

## Original Article

## The Impact of the COVID-19 Pandemic on Head and Neck Cancer Practice –A Tertiary Health Care Center Experience

### COVID-19 Pandemisi Sürecinin Baş Boyun Kanserleri Pratiğine Etkisi –Üçüncü Basamak Sağlık Merkezi Deneyimi

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#### ABSTRACT

**Introduction:** Coronavirus disease 2019 (COVID-19) has changed practice patterns of head and neck oncology services, as well as other service areas of health care. This study aims to describe the impact of COVID-19 on the services of the division of otorhinolaryngology, head and neck surgery at an academic tertiary referral hospital specialized in oncology. This is a single-center descriptive study conducted within the otorhinolaryngology department of a tertiary health care institution, which mainly provided service to oncological cases during the pandemic.

**Methods:** Data of cases over 18 years old on the numbers of outpatient visits, hospitalizations, otorhinolaryngological surgeries, and indications were obtained from March 1 to May 15 for 2019 and 2020 from hospital information management system. Data on preoperative test results of asymptomatic patients for COVID-19, going through for head and neck oncological surgeries were obtained from the same system.

**Results:** There is a decrease in the total number of outpatient visits in 2020 compared to 2019. (16814 vs. 7108, 57.7%). The numbers of hospitalizations and surgeries related to head and neck malignancies were increased despite the decrease in the total number of hospitalizations (278 vs. 129,  $p < 0.001$ ) and in the total number of surgeries (231 vs. 111,  $p < 0.001$ ). One of the 88 preoperative COVID-19 tests of asymptomatic patients was positive. No member of the staff got infected.

**Discussion and Conclusion:** Although there is a decrease in the number of patients in the 2020 period, the increase in the qualitative characteristics of the head and neck oncological procedures performed causes an increase in the difficulties / risks that health professionals face even though they do not work for pandemic services.

**Keywords:** Pandemics, Otolaryngology, COVID-19, Surgical Oncology, Health Care

#### ÖZET

**Giriş ve Amaç:** Koronavirüs hastalığı-2019 (COVID-19), sağlık hizmetinin diğer alanlarında olduğu gibi, baş ve boyun onkolojisi hizmetlerinin uygulama düzenlerini değiştirmiştir. Bu çalışma, COVID-19'un, onkolojide özelleşmiş üçüncü basamak bir akademik sağlık kurumunun Kulak Burun Boğaz, Baş ve Boyun Cerrahisi Bölümü hizmetleri üzerindeki etkisini açıklamayı amaçlamaktadır. Çalışmamız, pandemi sürecinde onkolojik olgulara hizmet veren üçüncü basamak bir sağlık kurumunun Kulak Burun Boğaz bölümünde yürütülen tek merkezli tanımlayıcı bir çalışmadır.

**Yöntem ve Gereçler:** Hastane bilgi yönetim sisteminden 2019 ve 2020 yıllarının 1 Mart-15 Mayıs tarihleri arasında 18 yaşından büyük olguların poliklinik başvurusu, hastaneye yatış ve kulak burun boğaz ameliyatları sayıları ile yatış ve ameliyat endikasyonlarına ilişkin veriler elde edildi. Baş ve boyun bölgesi onkolojik cerrahisi planlanan asemptomatik preoperatif hastaların COVID-19 test sonuçlarına ilişkin veriler aynı sistemden elde edildi.

**Bulgular:** 2020'de poliklinik başvurularının toplam sayısında 2019'a göre azalma saptandı. (16814'e 7108, %57.7). Toplam hastaneye yatış sayısı (278'e 129, p <0.001) ve toplam ameliyat sayısındaki (231'e 111, p <0.001) azalmaya rağmen, baş ve boyun kanserleri nedeniyle olan ameliyat ve hastaneye yatış sayıları arttı. Asemptomatik hastaların ameliyat öncesi 88 COVID-19 testinden biri pozitif. Bölüm personelinde enfekte olan kişi olmadı.

**Tartışma ve Sonuç:** 2020 döneminde hasta sayısında azalma olmakla birlikte baş ve boyun onkolojisine yönelik olarak uygulanan işlemlerin niteliksel özelliklerinde artış olması, sağlık profesyonellerinin pandemi hizmetleri için çalışmadığı durumlarda dahi karşı karşıya olduğu zorluk / risklerde artışa neden olmaktadır.

