

Clinical and surgical management of Head and Neck cancer patients

Laura Tricarico, MD¹

¹Università Cattolica del Sacro Cuore, Largo

April 29, 2020

Abstract

Introduction For the ENT surgeon there are many challenges that show-up in the clinical management of a patient affected by a Head and Neck cancer during COVID-19 pandemic, especially in the postoperative period. **Methods** During the acute COVID-19 emergency phase in Italy, we analysed the management of a patient affected by a Head and Neck cancer. We reported several clinical data about the hospitalization period, pointing out the difficulties encountered both from clinical and management point of view. **Results** During pandemic, we admitted 27 oncological patients at our ENT department. Delays in surgical procedures, complications of hospitalizations, need for radiological studies and possible transfer to other hospital ward, due to suspect Sars-CoV-2 infection, were registered. **Conclusions** The changes in the whole health care system during the COVID-19 pandemic have impacted the management of head and neck cancer patients, generating several clinical challenges for the ENT surgeon.

Jacopo Galli^{1,2} MD, Stefano Settimi²MD, Laura Tricarico² MD, Giovanni Almadori^{1,2} MD, Gaetano Paludetti^{1,2}MD

Short title

Head and neck oncology issues during COVID-19 pandemic

Affiliation

¹ Otorhinolaryngology and Head & Neck Surgery Unit, Fondazione Policlinico Universitario “A.Gemelli” IRCCS, Rome, Italy

² Università Cattolica del Sacro Cuore, Rome, Italy

Corresponding author

Dr. Laura Tricarico, Head and Neck Department, Università Cattolica del Sacro Cuore, Largo F. Vito 1, 00168 - Rome, Italy. Tel. +393888981885. E-mail: lauratricarico90bis@gmail.com.

ABSTRACT

Introduction

For the ENT surgeon there are many challenges that show-up in the clinical management of a patient affected by a Head and Neck cancer during COVID-19 pandemic, especially in the postoperative period.

Methods

During the acute COVID-19 emergency phase in Italy, we analysed the management of a patient affected by a Head and Neck cancer. We reported several clinical data about the hospitalization period, pointing out the difficulties encountered both from clinical and management point of view.

Results

During pandemic, we admitted 27 oncological patients at our ENT department. Delays in surgical procedures, complications of hospitalizations, need for radiological studies and possible transfer to other hospital ward, due to suspect Sars-CoV-2 infection, were registered.

Conclusions

The changes in the whole health care system during the COVID-19 pandemic have impacted the management of head and neck cancer patients, generating several clinical challenges for the ENT surgeon.

INTRODUCTION

The COVID-19 pandemic in Italy has affected the entire national health service, by imposing the clinicians to adopt new security measures for out- and inpatients, and a re-organization of the clinical and surgical procedures in almost all the hospitals. The ENT surgeon represents one of the most exposed figures of the pandemic scenario, due to its field of action that includes the upper aerodigestive tract with high-risk procedures for COVID-19 transmission, such as endoscopic examination or aerodigestive surgery, including tracheostomy^{1,2}. At our Institution, “A. Gemelli” Hospital Foundation – IRCCS, immediate measures have been taken to reduce transmission of virus and to protect patients and providers. A neighboring building affiliated to our Institution was primarily dedicated to COVID patients care but it quickly got full, thus requiring more resources to our Foundation. All the outpatient clinics were therefore closed, reducing the activities to those strictly necessary, such as emergencies and indispensable admissions only for oncologic patients. In this setting, health care providers take part to the first cohort of infected patients and the equilibrium between the clinician mission to care for patients and the duty to protect them is fragile. Moreover, ethical issues are hard testing the efficacy of this revised system of health care in the distribution of resources among the needs of populations and the needs of individuals, leading to unavoidably treatment delays, sometimes dangerous especially for cancer patients³. Alongside these fundamental issues, for the ENT surgeon there are other challenges that show-up in the clinical management of a patient affected by a Head and Neck cancer, once admitted in the Clinic. This kind of patients, in fact, usually presents old age and several comorbidities, including cardiac disease, chronic pulmonary disease, peripheral vascular disease, diabetes, previous cancer history and other factors that could be confounding in the era of coronavirus pneumonia^{4,5}. Moreover, in several surgical oncologic procedures, a new permanent or temporary tracheostomy is required, increasing the risk of very dangerous aerosol generating condition in case of unexpected concomitant coronavirus infection.

