Glaucoma Practice in the COVID 19 Era

Zeynep AKTAS[1], Merih ONOL[2]

ABSTRACT

Coronavirus disease (COVID19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has recently changed our lives through different and unexpected ways. Various governments and medical societies of different countries have issued different guidelines for front-line health practitioners during the pandemic regarding how to protect physicians and all healthcare staff in front-line during this time. However, as ophthalmologists, we are also at great risk of infection because of the proximity to our patients during ophthalmic examinations. So we need to have our own guidelines according to our examination/diagnostic techniques.

In this article, we aimed to summarize precautions to be taken by glaucoma healthcare practitioners and glaucoma patients as recommended by Turkish Glaucoma Association and American Academy of Ophthalmology.

Keywords: COVID-19, Coronavirus, Pandemic, Glaucoma.

INTRODUCTION

On December 31, 2019, China reported pneumonia epidemic of unknown origin in Wuhan.[1] A new Coronavirus (CoV) was identified as the causative organism and the disease was named as the Coronavirus Disease 2019 (COVID-19) on February 11, 2020 by WHO.[2] While number of cases were increasing, Dr Li Wenliang, a 34 year-old ophthalmologist from the People's Republic of China warned his fellow medical school alumni of a possible ''SARS-like'' epidemic via a post on the Chinese messaging app WeChat on December 30, 2019.[3] However, he was told by police to "stop making false comments" and was investigated for "spreading rumours". Then he developed a cough after having treated a woman for "glaucoma" who had unknowingly been infected with the coronavirus, on January 10, 2020 and then unfortunately died on February 7, 2020.[4,5]

Since then, it spreaded to almost all over the world. Almost over 6 million people have been infected and 365 thousand people have died. Since it is also very common in all healthcare professionals, we do need to take some precautions as well, as a glaucoma specialists.

Beyond general precautions we need to take during standard ophthalmic care of our patients, we need to develop some specific protective measures for our own and glaucoma patient's safety. On the other hand, we should give them some important recommendations regarding how to apply their medications, how often they should come and visit for their follow-ups during the pandemic.

As we are planning to get back to our normal routine in a couple of months, we are all aware that waves of COVID19 are expected in fall and maybe later on. Thus, these precautions mentioned herein, seems to be valid at least taken until the end of 2020.

In this paper, precautions to be taken for glaucoma specialists and patients in the light of Turkish Glaucoma Association and American Academy of Ophthalmology guidelines are aimed to be summarized.[6,7]

Precautions to be Taken as Recommended by Turkish Glaucoma Association

Biomicroscopic Examination: As we all know, slit lamp biomicroscopy is needed in almost every step of the assessment of our glaucoma patients. Protective shields on biomicroscopes are highly recommended. Several market models are commercially available for purchase or it can

1- MD, FEBO, FGS, Associate Professor, Gazi University School of Medicine, Dept of Ophthalmology, Ankara, Turkey

2- MD, Professor of Ophthalmology, Dunya Goz Hospital, Kavaklıdere, Ankara, Turkey

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Correspondence Adress:
Zeynep PEHLIVANLI AKTAS
Gazi University School of Medicine, Dept of Ophthalmology, Ankara, Turkey

Phone: +90 312 202 6315
E-mail: drzeynep2000@yahoo.com

easily be made by using cellophane sheets. One should examine patients assuming that the outer side of the sheath, facing the patient, might possibly be contaminated; and should clean or change it regularly. Chin rest papers should not be used in order to keep this area clean efficiently. Masks being worn by both patients and physicians should definitely increase the protection **(Figure 1)**. Patients should be reminded that they should not talk during the biomicroscopic examination unless they are supposed to do so. Each part of biomicroscope that patients touched should be cleaned right after the examination.

