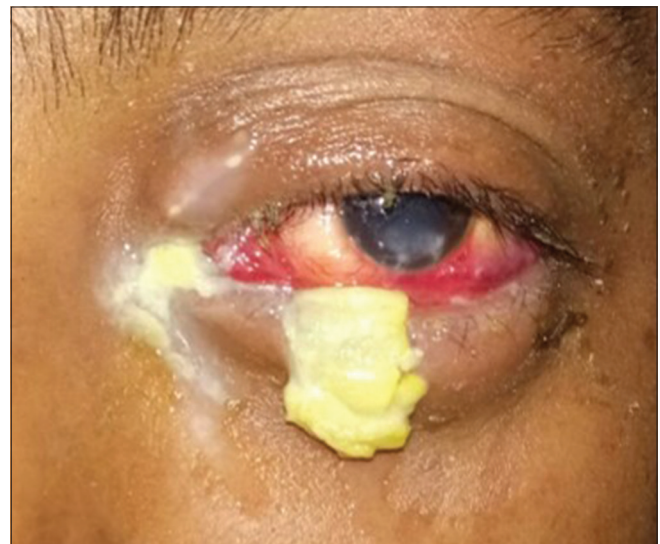


Figure 1: Image showing exuding grease material from left inferior fornix

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The material was cleaned thoroughly. Relative afferent pupillary defect (RAPD) was present in LE. Slit lamp examination revealed corneal abrasion at the lower part. Digital tonometry suggested high intra-ocular pressure and fundus examination was unremarkable. Orbital CT (non-contrast) revealed lateral displacement of the globe by some crescentic shaped hypodense foreign body material with proptosed left globe [Fig. 2a and b]. We provisionally diagnosed it as a traumatic optic neuropathy caused by grease gun injury and treated with methyl prednisolone injection. Intravenous ceftriaxone 1 gm BD and topical antibiotic (moxifloxacin eye drop) 8 times a day, 1% atropine sulphate drop TID, timolol maleate 0.5% drop BD, and artificial tear substitute 0.5% QID were started.

On next morning, same grease material was found to be exuding from the lower fornix (LE). As there was spontaneous incessant flow of the grease and there was no improvement of signs and symptoms, a surgical exploration was planned under local anesthesia on the 5th day [Fig. 3a-d]. On examination under microscope, two small conjunctival lacerations were found through which grease was coming out spontaneously, one was inferiorly and the other was medially. Both the wounds were explored by scissors and copious irrigation was done by Ringer lactate solution with the help of a 10-cc syringe. After nearly total

evacuation of grease, the wounds were thoroughly cleaned with 5% povidone iodine. Post operatively, topical moxifloxacin eye drops 8 times a day and artificial tear substitute 0.5% QID was given along with oral steroid.

On the first post operative day, the visual acuity in LE improved to 20/40 with marked reduction in proptosis and chemosis, and the extraocular motility improved. Corneal abrasion healed within 2 days. No further flow of grease was detected. At 2 weeks follow up, visual acuity improved to 20/20, and the pupil was round, regular, and reacting [Fig. 4]. Intraocular pressure by Goldman applanation tonometry was

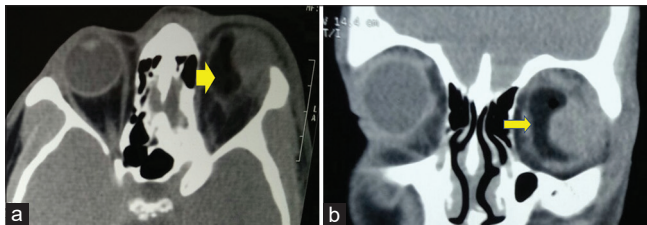


Figure 2: (a and b): Non-contrast orbital CT axial and coronal view showing crescentic shaped hypodense foreign body material with lateral displacement of the globe