^{6,7}. The post-operative period management of these patients, already rich of pitfalls for the clinician, could be characterized also by cardiovascular and respiratory complications, thus requiring complex differential diagnosis with COVID-related conditions, in a setting of poor resources in the field of radiology and pneumology. With this manuscript, our aim was to highlight the challenges encountered during the hospitalization of oncologic patients at our ENT Clinic, both from clinical and management point of view, during the pandemic in a COVID-19 dedicated center.

METHODS

Setting and population

During the most acute COVID-19 emergency phase, from 8 March 2020 to 20 April 2020, we prospectively collected data from patients admitted to ENT department of Fondazione Policlinico Universitario “A. Gemelli”, in Rome (Italy). As a result of new restrictions imposed by the health emergency and infectious risk, hospitalization at ENT department was permitted strictly for patients suffering from head-neck cancer, assessed by a multidisciplinary team (MDT) and candidate for an appropriate surgical therapy. The MDT in our practice is composed by several specialists⁸: head and neck surgeon, radiation oncologist, medical oncologist, neuroradiologist, supportive and palliative care specialist, speech language pathologist, nutritionist, dentist, who during COVID-19 pandemic, can meet only in a virtual conference room with an associated tele-conference line. Remote participants were able to join via on-line platform, observing eventual imaging reproduced during the conference and discussing the post-operative care. For non-emergency patients or patients with benign head and neck tumors, the in-hospital treatment was postponed according to national

and regional authorities' indications.

Admission during COVID-19 pandemic

Before the hospitalization, each patient underwent a pre-operative anesthesiological evaluation, consisting of global medical history collection, patient's parameters observation including body temperature, complete blood count, ECG and chest x-ray examination or chest CT scan when it was necessary. Although asymptomatic, each patient underwent the COVID-19 RT-PCR swab test, a real-time reverse transcription polymerase chain reaction (rRT-PCR) test for the qualitative detection of nucleic acid from SARS-CoV-2, through nasopharyngeal (NP) and oropharyngeal (OP) swab ⁹. Only in case of negative result to the COVID-19 test and confirmed eligibility for surgery at the anesthesiological evaluation, patients were admitted to the head and neck inpatient clinic. Body temperature was screened again at the entrance by the nurses, who used secondary protective measures by means of personal protective equipment (PPE) for routine patient evaluation. We defined "appropriate PPE" as the use of standard-of-care procedure-specific PPE for patients who are confirmed to be negative for COVID-19. Otherwise, in case of positive result to the COVID-19 test, the institutional guidelines stated that surgery should be performed in a dedicated operating room and the post-operative hospitalization should continue in COVID-reserved Department. Only one visitor for patient was allowed in the time interval between 06.00 and 07.00 pm and, in any case, with due regard for safety distances and wearing PPE. The purpose of these measures was to control population flow in the department area and to reduce the number of cross-infections.

Post-operative procedures

Before the epidemic of new coronavirus infection, once the surgical and anesthesiological procedure was over, the patients were usually transferred to the recovery room to continue the post-operative assistance. To avoid overcrowding of multiple patients, during the COVID-19 emergency phase, the single patient was monitored in the post-operative period in a reserved room adjacent to the operating room, under the supervision of the anesthesiology specialist and then was transferred at the ENT inpatient clinic. During the post-operative stay, all patients were assisted at ENT department using special precaution for patients with temporary or permanent tracheostomy, considering the heightened risk of viral transmission ¹⁰. On the basis of the definitive histological examination, all oncological clinical cases were newly discussed by the weekly virtual multidisciplinary tumor board to define the eventual adjuvant therapy plan and the follow up procedures.

Data collection and clinical management

We prospectively collected data from oncologic patients admitted at our ENT department during COVID-19 pandemic, and in particular: demographics, oncologic diagnosis, comorbidities, number of NP and OP swab test performed, surgical procedures performed, presence of tracheostomy, length of hospitalization, complications of surgery and hospitalization, radiological studies, possible transfer to other hospital ward.

