

Guidelines for the management of ocular trauma during the COVID-19 pandemic

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As the COVID-19 pandemic rages on, India is recording a very high number of new cases daily; even as the country prepares to gradually “unlock”, after months of lockdown. While elective eye surgeries such as uncomplicated cataract surgeries, blepharoplasty and eyelid procedures and refractive surgeries can be planned at a later date; emergency cases pertaining to ocular trauma cannot be deferred. This manuscript gives a brief overview of the general guidelines for the management of ocular trauma during the COVID-19 pandemic.

Key words: Blunt trauma, coronavirus, ophthalmic trauma, traumatic cataract

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Coronavirus 2019 disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Looking ahead, the COVID-19 pandemic has possibly changed the way medicine would be practiced in the foreseeable future.^[1,2]

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The COVID-19 pandemic has affected ocular trauma in multiple ways. In a comparative study where Pellegrini *et al.*, studied the trends of ocular trauma during the pandemic in Italy; they found a striking 68.4% decrease in the number of eye injuries seen compared to the same time period of the previous year. They hypothesized that behavioral changes during the quarantine could be associated with lower risk of trauma. The decreases of sport injuries and of injuries in children during school closure seem to support this hypothesis.^[3] On the other hand, another report from the United Kingdom noted that there was a rise in traumatic ocular injuries occurring at home, (when compared to the same time duration of the previous year) The activities that the patients were involved in were gardening, do-it-yourself/home improvement projects and exercise at home (skipping rope and resistance elastic bands injuries).^[4] These reports and others have shown that the frequency and nature of accidents leading to serious ocular trauma have been affected by the on-going pandemic.^[5]

Globally, elective surgeries have been deferred.^[1] However, ocular trauma in any form is always an emergency. While attending to ocular trauma cannot be deferred, there are a few changes that have to be incorporated into our practices, specifically while treating ocular trauma. Ophthalmologists

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are at a particularly high risk when it comes to the likelihood of contracting COVID-19 from patients given the proximity of examination and the exposure to mucosal surfaces.^[6]

The guidelines presented in this document focus only on surgical procedures and subsequent follow-up visits and are based on the available literature on COVID-19, guidelines issued by other societies and other branches of medicine. The necessary precautions to be followed as a routine in the outpatient department have been elaborately discussed by Sengupta *et al.*^[7] Surgical procedures addressing ocular trauma cannot be deferred, however, the measures enlisted in this document can be incorporated in real life to ensure maximum protection and to minimize the transmission of COVID-19.

Preoperative Assessment

When evaluating a case of ocular trauma, all precautions must be taken, assuming that the patient is a case of COVID-19. This would involve having basic protective gear including but not limited to the facemask, face shield and gloves. In addition to ophthalmic history and assessment, a general medical history would also have to be elicited using the COVID-19 questionnaire as shown by Ali *et al.*^[1] If the patient has symptoms strongly suggestive of COVID-19, they should be screened for COVID-19, keeping in mind local municipal and state guidelines for testing; or carry out any further treatment at a higher center that is equipped to handle cases of COVID-19. Patients of ocular trauma who have symptoms suggestive of COVID-19 should also have an urgent physician's consult and if required, further imaging to rule out COVID-19. In case surgery has to be taken up earlier or while awaiting the results of COVID-19 testing, it must be ensured that the entire medical, paramedical and anesthesia teams should be appropriately prepared with PPE, with assumption that the patient is seropositive for COVID-19.

Often times, ocular trauma is seen in the setting of pan-facial trauma. In such cases, examination of patients with injuries that may involve the mucosal surfaces of the head/face, nose, and pharynx must be considered to be aerosol-generating, and therefore all appropriate institutional PPE guidelines should be followed. The recommended procedural management would require N95 masks, eye protection, gown, and gloves.^[8]

It is also recommended that any surgical procedure on a previously diagnosed case of COVID-19 be done in a hospital that has dedicated COVID-19 care facilities including inpatient care, operating room and intensive care facilities for COVID-19 patients. When a surgical intervention is planned, it must be as expeditious as possible, even if these are not the clinical decisions that would be chosen under more typical circumstances. Effort must be made to limit the number of providers involved in the patient care. No observers and non-essential staff should be involved in the entire process. These attempts are aimed at reducing the overall patient time in the hospital, reduce the number of providers exposed to the patient, and reduce the utilization of operating room resources which are very critical.^[8]

Basic Guidelines for Ocular Trauma Surgery During the COVID-19 Pandemic

- a. Avoid general anaesthesia (intubation, extubation) whenever possible
- b. PPE for all medical and non-medical personnel as per

