Preferred Practice

All India Ophthalmological Society - Oculoplastics Association of India consensus statement on preferred practices in oculoplasty and lacrimal surgery during the COVID-19 pandemic

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Oculoplastic surgeries encompass both emergency surgeries for traumatic conditions and infectious disorders as well as elective aesthetic procedures. The COVID-19 pandemic has brought about a drastic change in this practice. Given the highly infectious nature of the disease as well as the global scarcity of medical resources; it is only prudent to treat only emergent conditions during the pandemic as we incorporate evidence-based screening and protective measures into our practices. This manuscript is a compilation of evidence-based guidelines for surgical procedures that oculoplastic surgeons can employ during the COVID-19 pandemic. These guidelines also serve as the basic framework upon which further recommendations may be based on in the future, as elective surgeries start being performed on a regular basis.

Key words: Blepharoplasty, botox, corona, coronavirus, dacryocystorhinostomy, DCR, eyelid surgery, guidelines, lockdown, ophthalmology, orbital surgery, precautions, ptosis

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Coronavirus disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The COVID-19 pandemic has possibly changed the way medicine would be practiced in the foreseeable future. In an attempt to reduce the spread of the pandemic, the government of India has imposed an extended lockdown across the country.[1] As the restrictions on the movement of people will ease in the future, the potential for transmission of COVID-19 is likely going to increase. When clinics open up, it may be prudent not to start elective cases immediately. This is because patients who are pre-symptomatic or asymptomatic may not exhibit any clinical signs suggestive of the disease, and therefore can be a potential source of infection to the hospital staff, if taken in for an elective procedure.[2] This underscores the need for operating only those cases where the procedure is indicated on an emergency basis for some time before considering semi-urgent and elective cases. A local prevalence of the disease is an important factor to make this decision.

It has been found that SARS-CoV-2 particles have been found in nasal swabs, pharyngeal swabs, sputum, bronchial swabs, tears, gastrointestinal tissue, blood, and stool. Therefore, procedures such as dacryocystorhinostomy—both external and endoscopic—would be classified as 'high-risk' procedures. In addition, even shoe covers of healthcare workers have tested positive for viral particles.[3,4] It has also been established that the virus can spread via aerosols and fomites, and survive as aerosol for at least 3 hours and for longer periods of time on other surfaces.[5] In the past, from a surgeon's perspective, studies of other viruses have found viral load in almost all

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tissues and fluids tested and even in surgical smoke emanating from the use of electrocautery.[6,7]

With this background, it is imperative that the practice of ophthalmology and more specifically oculoplastic surgery cannot go back to practicing the 'pre-COVID' way. The wait is on for an effective treatment, a safe vaccine and 'herd immunity', all of which can potentially limit the spread of the disease and improve outcomes. The guidelines presented in this document focus only on surgical procedures and are based on the available literature on COVID-19, guidelines issued by other societies and those being followed in other branches of medicine. The necessary precautions to be followed as a routine in the outpatient department have been discussed in detail by Sengupta *et al*.[8]

The basic idea behind deferring elective surgeries is that even an asymptomatic patient when placed under the stress of surgery and general anesthesia can turn a simple procedure into a complicated situation. Every surgical intervention can potentially weaken the immune system leading to complications that may require hospitalization and possibly intensive care.[9] While this document provides a framework for providing non-emergent care following easing off of the COVID-19 lockdown restrictions, it will take a longer time before routine elective surgeries can be offered to patients.

In a joint statement of the American College of Surgeons, American Society of Anesthesiologists, Association of peri-operative Registered Nurses and the American Hospital Association, it is mentioned that multiple factors need to be taken into consideration before beginning non-emergency, elective surgeries. These include sustained reduction in rate of new COVID-19 cases in the relevant geographic area for at least 14 days before resumption of elective surgical procedures; Considering that at the time of putting this document together, India has not yet witnessed the peak of its COVID-19 pandemic, it is likely that utilization of precious operating room resources and protective equipment for routine procedures is a long way off. Until such time, it is hoped that the preferred practice patterns mentioned in this document will serve ophthalmologists, specifically oculoplastic surgeons, well.