**Anahtar kelimeler:** Pandemi, otolaringoloji, COVID-19, Cerrahi Onkoloji, Sağlık hizmeti

## Introduction

Coronavirus Disease – 2019 (COVID – 19) is a global problem and named as a pandemic by the World Health Organization on March 11, 2020. Since the very first cases of the disease in China, it is compared to the SARS (Severe Acute Respiratory Syndrome) and the MERS (Middle East Respiratory Syndrome) pandemics but it was clearly seen that the world is facing to a much bigger problem affecting all medical, social and economic issues.

Pandemics are periods in which the emergency and compulsory services that constitute the basics of health services should be prioritized. After the first COVID – 19 cases were reported, it was recommended that all hospitals review their pandemics plans, and to stratify urgent, non-delayable, and elective cases for each branch [1]. Head and neck cancer related procedures are prioritized by otolaryngology departments across the world. Clinical experiences provided in pandemics periods are also very valuable in terms of regulation of health services. Otorhinolaryngology units, providing either outpatient or inpatient services, were the first line to be affected by this pandemic because of the transmission way of the disease[2]. In the multimedia era, which is a main component of globalization, both patients and healthcare workers were getting information more quickly than the spread of the disease and this situation changed some practice patterns [3].

Herein, we discuss the early effects of the COVID-19 pandemic on our otorhinolaryngology service practice. Our institution is specialized in oncology long before the pandemic. The primary objectives were to examine the quantitative changes in outpatient visits, hospitalizations, and performed surgeries over the first months of the virus's impact within Turkey, in comparison with the prior year, paying extra attention to head and neck cancers. Secondly, we analyzed trends of mentioned parameters in weekly changes.

## Materials and methods

### Setting

This was a retrospective, single-institution study conducted within the entirety of the department of otorhinolaryngology at a tertiary health care centerspecialized in oncology. The institution is an academic center that also includes community clinics. Cases requiring major surgeries are widely referred from all over the country, but also general otorhinolaryngological services provided to a city which has a population of near 6 million people. This study was approved by the Local Committee on Ethics (No. of meeting: 2021-01/937, January 13, 2021).

### Period and Data

The first COVID-19 case was reported on March 11, 2020, in the country but a change of practice patterns, and postpone of elective surgeries on patient demand was seen before

that. Elective surgeries were temporarily halted by March 17, 2020, after the formal letter from the Ministry of Health.

As the focus of the study was on COVID-19's impact on otorhinolaryngology services and especially head and neck cancers, we queried data of from March 1 to May 15, 2020 (the 2020 period). For a comparison group, we queried the corresponding period from the previous year—March 1 to May 15, 2019 (the 2019 period). Dates were grouped into weeks 1–11 for each period from March 1, every seven days consisting of a week.

All patients attending the department aged over 18 years old (all database population) was included to minimize potential sources of bias. With the approval of the Local Committee on Ethics, writers had access to the database of the hospital information management system (HIMS) for data of all patients consisting date, diagnosis, performed procedures, results of preoperative tests.

Number of all outpatient visits within the otorhinolaryngology division were obtained from the HIMS. Detail of indications (hospitalizations and surgeries) were obtained from HIMS database search with ICD-10 (International Classification of Disease) codes. Detailed data of performed surgeries were obtained by hospital information management system database search with Health Application Notification (HAN) codes. Data of surgeries were cross checked by departments operation registry book.

Hospitalizations were distributed to five major indication groups. The first group consists of patients with planned elective surgeries. The second group was hospitalizations before planned surgeries for head and neck cancers. The third group consists of patients who need hospitalization for advanced diagnostic procedures or biopsy (direct laryngoscopic examination, lymph node excision, imaging techniques requiring

inpatient evaluation before a procedure, etc.). The fourth group of patients was hospitalized for debridement or drainage of infections like a peritonsillar abscess, chronic osteomyelitis of the jaw after radiotherapy, etc. The fifth group of patients had otorhinolaryngological emergency conditions requiring medical or surgical treatment, like desaturation because of upper respiratory tract obstruction (common presenting symptom of head and neck cancers), post-tonsillectomy bleeding, or sudden sensorineural hearing loss.