Intraocular Pressure Measurements: There is no agreement on this subject currently. People still use both non-contact and contact tonometers. Pneumotonometers and air-puff tonometry, presumably aerosolize the tear film and viral particles, and these particles can remain in the air for 3 to 8 hours.[8-11] Thus, some authorities have an opinion that air-puff tonometers should be avoided in endemic areas since these viral particles suspended in air have been a huge risk for spreading infection.[10,11] For the contact tonometry, tonometers should be changed after each patient and sterilized with ethylene oxide or wiped with 70% alcohol after every single use and dried in room temperature.[12] Since the COVID19 virus is enveloped, it has been thought that wiping and cleaning with alcohol might be effective. For further information on sterilization methods, paper by Junk A at al. is recommended.[12] Person who is cleaning these instruments should wear gloves. Another alternative approach for measuring intraocular pressure might be the use of Tonopen and then changing its tip covers in each patient or the use of Rebound tonometer and again changing its probes regularly in the same way.

Figure 1: *Slit-lamp examination of the patient. Masks being worn by both patient and physician, protective face shield and a slit-lamp droplet shield are the main barriers increasing the safety of both physican and the patient.*

Gonioscopy: Same recommendations regarding biomicroscopic examinations might apply here. Physicians should definitely use gloves during gonioscopy. Goniolens should not be used without being disinfected. Goniolens disinfection guidelines were issued by American Academy of Ophthalmology, National Society to Prevent Blindness and Contact Lens Association of Ophthalmologists in 1988. It has been recommended that the surface of the lens should be cleaned with alcohol sponges. For further protection, 1:10 bleach solution is recommended to be left on the concave surface of the lens for 5 min then to be rinsed with water and then to be used once dried. In this way, anti-reflective coating of the lens might not be harmed. Various companies recommend glutaraldehyte 2% and 1:10 bleach solution as a disinfectant. Most of the lenses can be sterilized by gas. Some of them might also be autoclaved. On the other hand, it might also be thought that gonioscopy can be postponed during pandemia unless it is too necessary. Non-contact imaging modalities for anterior segment and the angle like OCT might be applicable instead of gonioscopy in those cases.

Pachymetry: During pandemia optical pachymetry is recommended instead of ultrasonic pachymeter. If ultrasonic pachymeter is going to be used, probe should be wiped with alcohol after each measurement same as described for contact tonometer.

Other Procedures: One should pay attention not to touch lenses, injectors, forcepses that were used during some office-based procedures like suture removal or adjustment, suturolysis, subconjunctival injection and not to contaminate surfaces during these procedures. Same recommendations for gonioscopy mentioned above might also apply to laser iridotomy and trabeculoplasty. Care should be taken to keep clean all areas that can possibly be contaminated right after the use of visual field and optical coherence tomography.

Urgent Glaucoma Surgical Procedures

As we all know, the whole world has gone through an

unprecedented period during the pandemic of COVID-19. This pandemic has affected all aspects of our daily life with far-reaching implications. Since hospitals and intensive care units (ICU) have been flooded during the pandemic, most of the hospitals have converted operating rooms, recovery rooms into ICU rooms well equipped with ventilators.

Because of these factors, practice of ophthalmic surgery like any other surgeries across the globe has totally changed. Surgeons have re-scheduled their surgeries based on the severity of threat to the patient's general health status and vision. During the epidemic, all elective surgeries have been cancelled and a need for emergency surgery have considered as a priority for admission. Thus, lots of professional medical societies have listed their surgical emergencies and risk-stratified their elective cases.

Table 1 shows the list of urgent and emergent surgical procedures for treatment of glaucoma or complications of glaucoma surgeries described by *American Academy of Ophthalmology and American Glaucoma Society.*[13]

Delivery of Glaucoma Care in the Postpandemic COVID19-era

In the postpandemic COVID19-era the way we deliver glaucoma care seems to be changed at least until the end of 2020. Telemedicine has become more and more popular during this period and probably is going to be. It might be used for some routine or postoperative follow-ups. For glaucoma eye care, telemedicine is particularly useful for assessment of anti-glaucoma-medication use and tolerance. On the other hand, any anterior segment pathology is actually difficult to address via telehealth unless the pathology is grossly obvious on external evaluation.

