



Strategic use of obturator prostheses for the rehabilitation of oral cancer patients during the COVID-19 pandemic

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Abstract

During the current pandemic scenario, maxillofacial rehabilitation specialists involved with supportive care in cancer must transform its practice to cope with COVID-19 and improve protocols that could quickly return the oral function of complex cancer patients who cannot wait for surgical complex rehabilitation. This includes the role of the maxillofacial prosthodontist for the rehabilitation of surgically treated patients with maxillary cancers by the means of filling obturator prostheses that are considered an optimal scientific-based strategy to reduce hospital stay with excellent pain control, oral function (speech, swallowing, mastication, and facial esthetics), psychologic and quality of life outcomes for the patients following intraoral cancer resection. Therefore, the aim of this commentary was to bring new lights to the strategic use of obturator prostheses for the rehabilitation of oral cancer patients during the COVID-19 pandemic as well as to present a protocol for managing such cases.

Keywords COVID-19 · Oral cancer · Rehabilitation · Obturator prosthesis

From the initial identification of the novel coronavirus 2019 disease (COVID-19) passing through the World Health Organization (WHO) recognition as a pandemic to the current chaotic world scenario, specialists discuss criteria for prioritizing surgical treatment for head and neck aggressive malignant tumors [1–3]. Several head and neck surgery services

have prioritized less complex surgical procedures, avoiding longer surgical time for tumor resections and microsurgical reconstructions aiming to reduce the exposure of the patients and team members to the risk of contagion [4]. These decisions were also based on the need for reducing the period of hospitalization and on the fact that microsurgical reconstructions often require long-standing patient monitoring in intensive care units, which may not be currently available due to the pandemic.

In this scenario, when the medical teams consider the surgical procedure unavoidable (weighing the risks of contamination of the patient/team and prognosis of the oncological disease), the multidisciplinary teams must be involved to allow the best possible results. This includes the role of the maxillofacial prosthodontist for the rehabilitation of surgically treated patients with maxillary cancers by the means of filling obturator prostheses that are considered an optimal scientific-based strategy to reduce hospital stay with excellent pain control, reestablishment of oral function (speech, swallowing, mastication, and facial esthetics), and the improvement of psychological and quality of life outcomes for the patients following intraoral cancer resection (Fig. 1) [5–7].

The strategic use of obturator prostheses for the rehabilitation of oral cancer patients has the potential to reduce the professional burden of head and neck surgical oncology staff

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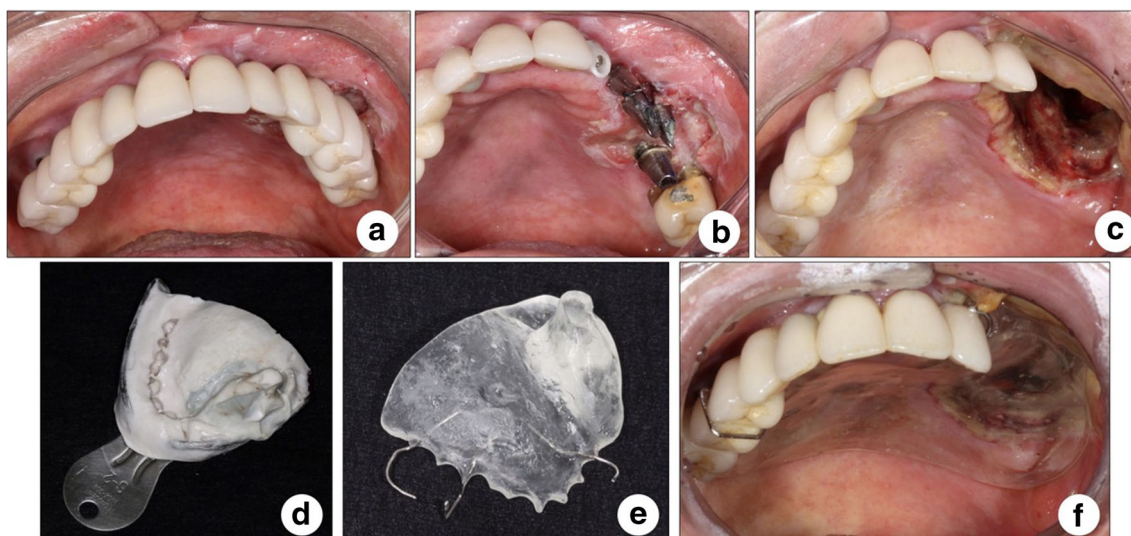