- c. the Government of India guidelines dated 1st May 2020
- c. Only the essential anaesthetic, surgical and allied health staff should be present inside the operating room.
- d. Surgeon and surgical assistants should be outside the operating room during intubation and extubation
- e. Use of aerosol protection devices is advisable during intubation and extubation to limit the spread of aerosols away from the patient.
- f. Avoid monopolar cautery for cutting/coagulation.
- g. Use a cutting blade for skin and mucosal incisions whenever possible.
- h. Use bipolar cautery for haemostasis only in the lowest power setting.
- i. Practise minimal handling of tissues especially mucosal surfaces such as conjunctiva
- j. Avoid repeated irrigation and suctioning of tissues while dealing with orbital trauma
- k. In the case of orbital fractures, avoid/minimize drills, oscillating osteotomes and other powered instruments which are aerosol-generating.
- l. Consider closed reduction if the fracture is stable for zygomatico-maxillary complex (ZMC) fractures. Avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization.
- m. Pole to pole surgeries (multi-speciality surgery) should be done in the same setting – to avoid repeated exposure to anaesthesia.
- n. If a planned second surgery is to be done, it should be at least 14 days after the primary procedure and treat the case as a new patient in terms of the pre-operative workup.

Risk Stratification for Ocular Trauma Surgery

This classification [Table 1] offers a rough guide but is not exhaustive and may be modified based on individual/institutional discretion on a case-to-case basis.^[9]

Level A – Emergency/Urgency—The need to operate within 4–72 h.

Level B – Can be deferred for up to 4–6 weeks with or without conservative management.

Level C – Can be deferred beyond 3 months without adversely affecting the outcomes.

Follow-up

Routine follow-up on post-operative day 1 can be conducted by the operating surgeon as before. Subsequent follow-ups at day 3 and day 7 post-operatively need to be scheduled at the discretion of the operating surgeon. It is advisable that as few post-op visits as possible, without compromising on the outcome of the treatment. The operating surgeon may defer/reschedule the post-op follow-up visits taking into consideration the type of surgery, the type of intraocular foreign body (organic vs. inorganic) and the presence of complaints. Telemedicine has been used effectively in ophthalmology for a wide variety of circumstances and conditions and therefore should be utilized effectively.^[10] Engaging the referring surgeon (if any) for interim visits may be useful in minimizing visits to the hospital.

The COVID-19 pandemic has changed the practice patterns in ophthalmology.^[11] Ocular emergencies cannot be deferred

Table 1: Risk stratification for ocular trauma surgery

Level A	Level B	Level C
Open globe injury (penetrating, perforating and globe ruptures).	Tectonic corneal and scleral grafts	Enucleation/Evisceration for phthisis bulbi
Deeply embedded corneal foreign bodies	Traumatic cataracts in adults without endothelial touch, secondary glaucoma	Aesthetic/functional keratoplasty
Intraocular foreign bodies		
Retinal detachment/tear		
Vitrectomy for trauma-related complications*		
Paracentesis for vision-threatening hyphaema		
Chemical and Electrical Injuries		
Repair of orbital and other facial fractures fracture in presence of oculocardiac reflex.		
Orbital hematomas/edema leading to vision loss from superior orbital fissure syndrome/apex syndrome		
Intravitreal injections for traumatic endophthalmitis		

*Intraocular infection, vitreous hemorrhage, retinal tear, IOFB, misdirected aqueous/ciliary block glaucoma, malignant glaucoma, vitreous prolapse, tube shunt blocking filtration

indefinitely and need to be tackled immediately in most cases. These guidelines will serve as a good resource such that ophthalmologists can resume offering healthcare services to patients in need of emergent care without compromising on safety; their own and the patients'.

Disclaimer

The authors of this document would like to declare that these guidelines are based on the information issued by various relevant organizations, and State and Central Governments as on the date of their release. These guidelines are provided for informational and educational purposes only. Adherence to any recommendations included in this document may not ensure a successful outcome in every situation. Furthermore, the recommendations contained in this document should not be interpreted as setting a standard of care or be deemed inclusive of all proper methods of care nor exclusive of other methods of care reasonably directed to obtaining the same results. These guidelines reflect the best available information at the time the document was prepared. The results of future studies may require revisions to the recommendations to reflect new data. The guidelines do not replace or override existing national/regional/local statutory requirements. The guidelines are to be tempered with the regional, local and individual hospital guidelines and expertise. The ultimate judgment regarding the propriety of any specific therapy must be made by the physician and the patient considering all the circumstances presented by the individual patient, and the known variability and biological behavior of the medical condition. This expert panel does not warrant the accuracy or completeness of the guidance and assumes no responsibility for any injury or damage to persons or property arising out of or related to any use of this guidance or for any errors or omissions. We will not be a party to/for medico legal implications arising out of following or not following these recommendations.

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Conflicts of interest

There are no conflicts of interest.

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