Surgical procedures were distributed to four groups. The first three groups are the same as hospitalization groups. The fourth and fifth groups were combined for statistical purposes: surgeries for debridement and emergencies consist the fourth group.

Service providing specialists were general otorhinolaryngologists as subspecialties are not yet established in the country. All have at least 5 years of experience in head and neck surgery.

#### Statistical Analysis

Chi-square ( $\chi^2$ ) test was used to compare categorical data. Statistical analysis was performed via IBM SPSS for Windows version 26.0 and significance was set at  $p < 0.05$ .

#### Results

##### Outpatient services

Between March 1 and May 15, 2019; 16814 visits are completed within the otorhinolaryngology division. This was distributed to 14 providers: seven otolaryngologists (one professor, two associate professors, four specialists), four residents (all general practitioner, medical doctors), one speech and language pathologist, and two audiologists. In the COVID – 19 period (March 1 – May 15, 2020) 7108 outpatient visits were completed by the same providers. There is more than half

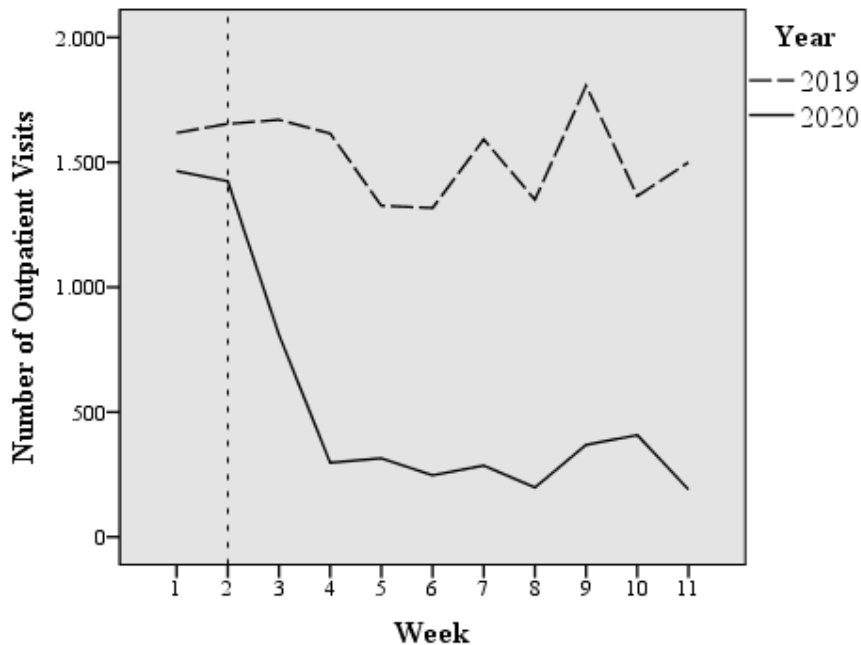


Figure 1. The weekly breakdown of completed outpatient visits in the 2019 and 2020 periods. Note that the first case was seen on March 11, 2020 (week 2, vertical dotted line).

decrease (57.7%) of closed outpatient visits (Figure 1).

#### Hospitalizations

Between March 1 and May 15, 278 patients were hospitalized in 2019. Between March 1 and May 15, 129 patients were hospitalized in 2020. On chi-square analysis, a smaller number of patients were hospitalized in 2020 period as compared with 2019 period. (129 vs 278,  $p < 0.001$ ). The decrease in the number of hospitalized patients is obviously seen on weekly basis (Figure 2). Distribution of hospitalization indications has also changed by the pandemic, mainly because of elective cases (Figure 3).

#### Surgical procedures and preoperative tests

Between March 1 and May 15, 231 otorhinolaryngological surgeries were performed in the operating room in 2019. Between March 1 and May 15, 111 otorhinolaryngological surgeries were performed in the operating room 2020. On chi-square analysis, there is a

significant decrease in the number of operations in 2020 as compared with the number of operations in 2019 (111 vs 231,  $p < 0.001$ ). This decrease can be seen in the weekly breakdown of surgeries (Figure 4).