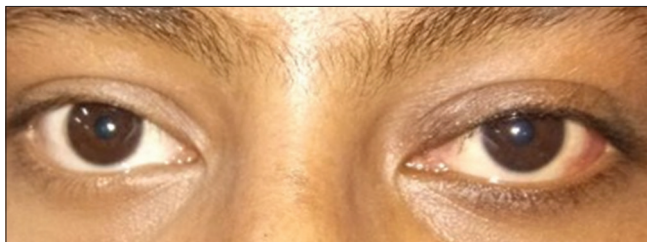


Figure 4: Image at 2 week follow up

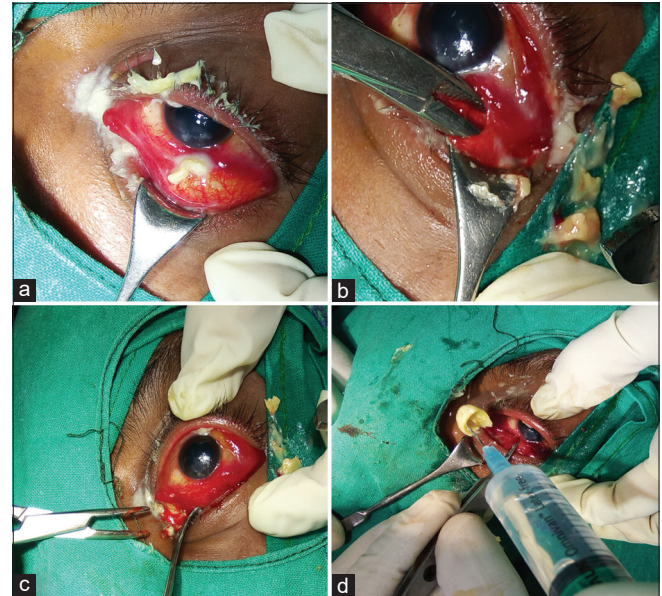


Figure 3: (a-d): Images showing surgical steps of grease removal

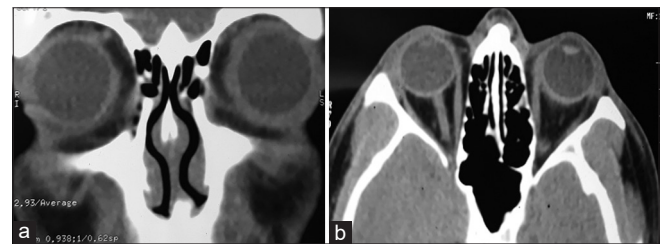


Figure 5: (a and b): Non-contrast CT scan axial and coronal view at 3 month follow up showing near total disappearance of grease material

Table 1: Reported cases till now

Author	Year	Machine Involved	Management	Outcome
1. Dallas NL ^[1]	1964	Grease gun	Orbitotomy and long term steroid treatment	Bilateral disc edema with poor visual outcome
2. Boukes RJ, <i>et al.</i> ^[2]	1987	Grease gun	Irrigation and aspiration	Good visual recovery at 6 weeks
3. Goel, <i>et al.</i> ^[3]	1994	Grease gun	In case 1- enucleation, ethmoidectomy, shenoidectomy, inferior turbinectomy and antrostomy In case 2- anterior orbitotomy	In case 2 outcome was good after three weeks
4. Gekeler, <i>et al.</i> ^[4]	2005	Grease gun	Conservative care for 6 weeks	Outcome is good
5. Wang Y, <i>et al.</i> ^[5]	2008	Grease gun	Orbital exploration	Good outcome
6. Ji Hyun Park, <i>et al.</i> ^[6]	2010	Grease gun	Orbital exploration	Poor outcome

14 and 16 mm of Hg in the right and left eye respectively. Fundus examination was normal. At 1 month follow up, CT orbit was repeated, and there was no grease or any other abnormalities detected [Fig. 5a and b].

Discussion

Most authors have reported that surgical removal is necessary, but Gekeler *et al.* suggested close observation in the absence of ocular symptoms [Table 1]. In our case, there was a 5 days delay in surgical removal of the grease, during this period the patient was on close observation with pulse steroid therapy. There was spontaneous flow of grease through conjunctival laceration, which also prompted us for initial conservative management.

Conclusion

The decision to operate or not should be made according to the signs and symptoms of a case, as the tissue toxicity of grease itself is limited. Timing of surgery varies from case to case, it depends upon factors like visual acuity at presentation, pupillary reaction, extent of other tissue damage, and amount of grease present in the orbital cavity. In our case, although initially we kept the patient on conservative management, finally we had to opt for the surgical removal of grease.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other

clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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