Fig. 1 Step-by-step procedure for fabricating immediate obturator. **a** Initial clinical aspect. Note the cancer lesion under the prosthetic reconstruction on the left side of maxilla. **b** Cement-retained multiple implant crowns were removed before partial maxillectomy. **c** Postoperative aspect 3 days after surgery showing the oronasal communication. Note that the crown of tooth no. 22 was re-cemented before impression. **d** Conventional impression with irreversible hydrocolloid

(Cavex Colorchange Type 1; Cavex Holland BV, The Netherlands) after the individualization of the stock tray by using polysiloxane impression material (Zetaplus, Zhermack SpA, Italy). **e** Immediate obturator was fabricated with autopolymerizing acrylic resin and stainless steel clips. **f** Prosthesis in position. No escape of fluids was observed and speech was restored satisfactorily

member during the COVID-19 pandemic. Potential benefits include a reduction in the number of patients' visits by the surgeons because of improved control of pain and oral infections and decreased risk of bacteremia. Also, the reestablishment of oral function immediately following wide surgical resections will help the patient's nutritional status and weight maintenance. In addition, the protocol allows for a prompt surgical recover and hospital discharge. Our team observed a similar number of obturators for oral cancer patients when comparing this same period of time (March to June) between the years 2019 and 2020, 8 versus 6, respectively; however, the number of microsurgical reconstructions dropped from 7 to 0 cases in this same period of time between 2019 and 2020. This may be considered an additional evidence for the fact that the use of obturator prostheses for oral cancer patients improves not only the overall quality of life of patients but also the professional workflow of head and neck surgical oncology teams.

In addition, the protocol proposed in this commentary allows for a prompt surgical recovery and hospital discharge. Our team confirmed a similar number of delivered obturators for oral cancer patients between March and June of 2019 and 2020, 8 versus 6, respectively. However, the number of microsurgical reconstructions dropped from 7 to 0 cases in this same period of time. This may be considered an additional evidence that the use of obturator prostheses for oral cancer patients improves not only the overall quality of life of patients but also the professional workflow of the head and neck surgical oncology teams.

In our center, the prosthodontic rehabilitation of oral cancer patients is divided into three phases, as follows:

1. Immediate surgical obturation: impressions by using arbitrary extended trays and altered casts are obtained before surgery, and the prosthesis is placed during surgical procedure and packed by using circum-zygomatic wires, when necessary
2. Delayed surgical obturation: impressions of the defect are generally performed at ≈ 7 days after surgery and prosthesis is fabricated with an obturator by using a non-altered working cast
3. Definitive obturation: involves definitive prostheses after 3 to 4 months post surgically or 6 to 12 months after radiotherapy

Table 1 and Fig. 2 summarize the impact of the COVID-19 pandemic in the workflow of the fabrication of obturator prostheses for the rehabilitation of oral cancer patients.