I. Definitions

a. Infectious Aerosols: These are defined as particles suspended in gas, less than 100 μm and can be respired. Aerosols between 10-100 μm are usually deposited in the upper respiratory tract, whereas less than 10 μm can penetrate deep into the lungs[10,11]
b. AGP (Aerosol Generating Procedures): Medical procedures or interventions that has the potential to generate aerosols and expose the healthcare worker to the pathogens. Examples are endotracheal intubation, mechanical ventilation, suctioning of body fluids, etc.[12]
c. PPE (Personal Protective Equipment): PPE refers to the equipment worn to minimize hazards of exposure to the pathogens and includes protective clothing, masks, goggles, face masks, face shields, helmets with or without respirators
d. FFP (Filtering Face Piece mask): FFP or simply called a respirator is a protective face mask known to filter dust particles and viruses. They are of three types based on the filtration capacity and inward leakage. The FFP2 (N-95) or FFP3 masks are commonly recommended for the viruses[13]
e. PAPR (Powered Air Purifying Respirators): PAPR or positive pressure masks are a specialized respirator designed to filter contaminated air. They are considered superior to N-95 mask; however, its use is limited by the cost and availability factors[14]
f. Ideal PPE (Type A): This would comprise of Hazmat suit + N-95 mask + Visor + Shoe cover[15]
g. Minimum PPE (Type B): This would comprise of Surgical gown + N-95 mask + Visor + Shoe cover + cap +/- monkey hood or cap +/- plastic apron +/- goggles/surgical loupes.[15,16]

II. COVID screening in practices

When resuming services, it would be ideal to screen every patient who comes for a consult. An easy way to perform it during demanding situations like a pandemic is the use of a simple questionnaire [Table 1]. In addition, make a note of the patient's residential address and the colour code of the zone of the location. This questionnaire would then form the basis for pre-surgical screening subsequently [Table 2]. The use of these two simple methods would allow the surgeon to make decisions with regards to proceeding with clinical examination, surgery where needed, and the degree of logistical needs.

III. General pre-operative, intra-operative and post-operative guidelines for SARS-Cov-2 positive or suspected patients

1. PPE for all medical and non-medical personnel involved in the surgery (at least minimum PPE described as above)[14,17-19]
2. Only minimum necessary anaesthetic, surgical and allied health personnel should be present inside the operating room[14]
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[20,21]
4. Non-anaesthetic manpower should be outside the operating room during intubation and extubation[14,22]
5. The surgical operating team should be outside the door ideally for 20 minutes following intubation before entering the operating theatre. The team may then enter with appropriate PPE (N95 or PAPR)[14,22]
6. Povidine Iodine (PVP-I) disinfection for endonasal lacrimal and orbital procedures: PVP-I has viricidal activity on coronaviruses related to SARS-Cov-2. Studies suggest 0.5% PVP-I preferably in atomised form for disinfection of nasal mucosa and nasopharynx for both the medical personnel involved in surgery and the patient. Alternatively, 2% PVP-I oral solution can be used for oral mucosal dis-infection of medical personnel before surgery and 5% PVP-I solution in the case of the patient. The method of instillation depends on the availability, region and institution where surgery is being performed[23]
7. An interval of 20-30 minutes between cases is essential during the time of this crisis to give enough time for aerosols generated during the previous procedure to clear. The exact interval timing will depend on operating theatre air exchange rates- which should be decided by individual hospitals.[14]

IV. Role of respirators- use of N95 respirators vs powered air-purifying respirators (PAPRs)

There is enough evidence in literature of superior protection of N95 respirators and PAPRs compared to regular 3-ply face masks especially against Influenza virus and SARS-CoV (the virus responsible for the previous SARS outbreak) making them indispensable during this present pandemic[24,25] In one significant comparative study, N95 respirators had 30 times more protective factor than the regular 3-ply masks.[26]

