



# Safe Delivery of Surgical Care in Head and Neck Cancer Patients During COVID-19—an Audit of Pattern of Presentation and Treatment Strategies in an Oncology Centre in the Northern India

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## Abstract

Delay in treatment of head and neck cancer leads to stage migration and increased morbidity. Due to the COVID-19, surgical care has been severely affected. We continued our oncology services during the pandemic. We present here the pattern of presentation of head and neck cancer patients to the hospital and strategy to continue services. A retrospective audit of patients registered under Head and Neck Disease Management Group during lockdown, 23rd March to 31st May 2020, was done. Four categories were made new registrations, post-surgical patients, emergency department visits and follow-up presentation. Of the 693 patients assessed, a majority were with oral cavity cancer (80%). Seventy-eight percent of patients presented with stage IV disease. There were 382 new registrations, of which 68% were symptomatic. Of the 69 patients that underwent surgery, 17 patients were on adjuvant treatment. A total of 60 patients presented to emergency department during this period, maximum with complaints of dyspnoea (67%). One hundred eighty-nine patients were follow-up patients of which 43% were symptomatic. Among these, 12 patients were diagnosed with recurrence. Various administrative and clinical policies were formulated to continue cancer care during this time. Surgical services need not be halted during the COVID-19 pandemic. Following scientific rationale and treatment strategies, safe oncosurgical care can be delivered during pandemic.

**Keywords** Pattern of presentation · Head and neck cancer · Treatment strategy · COVID-19

## Introduction

Head and neck cancers are the most common cancer in the Indian subcontinent. It constitutes almost 30% of all the cancers in the country [1]. In addition, the COVID-19 pandemic with the associated social distancing norms and lockdown had disrupted the healthcare delivery and management of

the cancer patients, especially the head and neck cancer patients. Most of the hospitals had shut down their elective surgical procedures and routine out patients' services due to COVID-19.

There had been studies from China which reported an increased mortality in cancer patients during the pandemic due to immunocompromised status [2]. Along with that,

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there is also an increased risk of contracting the infection to the otolaryngologists [3]. This is primarily due to the nasopharyngeal and oropharyngeal regions harbouring the infection. Performing diagnostic and surgical procedures in the affected region increases the risk of aerosol generation and shedding the SARS-COV [4].

Head and neck cancer is a semi-emergent condition, and surgery is the preferred modality of treatment for the majority of head and neck cancers. Delaying timely surgical intervention would lead to significant disease progression and an associated poor survival outcome. Though measures are taken by the government, but increased morbidity and mortality secondary to advanced stage head and neck cancer may topple the overburdened healthcare system of the country. Due to the various policies in effect for preventing the COVID-19, a majority of the hospitals were under alert. They had to shut down their general services, postponed elective surgeries and continued only emergency services. Our hospital had been one of the few government tertiary oncology centres in India that could continue its full oncology services during the lockdown. We followed the guidelines laid by the government and regulations for prevention of COVID-19 and continued the surgeries. We have audited our data to analyse how the head and neck surgical services were safely continued during pandemic.

## Materials and Methods

This was a retrospective audit of the data of patients with head and neck cancer presenting to the hospital during the period of lockdown in India i.e. 23rd March till 31st May 2020. All patients registering under the head and neck disease management group (DMG) were included in the study. Patients with cancer of other subsites referred to the head and neck services or patients registered under other disease management groups were excluded from this cohort. The number of patients that underwent surgical treatment for head and neck cancers was recorded during this period. A number of patients that were visiting the head and neck surgical OPD after the surgical treatment was recorded and patients that had completed the oncological treatment and were visiting for routine follow-up visit were recorded. As our centre was not a COVID treatment facility, we had operated upon COVID-negative individuals. Any patient who was positive for COVID infection was referred to the COVID facility for treatment and management.

### Collection of Data

The registration data was recorded from the central registration office, and the patients' clinical and demographic details were recorded from the electronic medical records. The chief

presenting complaints, previous consultation records, the oncology diagnosis and the staging of the malignancy was recorded.

Four categories were made for the ease of analysis of the pattern of presentation of patients visiting the hospital which were new registrations, post-surgical patients, emergency department presentation and follow-up presentation.

