

COVID-19 did not delay time from referral to definitive management for head and neck cancer patients in a regional Victorian centre

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Key words

cancer, COVID, head and neck, otolaryngology, regional, surgical oncology.

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Abstract

Background: The COVID-19 pandemic has had widespread impacts on health services, particularly regarding the provision of urgent elective surgical services. It has influenced the evaluation of surgical patients, patient willingness to consult with medical services, and the ability to provide timely care to these patients. The aim of this study is to assess the impact of the COVID-19 pandemic on the time to definitive management for head and neck cancer in a regional setting.

Methods: A retrospective review was performed through the University Hospital Geelong Head and Neck Unit records and electronic medical records. Ethics approval for quality assurance was attained. The primary outcome was time from the first clinic appointment to commencement of definitive management. Statistical analysis was performed using Prism (version 8.0, GraphPad).

Results: A total of 127 patients were identified, 64 in the pre-COVID and 63 in the post-COVID period. In the post-COVID period, more patients (14.3%) had their first clinic appointment with telehealth compared to the pre-COVID period (1.6%). There was also no significant difference in time from referral to first clinic appointment or time from first clinic appointment to date of definitive treatment decision or multidisciplinary meeting. There was no significant difference in definitive treatment modality between groups.

Conclusion: Despite increased adoption of telemedicine and increased public health considerations, there was no increase in time to definitive treatment from the time of referral to a regional head and neck cancer service.

Introduction

In the head and neck cancer population, increasing time to treatment initiation is associated with worse overall survival, poorer functional measures and reduced quality of life.^{1–4} The 2019 novel coronavirus (COVID-19) pandemic continues to have a significant impact on the receipt and delivery of head and neck cancer management.² The emerging disruptions to diagnosis and treatment include patients deferring primary care for newly emergent problems and a reluctance to attend hospital due to fear of contracting COVID-19. Government public health orders such as social distancing and stay-at-home directives affect transport options and limit the capacity of outpatient clinic waiting rooms. Hospital outpatient clinic appointments and elective surgery list availability were reduced to prepare for a potential influx of COVID-19 patients requiring hospitalisation and intensive care unit management.^{2,5} In addition, otolaryngologists are considered a high-risk group for exposure to aerosol-generating procedures (AGPs) and therefore access to personal protective

equipment has altered clinical practices and guidelines to reduce the number of AGPs performed.^{5,6} This results in unavoidable conflict between ethical considerations for patients, communities, clinicians and the healthcare workforce.⁷ This study aims to determine the impact of COVID-19 on the time to definitive management for head and neck cancer in a regional setting, specifically, following changes to the delivery of service, due to public health concerns and government restrictions.

Setting

In Victoria, Australia, a state of emergency was declared on 16 March 2020 and a subsequent state of disaster was declared on 2 August 2020. The University Hospital Geelong (UHG) is a 476-acute-bed hospital located in regional Victoria, which provides a head and neck cancer service including surgical, medical and radiation oncology.⁸ The primary community serviced by the UHG comprises the areas of the City of Greater Geelong, Colac Otway

Shire, Golden Plains Shire, Borough of Queenscliffe and Surf Coast Shire, with an estimated population of 324 067 people in 2017.⁹ The UHG is located within a major city and its surrounding areas are considered inner regional.¹⁰ During the COVID-19 pandemic, our head and neck cancer service increased the use of telemedicine, decreased non-urgent physical clinic appointments, and transitioned to an online teleconference system for multidisciplinary meetings (MDM).

Methods

A retrospective review was completed using the Geelong Head and Neck Unit records and electronic medical records. The inclusion criteria were new cases of adult head and neck cancer patients presented in the head and neck cancer MDM. The pre-COVID period was defined as a 32-week period before the Victorian state of emergency was declared (6 August 2019 to 15 March 2020) and the post-COVID period was defined as a 32-week period after the Victorian state of emergency was declared (16 March to 27 October 2020). Patients treated in both the public and private health systems were included. The exclusion criteria were patients with confirmed or suspected recurrence, patients with thyroid malignancies or lymphoma diagnoses.

Collected demographic data included patient age, gender, smoker status and remoteness area (RA) of the patients' address. RA was determined using the Accessibility and Remoteness Index of Australia 2016 data, where major city, inner regional, outer regional, remote and very remote are designated numbers 1–5, respectively.¹⁰ Tumour data collected included primary site, pathology, TNM stage and tumour staging as per the American Joint Committee on Cancer 8th Edition (AJCC 8th).¹¹ The collected clinical data focussed on the chronological timeline of treatment decisions, including dates for referral, first clinic appointment, definitive treatment decision or MDM discussion and commencement of definitive management. Data also included the number of telemedicine appointments and the number of radiology or surgical attendances. The modality of definitive management was categorised into surgery, chemoradiotherapy, radiotherapy alone or palliative without radiation.