Following the guidelines to avoid unnecessary consultations, molding for the fabrication of the surgical obturator prosthesis must be performed at the same time of hospitalization, followed by intraoperative installation. In order to reduce follow-up for necessary adjustments, a relines or an impression and installation of a new prosthesis (interim obturator) must be performed on the day of hospital discharge—reducing the ideal time of this phase transition from 7 days to approximately 3 days [10]. Obviously, this is a desirable outcome during the pandemic of COVID-19. In addition, such procedure will

Table 1 Differences between traditional versus COVID-19 workflow for obturator prostheses

	Traditional workflow (≈ days/local)	COVID-19 workflow (≈ days/local)
Consultations and molding for surgical obturator prosthesis fabrication	At least 7 days before surgery/dental clinic	1 day before surgery/surgical admission at the hospital
Installation of surgical obturator prosthesis	During the surgery/operative room	During the surgery/operative room
New impression and installation of interim obturator prosthesis	7 days after the surgery/dental clinic	3 days after the surgery or at the day of hospital discharge/surgical admission at the hospital
First control consultation of interim obturator prosthesis	14 days after the surgery/dental clinic	10 days after the surgery/video or telephone calls
Second control consultation of interim obturator prosthesis	21 days after the surgery/dental clinic	23 days after the surgery/dental clinic

ensure a longer period of time until the need for a replacement or relining of the prosthesis. Also, with these protective measures, telephone calls, and, mainly, video calls are considered reliable strategies for patients’ guidance and functional assessments [11]. When consultation is unavoidable, breaks in appointments are allowed for proper time of environment disinfection between patients. Of importance is the education of the

patient to arrive at the scheduled time, minimizing long waiting. Whenever possible, the patient’s family member or carer should not enter the dental office.

The COVID-19 pandemic presented time-sensitive challenges and urgent issues that require developing new and rapid solutions as alternatives to routine standard evidence-based protocols which require substantial time and interactions