Table 1: COVID-19 screening questionnaire

COVID-19 Questionnaire			
History	**Question**	**Yes**	**No**
Occupation	Was the patient working at a grocery shop/bank/hospital/etc., which potentially involves exposure to large group of people in the last 28 days		
Travel	National travel (Inter-district or Inter-state) particularly to hotspot areas or international travel in past 28 days		
Family	Any travel by family members to hotspots (Inter-district or Inter-state) or international travel in past 28 days		
	Any history of symptoms (URI/LRI/FEVER/DIARRHOEA) in past 28 days		
	Any family member on COVID Duty (Police/Army/Doctor/Drivers etc.) living in same house		
Contact	Any contact with suspected or diagnosed COVID Case in the past 28 days		
Symptoms (Current or in last 28 days)	Fever		
	LRTI symptoms - Cough/Expectoration/Breathlessness		
	URTI Symptoms - Sore throat/Nasal block/Rhinorrhoea/Cough		
	GI Symptoms - Diarrhoea		

For emergency procedures[16]

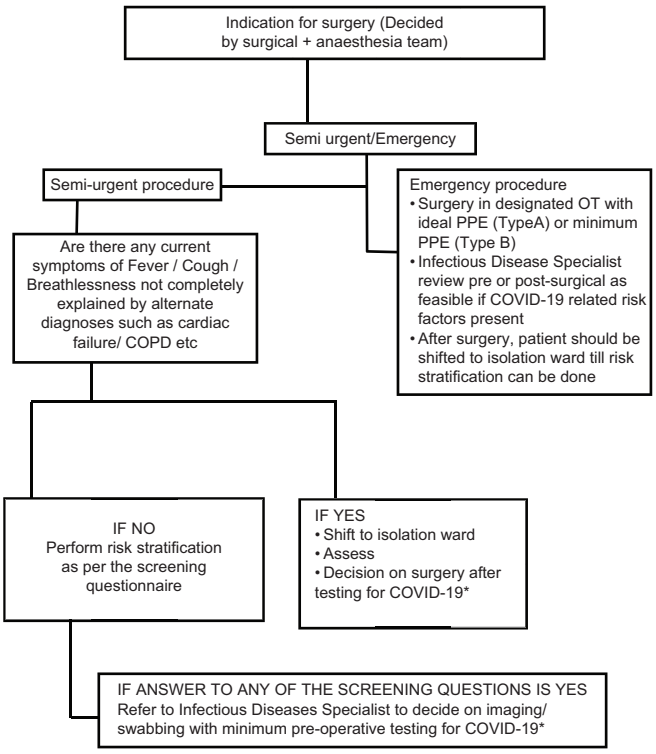
Please score the above sheet, but can go ahead with surgery with full PPE in designated operating rooms. A pre or post-operative consultation from an infectious disease (ID) specialist or General Physician. It is also advised that nasopharyngeal swab/ blood be sent preferably for COVID-19 testing* pre-operatively. Operating team may not be able to wait for results before proceeding with surgery.

For semi urgent/elective procedures

1. If the answer to all the questions above is NO, then may proceed with surgery with preferably testing for COVID-19.*
2. If the answer to any of the above is YES – please consult infectious diseases specialist before proceeding.

*Either RT-PCR of nasopharyngeal swab OR protective serum IgG level.

Table 2: Pre-operative screening



*Either RT-PCR of nasopharyngeal swab OR protective serum IgG level

Experiences from Wuhan, China and Northern Italy suggest that PAPR (FFP3) were deemed to have accorded better protection than N95 respirators (FFP2) and helped in keeping infection rates among medical personnel in control.[14] There are issues of comfort and physiological effects on medical personnel using N95 masks. Earlier studies have reported decreased concentrations of inhaled oxygen (O2) and increased concentrations of inhaled carbon dioxide (CO2) associated with use of N95 respirators for long periods.[27-29] With expected prolonged mask wearing, long term health implications of the medical personnel needs be carefully considered. In a long-term study, the subjects consistently reported headache, dizziness, feeling tired and communication obstacles.[13,30] In many surgeries, mask wearing time may be significantly longer and there may be increased O2 utilisation rate than in experimental settings. These issues are obviated by PAPRs making them the respirators of choice. Though PAPRs are preferred over N95 respirators, considering the cost factor involved and availability of PAPRs, the choice of respirators may be left to the individual institutions, hospitals and practices in the present time. Full Face-shield Respirators with better air ventilation and N95 specifications can be considered as an alternative to N95 respirators. There are suggestions for disinfection of respirators to conserve expensive respirators in this period of crisis. Ultraviolet irradiation, atomised hydrogen peroxide and moist heat are the most promising decontamination procedures, but there is not enough literature to support its specific efficacy against SARS-CoV-2. Reusing respirators after disinfection may reduce its efficacy over time.[31]

