Anterior Segment Surgery Performed During the COVID-19 Pandemic

Copyright 2021 by Beyoglu Eye Training and Research Hospital - Available online at www.bey oglueye.com

How to cite this article: Bektasoglu DL, Cakmak S, Kirgiz A, Kandemir Besek N, Kepezyildiz B, Taskapili M. Anterior Segment Surgery Performed During the COVID-19 Pandemic. Beyoglu Eye J 2021; 6(4): 257-261.

Address for correspondence: Damla Leman Bektasoglu, MD. Saglik Bilimleri Universitesi, Beyoglu Goz Egitim ve Arastirma Hastanesi, Goz Hastaliklari Bolumu, Istanbul, Turkey
Phone: +90 532 425 57 46 E-mail: bektasogldamla@gmail.com

Submitted Date: August 11, 2021 Accepted Date: October 31, 2021 Available Online Date: December 17, 2021

©Copyright 2021 by Beyoglu Eye Training and Research Hospital - Available online at www.beyoglu eye.com
OPEN ACCESS This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License.
hospitals. In addition, many ophthalmology clinics in Istanbul have been turned into COVID-19 clinics to provide an adequate number of beds for COVID-19 patients. Our clinic continued to work as a reference center during this period to perform emergency ophthalmologic surgeries in Istanbul.

During this extraordinary period when the whole world was caught unprepared, there were changes in our surgical approaches. Until then, there was no evidence-based guideline on an ophthalmic emergency case definition. The Turkish Ophthalmology Association (TOA) published a guideline on which ophthalmic surgeries should be considered as an urgent eye condition and which should be postponed (4). It is clear that it is not always easy to distinguish between emergency and elective cases in ophthalmology surgery (5, 6). Sometimes, the timing of surgery can affect the patient’s possible final visual acuity and risk of blindness (7, 8).

The aim of this study was to evaluate the anterior segment surgeries performed in our hospital in terms of etiology and surgical technique and to reveal the demographic characteristics of these cases during the period of restrictions due to the COVID-19 pandemic.

Methods

This retrospective study was conducted by reviewing the archive files of the surgeries performed in the anterior segment unit of our hospital between March 19, 2020, and June 1, 2020. Ethical approval was obtained from the ethics committee of the Health Sciences University (2021/3, 3/7), and the study followed the tenets of the Declaration of Helsinki. Preoperatively, a brief overview of the surgery was given, and written informed consent was obtained from all the cases.

During the lockdown period, our hospital continued to perform surgeries. A number of measures have been implemented to reduce the risk of contamination for health-care professionals and patients while ensuring the continuity of the service. All cases admitted to our clinic were evaluated in terms of fever, symptoms of upper respiratory tract infection, and contact with suspected or confirmed COVID-19 cases before the surgery.

Surgical preparations were initiated by deciding the urgency of the operations to be carried out in line with the TOA guideline (4). The patients were evaluated, and surgeries were performed under local or general anesthesia. Surgeries performed on the cornea, lens, sclera, anterior chamber, and conjunctiva were included in the study. Patients who underwent vitreoretinal procedures and glaucoma surgeries were excluded from the study.

The age and gender of the patients, the region they were referred from, whether they had been followed up in our hospital before, the number of centers they applied to, and the operations performed were recorded. Visual acuities of the patients were evaluated using the Snellen chart at the pre-operative and post-operative final control examination. Detailed biomicroscopic and fundus examinations were noted, and intraocular pressures (IOPs) were measured.

Statistical analysis was performed using SPSS version 22.0 (SPSS Inc., Chicago, Illinois, USA), and descriptive statistical methods were used in the analysis of the data. Descriptive analyses were represented as number, percentage, mean, and standard deviation for continuous variables, and number, percentage, median, and standard error for categorical variables.

Results

A total of 144 cases were included in the study, 49 women (34%) and 95 men (66%). The mean age of the patients was 31.30±25.88 (1–86) years. While the presenting complaint was in the right eye in 43.7% of the cases, it was in the left eye in 52.8% and in both eyes in 3.5% of the cases.