Surgical indications were also changed. In 2019 most of the surgeries were elective (71.9%), whereas surgeries for malignancies take the first place (40.5%) in 2020 (Figure 5).

The most common surgical procedure in the 2020 period was a major head and neck cancer surgery: 14 neck dissections of eight patients (five total laryngectomy + bilateral neck dissection, two hemiglossectomy + unilateral neck dissection, one lower lip midline carcinoma excision + bilateral anterolateral neck dissection) were performed. Also, one patient had neck dissection within the COMMANDO Procedure (COMBined MAndibulectomy and Neck Dissection Operation) and pectoralis major muscle skin flap repair. Another patient with oral cavity (gingiva-mandible) carcinoma diagnosed just

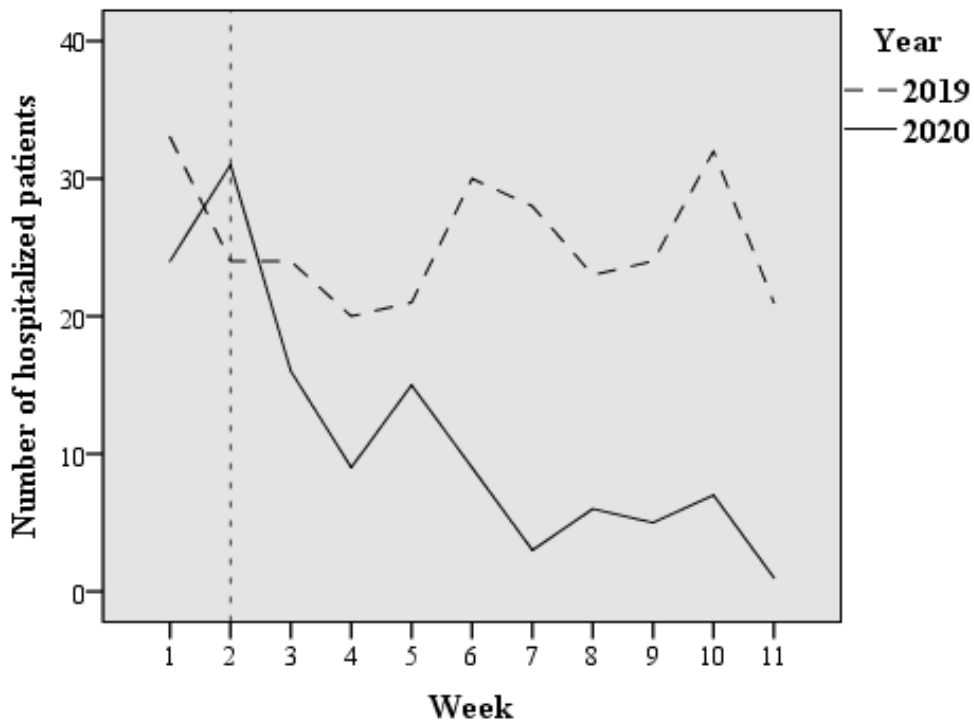


Figure 2. The weekly breakdown of hospitalizations in the 2019 and 2020 periods. Note that the first case was seen on March 11, 2020 (week 2, vertical dotted line).

