

# A Retrospective Study of Disease Burden as a Consequence of Delayed Patient Follow-up in the COVID-19 Pandemic in a Tertiary Care Voice Clinic

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## ABSTRACT

**Purpose:** The aim of our study is to retrospectively analyze the consequences of delayed follow-ups and their impact on disease prognosis at our voice clinic. We studied the increase in disease burden and upstaging of laryngeal cancers and associated morbidity, consequent to delayed follow-up.

**Materials and methods:** This is a retrospective, observational study performed by retrieving archived data of patients who visited our voice clinic prior to the pandemic (before 2019). We included all patients who were advised on long-term regular follow-ups (every 3–4 months for a period of 3–4 years). We noted the follow-up compliance and disease progression of these patients prior to the pandemic (2019) and during the coronavirus disease 2019 (COVID-19) pandemic (2020). Data collected were entered using Microsoft Excel 2007. Descriptive analysis for numerical data was summarized and categorical data was represented for various parameters.

**Results:** In our study, 92.03% of patients who had followed-up regularly in 2019 did not follow-up in the pandemic year (2020). Out of these patients, 9.6% had disease upstaging and 30% of the required total laryngectomy, which dramatically changes the quality of life in an individual. Almost 50% of patients who did not regularly follow-up in 2020 were located in another city.

**Conclusion:** Under unforeseen circumstances, it is important to create a system to identify high-risk patients and ensure timely management to prevent disease progression. Video laryngoscopic evaluation at the nearest center and routine teleconsultation with the treating laryngologist in order to assist in disease surveillance is suggested in case of travel restrictions.

**Keywords:** Coronavirus disease 2019 pandemic, Disease burden, Disease upgrading, Follow-up, Laryngeal lesions.

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## INTRODUCTION

Coronavirus disease 2019 (COVID-19) has been a global burden causing dramatic morbidity and mortality in the past 2 years. There have been devastating socioeconomic and disease impacts in the world.<sup>1</sup> Having overwhelmed the healthcare infrastructure, there have been collateral consequences on the routine care of many non-COVID-19-related illnesses.

Patients with cancer form a distinct subset of the population in whom correct and timely treatment has a huge impact on the outcome of the disease.<sup>2</sup> These patients need continued monitoring and support during and after treatment. The management and prognosis of certain laryngeal conditions, including malignancy, are significantly different from other advanced diseases. In order to attain maximum benefits, immense commitment and compliance are mandatory from the patients. Any unjustifiable deviation from the timely, well-established standards of patient care may lead to fragmented, poor quality care and in turn, hamper patient outcomes.

In 2021, Kiong et al. in their study predicted diagnostic delays and an increased incidence of head and neck cancers due to COVID-19.<sup>3</sup> A study conducted in the United Kingdom in 2020 showed a reduction of immediate referrals (decreased by –70.4% and attendance for chemotherapy decreased by –4.5% during COVID-19).<sup>4</sup> During the pandemic, various causes like travel restrictions, fear of contracting COVID-19 during hospital visits, and financial or social factors may have led to delayed follow-ups of patients.

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The aim of our study is to retrospectively analyze the consequences of the delayed follow-ups as well its impact on the prognosis of the disease. We studied the increase in disease burden and upstaging of laryngeal cancers and associated morbidity consequent to delayed follow-up.

## MATERIALS AND METHODS

This is a retrospective, observational study performed by retrieving archived data of patients who visited our voice clinic prior to the

pandemic (before 2019). We included all patients who were advised on long-term regular follow-ups (every 3–4 months for a period of 3–4 years). The age, gender, geographical distribution, type of disease pattern, upstaging of malignancy if any, and mortality were noted. We noted the follow-up compliance of these patients prior to the pandemic (2019) and during the COVID-19 pandemic (2020). Data collected were entered using Microsoft Excel 2007. Descriptive analysis for numerical data was summarized as mean with standard deviation, and categorical data were represented as frequencies with percentages for various parameters. Thereafter, we studied any consequent increase in the disease burden due to inconsistent or absent follow-up in the pandemic period.

## RESULTS

A total of 1,462 patients visited the voice clinic in the prepandemic year of 2019. Out of them, a total of 156 patients (135 males and 21 females), who fit into our inclusion criteria, formed the sample size of this study.

In 2019, out of the total 156 patients, 113 of them came for regular follow-up, while 43 patients were irregular. However, out of the 113 patients who were regularly following-up earlier, only nine of them followed-up regularly during the COVID-19 pandemic year of 2020. Out of the 43 patients who had an irregular follow-up in 2019, 37 patients did not follow-up at all, and six of them continued to follow-up irregularly in 2020.