V. General guidelines for oculoplastic surgery

1. Avoid general anaesthesia (intubation, extubation) whenever possible[18]
2. Avoid monopolar cautery for cutting/coagulation[14,19]

3. Use cutting blade for skin and mucosal incisions whenever possible[14,19]
4. Use bipolar cautery for haemostasis in lowest power setting[14]
5. Practise minimal handling of tissues especially mucosal surfaces[18]
6. Avoid repeated irrigation and suctioning of tissues[14,19]
7. Avoid/minimize drills, oscillating osteotomes and other powered instruments[14,18]
8. Consider closed reduction if fracture is stable for zygomatico-maxillary complex (ZMC) fractures. Avoid intra-oral incision, if two-point fixation (rim and ZF) is sufficient for stabilization[14]
9. Self-drilling screws preferred over self-tapping ones that require pre-drilling[14]
10. An optional use of a smoke and suction evacuator device having fluid suction high-efficiency particulate air (HEPA) filter compartment and an ultra-low penetrating air (ULPA) efficiency rating will keep the aerosol and smoke dispersion in check[32]
11. To plan orbital decompression surgery avoiding endo-nasal endoscopic approach and only utilising an orbital approach, so that there is minimal to no breach of sinus mucosa. The operating surgeon can even consider—in a known COVID-19 positive patient—a single wall, aggressive lateral wall decompression as a temporising procedure to protect the optic nerve or/and reduce orbital congestion. The surgeon can plan for a more complete decompression at a later date.[16]

VI. Donning and doffing of complete and minimum PPE[15]

The decision to use either complete (Type A) and ideal PPE versus minimum PPE (Type B) depends upon the nature of the risk and availability of the protective suits. The donning and doffing techniques of each type is described Tables 3 and 4.

Table 3: Donning and doffing techniques of an ideal PPE (Type A)[15]

Type A	
Donning (Putting on protective wear)	**Doffing (Removing Protective wear)**
N-95 Mask Plastic Apron (Optional) Hand hygiene ↓ First pair of sterile glove Hazmat suit Shoe cover ↓ Put the coverall hood ↓ Wear Surgical gown (Surgical team) Visor Second pair of sterile gloves	Hand hygiene + Remove shoe cover and surgical gown in the theatre and head to doffing area ↓ Hand hygiene + Remove first pair of hand glove ↓ Hand hygiene + Remove visor ↓ Hand hygiene + Pinch out the hood and roll down the Hazmat suit without touching outer surface ↓ Hand hygiene + Remove second pair of hand glove ↓ Hand hygiene + Wear new pair of hand glove Hand hygiene + Remove N-95 mask Remove gloves ↓ Wash hands

Table 4: Donning and doffing techniques of a minimum PPE (Type B)[15]

Type B	
Donning (Putting on protective wear)	**Doffing (Removing Protective wear)**
N-95 Mask ↓ Shoe cover (2) ↓ Hand hygiene ↓ Surgical gown ↓ Monkey hood ↓ Visor ↓ Sterile gloves (2 pairs)	Hand hygiene + Remove first shoe cover in the theatre and head to doffing area ↓ Hand hygiene + Remove first pair of hand glove ↓ Hand hygiene + Remove visor ↓ Hand hygiene + Remove monkey hood ↓ Hand hygiene + Remove surgical gown ↓ Hand hygiene + Remove second pair of hand glove ↓ Hand hygiene + Wear new pair of hand glove ↓ Hand hygiene + Remove N-95 mask ↓ Remove gloves ↓ Wash hands

VII. Classification of clinical and surgical procedures[14,17,18,22]

This classification offers a broad time line but is not sacrosanct and may be modified based on individual or institutional discretion.

Level A – Emergency/Urgency – The need to operate within 4-72 hours.

Level B - May be deferred for up to 4 weeks with or without conservative management.

Level C – May be deferred beyond 6 weeks without adversely affecting the outcomes.