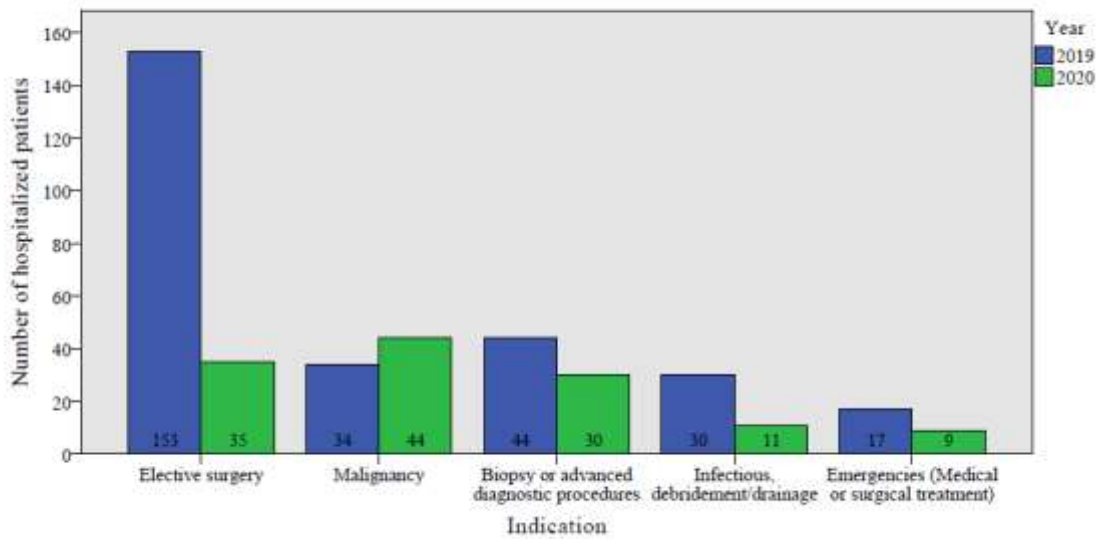


Figure 3. Distribution of hospitalization indications in the 2019 and 2020 periods.

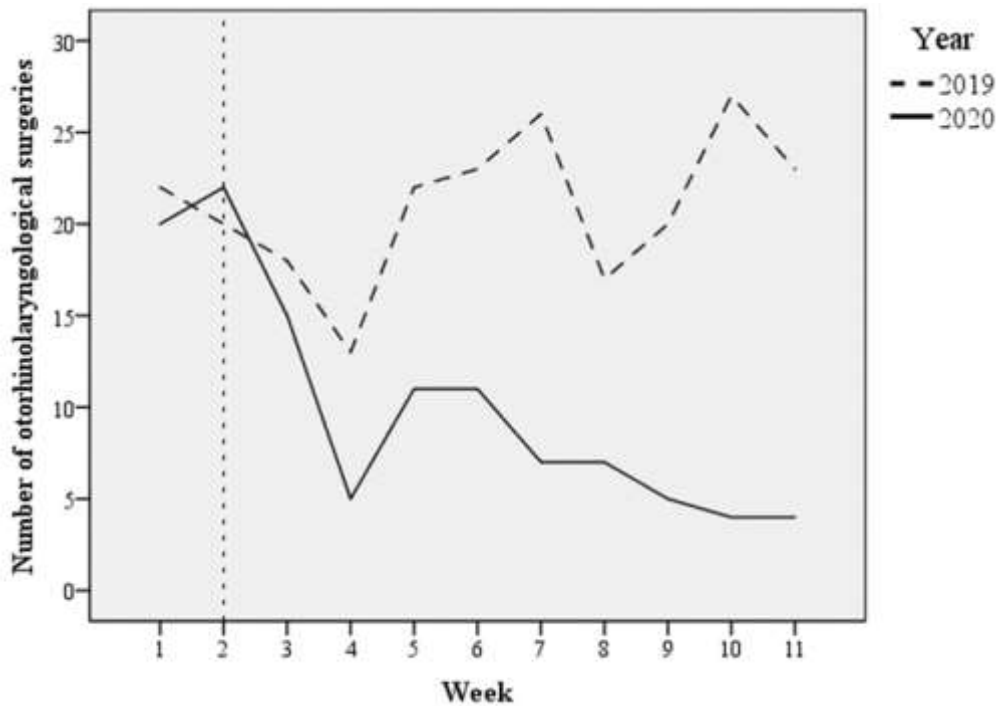


Figure 4. The weekly breakdown of otorhinolaryngological surgeries performed in the operating room in 2019 and 2020. Note that the first case was seen on March 11, 2020 (week 2, vertical dotted line).

