

## Research Article

# Impact of COVID-19 Restrictions on Hospitalization and Post-Operative Rehabilitation of Head and Neck Cancer Patients

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## Abstract

The COVID-19 pandemic emergency forced the health system in Italy to implement an immediate reorganization to support the care of tens of thousands of patients and to maintain the quality of care for patients with other pathologies, such as oncologic diseases. The main goal of this study was to evaluate the impact of COVID-19 restrictions on the hospitalization and post-operative rehabilitation of head and neck oncologic patients and to determine whether the introduction of new technologies such as video-communication may be useful to mitigate social distancing by close family members. Fifty-one consecutive patients underwent surgery for head and neck cancers during the period of lockdown caused by the COVID-19 pandemic. The data collected (post-operative pain, post-operative complications, duration of hospitalization) were compared with those of 51 consecutive patients treated for head and neck cancers in the period immediately preceding lockdown. The average duration of hospitalization was longer in patients operated on in the COVID-19 period, in particular, in patients who underwent a more demanding rehabilitation protocol. Despite this, our study did not show a significant difference in psychological aspects during hospitalization. In our experience, the greatest difficulties that occurred in the COVID-19 period were met by a greater commitment from all medical staff, allowing the quality of life of head and neck cancer patients to be maintained at a similar level during post-operative rehabilitation to that before the pandemic. In the future, there will be a need for technological solutions to bring the patient closer to family members.

**Keywords:** COVID-19; Head neck cancer; Rehabilitation

## Introduction

The emergency caused by the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) pandemic forced the health system in Italy to implement an immediate reorganization to support the care of tens of thousands of Coronavirus Disease 2019 (COVID-19) patients and at the same time to maintain the quality of care for patients with other pathologies [1-3]. Diverting the attention of the healthcare system to focus on overcoming the pandemic has increased the risk of overlooking other important and urgent pathologies, such as oncologic ones [4]. Surely oncologic patients have a more severe treatment to face and overcome, from both a physical and psychological point of view [5], especially patients affected by head and neck cancer. Head and neck oncologic surgical procedures are considered to be onerous treatments with a severe impact on physical, functional and psychological domains; post-operative recovery involves the rehabilitation of important functions from both a physical and social perspective (swallowing, verbal communication, breathing) [6,7]. In the rehabilitation period, a fundamental role is played not only by healthcare staff, but also by the caregivers. Relatives and close family members offer the patient important psychological and motivational support when it is often difficult to face the disease in a positive and rational way. For this reason, in the normal situation pre-pandemic, the caregiver can be present during the hospitalization period and

this is highly recommended for motivational reinforcement for the patient. This support was lost during the COVID-19 pandemic, which forced the adoption of strict rules to counter the spread of viral infection, including banning caregivers from entering hospitals. This situation meant that the oncologic patient had to endure the treatment process without the important psychological support of a family member.

The main goal of this study was to evaluate the impact of COVID-19 restrictions on the hospitalization and post-operative rehabilitation of head and neck oncologic patients and to determine whether the introduction of new technologies such as video-communication may be useful to mitigate social distancing by close family members.

## Materials and Methods

This study evaluated 51 consecutive patients (35 males and 16 females, age (mean  $\pm$  SD) 65.4 $\pm$ 14.1 years) who underwent surgery for head and neck cancers. All patients were treated at the Head and Neck Oncological Unit of the FPO IRCCS, Candiolo Cancer Institute, Turin, Italy in the period of lockdown caused by the COVID-19 pandemic (March-June 2020). During this period, only non-deferrable surgical procedures were carried out. For this reason, a greater number of patients with malignant tumors underwent

**Table 1:** Demographic characteristics of patients treated in the pre-COVID-19 and COVID-19 periods.

Characteristics	pre-COVID-19 period No. of patients (%)	COVID-19 period No. of patients (%)
Age, years		
Mean	66	65
Range	160-87	20-89
Sex		
Male	40 (78)	35 (69)
Female	11 (22)	16 (31)
Tumor site		
Neck (CUP, skin cancers)	13 (25)	14 (27)
Oral cavity and oropharynx	16 (31)	16 (31)
Larynx and hypopharynx	15 (29)	17 (33)
Salivary glands	7 (14)	4 (8)
Type of surgery		
Without reconstruction	40 (78)	35 (69)
With reconstruction	11	16
Pedicled flap	6 (12)	11 (22)
Free flap	5 (10)	5 (10)
Tracheostomy		
No	25 (49)	25 (49)
Yes	26 (51)	26 (51)
Nasogastric tube		
No	36 (71)	29 (57)
Yes	15(29)	22 (43)
Post-operative complications		
Minor		
Surgical wound dehiscence	0 (0)	1 (2)
Surgical site infection	0 (0)	1 (2)
Subcutaneous emphysema	1 (2)	2 (4)
Major		
Surgical wound dehiscence	0 (0)	4 (8)
Bleeding	2 (4)	2 (4)
Duration of hospitalization		
≤7 days	27 (53)	28 (55)
>7 days	24 (47)	23 (45)
HADS score		
≤7	20 (39)	17 (33)
8-10	9 (18)	13 (25)
>10	22 (43)	21 (41)

