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EDITORIAL

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Staying ahead of the curve: Early lessons from a New York City Otolaryngology Department's organizational response to the coronavirus pandemic

1 | SCOPE OF THE PROBLEM

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), or the etiologic organism behind the coronavirus disease 2019 (COVID-19) pandemic, has infected over 2 700 000 patients globally and caused over 188 000 deaths worldwide as of April 25, 2020.[1] It has caused trillions of dollars in economic damage and has disrupted daily life and hospital operations considerably. Herein we present our early logistical experience as it pertains to the Department of Otolaryngology—Head and Neck Surgery in a large hospital system within New York City, the current American epicenter of the pandemic.

2 | CESSATION OF NONURGENT CASES, REMAINING CLINICAL ACTIVITIES, AND THE ROLE OF TELEMEDICINE

Early in the course of our hospital system's response, a decision was made by department leadership to cease nonurgent surgical cases as well as routine in-person outpatient visits. "Urgent" clinical problems requiring operative intervention or in-person visitation included new or known malignancies, high-risk cerebrospinal fluid leaks, active infections, acute airway events, sudden sensorineural hearing loss, intractable and disabling vertigo, and upper aerodigestive tract bleeding. Treatment of all benign pathology was postponed except in cases of severe functional compromise (eg, massive goiter with severe compressive symptoms). The vast majority of postoperative visits were also postponed unless there was a clear need to be seen. This required close coordination among the attending physicians, medical assistants, and surgical schedulers. Anecdotally, patients were very understanding and expressed a desire to avoid coming to the hospital unnecessarily.

While urgent cases were still being performed, a skeleton crew of otolaryngology residents was available to assist intraoperatively and postoperatively. All inpatient consults were screened by a senior resident by phone to determine the level of urgency and to provide recommendations on a case-by-case basis. In order to avoid coronavirus exposures for clinical staff, aerosol-generating procedures such as nasal endoscopy and laryngoscopy were avoided unless there was a strong indication. Indicated procedures were performed with appropriate personal protective equipment, and any consults that could be adequately managed as an outpatient were deferred. This policy was clearly communicated to health system leadership including the emergency departments, medical, surgical, and pediatric services, and the chief medical officer.

Clinicians were encouraged to make use of telemedicine visits available through the electronic medical record platform as opposed to conventional telephone calls to better engage in patient care and to generate increased revenue for equivalent work. The Centers for Medicare and Medicaid Services[2,3] have recently released guidelines demonstrating increased flexibility in this respect. Patients requiring in-person visits were seen, and only necessary staff were present.

3 | OPERATING ROOM PRECAUTIONS

When feasible, all surgical patients underwent preoperative coronavirus testing in the 48 h leading up to their procedures. Due to low positive rates of 30% to 60%[4,5] for reverse-transcriptase polymerase chain reaction (RT-PCR) at initial presentation and low concordance between initial RT-PCR results and chest computed tomography,[4] initial policy had been to require two negative tests preoperatively to minimize the chance of false negatives. However, due to the shortage of testing kits, this was unachievable. Our latest preoperative screening policy includes one negative COVID-19 test, pulse oximetry the morning of surgery, and a chest X-ray as needed to maximize the sensitivity of detection. During all aerosol-generating procedures, appropriate PPE is worn. Noncritical staff remain outside the operating room during intubation and extubation. Rapid sequence intubation and paralytics are used in coordination with the Department of Anesthesiology; patients are also extubated relatively "deep" to avoid coughing. Awake intubations are avoided except when absolutely necessary.

4 | DIDACTICS AND TELECONFERENCING

While many of our clinical staff have been deployed throughout the system, we have made a concerted effort to address resident education via videoconferencing and daily lectures. These live lectures are also recorded and available for later viewing. All faculty and departmental staff meetings are conducted via the same teleconferencing platform as our didactic program to be in compliance with social distancing protocols. We have further made efforts to address relevant educational content related to COVID-19 during the pandemic. For example, we created a multidisciplinary system-wide grand rounds on COVID-19 airway management and had another grand rounds with invited speakers from intensive care and otolaryngology from the University of Verona, Italy.

5 | DIFFICULT AIRWAY RESPONSE TEAM

Prior to the pandemic, our hospital system had recently implemented a difficult airway response team (DART), which consisted of either an intensivist or Emergency Department physician, an anesthesiologist, and otolaryngologist. In light of the pandemic, a concerted effort was made to more clearly define roles and the relative hierarchy of the team, and to have the most senior staff members available for airway management. As a result, an attending otolaryngologist was available on premises at all times to assist. The purpose of defining roles and a chain of command was to minimize unnecessary disease exposure by having the most experienced clinicians performing airway interventions and to preserve PPE as much as possible.