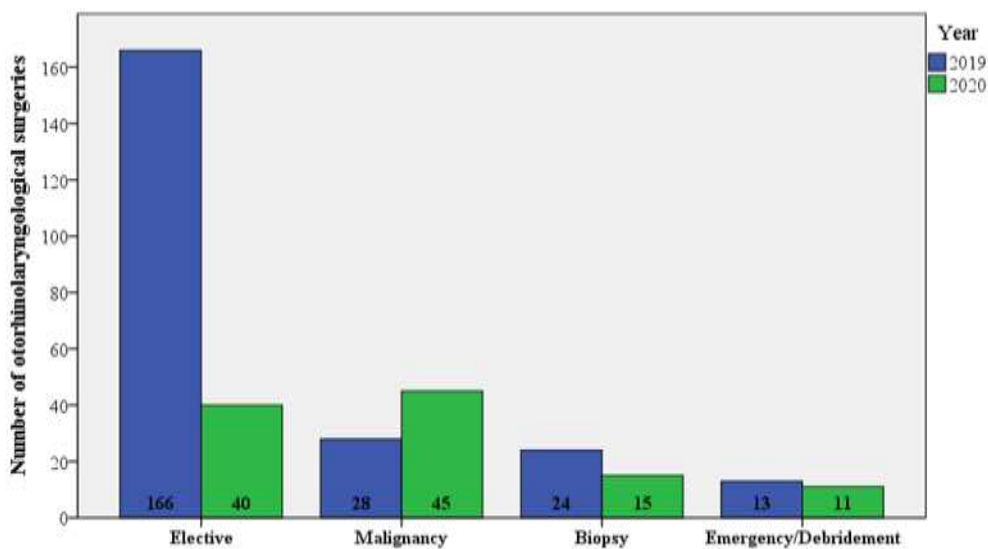


Figure 5. Distribution of indications for surgery in the 2019 and 2020 periods. 40 elective surgeries were performed between March 1 and March 17, 2020

before the outbreak, 10 years after tongue carcinoma treatment on the same side, had lateral segmental mandibulectomy for tumor resection and pectoralis major muscle skin flap repair.

The second most common surgical procedure in the 2020 period was direct laryngoscopy and laryngeal biopsy of 11 patients with suspected malignancy. Two of them had a tracheotomy in the same session. Besides, one

patient with respiratory distress and one patient with prolonged intubation received a tracheotomy.

Total laryngectomy for five patients, partial / hemiglossectomy due to tongue carcinoma (+/-neck dissection) for four patients was performed in the 2020 period. Other surgeries include resection and repair of facial skin cancers, debridement of invasive fungal rhinosinusitis in the same period.

To protect staff and to ensure continuity of healthcare, preoperative polymerase chain reaction (PCR) testing for COVID-19 was provided for asymptomatic head and neck cancer patients by the ninth week of the 2020 period, after discussion with the institutional COVID-19 committee. Samples for PCR tests were collected by nasopharyngeal/ oropharyngeal combined swabs. A total number of 12 PCR tests were performed, 1 resulted positive. The staff members involved with the patient were isolated at home with symptom monitoring, all had PCR tests done on the fifth day, all results were negative. After the start of the "normalization period" (June 1, 2020), to July 29, 2020, an additional number of 76 PCR tests were performed and all resulted negative. The latter 76 test were performed in consistency with the recommendation of the Ministry of Health, for patients with planned undelayable major surgeries.

## Discussion

The COVID – 19 pandemics has changed the structure of health care globally and continues to do so with every piece of knowledge obtained about it [4]. Using different platforms, physicians are trying to get information about each other's practices to give the best decisions about the model of service, sometimes requiring new methods for sharing updated knowledge [5]. The knowledge about the virus, ways of treatment, and protection is updating and characteristics involving otorhinolaryngology are widely

discussed[6] but we have to put this information into practice.

An outbreak period caused by an aerosol-borne disease, people with flu-like symptoms are stratified as "high-risk patients"[7]. This group of patients constitutes an important part of otorhinolaryngology outpatient visits. Another important problem is that COVID-19 cases can be asymptomatic at a rate of 5-80%[8]. Therefore, high risk is not only limited to pandemic outpatient services but also directly related to the nature of the examinations or procedures performed. In all units of the department performing outpatient otolaryngological services, personal protective equipment (PPE) consist of N95/FFP2 mask plus surgical mask, goggles/ visor, bonnet, double gloves and disposable gowns recommended by local association of otorhinolaryngology head and neck surgery [9] are routinely used for procedures described as "close contact" by the "COVID-19 Advisory Committee of Ministry of Health of Turkey".