The primary outcome was time from first clinic appointment (either physical or telemedicine) to commencement of definitive management. Secondary outcomes were time from referral to first

clinic appointment, time from first review to definitive treatment decision or MDM, total number of clinical attendances (physical clinic appointments and radiology scans performed on the same

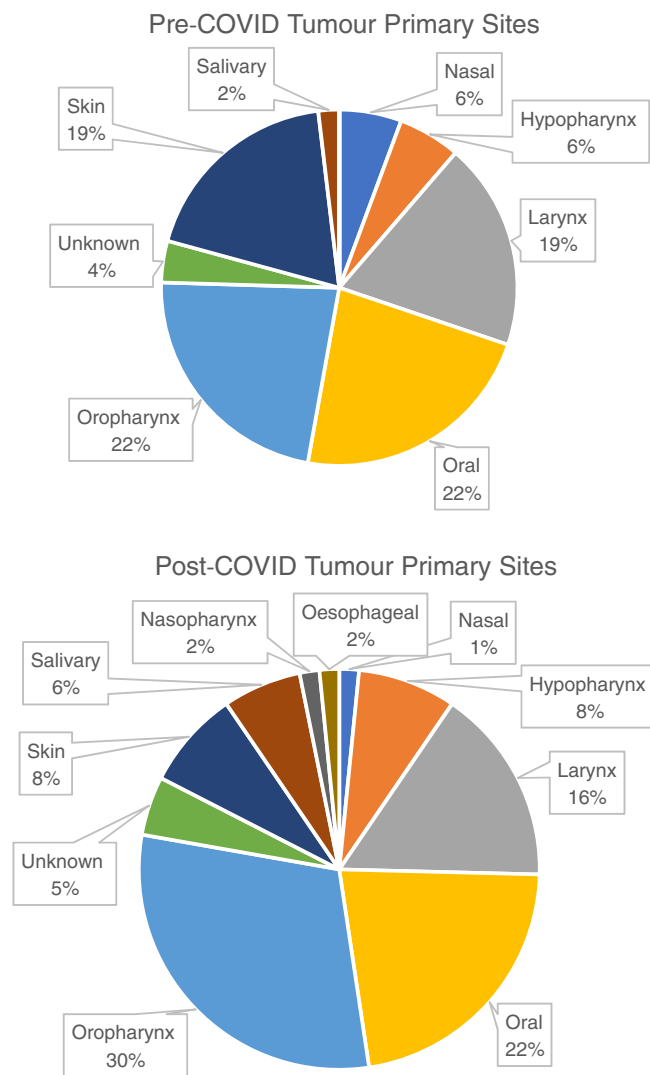


Fig 1. Pre-COVID and post-COVID tumour primary sites.

Table 1 Patient and tumour characteristic comparison between pre-COVID and post-COVID

	Pre-COVID	Post-COVID	p Value
Males, n (%)	17 (26.6)	22 (34.9)	0.311
Age in years, median (range)	65.7 (26.2–95.0)	67.1 (45.3–92.7)	0.591
ASGS Remoteness area	2 (1–3)	2 (1–3)	0.849
Referral from general practitioner, n (%)	22 (34.4)	24 (38.1)	0.363
Duration of symptoms in months, median (range)	2 (0.1–16)	3 (0.5–24)	0.550
Smoker, n (%)	36 (56.3)	39 (61.9)	0.575
Regular alcohol intake, n (%)	21 (32.8)	23 (36.5)	0.604
Lives at home alone, n (%)	21 (32.8)	17 (27.0)	0.554
Patients reviewed in the private health system, n (%)	22 (34.4)	27 (42.9)	0.330
Squamous cell carcinoma pathology, n (%)	57 (89.1)	59 (93.7)	0.363
AJCC staging 3–4, n (%)	38 (59.4)	29 (46.0)	0.134

