



Mortality risk in post-operative head and neck cancer patients during the SARS-Cov2 pandemic: early experiences

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Received: 23 May 2020 / Accepted: 16 June 2020 / Published online: 22 June 2020
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Abstract

Purpose The objective of this report is to outline our early experience with head and neck cancer patients in a tertiary referral center, during the SARS-Cov2 pandemic, and to describe the poor outcomes of patients who acquired the infection.

Methods In this case series from a single-center, national tertiary referral center for head and neck cancer we describe three consecutive head and neck cancer patients who contracted SARS-Cov2 during their inpatient stay.

Results Of the three patients described in our case series that contracted SARS-Cov2, two patients died from SARS-Cov2 related illness.

Conclusion We have demonstrated the significant implications that SARS-Cov2 has on head and neck cancer patients, with 3 patients acquiring SARS-Cov2 in hospital, and 2 deaths in our that cohort. We propose a complete separation in the location of where these patients are being managed, and also dedicated non-SARS-Cov2 staff for their peri-operative management.

Level of evidence IV.

Keywords Head and neck cancer · SARS-Cov2 · Mortality · Covid-19

Introduction

The SARS-Cov2 pandemic has major implications for the delivery of elective Otolaryngology—Head and Neck Surgery (ORL-HNS) oncology treatment internationally, with services in many jurisdictions coming largely to a standstill. ORL-HNS surgeons were noted to be in a high-risk group for transmission in reports from Wuhan, China, the UK and Italy [1–4]. Very high mortality rates have been reported in a wide range of post-operative elective surgery patients who were operated on in the prodromal phase of SARS-Cov2 [5].

Guidelines have been published for pre- and intra-operative management and protection to help reduce the risk of spread of SARS-Cov2 to patients and staff [1, 2, 6]. The post-operative implications for these high-risk patients are not yet clear.

With this in mind, we describe our early experience with three post-operative head and neck cancer patients at our institution, as it relates to the SARS-Cov2 pandemic, and the repercussions for future surgical practices.

Methods

We describe our experience of three patients with advanced head and neck cancer that underwent treatment prior to the onset the SARS-Cov2 pandemic in Ireland, who subsequently contracted SARS-Cov2 during their post-operative hospital stay. Our institution is the largest acute hospital in Ireland and a national tertiary-referral center for head and neck. This research was granted institutional review board exemption from the Tallaght University Hospital—St. James Hospital Joint Research Ethics Committee. Informed consent was obtained from the patient directly where possible, or their next of kin in cases where the patient was deceased.

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Results

Patient 1 was admitted to our institution for definitive treatment of tracheal stomal seeding from a previously resected T4 squamous cell carcinoma (SCC) of the oral cavity. He underwent a total laryngectomy with partial tracheal resection, followed by reconstruction with a pectoralis major pedicled flap. Final histology revealed clear margins.

Table 1 Patient demographics

	Patient 1	Patient 2	Patient 3
Age	56	68	62
Primary site	Trachea	Larynx	Hypopharynx
Date of admission	23/02/2020	04/02/2020	07/03/2020
Date of surgery	09/03/2020	25/02/2020	10/03/2020
Type of surgery	Laryngectomy	Tracheotomy, ND	Tracheotomy
Date of SARS-Cov2	07/04/2020	17/4/2020	16/04/2020
Ferritin	3137	1139	124
D-Dimer	6885	1161	N/A
IL-6	144	56	4.8
CD25	> 5000	3583	1770
Date of death	14/04/2020	30/04/2020	

The patient's post-operative course was complicated by wound healing issues related to his prior radiation treatment, as well as an acute exacerbation of the chronic renal disease. This caused a prolonged inpatient stay. Otherwise, the patient remained clinically well, with no evidence of post-operative infections. On his 4th post-operative week, a patient in the same ward contracted SARS-Cov2, which prompted isolation and testing of our patient. He was also found to be SARS-Cov2 positive, with elevated SARS-Cov2 markers (Table 1). While the patient initially remained stable, his d-dimer and ferritin continued to climb, and his oxygen requirements escalated 6 days after testing positive for SARS-Cov2. He was commenced on hydroxychloroquine and broad-spectrum antibiotics. He continued to deteriorate both from a respiratory and renal point of view. He was transferred to the intensive care unit (ICU) for ventilatory support and continuous renal replacement therapy. He subsequently succumbed to respiratory complications from SARS-Cov2 7 days after diagnosis (Fig. 1).

Patient 2 presented with progressive hoarseness, dysphagia and weight loss secondary to a large obstructing supraglottic T4aN2bM0 SCC.