VIII. Risk stratification for oculoplastic surgeries

The risk classifications of orbital surgeries are shown in Table 5, eyelid and facial procedures in Table 6 and that of Ocular Oncology in Table 7 and lacrimal procedures in Table 8. In addition, certain specifics of eyelids, orbital and lacrimal malignancies are dealt within the respective risk stratification tables.

IX. Lacrimal surgeries

Unlike other oculoplastic surgeries, lacrimal procedures involves various interventions into the nasal cavity which enhances the risks for a lacrimal surgeon. Hence it requires a brief discussion on the intricacies of clinical examinations like lacrimal irrigation and nasal endoscopy and common surgical procedures.

A. Lacrimal irrigation

This is a basic clinical examination in any ophthalmic clinic. However, it is potentially an aerosol generating procedure – especially in the setting of an obstructed lacrimal drainage system. This can be compounded by the controversy of presence of virus in the tears.[33,34] The previous guideline was to avoid lacrimal irrigation and instead rely more on Fluorescein dye disappearance test (FDDT).[35] In the immediate aftermath of lockdown, this view may not be entirely valid.

Table 5: Risk classification of orbital surgeries

Level A	Level B	Level C
1. Canthotomy and cantholysis for sight-threatening orbital haemorrhage. 2. Drainage of an orbital or periorbital abscess. 3. Exenteration for life-threatening infection or malignancy. 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 unsalvageable globe trauma, untreatable infection, malignancy.	1. Optic nerve sheath fenestration for progressive visual loss. 2. Orbitotomy for malignancy or sight threatening tumour/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.	1. Orbital decompression for cosmetic rehabilitation. 2. Socket Reconstruction.

Table 6: Risk classification of eyelid and facial plastic surgery

Level A	Level B	Level C
1. Periocular malignancy (biopsyproven or suspected) including locally advanced disease with features such as orbital invasion 2. Severe unilateral ptosis in an infant 3. Eyelid lacerations including canalicular lacerations 4. Tarsorrhaphy in cases of impending corneal compromise	1. Entropion in the presence of progressive sight-threatening corneal exposure/ disease 2. Botulinum toxin injections for severe blepharospasm and other facial dystonia	1. Other eyelid malposition's like long standing congenital or acquired ptosis, ectropion and dermatochalasis 2. Benign periocular tumours like chalazion, papilloma 3. Upper & lower blepharoplasty 4. Aesthetic procedures and surgeries like browlifts, facelifts, thread-lift, cosmetic fillers and botulinum toxin injections for cosmetic indications

Table 7: Risk classification of procedures and surgeries in ocular oncology

Level A	Level B	Level C
1. Examination under Anaesthesia for Intraocular Tumours 2. Enucleations for Intra-ocular malignancies particularly Intra-ocular malignancy. 3. Exenterations/Limited resections for invasive and aggressive malignancies involving conjunctiva and globe- Squamous Cell Carcinoma, Melanoma, Sebaceous Cell Carcinoma, Basal Cell Carcinoma, etc	1. Surgery for Ocular Surface Squamous Neoplasia. 2. Plaque brachytherapy.	1. Benign lesions of the conjunctiva or ocular surface.

Table 8: The risk classification of lacrimal drainage disorders and surgeries

Level A	Level B	Level C
1. Congenital Dacryocystocele with airway compromise 2. Lacrimal Abscess 3. Pediatric Acute Dacryocystitis 4. Acute lacrimal drainage trauma (canalicular lacerations, NLD injury in complex facial trauma) 5. Lacrimal Sac Malignancy (biopsy proven or suspected) including locally advanced disease with features of orbital or intranasal extension.	1. Inflammatory secondarily acquired nasolacrimal duct obstruction (SALDO) with exacerbations (ex - autoimmune disorders) 2. Infectious canaliculitis 3. Post-traumatic SALDO without complex facial trauma 4. Biopsy proven benign lacrimal sac mass 5. Stent extubation. 6. Idiopathic canalicular inflammatory disease (ICID) 7. Lacrimal sac diverticulitis	1. Primary Acquired Nasolacrimal Duct Obstruction (PANDO) (exceptions in level A) 2. CNLDO (exceptions in levels A and B).