Table 2 Work up and treatment comparison between pre-COVID and post-COVID

	Pre-COVID	Post-COVID	<i>p</i> Value
Work up			
Pathological diagnosis made prior to first clinic appointment, <i>n</i> (%)	36 (56.3)	33 (52.4)	0.340
First clinic appointment conducted via telemedicine, <i>n</i> (%)	1 (1.6)	9 (14.3)	0.008
Number of telemedicine appointments, median (range)	0 (0–2)	1 (0–3)	<0.001
Number of physical appointments, median (range)	2 (0–4)	1 (0–3)	0.003
Number of radiology investigations, median (range)	2 (0–4)	1.5 (0–4)	0.099
Number of surgical attendances, median (range)	0 (0–2)	0 (0–1)	0.587
Definitive treatment modality, <i>n</i> (%)			
Surgery	33 (51.6)	26 (41.3)	0.248
Chemoradiotherapy	21 (32.8)	23 (36.5)	0.665
Radiotherapy only	7 (10.9)	11 (17.5)	0.296
Palliative without radiotherapy	3 (4.7)	3 (4.8)	0.990

Table 3 Outcomes

	Pre-COVID	Post-COVID	<i>p</i> Value
Primary outcome			
Days from clinic to commencement of definitive management, median (range)	32 (5–116)	27 (2–127)	0.161
Secondary outcomes			
Days from referral to first clinic appointment, median (range)	7 (0–419)	9 (0–184)	0.528
Days from first clinic appointment to date of definitive treatment decision/MDM, median (range)	11 (0–54)	9 (0–61)	0.296
Days from referral to date of definitive treatment decision/MDM, median (range)	34 (0–214)	42 (0–416)	0.101
Number of total clinical attendances, median (range)	4 (1–9)	3 (1–6)	0.007
T staging 3–4, <i>n</i> (%)	20 (31.3)	19 (30.2)	0.920

MDM, multidisciplinary meeting.

day were counted as one attendance) and percentage of locally advanced cancer on presentation (T3 or T4).

Statistical analysis was performed using Prism (version 8.0, GraphPad). Analyses on differences were performed using the Mann–Whitney U test, with statistical significance defined as a *p* value of <0.05. Ethics approval was received through the Barwon Health research office (Reference QA/69099/VICBH-2020-245 421(v5)).

Results

A total of 127 patients were identified, 64 in the pre-COVID and 63 in the post-COVID period. There were no known patients who tested positive for COVID-19 within the study period.

There was no statistical difference between groups for median age, gender ratio, smoker status, history of alcohol misuse, home alone status, RA or duration of symptoms (see Table 1). The most common diagnosis in both groups was squamous cell carcinoma. There was no significant difference between groups for overall prognostic staging or tumour site distribution (see Fig. 1).

In the post-COVID period, more patients (14.3%) had their first clinic appointment with telemedicine compared to the pre-COVID period (1.6%) (*p* = 0.008). The median number of total telemedicine appointments per patient was higher in the post-COVID period (*p* < 0.001) and the median number of physical appointments was less in the post-COVID period (*p* = 0.003). There was no significant difference in number of radiology and surgical attendances between groups. There was also no significant difference in definitive treatment modality between groups. A summary of work up and treatment is seen in Table 2.

Outcomes

A summary of primary and secondary outcomes assessing duration from first clinic appointment to commencing definitive management showed no significant difference between groups (see Table 3). There was also no significant difference for the intervals from referral to first clinic appointment, referral to definitive treatment decision or MDM, and from first clinic appointment to definitive treatment decision or MDM. Total clinical attendances during

workup were significantly less in the post-COVID group ($p = 0.007$). There was no significant difference in proportion of T3 and T4 tumours between groups.

Discussion

The COVID-19 pandemic presented extensive widespread challenges to public health, resource allocation and timely management of healthcare issues. Similar healthcare challenges have been observed in previous pandemics and natural disasters. Bowman et al.⁵ reported on the impact of Hurricane Katrina on head and neck cancer management, highlighting two pertinent issues that are also relevant to the COVID-19 pandemic. Firstly, preparations for a pandemic response cause a reduction in the availability of primary care. Secondly, there is a reluctance of patients to present to emergency services or primary care due to fear of contracting COVID-19. Of particular concern is referral delay (time between first symptom and referral to specialist), which is associated with a threefold mortality risk.¹² Our regional Victorian-based study of 127 head and neck cancer patients there was no significant difference in the proportion of locally advanced cancers (T3 or T4) between pre and post-COVID groups. There was also no significant difference between groups for overall prognostic staging or for primary tumour site distribution; with oropharyngeal, oral cavity and larynx being the most represented. There was no delay from referral to a tertiary cancer service to the commencement of definitive treatment. There were also no significant demographic differences such as geographical remoteness or living alone. Additionally, there was no significant difference in duration of symptoms.

