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Brief Opinion

Practical Challenges of Mask-to-Mask Encounters with Patients with Head and Neck Cancers amid the Coronavirus Disease 2019 Pandemic

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Abstract

The coronavirus disease 2019 (COVID-19) pandemic has forced a re-design of care in radiation oncology. Perhaps more than any other disease site we commonly see, the evaluation and treatment of head and neck cancer has posed the greatest risk of COVID-19 transmission between patients and radiotherapy providers. In our early experience with the novel coronavirus, several staff members were exposed to a COVID-positive patient and this caused us to devise policies and procedures to mitigate further risk in a way that could practically be employed across a large health system while not compromising care delivery. Here, we formulate a concise summary of simple steps, including a novel thermoplastic mask fitting technique and procedures for intraoral immobilization devices, to guide practices and provide new layers of protection for both patients and staff.

Introduction

The severe acute respiratory syndrome coronavirus disease-2 (ie, coronavirus disease 2019 [COVID-19]) pandemic is straining health care systems and placing a disproportionate risk of morbidity and mortality on patients with active cancer.[1] The safety of health care workers is of paramount importance during this time, both to preserve their well-being and to ensure uninterrupted delivery of vital services to patients. Of the myriad challenges unique to radiation oncology practices at this time, the management of patients with head and neck cancer (HNC) requires special attention. The care of patients with HNC involves an in-depth examination of the upper aerodigestive tract (where aerosolization of COVID-19 is possible), immobilization devices that require hands-on manipulation of the head and neck (sometimes with intraoral treatment devices) on a daily basis, and a long treatment course, during which an initially COVID-negative patient may become exposed and even infected with COVID-19. These factors and more must be considered in a patient population where cough, shortness of breath, sore throat, and fatigue are common symptoms, where radiation is typically given with immunosuppressive systemic agents, and where

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treatment typically may not be delayed while waiting for pandemic-related constraints to subside.[2]

It has been very challenging to redesign care (almost overnight) for our patients with HNC. Although we have done our best to be proactive, we have been unable to predict and prepare for all the potential failure modes of our standard workflows. Most health care systems have implemented surgical mask policies for patients and health care workers, that is, surgical masks are to be worn at all times by both parties when in the hospital. Incorporation of the surgical mask policy into our standard workflows and interactions with patients with HNC has been difficult. In our early experience with the pandemic, a small group of staff was exposed to a patient who had unexpectedly later tested positive for COVID-19. Briefly, this patient required that an Aquaplast mask be made at simulation. Before this event, we allowed the surgical mask to be removed during an in-office physical examination, simulation, and treatment. This patient tested positive for COVID-19 within 24 hours of the simulation, resulting in the quarantine of several of our radiation oncology staff. The quarantine recommendation was primarily made on the fact that the patient's surgical mask was removed during simulation, despite our staff wearing a surgical mask concurrently.

This experience prompted us to modify our risk-reduction policies in a way that could be deployed immediately across a large health system that delivers radiation therapy at sites across the state, which range from a large academic center to small and medium regional hospitals. The guiding principal of these new policies is that *all* face-to-face encounters between providers and patients are performed with both parties wearing masks ("mask-to-mask" encounters). The mask-to-mask policy poses unique challenges in the care of patients with HNC, for which we have devised several solutions. Here, we present a formulation of practical changes we have made in our clinical practices for the management of HNC patients during the COVID-19 pandemic.

Physical Examination

Physical examination is a key diagnostic study in the management of patients with HNC. We administer a questionnaire that screens for fever or new and worsening symptoms of cough, sore throat, shortness of breath, loss of taste or smell, or vomiting/diarrhea in anyone entering the facility. Patients with a positive screen may require formal testing for COVID-19, whereas those with a negative screen require further evaluation, including physical examination conducted with physical distancing. However, physical distancing is not possible when conducting a proper head and neck examination, and the transoral examination and in-office nasopharyngolaryngoscopy place the examiner and others in the room at substantial risk of exposure/infection. If a patient coughs or sneezes during the examination, COVID-19 can become aerosolized. Nasal decongestion and anesthetization before fiberoptic examination is also an aerosolization procedure. The American Academy of Otolaryngology has recommended that all upper airway procedures should be done with personal protective equipment (PPE) (eg, N95 mask, gown, eye shield, and gloves).[3] We have avoided the use of fiberoptic nasopharyngolaryngoscopy in most cases (except where it is essential for management) because it is an aerosol-generating procedure that requires the use of valuable fitted respirator masks and other PPE.[4] Similarly, we have eliminated the use of manual examination of the oral cavity and tongue depressors in the vast majority of cases, as this does not comply with the mask-to-mask policy (ie, the patient has to remove his/her surgical mask). Our ENT colleagues don an N95 mask and eye shield when conducting transoral examinations and full PPE when scoping patients. We rely on their documentation of the physical examination, including a discussion of endoscopic findings, and ideally, a review of its video recording. The value of additional information gained by a clinical examination over that which is obtained by cross-sectional imaging alone must be weighed against the risks of a clinical examination. For example, determining the extent of soft palate invasion from a primary tonsil cancer is an important determinant of radiation therapy fields, and might only be fully assessed by a comprehensive physical and radiographic examination. Should we deem it necessary to do a transoral or fiberoptic examination, we also don the appropriate PPE (following our ENT colleagues). But in general, we defer these additional examinations. Finally, it is important to ensure that the safety measures described previously do not hamper the delivery of cancer care, and there are many factors to consider when weighing the risks and benefits of an abbreviated physical examination. Specifically for human papillomavirus–associated oropharyngeal cancers, there are data suggesting that the clinical examination is of limited utility and that patient-reported symptoms may be a more valuable measure.[5]