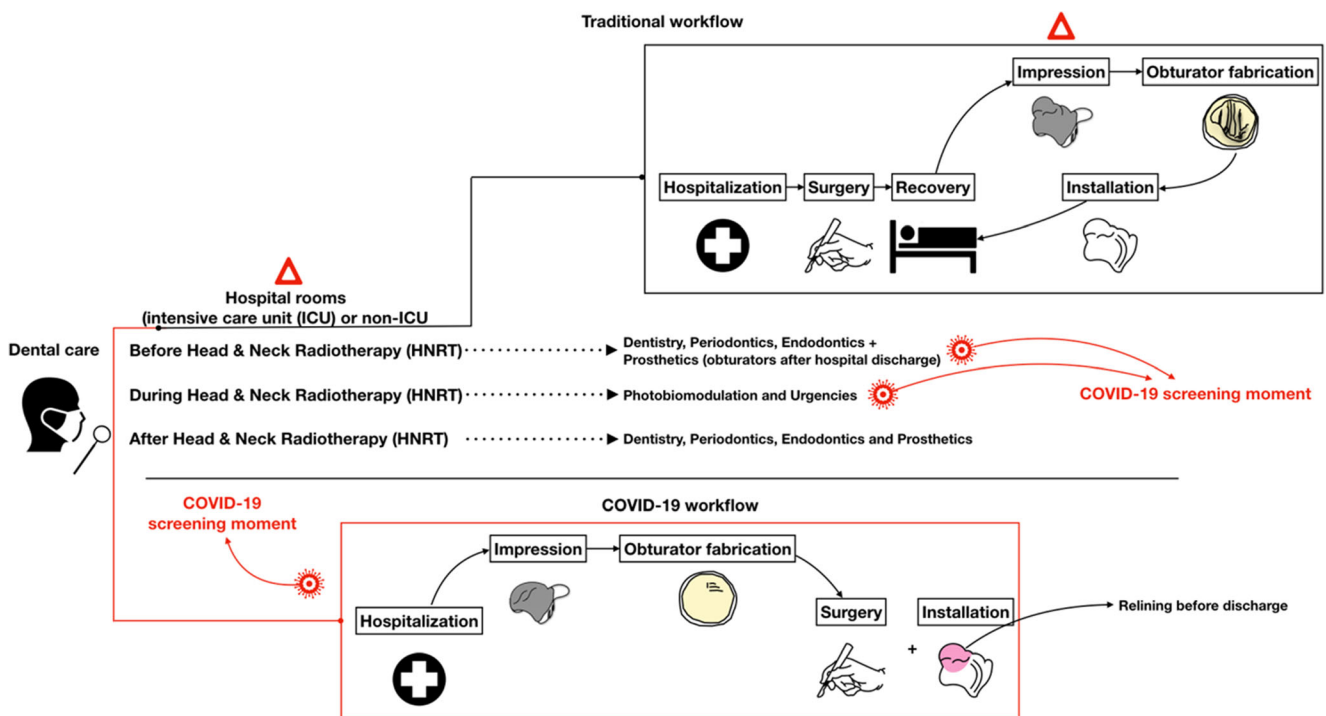


Fig. 2 Traditional versus COVID-19 workflow for obturator prostheses. Note the differences in the sequence for fabricating obturator prostheses between both scenarios. In the COVID-19 pandemic, a symbiosis between phases 1 and 2 of the traditional prosthetic treatment for patients subjected to maxillectomies is suggested whereas the impression will be conducted when the patient is admitted to the hospital for surgery preparation, and prosthesis will be installed at surgical procedure without packing, and it will be relined before patient’s discharge. Such workflow will provide a short hospitalization period and delay the return of the patient to dental ambulatory because the bulb part of the obturator prosthesis may improve the restoration of oral functioning (speech and

swallowing, for example) for a prolonged period. Besides, this strategy may turn available hospital rooms, reduce PPE intake and the demand for health professionals similar to other rehabilitation approaches [8]. The present figure also illustrates the hospitalization burden of the COVID-19 pandemic, in which tertiary hospitals had to implement new strategies of care in order to reduce the PPE intake and hospital resources, support the high demand for IUC beds, and also to prevent COVID-19 dissemination and infection of patients and health professionals [8, 9]. Observe that the proposed workflow for obturator prostheses is not inserted in the well-known situations for COVID-19 contagion (Δ) and screening moments, reducing the risk of health professional infection