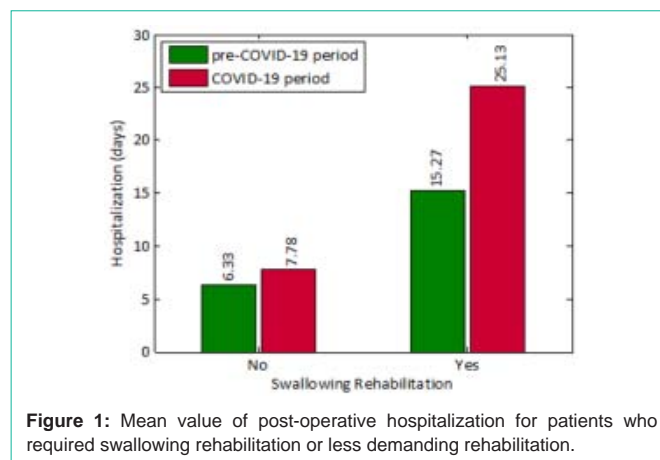
CUP: Carcinoma of Unknown Primary (origin); HADS: Hospital Anxiety and Depression Scale.

surgery in a shorter period of time.

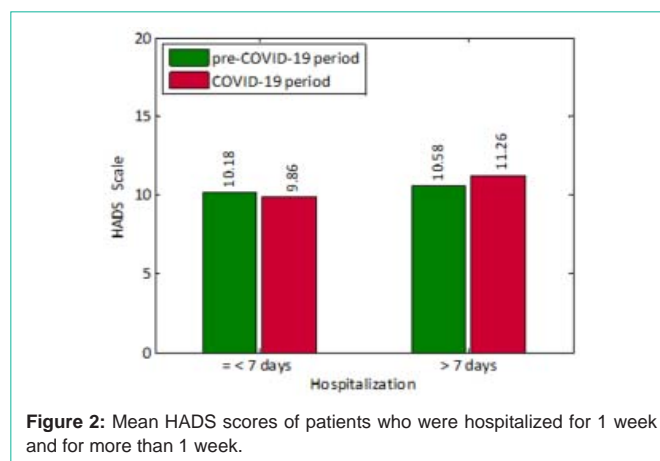
The study received approval from the Committee of Ethics in Research in our hospital. All of the procedures were considered to be conventional in terms of technique and indications, in accordance with current guidelines and therefore also in accordance with the ethical standards of the Institutional and/or National Research Committee and with the 1964 Helsinki Declaration and its later amendments.

During the health emergency caused by the COVID-19 pandemic, entry into our hospital by any person was regulated by a triage: measurement of external body temperature, hand sanitization, wearing of a surgical mask. Access was only allowed to completely self-sufficient patients and not to caregivers. All oncologic patients were hospitalized the day before surgery to collect a nasopharyngeal swab for SARS-CoV-2 RNA research, and also a chest X-ray. Patients remained hospitalized in a dedicated isolation ward awaiting their results. If both tests (nasopharyngeal swab and chest X-ray) were negative, patients were transferred to the ward in the afternoon.

During the patients' period of hospitalization, no relative was admitted to the ward, apart from non-self-sufficient patients, for whom the presence of a caregiver was mandatory. For the same reason, patients were not allowed to leave the ward.



**Figure 1:** Mean value of post-operative hospitalization for patients who required swallowing rehabilitation or less demanding rehabilitation.



**Figure 2:** Mean HADS scores of patients who were hospitalized for 1 week and for more than 1 week.

The following data were collected: post-operative pain (Visual Analog Scale (VAS) scores), post-operative complications, duration of hospitalization. Furthermore, at the end of the hospitalization period, patients completed the Hospital Anxiety and Depression Scale (HADS) questionnaire [8,9]. These data were compared with those of 51 consecutive patients (40 males and 11 females, mean age 66.0 years, SD 14.6) treated for head neck cancers in the period immediately preceding lockdown (September 2019-January 2020) (Table 1).

## Results

The hospitalization period for patients who underwent head and neck surgery during lockdown spanned the interval 3-91 days with a mean value of 12.9±14.4 days, whereas for patients operated in the pre-COVID-19 period, the interval was 2-23 days with a mean value of 9.0±5.7 days. The average duration of hospitalization was longer in patients operated on in the COVID-19 period, considering both the tumor location and type of surgery. In particular, the period of hospitalization was longer in patients who underwent a more demanding rehabilitation protocol (Figure 1).