Telehealth for the In-office Visit

On March 17, 2020, nationwide coverage for visits performed via telephone- or video-based medical encounters (ie, telehealth or telemedicine) was expanded by the Centers for Medicare and Medicaid Services (CMS).[6] Telehealth is not a new method of health care delivery, but the expansion of Medicare coverage will probably accelerate adoption of it to improve health care access for Americans while they practice physical distancing. With the recent Centers for Medicare and Medicaid Services

Figure 1 A woman with SCC of the left tonsil treated with chemoradiation over 10 years ago presented with a new primary human papillomavirus–positive SCC of the right tonsil with soft palate invasion. The left image was taken in the office during a face-to-face encounter prior to the arrival of the coronavirus disease 2019 pandemic in our state. The patient began induction chemotherapy and after two cycles had an excellent treatment response. During this time, the mask-to-mask policy was developed, and the patient returned for a combined in-person and video-based visit, where the image on the right was obtained with the patient in an isolated exam room. *Abbreviation*: SCC = Squamous cell carcinoma.

regulatory changes, we have pivoted to conducting the majority of consults and follow-up visits in the telehealth setting with the patient in their home. We have also developed a process for the telehealth assessment of patients who are seen in office for their follow-up, consult, or weekly on-treatment visits. A mask-to-mask discussion is performed in the clinic room when evaluating the patient, and this allows the provider to perform a directed physical examination, including neck palpation and evaluation of most cranial nerves, without removal of the mask. When examination requires removal of the patient's mask, typically to allow a transoral examination, the encounter can proceed with the provider(s) using a video connection outside the room (Fig 1). It is worth emphasizing that only a cursory physical examination is possible with telehealth, and although a video visit may permit an assessment of oral candidiasis, general dental health, or tumor response, it cannot replace the mask-to-mask interaction.

In our early experience, we have found several additional benefits to using telehealth for in-office visits. First, this practice may allow medical students to continue to participate in patient care at a time when there are several COVID-19–related educational restrictions. Second, many patients appreciate the additional effort being placed on minimizing their direct contact with health care workers and are satisfied to know that a provider can enter the room for a mask-to-mask interaction at the patient's discretion. Third, most telehealth platforms allow additional providers to seamlessly join the interaction, which has lowered some barriers to multidisciplinary encounters (eg, a joint discussion with the patient's medical oncologist). And finally, on-treatment visits are well-suited for telehealth because an audiovisual connection can be maintained throughout the day in one or more of the clinic's examination rooms, through which multiple providers can interact with the patient semiremotely.

Figure 2 CT simulation where a TM is fitted to a patient wearing a personal protective mask. A point of the TM in the region of the nose and mouth is held prior to the TM being lowered onto the patient's face. By retracting the TM while it hardens, the patient's protective mask stays dry and comfortable around the nose and mouth. The region extending anteriorly can then be cut away after simulation. *Abbreviations:* CT = computed tomography; TM = thermoplastic mask.