While 94.4% of all cases applied from Istanbul, the remaining 5.6% applied from outside the province. Whereas 43.7% of the cases consisted of the patients we had followed up previously, 56.3% presented to our hospital for the 1st time.

| Table 1. The diagnoses of the cases requiring surgery on March-June 2020 |
|---|---|---|
| Diagnoses | n  | %  |
| Corneal perforation | 26  | 18.1 |
| Keratitis | 19  | 13.2 |
| Intracorneal foreign body | 17  | 11.8 |
| Corneal suture after ocular surgery | 14  | 9.6 |
| Cataract | 10  | 6.9 |
| Corneal melting | 10  | 6.9 |
| Phacomorphic glaucoma | 10  | 6.9 |
| Persistent corneal epithelial defect | 9  | 6.3 |
| Scleral perforation | 6  | 4.2 |
| Conjunctival laceration | 4  | 2.8 |
| Loose sutures after PK | 3  | 2.1 |
| Wound dehiscence after PK | 2  | 1.4 |
| Granulation tissue of the conjunctiva | 2  | 1.4 |
| Suture exposure in scleral-fixated IOL implantation | 2  | 1.4 |
| Positive seidel test after ocular surgery, requiring corneal suturing | 2  | 1.4 |
| Anterior chamber dislocation of intraocular lens | 2  | 1.4 |
| Others (aphakia after lens removal, membranous conjunctivitis, iridodialysis, residual lens fragments on the anterior chamber, foreign body on the anterior chamber, giant papillae) | 6  | 4.2 |

PK: Penetrating keratoplasty; IOL: Intraocular lens.
time. Our hospital was the first referenced center in 39.6% of the cases, the second in 45.8%, the third in 11.1%, the fourth in 2.8%, and the fifth referenced center in 0.7%.

When evaluated in terms of etiology, corneal perforation (18.1%) was the most common followed by keratitis (13.2%) and intracorneal foreign body (11.8%). The diagnoses of the cases requiring surgery are shown in Table 1.

The most common (19.4%) surgical intervention was amniotic membrane transplantation (AMT), followed by perforation repair (16.7%), and phacoemulsification and intraocular lens implantation (13.8%), respectively. Surgical interventions performed are shown in Table 2.

### Discussion

The COVID-19 outbreak has changed not only the number of patients but also the nature of the surgeries performed in ophthalmology, as in many areas. In our hospital, arrangements were made for elective interventions in line with the TOA recommendations, and surgical interventions not included in the emergency category were postponed according to this guideline. However, as a result of the allocation of ophthalmology clinics to COVID-19 patients in many centers in Istanbul, an increase was observed in trauma patients referred to our clinic compared to previous periods.

In our center, several steps were taken to overcome the ongoing need for surgical intervention care during this epidemic period and to ensure that patients are examined and treated in a safe environment as possible. Each case was assessed for risk of visual loss and emergency. Operating room and emergency room teams working alternately were formed to prevent cross-contamination. Necessary applications were performed to provide environmental disinfection between operations performed on the same day.

The routes of transmission of COVID-19 are thought to include droplet, contact, and contaminated surfaces, as well as the ocular surface. Ophthalmologists are in the high-risk group in terms of transmission not only because they are in close proximity to patients during the examination, contact with conjunctiva and tears, but also because of the high daily number of outpatients and emergency patients (9, 10). Furthermore, studies suggest that virus particles can survive in droplets for a few hours and can survive on surfaces for several days (11). Therefore, to reduce human-to-human virus transmission in the struggle against the COVID-19 pandemic, national ophthalmology associations in many countries have recommended that any treatment other than emergency or urgent should be avoided. The frequencies and distributions of ophthalmological procedures performed during the pandemic have been discussed in the literature (1-3, 5, 6). However, as far as we know, there are no studies in the literature that evaluate epidemiologic and clinical features of a large patient series, as our patient series, during the lockdown period, and report anterior segment surgical interventions performed in Turkey.

In our study, when ophthalmic emergencies were examined in terms of etiology, corneal perforation was the most common by 18.1%. When the study conducted by Tang et al. (12) between February and April 2020 in a tertiary center in Hong Kong was evaluated in terms of anterior segment surgery, corneal perforation repair was the most common by 15.8%. Unlike the Tang et al. study, in which no evaluation was made in terms of etiology, in our study, corneal penetration was the most common etiology, but AMT was the most common procedure. The reason for this difference is that AMT was also applied in etiologies such as keratitis, spontaneous perforation, corneal melting, and persistent epithelial defect in our cases.