At the time of surgery, the tumor was found to be directly invading his right common carotid artery and was deemed unresectable, upstaging him to T4b disease. A tracheotomy was performed to protect his airway. Following repeat

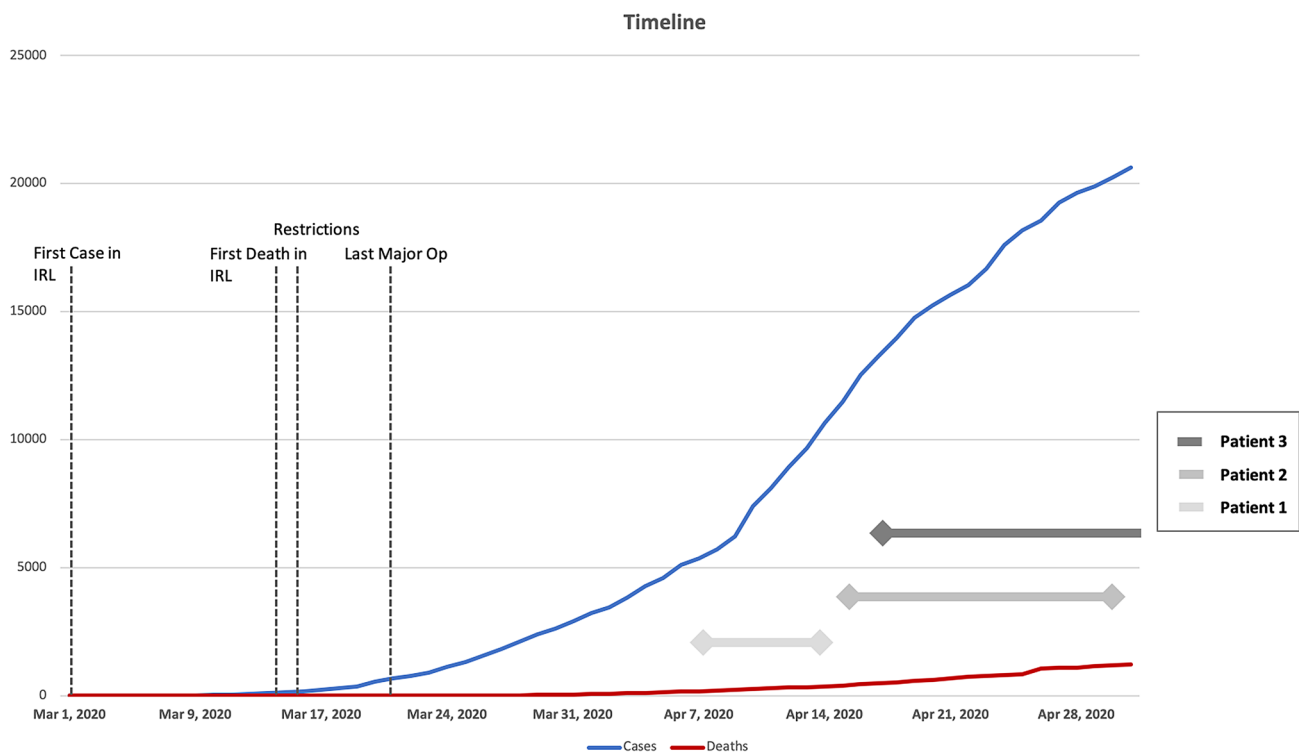


Fig. 1 Timeline including first cases and deaths in Ireland and when country-wide restrictions were implemented. IRL: Ireland, deaths: total number of deaths in Ireland, cases: total number of cases in Ireland

discussion at the head and neck oncology MDT he commenced palliative radiotherapy (40 Gy/15#) as an inpatient.

He developed respiratory symptoms during week two of radiotherapy treatment, with increased tracheal secretions and shortness of breath as well as tachycardia, reduced oxygen saturations and raised inflammatory markers. He was swabbed and tested positive for SARS-Cov2 the following day, with elevated SARS-Cov2 markers (Table 1). Unfortunately, he continued to deteriorate, his radiotherapy treatment was stopped and palliative care was initiated. His chest x-ray demonstrated progressive SARS-Cov2 infection with diffuse airspace opacification throughout both lungs and he died 15 days following SARS-Cov2 diagnosis (Fig. 1).

Patient 3 was receiving full-dose concurrent chemo-radiotherapy for a T4b hypopharyngeal SCC with curative intent when he was admitted to hospital with new-onset stridor. Flexible nasolaryngoscopy revealed significant radiotherapy-related supraglottic edema that failed to settle with medical management with steroid and inhaled epinephrine. He underwent tracheotomy to protect his compromised airway, which was completed without complication. The patient subsequently resumed radiotherapy treatment as an inpatient, as he was unsuitable for immediate discharge. One month after admission to hospital he was found to be SARS-Cov2 positive, having shared a ward with patient 2. His initial bloods were not significantly elevated (Table 1). As he had less than 1 week of radiation treatment remaining, it was decided to halt his treatment. He remains well without oxygen requirements and is planned for discharge in the coming week.