### New Registrations

The patients categorised under new registrations were then further grouped into (a) first-time presentation to the hospital, (b) delayed presentation of patient after diagnosis in an outside hospital or clinic and (c) patients on treatment at different oncology centre presenting to us during lockdown.

### Post-Surgery

The second group included patients who were operated during lockdown due to COVID-19 pandemic and were on peri-operative care or were called for adjuvant treatment. These included patients visiting the hospital for physiotherapy, speech and swallowing therapy, dental care, suture removal, dressings etc. and patients on adjuvant treatment.

### Emergency

The third group were patients presenting to the emergency department. There were increased emergency visits during this time. The main reasons were pain, dyspnoea and bleeding from tumour site and miscellaneous cases which include swelling, pus discharge etc.

### Follow-up

And the last were the follow-up cases: these included patients who were on follow-up post completion of treatment. These were divided into patients presenting with symptoms during follow-up, patients presenting for routine check-up and miscellaneous patients (i.e. patients who came to refill their pain prescriptions and supportive or palliative medicines).

### Safety Assessment

The safety of the surgical services was assessed by post-operative morbidity, prolonged hospital stay, any COVID infection in peri-operative period and any mortality related to COVID or mortality. Any COVID infection of the health-care personnel was also recorded.

## Results

### Demographics

A total of 693 patients visited the head and neck DMG, during the period of lockdown in the country from 23rd March till 31st May 2020. The mean age of presentation was 52.7 years and maximum patients comprised in the age group of 40–60 years. Of 693 patients, 520 were male. M:F ratio was 3:1.

### Site and Stage of Disease Presentation

The most common site was oral cavity 80% followed by the oropharynx (9%) and larynx and hypopharynx (8%). The majority of the patients presented with advanced stage cancer. Almost 78% of patients presented at stage IV disease and 12% of cases were of stage III disease. Early lesions of stages I and II constituted 5% each of the total cases. The basic demographics and distribution are depicted in Table 1.

### Categorisation

#### New Registrations

The reason and pattern of presentation of patients were analysed for each group. Among the new registrations, 68% patients were first-time presentation to hospital. These

included patients who developed symptoms related to the cancer and presented to the hospital for the first time for diagnosis. Twenty-two percent of the patients comprised of patients who were already on treatment at a different oncology centre in the country. However, they visited our centre for treatment due to regular availability of services during lockdown.

#### Post-Surgery

Patients who were operated during lockdown were included in the post-surgery category. A total of 69 cases were operated of 382 new cases registered. Among these 60 patients were among patients with 1st time presentation (68%), and the remaining 9 were among 32% cases who had already visited different oncologic centres and came to our hospital due to unavailability of services at other centres. Patients who were not suitable for surgical treatment were treated with other modalities of oncologic treatment (chemotherapy/radiotherapy) as required. Among the 69 operated cases, 54 patients were operated on for oral cavity cancer, 3 patients of larynx, 2 patients of thyroid cancer and 10 miscellaneous cases which included salivary gland malignancy, temporal bone lesions, etc. Among the 69 patients operated, 24 patients did not warrant any adjuvant therapy. Seventeen patients were on their adjuvant treatment in form of radiotherapy/chemoradiotherapy. No COVID-positive patient underwent surgery at our centre.

#### Emergency

There was an increase in a number of head and neck cancer patients visiting emergency department during lockdown. Sixty-seven percent of patients presented to the emergency due to complaints of dyspnoea, followed by patients presenting due to pain 18%. Nine patients needed urgent tracheostomy. Tracheostomy was performed after isolating the patient and after following all COVID protocols by the Senior member of the team. Following tracheostomy COVID testing by RT-PCR was done for all patients to ensure the safety of the healthcare professionals. All patients were found to be COVID-negative on testing.