Previously, tele-ophthalmology was more reserved for rural areas. During this pandemic, everyone became remote and this made telehealth mainstream. On the other hand, it seems to keep its position in ophthalmology and glaucoma practice in the post-COVID19 era.

However, we all need to see our patients physically as well, so we need to modify the way we see our patients while trying to get back our normal life. We might start examination with questioning any history of sore throat, fever, fatigue, loss of smell and respiratory symptoms; and whether the patient has been in the presence of someone with known COVID19 in the last 2-14 days. If patient has a positive history of these symptoms and a close contact to a person with COVID19; he or she might be seen or operated later if the clinical situation is not urgent.[14]

Furthermore, medical treatments that our patients are using should be questioned and the importance of frequent hand washing before and after instilling anti-glaucoma drops should be reminded. We should keep paying attention to all precautions described above including barriers between physician and patients, personal protective equipments (PPEs) and all sterilization techniques for our and patient's safety.

Table 1. *List of urgent and emergent surgical procedures for treatment of glaucoma (American Academy of Ophthalmology)*[13]

Surgical Procedure	Indications
Closure of cyclodialysis cleft	Sight-threatening hypotony due to trauma
Examination under anesthesia	Pediatric patients with glaucoma
Filtration surgery (XEN45 gel stent)	Uncontrolled intraocular pressure that is sight-threatening who are poor candidates for trabeculectomy or aqueous tube shunts
Goniotomy ab externo or ab interno	Uncontrolled intraocular pressure that is sight-threatening
Insertion of drainage implant with or without graft	Catastrophic or rapidly progressive glaucoma
Removal of aqueous drainage implans	Endophthalmitis, corneal touch, corneal decompensation, or exposed plate
Synechiolysis	Lens-induced glaucoma or angle-closure glaucoma
Trabeculectomy with or without scarring	Catastrophic or rapidly progressive glaucoma and markedly elevated intraocular pressure, or uncontrolled secondary or primary glaucoma
Trabeculotomy	Uncontrolled intraocular pressure that is sight-threatening
Transscleral cyclophotocoagulation	Uncontrolled glaucoma or absolute glaucoma with a blind and painful eye
Vitrectomy	Misdirected aqueous, ciliary block glaucoma, malignant glaucoma or a tube shunt that blocks filtration
Washout of the anterior chamber	Hyphema that is sight-threatening

Furthermore, entry to the clinic, waiting areas and patient's flow should be arranged appropriately. Thus, we need to modify our daily schedule and working hours. Other than physical distancing and safety protocols; patient's appointments, staff and physician working schedule should definitely be modified in this critical period. Appointments should be scheduled as not to be so tight to avoid the accumulation of so many people in the waiting room. During the examination more than one people should not be allowed to be in the same room. Pre-surgical testing should include COVID19 serologic tests.

During the postoperative care of our patients, visits might be arranged not to be so frequent unless there is an indication to do that. In the MIGS era, it might be time for shifting towards less invasive procedures with less intensive postoperative care. Telemedicine might also have a role here. For a routine postoperative follow-up of cataract patient "without glaucoma" might be done using telemedicine to have more space and time for our risky cases, such as advanced glaucoma or patients with acute problems etc.

CONCLUSIONS

Starting with Dr Li, so many healthcare workers died during pandemic all over the world. For the safety of our patients, healthcare staff and us, we should strictly take these precautions recommended above. We may observe "teleophthalmology" finding a more permanent role in glaucoma practice in the near future.

Finally, we should not be discouraged by these challenges and should always think about the ways to address the needs of our patients and to preserve their vision as we always did. As we develop our new glaucoma care models, there is going to be a "new normal" after this pandemic for sure and we'll see how this will affect patient's and our lives in the following years.

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