CT Simulation

Mask-to-mask policy during simulation

In accord with the mask-to-mask policy described for patient office visits, we devised our CT simulation procedures so that no staff member is in the room with an unmasked patient. Patients and providers enter the CT simulation suite with both parties wearing personal protective masks. The patient is prepared for immobilization with a thermoplastic mask (TM), and then special immobilization devices (addressed in more detail to follow) are created if needed. The heated TM is placed over the patient's head and neck while a provider holds a single point on the TM in the region of the patient's mouth. Holding this point at approximately 6 inches above the patient while the mask is lowered will create a circular retraction in the TM as it hardens, which allows

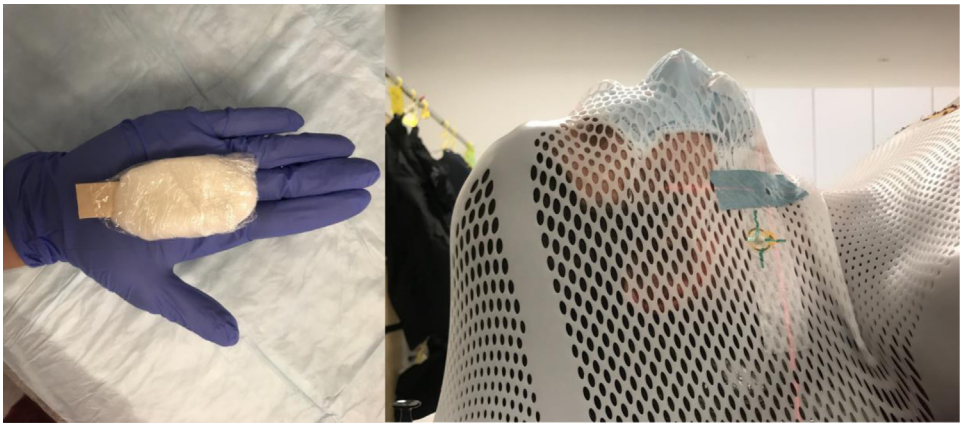

Figure 3 A tongue depressor with a custom thermoplastic-bead mouthpiece ("popsicle stick") was created for a patient with HNSCC of the soft palate. The patient's personal mask required removal during CT simulation, but the distal end of the tongue depressor was removed so that all future uses could be done according to the mask-on policy. The patient was trained to insert the device and then replace the personal protective mask prior to RTTs entering the room and immobilizing the patient with the TM. The mouthpiece may then be removed by the patient following treatment, cleaned, wrapped in cellophane, and stored in a sealed biohazard bag until the next fraction's use. *Abbreviations:* CT = computed tomography; HNSCC = head and neck squamous cell carcinoma; RTT = radiation therapist; TM = thermoplastic mask.

the patient to be comfortably immobilized without their personal protective mask becoming wet as it tightens around their nose and mouth (Fig 2). For patients wearing an ear-loop surgical mask, placing tape over the strings reduces sticking between the TM and the personal protective mask. After CT simulation, the retracted portion of the TM can be cut away (a small modification that is not expected to affect immobilization). When the simulation is complete and the TM is being removed, either a provider or the patient can hold the personal protective mask in place so that it is not removed along with the TM. An alternative method used by some of our other clinic locations is to use an open-faced TM and place a nonstick barrier between the TM and surgical mask during the TM-making process.

Treatment Procedures

Patient setup and special immobilization devices

The mask-to-mask policy during CT simulation applies similarly to daily radiation treatments of HNC patients. That is, every effort is made to maintain that the patient and providers' personal protective masks are in place when sharing the same airspace. The treatment of HNC patients often requires the use of customized dental guards, bite blocks, or tongue depressors, and therefore a patient's protective mask must be removed for insertion of these; this challenges the mask-to-mask policy. However, patients may be reliably trained to insert their own intraoral device and replace their protective mask while RTTs are outside the treatment area, which maintains the mask-to-mask policy and minimizes patient–provider interaction during a potentially aerosol-generating procedure (Fig 3). Still, if the creation or daily use of intraoral immobilization devices requires a hands-on interaction with a provider, we recommend use of full PPE for that provider, including fitted respirator mask, gown, eye protection, and gloves that are disposed of after each use.

Conclusions

The effect of the COVID-19 pandemic on radiation oncology practices is without precedent, and it is difficult to predict what its near- and long-term outcome will mean for cancer care. Patients with HNC pose unique challenges, even among cancer patients, in the COVID-19 era owing to the prolonged treatment duration, inability to delay radiation for an extended period of time, and the heightened risks posed to health care workers. Many unanswered questions remain, such as how long to wait between a patient removing his or her mask and staff entering the room, how best to sterilize a telehealth console being used by a patient, what would be the optimal way to clean and store intraoral devices, when to test or retest patients before or during treatment, and how an increased availability of rapid testing for COVID-19 infection and immunity might augment these policies. The mask-to-mask policy and several simple procedural modifications represent early steps to reduce the risk of viral transmission, and as more is learned regarding COVID-19, additional guidance can be given to inform best practices.

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