

Guidelines for the Oculoplastic and Ophthalmic Trauma Surgeon during the COVID-19 era.

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Background

The outbreak of COVID-19 pandemic is changing the infection transmission and safety practices of medical establishments globally. From evidence that is available presently, the risk of transmission of this virus is high amongst medical personnel involved in procedures and surgeries around the head and neck region- Ophthalmology, Otorhinolaryngology, Craniomaxillofacial surgery, Head and Neck Oncology, Neurosurgery including Anesthesiology. The field of Oculoplastic Surgery has risk factors common to both ophthalmology and all of the above craniofacial subspecialties. While clear directives and strategies to handle elective, urgent and emergency surgeries in SARS-Cov2 positive patients is constantly evolving, we herewith attempt to consolidate various guidelines from various relevant professional global medical societies which will be beneficial to the orbit, oculoplastic and ophthalmic trauma surgeon and also their hospital administrators.

Proposed Outline

The aim of this article is to lay down strategies and guidelines in both emergencies and elective surgeries in the environment of the COVID-19 pandemic based on guidelines issued by various authorities worldwide. We will cover surgeries/procedures of eyelid, lacrimal system, orbit, endonasal and ocular trauma surgeries. The focus of this article will be

1. Risk stratification of Oculoplastic and other ophthalmic procedures depending on urgency required for different surgeries.
2. Safety of medical personnel who will come in contact with patients and prevention of transmission from SARS-Cov2 positive patients.
3. Guidelines for surgery in a SARS-Cov2 positive patient who needs urgent oculoplastic surgery. We however understand that these guidelines will keep evolving as more data comes in.

General considerations

- Developing new clinic workflows to segregate and minimize staff members needed for patient management to reduce the risk of transmission to staff, staggering patient appointment timings, and minimizing patient-staff contact time are recommended.^[3]
- Viral presence in air and surfaces: Viral particles become aerosolized and stay in the air for at least 3 hours but may last up to 72 hrs on plastic and stainless steel surfaces. Based on

experience in Wuhan, China, and Northern Italy, N95 masks were ineffective in controlling spread of the disease and it was not until Powered Air-Purifying Respirators (PAPRs) were introduced that transmission of the virus was controlled among medical personnel. Transmission by elevator buttons and faucet taps is thought to have contributed to clusters of cases in Wenzhou, China. These findings underscore the importance of surface cleanings with virucidal agents such as bleach, quaternary ammonium, and hydrogen peroxide. ^[4]

- Procedures involving the nasal, naso-lacrimal, oral and endotracheal mucosa are considered high-risk for transmission due to viral aerosolization. There is significant evidence that the viral load is high in these locations compared to other parts of the body including lower respiratory tract. ^{[1][2][3][4][5]}
- Aerosol generating equipment and procedures (AGP) should be minimised. These include lacrimal irrigation, invasive procedures including nasal endoscopic procedures, use of monopolar cautery, powered drills including other irrigation and suction procedures. ^{[4][5]} Thus, all elective diagnostic and therapeutic intranasal procedures, lacrimal irrigation and probing, removal of lacrimal stents, and lacrimal surgery should be deferred.
- All elective, non-vision and non-life threatening procedures should be deferred until a later date.
- Urgent procedures where deferral may not be possible include removal of lacrimal drainage system malignancies, trauma including canalicular lacerations (monocanalicular stenting preferred) and removal of stents that are causing keratopathy. ^[5] If any urgent procedure is required, Personal Protective Equipment (PPE) is advised. ^[5]
- Before taking up for surgery, it is important to risk stratify all patients. ^{[1][2][3]} Unless well screened, all patients may be considered to be COVID-19 positive and appropriate preventive measures and PPE should be practiced. This is performed by appropriate history taking, general medical status assessment, endemicity of the infection within the local population and where available, antibody testing (ideally IgM antibody) and 2 successive negative nasopharyngeal swab tests by PCR-RT. ^[4] Potential asymptomatic carriers of Covid-19 should always be borne in mind and hence appropriate precautions should always be taken.
- **Patients at low risk of COVID-19 infection:** These patients may undergo emergency and urgent and semiurgent procedures in a controlled environment. Surgeons and anesthetists should wear appropriate PPE (non-porous gown, cap, surgical mask or N95 mask, goggles, gloves and drapes) ^[4]
- **High risk (possible or confirmed COVID-19 infection) patients:** Full PPE (N95 or FFP2 or FFP3 respiratory mask, goggles, complete facial/head cap, nonporous gown, overshoes, appropriate drape over microscope when used). COVID-19 positive patients should wear surgical masks at all times. ^[4]
- PPE is recommended for all procedures at present. The minimum requirements are:
 1. N95 or FFP2 mask plus face shield (or mask/with attached shield over N95) and gloves.
 2. Non-porous gown
 3. Disposable cap.
 4. It is generally accepted that FFP3 or PAPR provides better protection and should be used in place of N95 mask where available. ^[4]
- Povidone-iodine (Iodine with the water-soluble polymer polyvinylpyrrolidone) (PVP-I): PVP-I has higher virucidal activity (including SARS-Cov-2) compared to other commonly used antiseptic agents like chlorhexidine. This virucidal activity includes *in vitro* activity against all the coronaviruses including the SARS-Cov - Severe Acute Respiratory Syndrome (SARS) which caused the epidemic of 2002–03 and the MERS-CoV - Middle East Respiratory Syndrome (MERS) which caused the epidemic of 2012–13. Although PVP-I has high antimicrobial effectivity up to 1:100 dilution (0.1%), a 0.5% dilution is considered most practical in the pre-