#### Follow-up

The follow-up category included patients who had completed their oncology treatment. Among these, 43% of patients had some complaints like pain, ulceration or swelling, weight loss etc. Among these, 12 patients were diagnosed with recurrence. Thirty-three percent of the patients included those who had visited to refill their prescription of pain medication, nutritional supplements and supportive care. The remaining 24% comprised of patients visiting

**Table 1** Patient demographics

Total cases (693)	Number	Percentage (%)
Male	520	75
Female	173	25
Age (yrs)		
<30	28	4
30–40	152	22
40–60	368	53
>60	145	21
Stage I	35	5
Stage II	35	5
Stage III	83	12
Stage IV	540	78
Site		
Oral cavity	554	80
Oropharynx	62	9
Larynx and hypopharynx	55	8
Thyroid	14	2
Miscellaneous	8	1

for routine check-up post-treatment. The majority of these included poor patients who did not have access or could not be contacted through teleconsultation (Table 2).

### Strategy

There was no change in the oncological protocol followed in the management of head and neck cancer during COVID-19 pandemic. The standard treatment protocol was followed. To cope up with the increasing cancer patients and to continue our services to the patients the hospital laid down certain administrative and clinical policies. These are included in Table 3.

**Table 2** Distribution of patients based on category of presentation

	Number	Percentage (%)
New cases (382)		
On treatment elsewhere	84	22%
Diagnosed earlier but delayed presentation	38	10%
Symptomatic and 1st time presentation	260	68%
Post-surgery (69)		
On adjuvant therapy	17	25%
For peri-operative care	28	40%
Observation	24	35%
Emergency (60)		
Pain	11	18%
Bleeding	3	5%
Dyspnoea	40	67%
Miscellaneous	6	10%
Follow-up (189)		
Symptomatic	81	43%
Routine checkup	45	24%
Miscellaneous	63	33%

**Table 3** Summary of institutional policies during COVID-19

Administrative
CRT team
Daily meetings and dynamic strategisation
Staff rotation
Strict screening at hospital entrance
Clinical
Detailed history taking
Separate procedure room for minor procedures like oral punch biopsies, secondary suturing. Minimum staff allocation to avoid exposure
Proper PPE in operating room for all cases
Surgery avoided in patients with extensive comorbidities or requiring multiple transfusions
Close observation for symptoms for COVID-19 in ward—if suspicious—isolated immediately and tested
Early discharge of post-operative patients
Education and counselling of patients
Teleconsultations to minimise follow-up visits

### Safety Assessment

We had operated upon only COVID-negative patients. Any patient that was COVID-positive was referred to the nearest COVID facility for management. Two of the patient operated on during this period turned COVID-positive in the post-operative period after they were discharged from the hospital. These were subsequently referred to COVID facility and managed at COVID centre, and both the patients recovered.

There were no major complications encountered with any patients during this period. There were minor complications in 12 patients in the form of wound infection, parotid fistula and suture dehiscence which were managed conservatively during the follow-up visit in the out-patient department.

One of the healthcare personnel (Senior resident) was found to be COVID-positive. However, he was asymptomatic and was managed conservatively under observation at the nearby COVID facility.

### Discussion

Head and neck cancer is a major burden of cancer cases in India with more than 200,000 cases occurring per year. Oral cancer is the most common cancer among males in India [1]. This was primarily due to the increased tobacco usage, both in smoked and smokeless forms [5, 6]. The maximum number of cases in our study cohort belonged to the age group of 40–60 years. This corresponds to a study which analysed the trends of oral cancer at a tertiary centre in India [7].

The COVID-19 pandemic has disrupted the diagnostic and management strategies for head and neck cancer patients. According to previous studies, about 60 to 80% of patients present with an advanced stage disease [8]. However, during the COVID-19 crisis, almost 90% of our patients presented with stage III–IV disease in our cohort.

The lockdown imposed by the authorities for preventing transmission of COVID-19 infection leads to the forced closure of the interstate as well as the intrastate transport which was a contributing factor towards this trend of presentation. Besides, a majority of the hospitals were on the high alert, and major tertiary centres were converted into dedicated COVID centres. Most of the hospitals had been running only their emergency care services with a shutdown of normal services. Patients that presented at advanced stage were due to the symptoms of bleeding and severe pain, which signified advanced stage disease. Shutting down of local hospitals and clinics had also disrupted the referral pathway to tertiary centres, and this also led to the advanced stage of presentation. Oral screening for cancer was temporarily stopped due to the fear of the novel virus transmission especially in the backdrop of emerging reports of longer viability of the virus in saliva [9].