One, because of inherent sensitivity and specificity of the test and second, FDDT is neither confirmatory test for any lacrimal obstruction nor does it reflect the level of obstruction. Hence decisions to operate cannot be confidently taken. Irrigation, when necessary, should be performed ideally with at least a minimum PPE and preferably with a low capacity syringe (1 cc) and straight 25 or 27 G cannulas. This is to reduce the force generated to minimum and allow a more controlled and slower rate of fluid flow. This is likely to reduce the generation of aerosols. Since a straight canula is used on a slim syringe, the same canula can also be used to assess the level of canalicular obstruction if needed. The usual second intervention of using a probe to assess the level of obstruction can be avoided.

B. Nasal endoscopy

Routine nasal endoscopies prior to any lacrimal surgery is best avoided while the pandemic lasts. Yet it may be needed for a subset of patients, for example, in congenital dacryocystocele with signs of airway compromise, to assess intranasal cyst or in cases of acute lacrimal drainage trauma or malignancies. It is to be borne in mind that the nasal tissues harbour high viral load with higher risk for the examining surgeon. This

can be complicated by an unexpected sneeze reflex that it may occasionally induce. In addition, since the SARS-CoV-2 virus can be stable on the surfaces for long periods,[5] effective disinfection of the telescope before using it for another patient can be a dilemma. While disposable endoscopes can be an alternative, it is not an economically feasible option in the developing world. When performing nasal endoscopy, carefully decongest and anesthetize the nose. It is preferable to avoid the use of atomizers and suctions. Perform the procedure in a quick yet controlled manner, preferably with PPE.

C. Stent extubation

Stent extubation is not an emergency. It may be warranted on a priority basis where clinical examination reveals complications like internal common opening threatening tubal granulomas. Endoscopy route is the quickest to remove it. In the presence of concerns for endoscopy either because of logistic reasons or patient related factors, a careful external approach removal can be an alternative. However, for obvious reasons, there is no scope for its removal by sneezing manoeuvre as is the practice in some centres.

D. Probing for congenital nasolacrimal obstruction (CNLDO)

Routine probing is to be avoided till the decline of the pandemic. However, exceptional circumstances like congenital dacryocystocele or dacryocystopyocele may require endoscopic decompression. In such an eventuality, all precautions for a surgery as mentioned earlier including PPE is warranted.

E. Dacryocystorhinostomy

Routine dacryocystorhinostomy (DCR) by any approach is to be avoided till the decline of the pandemic. However, there may be certain indications that come under level A surgical classification may require it, for example recurrent lacrimal abscess with extraocular complications in younger individuals. The surgery would mandate a pre-operative testing for COVID-19 as described earlier and PPE. If an urgent DCR is planned, it is preferable to use the external route, use blades for incisions, avoid cautery, powered instruments like drills or ultrasonic aspirators and suction (use gauze instead). One needs to be very careful while fashioning the nasal mucosal flap. Use a direct decongestion on the nasal mucosa before incising it. Avoid suction here as it is a potentially aerosol generating step. A direct pack compression is preferable in case of troublesome bleeding. Use at least a PPE at minimum during the post-operative follow-ups of these patients.

F. Dacryocystectomy

Dacryocystectomy is comparatively a safer procedure than a DCR and mandates all the general precautions as elucidated above. It has certain absolute indications in the present era[36] and any other indications need to be weighed against the risk of persistent epiphora. For all extended DCTs, PPE is mandatory.

X. Conclusion

While all attempts have been made to make this a comprehensive document, these guidelines must be put into practice taking into consideration the rules and regulations laid down by the local state/municipal authorities. As a subspecialty, oculoplastic surgery will come out of this crisis but not without fundamental changes to the way we practice, and the new normal may be completely different. In reality, the bulk of surgeries in ophthalmic plastic surgery are elective surgeries, and it is evident that resumption of elective and aesthetic procedures is not on the cards in the immediate foreseeable future. How much of these changes that our practice has undergone will become permanent remains to be seen; and the guidelines presented in this document are likely to change over time. Until an effective treatment against COVID-19 or a vaccine is developed, it is hoped that this set of guidelines can help oculoplastic surgeons in resuming clinical duties and serving society at large in an optimal and secure way, without compromising on both their safety as well as their patients.

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Disclaimer

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