The mean value for post-operative pain verified with the Visual Analog Scale (VAS) score did not show a statistically significant difference between the first group (COVID-19 period) and the second group (pre-COVID-19 period). Complications were classified as minor (solved with medical treatments: surgical site infection,

surgical wound dehiscence, subcutaneous emphysema) or major (requiring surgical revision: bleeding, surgical wound infection). Post-operative complications were higher in patients operated on during the COVID-19 period: 10 (4 minor and 6 major) compared with those operated on during the pre-COVID-19 period 3 (1 minor and 2 major).

The HADS questionnaire did not report a statistically significant difference in the length of hospitalization of patients before and during the COVID-19 period (mean total scores of  $10.5 \pm 7.0$  and  $10.4 \pm 6.5$ , respectively; the score was evenly divided between depressive symptoms and anxious symptoms), even when considering hospitalization periods longer than 1 week (Figure 2).

## Discussion

In Italy, restrictions on access to hospitals imposed by the COVID-19 pandemic have certainly made head and neck post-operative rehabilitation more difficult [10]. The patients were not allowed to leave the ward, were alone, and lacked the possibility of distraction from the psychologically stressful situation caused by the illness and the physical difficulties they faced. Generally, in the post-operative period, head and neck patients can walk, but unfortunately, this activity was drastically limited during the pandemic.

It is well known that, in normal times, the role of caregivers is fundamental not only in assisting the patients, but also in supporting and encouraging them during rehabilitation. A delicate phase during the post-operative period in head and neck oncology is the rehabilitation of swallowing and the resumption of oral intake [11]. The speech therapist instructs the patient for some hours every day, but rehabilitation exercises must also be carried out during the rest of the day. In normal times, the caregiver is instructed in the appropriate exercises required and this makes a significant difference in helping the patient to carry out these exercises correctly during meals.

Assistance from the caregiver also stimulates the rehabilitation of verbal and non-verbal communication, a function that is difficult to practice alone. Furthermore, post-operatively, most head and neck patients can only communicate non-verbally; this makes it very difficult to stay in touch with family members who cannot be physically present close to the patient. Hospitalization is certainly more psychologically stressful if the patient can no longer communicate verbally and when there is no support from a family member who can reassure him.

This particular situation has prompted the medical staff to try to fill these care gaps during the COVID-19 period, paying more attention to oncologic patients than they normally would in the non-COVID period, and to aspects that are normally entrusted to caregivers.

In our study, the results show that the percentage of post-operative complications was higher in the group of patients operated in the COVID-19 period compared with the pre-COVID-19 period (10 vs 3 patients, respectively). A selection bias could be attributed to the greater number of critically ill patients who underwent surgery during the period of reorganization of health activities dictated by the pandemic. In fact, hospitals were only allowed to operate on non-deferrable cases.

Patients are generally discharged when they are self-sufficient

from a swallowing and respiratory perspective. The increase in average duration of hospitalization (13 vs 9 days) is a consequence of the rehabilitation difficulties caused by COVID-19 restrictions and patient isolation, encountered in the post-operative period. The difference in length of hospitalization was more evident for patients who had to undergo a more severe operation, which required more demanding rehabilitation. Despite this, our study did not show a significant difference in psychological aspects during hospitalization before and during the pandemic.

The HADS evaluation substantially reported the same mean score for the two groups. A HADS score of about 10 is considered to be borderline, but this is certainly due to having to accept and overcome the disease and surgery. During the SARS-CoV-2 pandemic, several efforts were made to maintain quality of care by paying greater attention to the psychological sphere of patients and family members. Surely both patients and their families have experienced a more difficult and stressful period which, in addition to the problems caused by the head and neck disease, has also seen the introduction of social distancing, restrictions on access to hospital, and the fear of SARS-CoV-2 infection. All of the medical staff have also been more involved in maintaining the quality of hospitalization and post-operative rehabilitation, and at the same time trying to ease the anxiety of patients and their families.

On the basis of these preliminary data, to date, caregivers can assist patients in the period commencing after preoperative collection of the pharyngeal swab through post-operative periods of hospitalization of more than 7 days.

## Conclusion

The COVID-19 pandemic has forced cancer patients to endure the treatment process without the important psychological support of a caregiver, especially during post-operative recovery. This particular situation has resulted in an increase in duration of hospitalization, particularly for patients who required more demanding post-operative rehabilitation. Nevertheless, the HADS score did not report a worse psychological situation from hospitalization during the COVID-19 restrictions.

In our experience, the greatest difficulties that occurred in the COVID-19 period were met by a greater commitment from all medical staff. Thanks to this, during the pandemic, it was possible to maintain the quality of life of head and neck cancer patients during post-operative rehabilitation at a similar level to that before the pandemic. This study highlights the fact that, in future, there is a need for technological solutions to bring the patient closer to family members, particularly when those members cannot be physically present.

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## Author Contributions

EC, conception and design of the study, surgeon, writing and editing the manuscript; MT, data collection, surgeon; GA, data

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