Though recent study from a tertiary cancer centre in India reported favourable outcome after major elective surgeries, earlier reports from China as well as Italy showed a high incidence of mortality in oncology patients which lead to deferred surgical and oncology care in many oncocentres [2, 10]. These fuelled the anxiety among patients already vulnerable due to diagnosis and delay in treatment of cancer. Anxiety among cancer patients has been shown to have a negative impact on treatment outcome and quality of life [11]. More than 50% patients that presented to hospital during this period were newly registered cases. Ninety percent of the patients presented at advanced stage (stage III/IV). Due to advanced stage of presentation, patients were not amenable to curative intent surgical treatment. Several patients chose not to undergo surgery during the lockdown for fear of COVID-19 infection despite being explained the risks of stage migration due to delay in treatment. This wilful postponement of the treatment had also contributed immensely to disease progression. Close follow-up for progression of disease, increase of symptoms by teleconsultation was advised to these patients.

Another important group of patients that presented to the hospital were those already receiving treatment for cancer at different centres. Eighty-five patients among the 382 new registered cases were patients who were undergoing treatment elsewhere in pre-lockdown period. They could not visit their primary centres as most hospitals had de-escalated their services in the wake of pandemic, and this hospital was the only fully functional oncologic centre catering to a large population. A recent study about the Indian scenario for management and status of head and neck during this pandemic analysed that out of 16 major tertiary healthcare centres 11 institutes had stopped their regular facilities, postponed elective surgeries and continued only emergency services during this period [12]. Besides, travel restrictions due to lockdown and the restrictions on the hotel industry

reduced the options of boarding and lodging facilities for patients who visit from different districts. There were several NGOs and district administration which extended their support to the patients taking treatment at the hospital and helped them provide the boarding and lodging facility.

For a head and neck cancer surgeon, surgical management of head and neck cancer during this pandemic had been a major dilemma: delay in surgeries would lead to the increased morbidity and poor outcome and also increase the stress on healthcare facilities. Performing surgeries, on the other hand, posed a difficult challenge due to lack of availability of blood and blood products, dearth of ICU beds and ventilators, and high-risk aerosol-generating surgical procedures. Besides, the majority of surgeons withheld services due to reports mentioning increased morbidity and mortality in cancer patients. Various international and national guidelines were formulated so as to maintain a risk-benefit ratio for the clinicians. International guidelines by American College of Surgeons and Centres for Medicare and Medicaid Services on priority classification of patients were made [13, 14]. The Foundation of Head and Neck Oncology (FHNO), India, also gave guidelines regarding diagnosis and management of head and neck cancer patients. Tata Memorial Centre also released their strategies to manage the cancer patients during the COVID-19 pandemic [15].

Our Institutional policies were laid down based on these guidelines. Patients were prioritised, and a total of 69 major head and neck cancer surgeries were performed. Surgery was avoided in patients with extensive co-morbidities or requiring multiple transfusions. Since in the initial period of lockdown, rotation of hospital staff was done, so less number of OTs were running compared to pre-COVID period. The detailed history of patients was taken again in ward, strict social distancing was maintained, and maintenance of proper hand and respiratory hygiene was stressed upon both for patients as well as their attendants. The use of full PPE in OTs was mandatory. Patients were monitored closely for any symptoms suspicious of COVID-19 both in pre-op and post-op periods. Any patient with symptoms similar to COVID was isolated immediately, tested for COVID-19. Care was taken so as to facilitate early discharge of patient post-surgery to minimise the risk of infection. Almost all patients were discharged within 5–7 days. Patients were educated and counselled regarding post-op care management and COVID-19 symptoms and were asked to report immediately if they experienced any such symptoms (Table 3). This resulted in no patients in surgical ward pre-op and post-op being infected with COVID-19 infection. Minor wound infections and dehiscence were noted in some post-op cases but were managed conservatively. We did not observe any increased morbidity or complications in patients operated on during this period. There was no mortality in any of the patients undergoing treatment. A recent study by a tertiary

care centre in India also showed favourable outcomes of elective surgeries conducted during this period [16].