RESULTS

Cancer statistics

During pandemic, we admitted 27 oncological patients at our ENT department, who all underwent head and neck surgery. Mean age was 67,2 and M:F= 3,3:1. Most frequent comorbidities were: chronic obstructive pulmonary disease (18.5%), idiopathic hypertension (77.7%), type 2 diabetes (25.9%), heart failure (Class. NYHA II – III) (14.8%), chronic kidney disease (11.1%) and Gastro-Esophageal Reflux Disease (62.9%). All the patients were negative at the first COVID-19 swab. About the oncological diagnosis and procedures: 4/27 patients (14.8%) were affected by oral cavity cancer and underwent surgical resection of the tumor; in three cases we performed an immediate reconstructive surgery with local or microvascular free flap. Five out of 27 patients (18.5%) were affected by laryngeal cancer and underwent laser type IV Cordectomy (1/5) and Total Laryngectomy (TL) with elective bilateral neck dissection (4/5); in two cases of salvage TL an internal mammary artery perforator (IMAP) flap was used for tracheostoma reconstruction. A parotid malignant tumor (previously diagnosed with fine needle aspiration biopsy, FNAB) was found in 5/27 patients (18,5%), all who underwent total parotidectomy and selective ipsilateral neck dissection. Three out of 27 patients

(11.1%) affected by hypopharyngeal carcinoma underwent biopsy and were addressed to radiation therapy. Paranasal sinus and nasal cancer were diagnosed in 6/27 patients (22,2%); 5/6 patients were suitable for endoscopic resection of tumor and one patient with cancer of nasal vestibule underwent local excision and brachytherapy. Finally, 1/27 patient underwent total thyroidectomy, 2/27 patients underwent unilateral super-selective neck dissection to confirm a suspected diagnosis of lymphoma and 1/27 patient was admitted to our department in emergency for a neck mass then revealed as large submandibular abscess. Mean hospital stay for all the patients admitted at our ENT department during pandemic was 10,3 days. Tracheostomy was performed in 8/27 patients (29.6%)

Post-operative management and issues

Post-operative period was even more complex. In one older patient affected by chronic pulmonary disease, we observed on the fourth day after surgery the onset of fever, dyspnea and desaturation during wide-spectrum antibiotic therapy; for this reason, he underwent chest-TC, which showed sign of interstitial involvement by an inflammatory process. The infectious disease specialist, was then asked to evaluate the patient and decided to move him from our inpatient clinic to a ward dedicated to COVID-19 positive patients, waiting for the result of NP and OP swabs. All the swabs resulted negative for infection and were repeated after 24h for a confirmation. However, the patient remained in the COVID-19 unit until the resolution of pulmonary infection, thus prolonging his overall hospital stay. In another case, we had a delay in the scheduled operatory session, due to the presence of suspect radiologic findings in an asymptomatic patient with ground-glass opacities and interstitial inflammation, emerged with a staging chest-CT and not evident at the routine pre-admission chest-RX. In a dialysis patient, the onset of fever and dyspnea on the second postoperative day required a new COVID-19 test; due to the waiting of the result (about 24 hours), the dialysis session was postponed by one day, without systemic consequences. Finally, we report the case of a female patient admitted to intensive care unit for dyspnoea, underwent emergency orotracheal intubation for acute respiratory failure and the case was considered suspect for SARS-CoV-2 infection; because of the improvement of the clinical conditions, she was extubated, transferred to medicine department and a COVID-19 swab resulted negative. Due to the onset of dysphonia following orotracheal intubation, she performed ENT evaluation with diagnosis of left vocal cord impaired mobility in malignant laryngeal tumor.

DISCUSSION

It's clear that our lives have changed with this pandemic and will continue to change in the next months, when the worst phase will be over. One of the most upset participants at this battle will definitely be our health care system. Modification in the attribution of priorities of care, reduction of non-COVID-19-related health care, redistribution of human and economic resources, are just some of the new challenges that will revolutionize our health care system. Clinicians and health providers are experiencing several technical, clinical, managing and ethical issues that are burdening their everyday activity. In our experience, as one of the most involved countries by the pandemic, our Institution has tried to guarantee a high-level standard of care for non-COVID oncologic patients and for emergencies. However, it was not simple to face up with the consequences of a huge re-organization in a hospital assigned to be one of the few COVID-centers of a European capital, as Rome is.

One of the hardest challenges was to guarantee the safety both for patient in admission and those already hospitalized in our clinic. We noticed that, during this pandemic, there was a general propensity, by radiologists, to highlight even minimal signs of interstitial and peri-bronchial lung inflammation, thus suggesting an adequate continuation of clinical studies and so overestimating COVID diagnosis. This represents one of the costs that we will have to pay for a safe way to prevent the loss of any possible infected patient, who could represent a high risk of infection for the community. However, this particular attention could slightly slow down the usual clinical activity in a Head and Neck oncologic department. Moreover, those patients with respiratory comorbidities, old age and fever represent another challenging issue in the post-operative period. Fever could be present is a frequent sign in the immediate post-operative period¹¹, as well as cough, increased C-reactive protein level and elevated lactate dehydrogenase¹², but when they occurred in a patient with dyspnea, oxygen desaturation and tracheostomy, chest-CT and evaluation by the infectious