surgical situations preferably in an atomised form to the patient as well as medical personnel. [6]

General pre-operative, intra-operative and post-operative guidelines for SARS-Cov-2 positive patients

1. Full PPE to all medical and non-medical personnel involved in the surgery (minimum PPE described as above). [1][2][3][4]
2. Only minimum necessary anaesthetic, surgical and allied health personnel should be inside the operating room. [4]
3. Use of aerosol protection devices is encouraged during intubation and extubation to limit spread of aerosols away from the patient. An oxygen mask/aerosol protection device should be placed over the face after the tube is removed to mitigate aerosolization with coughing. [7][8]
4. Non-anesthetic manpower should be outside the operating room during intubation and extubation. [4][9]
5. The surgical operating team should be outside the door ideally for 20 minutes following intubation before entering the OR. The team may then enter with appropriate PPE (N95 or PAPR). [4][9]
6. Povidine Iodine disinfection (PVP-I) (optional): There is very good evidence available from older *in vitro* studies which shows virucidal activity on similar coronaviruses related to SARS-Cov-2. Since PVP-I is part of preoperative disinfection in regular surgeries, it wouldn't be a disruptive measure. The studies suggest 0.5% PVP-I in preferably atomised form for disinfection of nasal mucosa and nasopharynx for both the medical personnel involved in surgery and patient listed for surgery. The method of instillation may have to be customised depending on availability, region and institution where surgery is being performed. [6]

Guidelines for the Oculoplastic & Ophthalmic Trauma Surgeons [1][2][3][4][9]

Oculoplastic Surgery and Ophthalmic Oncology Risk Stratification	
Level A	Urgent surgery required within 4-72 hours depending on type of injury/condition. Oncology: <i>Emergency surgery needed within 24-72 hours to save life depending on severity</i>
Level B	Can be deferred beyond 3-4 weeks +/- conservative treatment Oncology: <i>Elective surgery with the expectation of cure, prioritised to within 4 weeks to save life/progression of disease beyond operability</i>
Level C	Can be deferred beyond 3 months without change in outcomes. Oncology: <i>Elective surgery can be delayed for 10-12 weeks will have no predicted negative outcome.</i>

General Oculoplastic Guidelines

1. Avoid monopolar cautery for cutting/coagulation.
2. Use cutting blade for skin and mucosal incisions whenever possible.
3. Use bipolar cautery for hemostasis in lowest power setting.
4. Practise minimal handling of tissues esp mucosal surfaces.
5. Avoid repeated irrigation and suctioning of tissues.
6. Drills, oscillating osteotomes and other powered instruments are best avoided and used only when absolutely required. [4]

Eyelid and Facial Surgery

Level A	Level B	Level C
<ol style="list-style-type: none"> 1. Repair of eyelid lacerations including those involving canaliculi 2. Incision/Excision biopsy in suspected malignancy of the eyelid. 3. Tarsorrhaphy to prevent impending corneal compromise. 4. Upper lid entropion or retraction in the presence of progressive sight-threatening corneal exposure. 5. Temporal artery biopsy for suspected giant cell arteritis 	<ol style="list-style-type: none"> 1. Correction of severe amblyogenic ptosis with unilateral or bilateral brow suspension 2. Botulinum toxin injections for severe blepharospasm 	<ol style="list-style-type: none"> 1. Mild to moderate eyelid malpositions. 2. Long standing congenital or acquired ptosis 3. Upper & Lower Blepharoplasty 4. Aesthetic Procedures and surgeries like Brow Lifts, Face Lifts and Cosmetic Fillers and Botulinum toxin injections for cosmetic indications.