Our study showed no significant difference between the pre and post-COVID groups for the proportions of treatment modality (surgery, chemoradiotherapy, radiotherapy alone or palliation without radiotherapy). This suggests that primary treatment recommendations made by the Geelong head and neck MDM were not affected by restraints related to COVID-19 in a study population with no cases of COVID-19. In comparison, a recent study from the United Kingdom reported an enhanced selection criterion for head and neck malignancy surgical candidates during the COVID-19 pandemic.¹³ This directed a greater proportion of high-risk patients with multiple co-morbidities to alternative non-surgical treatments, with an overall reported reduction in surgical candidates by 50% compared to normal practice. In our study, there was a reduction in the number of patients treated surgically as the primary modality in the post-COVID period by approximately 10%; however, this did not reach statistical significance ($p = 0.248$). Additionally, the UK-based study reported patients undergoing chemotherapy and radiotherapy had their treatment de-escalated to reduce toxicity during the pandemic. This variance in response could be explained by the vastly different incidence of COVID-19 positive patients in the two populations, with 538 cumulative confirmed cases in the UHG catchment area by the end of the study period compared with 881 cases in Melbourne city and 3280 cases in the area serviced by the Jeannon et al. study,¹³ based in Southwark, London.^{14,15} In addition, our study had a small sample size with 63 patients in the post-COVID period, of which, there were 26 surgical candidates over approximately 8 months, compared to

the UK study which examined 69 surgical candidates over 2 months during the COVID pandemic. Therefore, our findings must be interpreted with this context in mind. Future studies geographically based in areas with more COVID cases, or more severe or longer duration of lockdown restrictions, would be suggested to examine the effect on time to definitive treatment for head and neck cancer.

The COVID-19 pandemic prompted a rapid increase in telemedicine appointments and virtual MDM to maintain social distancing while ensuring periodic, timely, multidisciplinary discussion of patient cases.¹⁶ Implementing telemedicine during the COVID-19 pandemic provided benefits in public health, patient convenience and clinician safety, particularly in the rural setting. Telemedicine was used for initial consultation, reviewing investigations, such as imaging or pathology, relaying results and communicating treatment decisions. The appointments were synchronous and conducted over the phone. A video-conference option was offered by our hospital; however, phone was the preferred method of communication by the majority of patients. In the post-COVID period, there was a significantly higher proportion of telemedicine for initial appointments, a higher overall number of telemedicine appointments per patient and less physical clinic appointments. This increased use of telemedicine by head and neck cancer services has been noted globally with Hong Kong reporting similar clinical arrangements with videoconferencing.¹⁷ Although time to definitive management was not significantly affected by the pandemic, employing telemedicine did reduce the total number of clinical attendances. Furthermore, patients now view telemedicine more favourably since the pandemic.¹⁸ This is an important finding in the context of the pandemic, which may instigate improvements to the future delivery of cancer care in non-pandemic circumstances by reducing patient travel and clinic waiting room times. There is some concern that head and neck cancer survivor care may be disproportionately impacted by delayed physical examination with fiberoptic nasendoscopy due to risk of AGPs, avoidance of non-urgent clinic appointments and delay of elective procedures to improve quality of life, such as oesophageal dilatations or speech valve insertion.¹⁹ However, current research reports an International consensus that telemedicine is appropriate for follow up from 3 months post-surgery, with face-to-face consultations recommended for any suspicious findings on surveillance imaging.²⁰ Further research into the 5-year mortality of the same population will be important to determine the overall impact of COVID-19 from a cancer survival perspective.

Conclusion

Our regionally based study found no delay from the time of referral to a tertiary cancer service to the commencement of definitive treatment during the COVID pandemic. This is possibly due to the early adoption of telemedicine within the study period which overcame issues with access to both primary and tertiary care. Future research on the effect of the COVID-19 pandemic on the overall survival and quality of life for patients diagnosed, treated and monitored during that period would be helpful. In addition, studies based in

areas with more COVID cases or public health order restrictions would be of interest.

Conflict of interest

None declared.

Author contributions

Hannah Tan: Conceptualization; investigation; methodology; project administration; writing-original draft; writing-review & editing.

Joel Preston: Data curation; writing-original draft. **Samuel Hunn:** Data curation; writing-original draft. **Matthew Kwok:** Formal analysis; software; writing-original draft. **Michael Borschmann:** Project administration; writing-review & editing.

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