6 | POLICIES REGARDING TRACHEOSTOMY

With 9.8% to 15.2% of COVID patients requiring prolonged invasive mechanical ventilation,[6-10] it is of critical importance to establish early guidelines with respect to performing elective tracheostomy, as risks to the healthcare team may be significant.[11,12] Our departmental policies regarding tracheostomy are consistent with those of the New York Head and Neck Society (NYHNS), which recently released comprehensive guidelines on the matter.[13] When feasible, we generally advocate delaying elective tracheostomy until 21 days after symptom onset to balance the risk of laryngotracheal stenosis with the higher viral loads present during the acute phase of the infection.[13-15] In addition, in the SARS-1 literature, mean time from disease onset to death was 23.7 days, providing little incentive to perform tracheostomy before this timeframe.[11,16] Patients with poor prognoses with imminent risk of death are also considered to be poor candidates for elective tracheostomy; we recommend consulting with the involved medical teams, the patient's family, and relevant hospital ethics committees as appropriate. Relevant procedural considerations for performing tracheostomy can be found in the NYHNS position paper[13] as well as in several other sources.[7,12,17]

7 | SEQUESTERING URGENT NON-COVID SURGICAL PATIENTS

As the COVID-19 pandemic has stressed our hospital system immensely and caused thousands of procedure cancelations, there remains an obvious need to address critical surgical pathology that if left untreated for even a few weeks, may cause deleterious effects. New York Eye and Ear Infirmary of Mount Sinai, a primarily ambulatory specialty hospital with 69 beds, has stepped up to become a surgical hospital for urgent procedures of various types on COVID-negative patients. Otolaryngology, ophthalmology, urology, general surgery, and gynecologic oncology will make up the bulk of the surgical services. The rationale behind this transition is to limit cross-contamination with other sites and to avoid transmission of the virus between vulnerable populations and clinicians.

General workflow includes approval of the surgical case by a clinical oversight committee ideally >7 days prior to the anticipated date of surgery, with subsequent review by the anesthesia team for appropriateness and the equipment committee to determine needs. COVID-19 testing is completed within 48 hours of surgery, and if pulse oximetry measures <95% on room air, the clinical team determines the need for chest X-ray. If the COVID-19 test is positive, the procedure is postponed and the patient does not enter the facility. Repeat testing is performed 7 to 10 days later, and the case is rescheduled when the result is negative. If the COVID-19 test is negative, the patient arrives on the day of surgery via a distant negative-pressure entrance, screened for symptoms and by pulse oximetry, and the decision as to whether to perform chest X-ray is made. If there is no clinical suspicion for COVID-19 infection, the patient is cleared to proceed. When admitted to the inpatient floor postoperatively, the patient undergoes repeat COVID-19 testing every 48 hours. If the patient converts to positive, they are masked, placed in a negative pressure room, and transferred to a COVID-capable affiliate hospital through a designated exit. The patient room is then thoroughly decontaminated. All staff are also to be carefully screened daily; anyone with concerning symptoms or pulse oximetry <95% will be screened and isolated until COVID-19 results are available.

8 | REDEPLOYMENT AND REPURPOSING OF STAFF

With an early decree by New York Governor Cuomo to drastically increase hospital capacity and with increased availability of clinical otolaryngology staff, the department was proactive in deploying its physicians to critical areas of need within the health system to offload the burden on intensivists, internal medicine, and emergency department staff. At Mount Sinai West, the department completely staffed an internal medicine ward of exclusively coronavirus patients; teams consisted of both attending and resident otolaryngologists, and consultation with a medicine hospitalist or intensivist was readily available. At Elmhurst Hospital, our New York City Health and Hospitals Corporation affiliate and training site, our otolaryngology residents led the charge in creating and staffing an overflow intensive care unit at the epicenter of the outbreak.

Many of us continue to work outside of our "comfort zones," with great attention toward humility and minimization of the classical hierarchy.

Outside of deployment, a pod system for otolaryngology services was developed for the residents to maximize the number of healthy team members and to be able to call in reserves. A given pod consisted of one senior and a few junior residents, and would work 1 week on, 1 week off at a given site (resources permitting). This system also allowed for team members to volunteer/redeploy on their "off" weeks.

9 | LOOKING FORWARD

As the acute needs of the hospital system dwindle, we seek to rep atriate our staff into their native roles and resume elective procedures in a measured way. This will depend on declining COVID-19-related admissions systemwide, widespread and rapid patient testing, and systematic antibody testing of staff to determine the presence of potential immunity. Additional data are needed with respect to the safety of resuming aerosol-generating procedures to make an informed decision as to when normal clinical activity may resume.

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