Discussion

The SARS-Cov2 pandemic has brought multiple challenges to clinical practice for ORL-HNS [1]. Strategies are emerging to overcome these difficulties during the pandemic, but concern remains for the high risk of mortality in patients contracting the infection in the postoperative period. A case series from Wuhan of 34 patients who underwent a range of elective surgeries during the incubation period of SARS-Cov2 were found to have very poor outcomes, with all patients developing SARS-Cov2 pneumonia shortly after surgery. Of those, 44% required admission to the ICU, and there was a 20.5% case fatality rate [5].

Furthermore, head and neck cancer patients are likely to have an increased risk of adverse outcomes from contracting SARS-Cov2 [2, 7]. They frequently have multiple comorbidities, are typically elderly, smokers with poor performance status. The current case-fatality rate from SARS-Cov2 for patients above age 70 is estimated to be between 8 and 22.5% [3, 8]. The presence of a tracheotomy or laryngectomy stoma is also thought to allow the easy transmission to and from the patient [9].

Each of our three patients was admitted to hospital before Ireland recorded its first SARS-Cov2 death on the 12th of March, and when the total number of cases in the country was less than 10 (Fig. 1). Furthermore, their procedures were carried out far in advance of the country-wide restrictions put into place on the 13th of March. However, head and neck cancer patients frequently require prolonged inpatient stay post-operatively, in particular those with a tracheotomy, advanced stage or prior radiation [10]. These patients are at increased risk of transmission during care and this risk is exacerbated by a lengthy hospital stay.

In response to the SARS-Cov2 pandemic, our institution implemented aggressive measures to help discharge patients from the hospital, isolate and protect existing inpatients, and create alternative pathways for prospective surgical candidates at other institutions, which are non-receiving SARS-Cov2 hospitals. Five patients admitted or treated prior to the onset of wide-spread restrictions or SARS-Cov2 cases in Ireland, were unable to be promptly discharged, either due to medical or social reasons. Three of these patients contracted SARS-Cov2, despite routine SARS-Cov2 institutional precautions in keeping with existing best-practice international guidelines. Two of these patients subsequently died from complications of SARS-Cov2 infection.

Our experience suggests that patients undergoing major head and neck cancer surgery are at very high risk during the SARS-Cov2 pandemic. We recommend aggressive separation and precautions for this vulnerable patient cohort. We propose two potential strategies to achieve this. We suggest the nomination of a SARS-Cov2 free hospital as the center for head and neck surgery, or stringent separation at a hospital level into non-SARS-Cov2 and SARS-Cov2 “streams”. In the latter scenario, patients would be cared for only by staff not exposed to SARS-Cov2 or high-risk patients. This is supported by evidence from the 2003 SARS outbreak, where it was shown that these patients should be cared for in entirely separate units, or even separate hospitals by designated health care workers [11–14]. Finally, stringent pre-operative testing and isolation of patients being considered for major head and neck surgery is also of utmost importance, as patients with prodromal SARS-Cov2 were also found to have very poor outcomes [5].

This is a small case series and thus has inherent limitations. However, other than the case series from Wuhan [5], there are as yet no further reports of postoperative surgical mortality in the SARS-Cov2 era. This is likely to be due to increased precautions in hospitals and decreased surgical activity across the globe. However, as countries ‘emerge from the lockdown’, it is likely that the risk to post-operative patients will become more apparent.

Conclusions

Head and neck cancer patients are not only part of a vulnerable patient cohort, but also present unique challenges for post-operative care. Their prolonged inpatient stay and levels of input from numerous health care professionals puts them at significantly increased risk of nosocomial SARS-Cov2 infection. We have demonstrated the significant implications that SARS-Cov2 has on these patients, with 3 cases of acquired SARS-Cov2 in hospital and 2 deaths in our inpatient cohort.

We propose a complete separation in the location of where these patients are being cared for, and also dedicated non-SARS-Cov2 staff for their peri-operative management.

Author contributions All authors contributed equally to conception and design of the manuscript. All authors contributed to drafting of the article and approved the final and are accountable for all aspects of the work.

Funding Not applicable.

Availability of data and material Not applicable.

Compliance with ethical standards

Conflict of interest The author(s) declare that they have no competing interests.

Ethics approval This manuscript was given institutional review board exemption.

Consent to participate All patients, or next-of-kin if deceased, consented to participate.

Consent for publication All patients, or next-of-kin if deceased, consented for publication.

Code availability Not applicable.

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