During the 2020 period, the number of outpatient visits is decreased as expected and observed in pandemics [4,10,11]. This may be both from the reduction of appointments and hesitation of patients to go to a hospital building during the outbreak. Despite the dramatic decrease compared to the year before, an average of 120 outpatient visits per day are completed, mainly for head and neck cancers. Although for the first days we had some organizational issues, we did not face any shortage of appropriate PPE recommended by national or international guidelines [9,12]. If the PPE mentioned above fits the healthcare worker properly, hypercapnia and associated symptoms develop after a while. This situation during the outpatient service causes additional strain, breaks between visits should be maintained. Transparent booths for patient examination were used when appropriate. Other valuable precautions to ensure the protection of staff is

flexible working order which also prevented cross-contamination and screening of all patients who were asked to wear surgical masks before the visit. All patients were screened for COVID-19 by measuring body temperatures without contact and filling the inquiry form prepared by the Ministry of Health, even if they are asymptomatic. If any patient has susceptible signs or symptoms, referral to the pandemic outpatient clinic is provided. As no member of the staff got infected during the period, these precautions seem to be protective for the outpatient clinic staff.

Most hospitalizations were for surgical purposes both in the 2019 and 2020 periods. The most prominent cause in the dramatic decreases in the number of hospitalized patients and in the number of otorhinolaryngological surgeries was the reduction of elective indications. These are common findings for pandemics [10,13]. By the fourth week of the 2020 period, there is a slight increase in the number of hospitalizations and surgeries. With a decision of the provincial health directorate, COVID-19 positive patients were cohorted to other specified hospitals in the city, and cases from those hospitals referred to our institution for major otorhinolaryngological surgeries, most of which are head and neck cancer. So, as a difference from other institutions' experiences [14], there was an increase in the number of surgeries for malignancies in the 2020 period. This caused extra effort of the staff with mentioned PPE but in the end, patients received appropriate treatment on time with no extra complications.

Our oncological practice also changed by the pandemic. As COVID -19 causes increased mortality in post-operative period[15], some head and neck carcinoma cases were referred to Radiotherapy Department directly instead of performing surgery, if the expected treatment success rate is close for each option.

Surgical treatment of squamous cell cancers of head and neck is recommended to continue in the pandemic period if postponing causes progression in the stage of the disease or results more aggressive approach [16]. Head and neck cancer operations involve upper aerodigestive tract surgery, causing extra aerosol production which increases the risk of viral exposure. A significant proportion of patients may be asymptomatic so temperature measurements and symptom inquiries may not work for these cases. After transnasal surgery of an asymptomatic case from China, over 14 health care workers have reported being infected [17]. Since the normalization period has started on June 1, 2020, even asymptomatic cases are having PCR tests before major surgeries in our institution, after the recommendations of the national advisory board. Appropriate filtration of the case with the isolation of the health care workers involved to the case may save money and health by performing preoperative PCR testing of asymptomatic patients. But in our experience (from March 1, 2020, to July 29, 2020), a total number of 88 preoperative PCR tests for asymptomatic patients were performed, one resulted positive. No member of the otolaryngology operating room staff developed symptoms or had positive PCR test results up to July 29, 2020. More researches should be done on the concept of preoperative PCR testing, as we are performing surgeries with the mentioned PPE even the PCR test is negative.

As mentioned before appropriate use of PPE by the entire otorhinolaryngological service providing team is very important, even with negative PCR results. We did not use powered air-purifying respirator (PAPR) or disposable overalls for patients with undetermined COVID-19 status. Performing major otorhinolaryngological surgeries with overalls + PAPR for hours may be an extra physical burden to the surgeon besides the costs.



Research should be conducted on this issue.

Because of the feature of the hospital mentioned above, we have no findings to present on proven COVID-19 positive cases. Another limitation of the study is the lack of telemedicine data which is still a matter of debate for some otorhinolaryngological services.

### Conclusion

In the current study, the COVID-19 outbreak experience of a tertiary otorhinolaryngology head and neck surgery department is

explained. In general, the number of patients by terms of outpatient visits, hospitalizations, and performed surgeries are reduced but the qualitative features of the procedures performed are increased, mainly as a result of the increase in head and neck malignancy related procedures. Because of these changes in practice patterns, the difficulties/risks that otorhinolaryngology healthcare professionals are facing are increased in the 2020 period compared to the 2019 period.

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Doi: 10.5505/aot.2021.46762