disease specialist are mandatory. We found several findings suggestive of novel coronavirus pneumonia, such as ground-glass opacities (GGO), multilobe and posterior involvement, bilateral pneumonia, and subsegmental vessel enlargement¹³, so the patient was transferred to a COVID-dedicated ward, waiting for NP and OP swab results. Obviously, technical difficulties showed-up immediately after the transfer, due to the limited number of clinical evaluation possible in a day by the ENT surgeon, and the difficult management of surgical dressings. This patient never became positive to both NP and OP swabs, repeated three times due to the persistence of fever, dyspnea and radiologic findings suggestive of novel coronavirus pneumonia and was finally addressed to our attention after antibiotic treatment. In conclusion, the changes in the whole health system that have been put in place during the COVID-19 pandemic have impacted our daily clinical practice and the management of head and neck cancer patients, which are the only patients, along with those in emergency situations, suitable of surgical treatment in our COVID-dedicated Institution. The guidelines in Italy are constantly evolving and more efforts are needed to assess the future impact of COVID-19 on oncology patients. Only a large multicenter study could help the head and neck surgeons' community to better standardize future guidelines to optimize the management of our patients.

REFERENCES

1. Zou L, Ruan F, Huang M, Liang L, Huang H, Hong Z, et al. SARS-CoV-2 Viral Load in Upper Respiratory Specimens of Infected Patients. *N Engl J Med*. 2020;382:1177–9.
2. Balakrishnan K, Schechtman S, Hogikyan N, Teoh A, McGrath B, Brenner MJ. COVID-19 Pandemic: What every Otolaryngologist – Head & Neck Surgeon Needs to Know for Safe Airway Management. *Otolaryngol Head Neck Surg*. 2020;
3. Shuman AG, Campbell BH. An Ethical Framework for Head and Neck Cancer Care Impacted by COVID-19. *Authorea*. April 09, 2020
4. Yang J, Zheng Y, Gou X, Pu K, Chen Z, Guo Q, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. *Int J Infect Dis*. 2020;
5. Mo P, Xing Y, Xiao Y, Deng L, Zhao Q, Wang H, et al. Clinical characteristics of refractory COVID-19 pneumonia in Wuhan, China. *Clin Infect Dis*. 2020;
6. Tran K, Cimon K, Severn M, Pessoa-Silva CL, Conly J. Aerosol generating procedures and risk of transmission of acute respiratory infections to healthcare workers: a systematic review. *PLoS One*. 2012;7:e35797.
7. Tay JK, Khoo ML-C, Loh WS. Surgical Considerations for Tracheostomy During the COVID-19 Pandemic. *JAMA Otolaryngol Neck Surg*. 2020;
8. Heineman T, St John M, Wein R, Weber R. It Takes a Village: The Importance of Multidisciplinary Care. *Otolaryngol Clin North Am*. 2017;50:679–87.
9. Falsey AR, Formica MA, Walsh EE. Simple method for combining sputum and nasal samples for virus detection by reverse transcriptase PCR. *J Clin Microbiol*. 2012;50:2835.
10. Kligerman MP, Vukkadala N, Tsang RKY, Sunwoo JB, Holsinger FC, Chan JYK, et al. Managing the Head and Neck Cancer Patient with Tracheostomy or Laryngectomy During the COVID -19 Pandemic. *Head Neck*. 2020;hed.26171.
11. Maday KR, Hurt JB, Harrelson P, Porterfield J. Evaluating postoperative fever. *JAAPA*. 2016;29:23–8.
12. Lassig A, Lindgren B, Itabiyi R, Joseph A, Gupta K. Excessive Inflammation Portends Complications: Wound Cytokines and Head and Neck Surgery Outcomes. *Laryngoscope*. 2019;129.
13. Caruso D, Zerunian M, Polici M, Pucciarelli F, Polidori T, Rucci C, et al. Chest CT Features of COVID-19 in Rome, Italy. *Radiology*. 2020;201237.

Conflicts of Interest and Source of Funding

The authors have no funding, financial relationships, or conflicts of interest to disclose

Authorship

Galli J: substantial contributions to conception and design, acquisition of data, analysis and interpretation of data; involved in drafting the manuscript and revising it critically for important intellectual content; gave final approval of this manuscript version to be published

Settimi S, Tricarico L, Almadori G, Paludetti G: acquisition of data, analysis and interpretation of data; involved in drafting the manuscript and revising it critically for important intellectual content; gave final approval of this manuscript version to be published