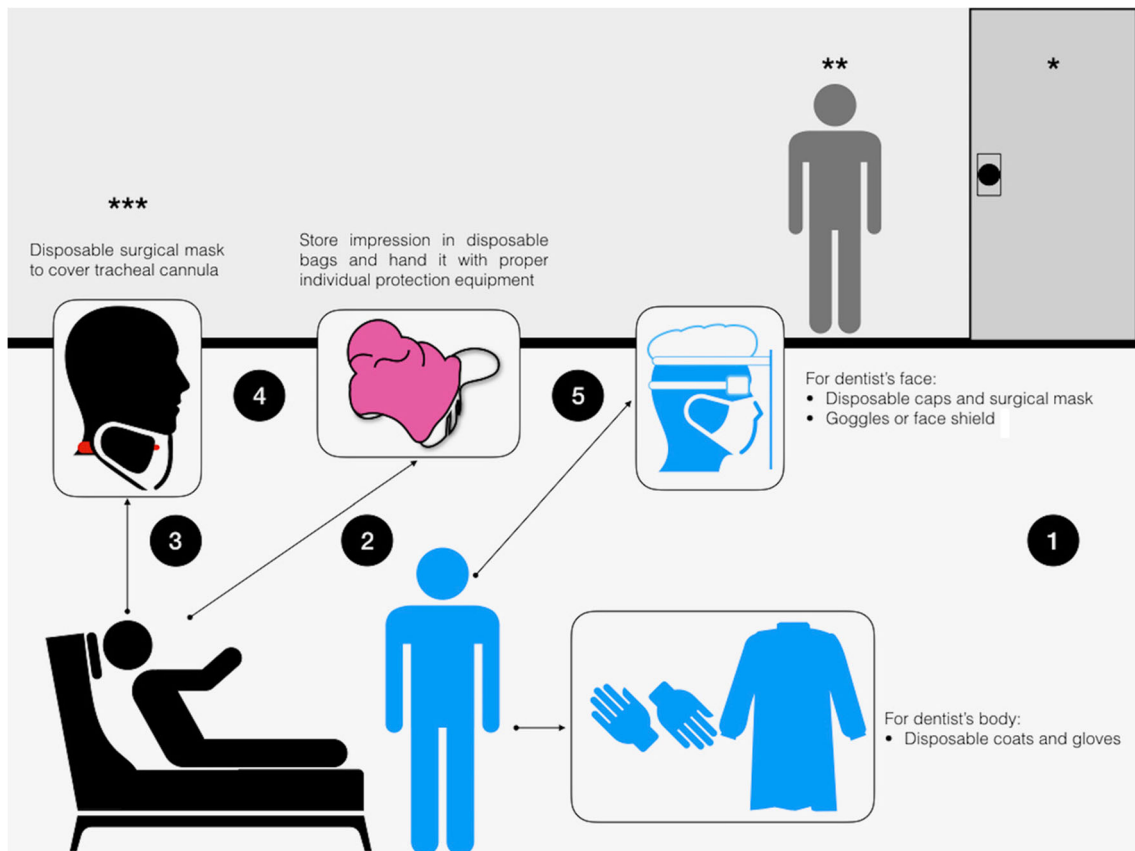


Fig. 3 Scheme summarizing all information presented herein to deliver obturators for patients with maxillectomy defects for three main situations: (1) before surgical procedure (phase 1 of the prosthetic treatment), (2) when dentists are requested after the surgical removal of the tumor and/or after hospital discharge (phase 2). *The door of the hospital room should be closed with low pressure inside in cases of COVID-19 suspicion or confirmation. If a low-pressure hospital room is not possible, one way to provide airflow should be provided (the door or window should be opened), minding to not put other individuals in risk of infection. Otherwise, the procedure should be performed in a better moment. **If possible, the patient's family member or carer should not enter the

hospital room. ***Patients with advanced tumor stages may be subjected to neck dissection with protective tracheostomy in complementation to solid tumor removal. They often develop cough and a considerable quantity of secretive content, which can be a significant infection route. Therefore, their tracheal cannula should be covered with a disposable surgical mask. Professionals should sanitize their hands with water and soap or alcohol gel (1) before patient examination, (2) before dental procedures, (3) after touching the patient, (4) after touching equipment without disinfection, and (5) after touching the oral mucosa or body fluids [14].

between provider and patient. Therefore, the dissemination of this information to health care professionals worldwide can help prevent COVID-19 dissemination. Dentists can be exposed to all common routes for COVID-19 infection on a single dental appointment (aerosols and droplets, contact with materials, dental sharp instruments, or contaminated surfaces) [2], even when a procedure is finished, due to the long period that pathogenic microorganisms remain suspended in the air [12, 13].

Facing a pandemic scenario, maxillofacial rehabilitation specialists involved in supportive care in cancer must adapt dental practice to allow for continuation of care of patients infected with COVID-19 who require prosthodontic appliances. Alternative and improved protocols such as the one described above could help patients with complex cases to quickly return to normal function, without the need to delay

surgery of complex cancer cases. By strategically altering the prosthodontic rehabilitation protocol, patients can receive necessary cancer care and avoid the need to go through long hospitalization, frequent follow-up visits for obturator adjustments, and still maintain adequate oral function and trauma control [14]. As an integral part of the described protocol, proper COVID-19 professional protective equipment (PPE) use (disposable working cap, isolation gown, goggles or face shield, disposable N95 mask, and disposable gloves, among others) is a must. Hand-washing techniques (water and soap or $\approx 70\%$ alcohol gel) must be consistent with World Health Organization protocols designed for health care workers [2].

To facilitate the visualization of the protocol described in the commentary, we present a workflow suggestion based on our experience developed in three different cancer care

reference centers covering from public to private facilities in São Paulo, Brazil (Fig. 3).

Data availability Not applicable.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Code availability Not applicable.

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