These nine patients who came for regular follow-up, even in the pandemic year of 2020, had good healing with no signs of recurrence or progression of the disease. However, out of the remaining 104 patients who were regularly following-up in 2019 but failed to visit in 2020, 10 of

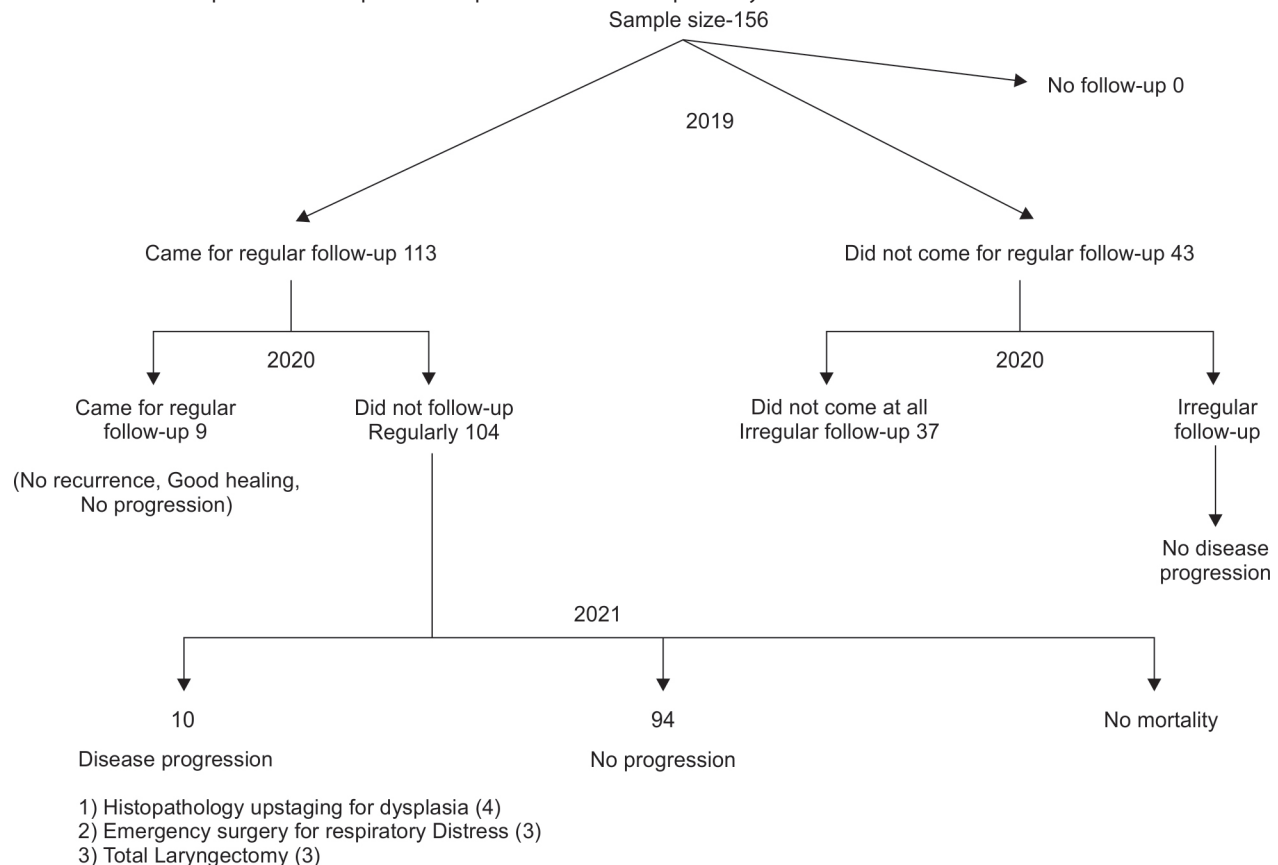
them showed disease progression in 2021. Of these 10 patients, four had histopathology upstaging of their dysplastic glottic lesion, three of them underwent emergency surgery for respiratory distress, and three of them had to undergo total laryngectomy. The above results have been represented in the form of a flowchart in [Flowchart 1](#). We noted that almost 50% of the 104 patients who did not regularly follow-up with us in 2020 were located in another city.

## DISCUSSION

The COVID-19 pandemic has changed routine clinical and surgical activities. New ways to guarantee cancer care and follow-up in order to avoid the negative impact on patients' life expectancy created by delay need to be considered.<sup>5,6</sup> Unmonitored progression of various laryngeal diseases, particularly malignancy, may occur due to delayed follow-ups. These cases may often require treatment intensification, resulting in subsequent effects on their functional outcome. Regular follow-up, especially for high-risk patients, can help pick up early disease recurrence prior to its progression to a stage where open surgery, such as total laryngectomy, or emergency procedures, such as tracheostomy, may be the only option possible.