In a study in which all emergency ophthalmological surgeries were evaluated by Du et al. (6) in the period from December 2019 to March 2020, during which measures began to be taken after the first COVID-19 case, it was reported that the most common surgery was glaucoma surgery and eye traumas were rarely observed. The fact that our center

### Table 2. Anterior segment surgeries performed from March to June 2020

| Surgical interventions                                      | n  | %  |
|-------------------------------------------------------------|----|----|
| Amniotic membrane transplantation                            | 28 | 19.4|
| Perforation repair                                           | 24 | 16.7|
| Phacoemulsification with intraocular lens implantation       | 20 | 13.8|
| Removal of intracorneal foreign body                        | 17 | 11.8|
| Removal of loose corneal suture                             | 11 | 7.5 |
| Corneal suturing                                             |  5 | 3.5 |
| Intrastromal injection of the antibiotic agent              |  5 | 3.5 |
| Examination under general anesthesia                        |  5 | 3.5 |
| Penetrating keratoplasty                                     |  5 | 3.5 |
| Allogenic lenticule implantation for corneal perforation     |  4 | 2.8 |
| Conjunctival suturing                                        |  4 | 2.8 |
| Surgical repair of loose sutures with iwound separation after PK|  4 | 2.8 |
| Secondary IOL implantation                                  |  2 | 1.4 |
| Excision of conjunctival granuloma                           |  2 | 1.4 |
| Management of suture exposure in scleral-fixated IOL implantation|  2 | 1.4 |
| Others (reposition of IOL, removal of anterior chamber foreign body, lens frag-ment removal from the anterior chamber, supratarsal steroid injection, conjunctival membrane removal) |  6 | 4.2 |

PK: Penetrating keratoplasty; IOL: Intraocular lens.
is a tertiary branch hospital, the closure of ophthalmology departments due to COVID-19 in some of the other health institutions, and the high number of patients referred to our hospital within and outside the province are among the reasons for performing the high number of eye trauma surgeries during the quarantine period in our hospital.

Pediatric patients diagnosed with congenital cataracts, elderly and weak patients over the age of 70, and patients diagnosed with phacomorphic glaucoma constituted the group with phacoemulsification and intraocular lens implantation surgery performed in our clinic during this period. In ophthalmology practice, while the patient group undergoing elective surgery constituted the majority of the patient population undergoing cataract surgery, the reasons for not delaying surgery in these patients included the primary evaluation of pediatric patients due to the risk of amblyopia, uncontrollable IOP elevation due to phacomorphic glaucoma, and possible optic nerve destruction (7). In pediatric cataract cases, the timing of cataract surgery has significant effects on ultimate visual acuity, amblyopia management, and stereopsis (13, 14). In cases with phacomorphic glaucoma, phacoemulsification and IOL implantation are effective in improving visual acuity and in the control of IOP (15). Furthermore, in a study by Shih et al. (16) in which elective cataract surgery performed during the pandemic period was evaluated, it was reported that elective surgeries should continue even at low capacity in cases that may cause morbidity in phacomorphic glaucoma cases.

When the cases included in our study were examined in terms of the ranking of referral centers, it was observed that 61.4% of the cases were referred to our hospital after their application to two or more health institutions. In a study conducted by Al-Khersan et al. (17) in which emergency oculocutaneous surgeries performed between April 2019 and April 2020 were compared, it was reported that 36% of all patients who underwent ocular surgery were referred from an external center. Moreover, we considered that the reason 56.3% of the cases applied to our hospital for the 1st time was due to the closure of ophthalmology clinics of the surrounding centers.

This study has some limitations. First, this study has a retrospective design. Second, although the data were obtained from our center with the highest number of patients within the boundaries of Istanbul, they may not fully reflect the ophthalmology cases across the country. Furthermore, the results of this study may not completely apply to other countries in the world, where restrictions imposed during the quarantine period may differ.

The COVID-19 outbreak has significantly affected patient selection and surgical interventions in Turkey, our hospital, and all over the world. The number of surgical interventions performed in our hospital decreased significantly, and only emergency cases were intervened. Each patient was considered a potential carrier of COVID-19 and examined by taking necessary measures before and after surgery. While the first examination was performed in the isolation room in emergency cases known to have a positive COVID-19 test, maximum measures were taken to prevent contamination during and after surgery. While this period caused unique difficulties for patients and surgeons, we were able to provide safe surgical care for the patients in need with the arrangements we made in our hospital in accordance with the TOA recommendations.

**Conclusion**

During this quarantine period, while corneal perforation was the most common indication among ocular emergencies requiring surgery, AMT was the most performed intervention. The struggle against COVID-19 is still ongoing. Special arrangements are required to reduce the risk of transmission for health-care professionals and patients and to ensure continuity of health-care services for ophthalmology patients. New emergency treatment algorithms can be developed for similar situations that may occur in the future.

**Disclosures**

**Ethics Committee Approval:** Ethics committee of the Health Sciences University, Number of decisions 3/7, Registration number 21/10, Date: 22.01.2021.