Adjuvant treatment in form of radiation/chemoradiation within the specified timeframe forms an integral part of treatment of head and neck cancer. Delay in adjuvant radiotherapy after surgery may affect the overall survival of patients [17]. Among 69 patients operated on during this period, 17 patients had started on their adjuvant treatment. On treatment visits form an important part for management of patients on radiation therapy. Measures for close surveillance of on treatment visits and proper screening protocols for COVID-19 were implemented so that cancer treatment care remained unhindered. Recently, an international consensus was also published which aimed to reduce the ambiguity and discrepancies in head and neck cancer treatment especially in resource-constrained settings. It was agreed upon that surgery should not be delayed for more than 4 weeks in advanced head and neck cancer, and alternative treatment method should be started immediately if surgery was delayed [18].

Teleconsultation for follow-up patients was the most rapidly and widely implemented measure to allow for social distancing and decrease the footfall in hospital. Guidelines have also come up for implementation of telehealth visits [19]. Attempts were made to minimise the follow-up appointments and encourage teleconsultations. Patients were counselled about both cancers related and COVID-related symptoms. Forty-three percent of the follow-up cases that visited hospital experienced symptoms of pain, swelling or non-healing ulcers. Among these patients, 12 patients were diagnosed with recurrence. With social distancing measures in place due to COVID-19, services of home healthcare workers, primary care physicians and hospice care services have also been hampered. Among the 189 cases of follow-up, 33% of the patients included those who were on palliative care for their late-stage disease or in remission and those who had to refill their prescriptions. WHO had reckoned a dearth of access to opioid analgesics even before the COVID-19 pandemic emerged [20]. The disruption of supply due to pandemic had further added to the shortage and unavailability of these medications locally forcing patients to travel long distances for their medicines.

A significant increase in the number of patients visiting the emergency department during lockdown was noted. Although our hospital was fully functional with regular outpatient services, but with social distancing norms in place, travel restrictions due to lockdown, shutdown of services by major tertiary hospitals and fear of COVID-19 infection, there was an increase in a number of patients visiting emergency. Besides, non-availability of local general practitioners and dearth of availability of analgesics added to the woes of the patients. About 60 patients visited the emergency department during the lockdown

among which 41 patients had complaints of dyspnoea. If absolutely needed, then tracheostomy was performed. FHNO guidelines for emergency tracheostomy were followed [21]. Pain and dyspnoea were the most common complaints of patients visiting the emergency according to a study by Lawson et al. which was also seen in our cohort [22].

Analysing the pattern of presentation helped us divert adequate healthcare services to key affected areas. A COVID Response Team (CRT) coordinating with the district administration helped in proper transport of the patients to the point of care. The boarding and lodging facility available around the hospital were made available to patients, and such coordination helps in delivering proper treatment to patients unhindered during the pandemic as well. Strict screening protocols ensured that no COVID-positive patients came in contact with patients admitted to our surgical ward. Early discharge of patients minimising the duration of hospital stay was emphasised decreasing the rate of hospital-associated infections. There was no significant increase in morbidity or mortality in patients undergoing surgical care. With dynamic strategizing, proper rationale and optimum utilisation of resources in our resource-constrained setup, we were able to continue our oncology services unhindered. Establishing these simple measures in most hospitals can lead to continued medical care and would prevent any burden on the healthcare system.

## Conclusion

Surgical treatment can be safely administered during the pandemic after following prevention guidelines. The oncology services must not be discontinued as there would be mortality associated with disease progression. The government bodies and administration must ensure that all oncology centres continue to provide oncology and surgical care without restrictions to prevent collateral damage of non-COVID patients. During any such future calamity, attention must be put on to continue oncology services unhindered. The pattern of presentation at our hospital shows the importance of continuing the oncology services due to the mortality associated with disease progression. Following strict preventive guidelines not only safeguards the interest of the patients but also prevents any morbidity and infection in the healthcare professionals.

## Declarations

**Conflict of Interest** The authors declare no competing interests.

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