Lacrimal Surgery

Level A	Level B	Level C
<ol style="list-style-type: none"> 1. Decompression of dacryocoele in a neonate with airway compromise. 2. Drainage of lacrimal abscess. 	<ol style="list-style-type: none"> 1. Drainage of an infected muco-pyocele 	<ol style="list-style-type: none"> 1. Dacryocystorhinostomy PANDO without any Acute/Chronic Dacryocystitis 2. Probing of nasolacrimal duct

Specific precautions during lacrimal surgery

1. Avoid lacrimal irrigation and nasal endoscopy for diagnosis. Consider Fluorescein Dye Disappearance Test (FDDT) for LDS obstruction diagnosis.
2. Avoid/minimize the use of nasal endoscopy and instrumentation.
3. Avoid excessive handling of nasal mucosal tissues to reduce aerosol generation.
4. If urgent dacryocystorhinostomy (DCR) is required, consider external DCR under local anaesthesia, without powered instrumentation, irrigation and suction when possible.

Orbital Surgery & Ophthalmic Oncology

Level A	Level B	Level C

<ol style="list-style-type: none"> 1. Canthotomy and cantholysis for sight-threatening orbital haemorrhage 2. Drainage of an orbital or periorbital abscess 3. Exenteration for life-threatening infection 4. Orbital biopsy (incisional or excisional) for life or sight-threatening conditions 5. Repair of orbital and other facial fractures fracture in presence of oculo-cardiac reflex 6. Evisceration/Enucleation for severe, untreatable infection, malignancy 	<ol style="list-style-type: none"> 1. Optic nerve sheath fenestration for progressive visual loss 2. Orbitotomy for malignancy or sight threatening tumor/ other lesions. 3. Thyroid Eye Disease: Orbital decompression in case of optic neuropathy or uncontrolled orbital congestion. 4. Orbital fracture repair with symptomatic residual entrapment. 5. Plaque brachytherapy 	<ol style="list-style-type: none"> 1. Orbital decompression for cosmetic rehabilitation. 2. Socket Reconstruction
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Specific precautions during Orbital surgery including orbital fractures with or without other facial fractures.

1. Use scalpel over monopolar cautery for all mucosal and skin incisions.
2. If osteotomy is required, consider osteotome instead of oscillating saw, high-speed drills, etc.
3. For zygomatico-maxillary complex (ZMC) fractures, consider closed reduction alone if fracture is stable following reduction and avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization. Self-drilling screws preferred over self-tapping ones requiring predrilling.

Ocular Trauma

Level A	Level B	Level C
<ol style="list-style-type: none"> 1. Open globe injury. 2. Deeply embedded corneal foreign bodies. 3. Intraocular foreign body 4. Retinal detachment/tear 5. Vitrectomy for trauma related complications* 6. Paracentesis for vision threatening hyphema 7. Chemical and electrical injuries 	<ol style="list-style-type: none"> 1. Traumatic cataract without endothelial touch, secondary glaucoma, etc 2. Tectonic grafts 	<ol style="list-style-type: none"> 1. Aesthetic and functional keratoplasty 2. Enucleation for phthisis bulbi

*intraocular infection, vitreous haemorrhage, retinal tear, intraocular foreign body, misdirected aqueous, ciliary block glaucoma, malignant glaucoma, a vitreous prolapse, or a tube shunt that blocks filtration.

Specific guidelines during surgery for Ocular Trauma

1. Use liberal viscoelastic devices instead of anterior chamber maintainers with high flow.

Summary

The COVID-19 infection has evolved from an epidemic to a pandemic with devastating clinical outcomes in high-risk and not infrequently even otherwise healthy patients. The onus is upon healthcare professionals to adopt and practice full scale protection against incidental infections from patients and spread amongst hospital staff. While these guidelines are considered universal, every practising surgeon, should adapt and modify his/her practice based on the recommendations and guidelines of their local professional medical society, their national and institutional guidelines.

Disclaimer

The above suggested guidelines are based on the current evidence available and meant to provide a general overview to surgeons and institutions, be they public or private. Individual surgeon, institutional and national discretion may be applied.

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