**Peer-review:** Externally peer-reviewed.

**Conflict of Interest:** None declared.

**Authorship Contributions:** Involved in design and conduct of the study (AK, DLB, SC); preparation and review of the study (DLB, SC, AK, MT); data collection (DLB, SC); and statistical analysis (BKY, NKB, MT).

**References**

1. Sengupta S, Honavar SG, Sachdev MS, Sharma N, Kumar A, Ram J, et al. All India Ophthalmological Society–Indian Journal of Ophthalmology consensus statement on preferred practices during the COVID-19 pandemic. Indian J Ophthalmol 2020;68:711–24. [CrossRef]
2. Safadi K, Kruger JM, Chowers I, Solomon A, Amer R, Aweidah H, et al. Ophthalmology practice during the COVID-19 pandemic. BMJ open ophthalmology 2020;5:e000487. [CrossRef]
3. Lai TH, Tang EW, Chau SK, Fung KS, Li KK. Stepping up infection control measures in ophthalmology during the novel coronavirus outbreak: an experience from Hong Kong. Graefes Arch Clin Exp Ophthalmol 2020;258:1049–55. [CrossRef]
4. Turkish Ophthalmological Association, Turkey. Guideline of urgent ophthalmic surgeries 2020. Available at: https://koronavirus.todnet.org/pandemi-nedeni-ile-acil-kabul-edilen-gz-ameliyatlar. Accessed Apr, 2020.
5. Tognetto D, Pastore MR, De Giacinto C, Cecchini P, Agolini
R, Giglio R, et al. Managing ophthalmic practices in a referral emergency COVID-19 hospital in north-east Italy. Acta Ophthalmol 2020;98:1057–8. [CrossRef]
6. Du H, Zhang M, Zhang H, Sun X. Practical experience on emergency ophthalmic surgery during the prevalence of COVID-19. Graefes Arch Clin Exp Ophthalmol 2020;258:1831–3. [CrossRef]
7. Saxena R, Singh D, Jethani J, Sharma P, Sinha R, Sharma N, et al. Pediatric ophthalmology, strabismus and neuro-ophthalmology practice in the COVID-19 era: All India Ophthalmological Society guidelines. Indian J Ophthalmol 2020;68:1300–5. [CrossRef]
8. Beğendi D, Duranoğlu Y. Konjenital katarakt cerrahisinde temel prensipler ve göz içi lens seçimi. Turkiye Klinikleri J Ophthalmol 2018;27:218–30. [CrossRef]
9. Shah RD, Randleman JB, Grossniklaus HE. Spontaneous corneal clearing after Descemet's stripping without endothelial replacement. Ophthalmology 2012;119:256–60. [CrossRef]
10. Bozkurt B, Eğrilmez S, Şengör T, Yıldırım Ö, Irkeç M. The COVID-19 Pandemic: clinical information for ophthalmologists. Turk J Ophthalmol 2020;50:59–63. [CrossRef]
11. Van Doremalen N, Bushmaker T, Morris DH, Holbrook MG, Gamble A, Williamson BN, et al. Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. N Engl J Med 2020;382:1564–7. [CrossRef]
12. Tang EW, Wong DH, Chan YY, Li KK. Emergency ophthalmic surgeries during COVID-19—a Hong Kong perspective. Graefes Arch Clin Exp Ophthalmol 2020;258:2867–8. [CrossRef]
13. Kucuksumer Y, Utine CA, Perente I, Kevser MA, Yilmaz ÖF. Pediatric cataracts: our surgical approach. Turk J Ophthalmol 2006;36:118–24.
14. Atalay HT, Gülpinar İkiz GD. Factors Affecting the Visual Prognosis in Bilateral Infantile Cataracts. Journal of Glaucoma-Cataract 2019;14:200–6.
15. Lee SJ, Lee CK, Kim W-S. Long-term therapeutic efficacy of phacoemulsification with intraocular lens implantation in patients with phacomorphic glaucoma. J Cataract Refract Surg 2010;36:783–9. [CrossRef]
16. Shih KC, Wong JKW, Lai JSM, Chan JCH. The case for continuing elective cataract surgery during the COVID-19 pandemic. J Cataract Refract Surg 2020;46:921. [CrossRef]
17. Al-Khersan H, Kalavar MA, Tanenbaum R, Lazzarini TA, Patel NA, Yannuzzi NA, et al. Emergent ophthalmic surgical care at a tertiary referral center during the COVID-19 pandemic. American journal of ophthalmology 2021;222:368–72. [CrossRef]