Our study is based on a single tertiary voice care center in South Asia. Out of the total sample size of 156 patients, 113 of them came for regular follow-up during the prepandemic period (2019), while 43 patients were irregular. Out of the 113 patients who were regularly following-up earlier, only nine of them followed-up regularly during the COVID-19 pandemic year of 2020. Prior to the occurrence of the COVID-19 pandemic, various patient factors responsible for delay in receiving treatment and irregular follow-ups included fear of a cancer diagnosis, the asymptomatic period in a

**Flowchart 1:** Flowchart representation of patient compliance with follow-up in the year 2019 and 2020



slow-growing tumor, symptoms mimicking other less threatening illness, illiteracy, and lower socioeconomic class.<sup>7</sup> Historically, in the wake of natural disasters, such as Hurricane Katrina, the availability of transportation significantly impacted access to cancer care in patients with early stage cancers.<sup>8</sup> In our study, we documented that >50% of our sample population were outstation patients who stated that they could not follow-up due to travel restrictions imposed during the pandemic. Other contributing factors, as per our survey, included fear of contracting COVID-19 infection in a hospital setting, an increase in telehealth consultations, and economic causes like loss of employment. Diagnosis and disease monitoring for laryngeal cancers require invasive or specialized examinations like flexible laryngoscopy, which is not easily available in healthcare centers in remote areas. Under the pandemic circumstances, most cities imposed strict travel restrictions, and lack of access to basic laryngoscopy is also a likely cause for the delayed treatment process.

Out of the total of 113 regular follow-up patients from 2019, 104 patients did not come for their regular follow-up during the pandemic (2020). Among those 104, 10 patients who followed-up after the pandemic (2021) showed disease progression—three of them had a recurrence of glottic malignancy and required radiation therapy, two patients who were known cases of recurrent laryngeal papillomatosis had disease upstaging, one patient who was diagnosed with contact granuloma returned with double the previous lesion size, and three patients with glottic malignancy required total laryngectomy. Kiong et al., in their study, noted that patients with mucosal malignancies (sino-nasal cavity and larynx) presented with higher tumor stage (T-stage) (size and extent of main tumor) disease compared to a prepandemic year.<sup>3</sup> Patients with higher T-stage require more extensive surgery or a wider radiation field with consequent morbidity. Given the progressive nature of malignant lesions, it may be expected that increased intervals between tumor-related signs or symptoms and treatment will result in worse oncologic and/or functional outcomes.

A study by Jyotsana and King showed that the inability of the immune system to distinguish between self and nonself leads to a link between cancer pathogenesis and viral infections. Both virus and cancer express proteins that can be detected by host T cells, and both stimulate T cell-mediated inflammation.<sup>9</sup> It is speculated that immune dysregulation and chronic inflammation may be potential drivers of severe outcomes in cancer patients who may have suffered from COVID-19 infection.<sup>9</sup> However, in our study, only three out of the 10 patients who showed progression of disease during the COVID-19 pandemic suffered from the novel COVID-19. Further studies are needed in order to understand if the COVID-19 plays a role in the progression of laryngeal disease/malignancy.

Regular follow-up, even during unforeseen circumstances, is of the essence, particularly for glottic cancers, and clinical decisions should be based on disease-related and patient-related factors. In our center, teleconsultation was adopted as a necessary practice during the pandemic year (2020). We also made a list of the high-risk patients requiring disease surveillance from our archives and a staff member was assigned to make telephonic communication in order to encourage and urge them to come for regular visits. We suggest making the best use of available technology and attempting to actively trace these high-risk patients. It would be advisable for them to undergo flexible laryngoscopy at their nearest accessible laryngology center and thereafter share the reports with their laryngologist (preferably video reports) so that immediate necessary treatment may be imparted to those who require it. Future pandemics may be inevitable, and it is vital to set

up early guidelines and create a system for identifying high-risk patients and reach out to them in case of missed follow-ups, so as to combat delays in laryngeal disease treatment, thereby reducing mortality and morbidity and providing a better quality of life to these patients.

## CONCLUSION

The COVID-19 pandemic has caused a delay in the diagnosis and treatment of many diseases, including laryngeal cancers. In our study, 92% of our patients who had followed-up regularly in 2019 did not follow-up in the pandemic year (2020). Out of these patients, 9.6% had disease upstaging and 30% of these patients required total laryngectomy, which dramatically changes the quality of life in an individual.

Under unforeseen circumstances like the recent COVID-19 pandemic, it is of utmost importance that a system is created in tertiary care centers to identify high-risk patients and ensure timely management to prevent disease progression. In case of travel restrictions for outstation patients, we suggest a combination of video laryngoscopic evaluation at the nearest accessible center and routine teleconsultation with the treating laryngologist, in order to assist them in the surveillance of their disease.

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