

Cancro de cabeça e pescoço na era Pós-COVID: os efeitos da pandemia ainda se mantêm?

Artigo Original

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Resumo

Introdução: O Cancro de Cabeça e Pescoço (CCP) representa o 7º cancro mais comum mundialmente, sendo o 5º no sexo masculino. A pandemia COVID, e disrupção dos cuidados de saúde decorrente, associou-se a diminuição da identificação, e consequente apresentação mais tardia, dos CCP. O presente estudo visa perceber se o impacto da pandemia se refletiu no período pós-COVID, nomeadamente conduzindo a apresentações mais tardias e com maior mortalidade associada.

Materiais e Métodos: Estudo retrospectivo observacional que incluiu todos os doentes com diagnóstico de CCP, no Serviço de Otorrinolaringologia e Cirurgia de Cabeça e Pescoço da ULSSA, entre Janeiro de 2020 e Dezembro de 2025. Foi realizada colheita de informação demográfica e clínica através do processo clínico eletrónico, sendo os doentes estadiados de acordo com as guidelines da American Joint Committee on Cancer de 2025, sendo subdivididos em Grupo 1 (estadio 0 (quando aplicável), I e II) e Grupo 2 (estadio III e IV) para efeitos estatísticos. Os anos COVID foram definidos entre 10 de Março de 2020 e 30 de Setembro de 2022, momento em que foi decretado o final do estado de alerta em Portugal.

Resultados: Um total de 277 doentes foi incluído no presente estudo, dos quais 89.5% (n= 248) eram do sexo masculino, tendo uma média de idades de 63.49 anos (DP 10.570). Não foi encontrada diferença estatisticamente significativa entre o número de doentes admitido pelo SU versus Consulta entre os diferentes períodos (p= 0.226). Nos doentes admitidos pela consulta, o tempo entre referência e consulta foi significativamente inferior durante o período COVID (p= 0.009), não se encontrando diferença estatisticamente significativa entre o tempo entre primeira observação e diagnóstico (p= 0.328) e entre diagnóstico e início de tratamento (p= 0.818). Não existiu, também, diferença estatisticamente significativa entre o número de doentes diagnosticado com estadio III-IV (p= 0.191) entre grupo COVID e Pós-COVID, com a realização de regressão logística binária a demonstrar a não associação entre o ano de diagnóstico e o estadio

à apresentação. A percentagem de doentes que morreu antes de completar 1 ano de diagnóstico foi significativamente superior durante os anos COVID ($p=0.042$), com uma regressão logística binária a demonstrar uma relação estatisticamente significativa entre o ano de diagnóstico e a mortalidade ao 1 ano (OR por ano 0.70, 95% IC 0.50-0.98, $p=0.037$).

Conclusão: Apesar do impacto negativo da pandemia COVID nos serviços de saúde, a adaptação na prestação de cuidados durante este período permitiu uma minimização dos efeitos potencialmente negativos da pandemia, não existindo apresentação mais tardia ou aumento da mortalidade ao 1-ano de diagnóstico no período pós-COVID.

Palavras-Chave: Cancro de Cabeça e Pescoço; COVID

Introduction

The COVID-19 pandemic remains one of the biggest challenges faced by healthcare systems worldwide in modern history, with its impact on overall health still being studied. During this period, the allocation of health professionals to patients suffering from acute SARS-CoV-2 infection, paired with fear of infection among the general public, led to the disruption of timely healthcare, with a decrease in consultation numbers, Emergency Department (ED) visits, and even in cancer screening programs^{1,2}. This disruption led to a decrease in the diagnosis of new cancer cases in the first 10 months of the pandemic, in the USA, a reflection of diagnostic delays³, with cancer numbers being 15 to 24% lower than expected in 2020, and 9% lower than 2019 in Portugal⁴. This data points to a deeply negative impact of the pandemic on cancer diagnosis, with numbers also showing a decline in the number of patients undergoing cancer treatment⁵.

Head and Neck Cancers (HNC) remain the 7th most common malignancy worldwide, with the ranking rising to fifth place when considering male patients⁶. Despite its prevalence, HNC remains associated with delayed diagnosis, something partly due to disparities in healthcare access, associated to socioeconomic barriers⁶. In fact, this type of tumor still presents its highest incidence

in lower socioeconomical communities, who are particularly vulnerable to healthcare disruptions, as happened during the pandemic^{7,8,9}.

Despite this vulnerability, the impact of the COVID-19 pandemic on HNC diagnosis, and its effect on HNC in the post-COVID era, remains largely unknown. Some studies have shown that, during the pandemic, HNC patients presented with more advanced disease stages, with higher proportions of stage IV patients^{10,11}. Additionally, fewer HNC diagnoses were also noted, with Gazzini reporting a statistically significant decrease in new HNC diagnoses in Italy¹¹. It is therefore plausible that these changes might have had an impact on the post-COVID years, increasing the number of HNC patients, advanced-stage disease cases, and mortality in the post-pandemic period, especially in the immediate years after the pandemic ended.

The goal of this study was, therefore, to determine whether the COVID-19 disruption of healthcare services and the associated lack of access to healthcare services were reflected in changes in HNC characteristics, namely disease stage and mortality.

Materials and Methods

The present retrospective observational study was conducted at Unidade Local de Saúde de Santo António – Porto. Patients diagnosed with Head and Neck Malignancies by the Otorhinolaryngology and Head and Neck Surgery department between January 2020 and November 2025 were included in the present study. Patients with lymphoid HNC were excluded. The present study was approved by the local ethics committee, and patients' rights were protected in accordance with the ethical principles of the Declaration of Helsinki. Demographic and clinical data were collected from patients' electronic medical records, including gender, age at diagnosis, referral type (D or Outpatient Consultation), cancer location, histological diagnosis, TNM staging, type of treatment, and the need for additional treatment and disease persistence.

Dates for the first clinical observation, histological diagnosis, and treatment initiation were also recorded. Patients were staged according to the 2025 American Joint Committee on Cancer guidelines for Head and Neck Cancer, then divided into Group 1 (which included Stage 0, when applicable, Stage I, and Stage II) and Group 2 (Stage III and Stage IV) for analysis. COVID years were considered from March 10th, 2020, until September 30th, 2022, the date on which the Portuguese government ended the COVID-19 state of alert, and were compared with post-COVID years (from October 1st, 2022, until 31st December 2025). Statistical analysis was performed using the SPSS version 30 software (IBM Corp., Armonk, NY). A descriptive analysis of patients' characteristics was performed considering frequencies (for categorical variables) and mean and standard deviation (SD) (for continuous variables). Normal distribution was assessed using the Shapiro-Wilks test and through analysis of the skewness and kurtosis. Differences among paired groups were evaluated with the use of a chi-square test (for categorical variables) and an independent sample t-test or Mann-Whitney test (for continuous variables).

Results

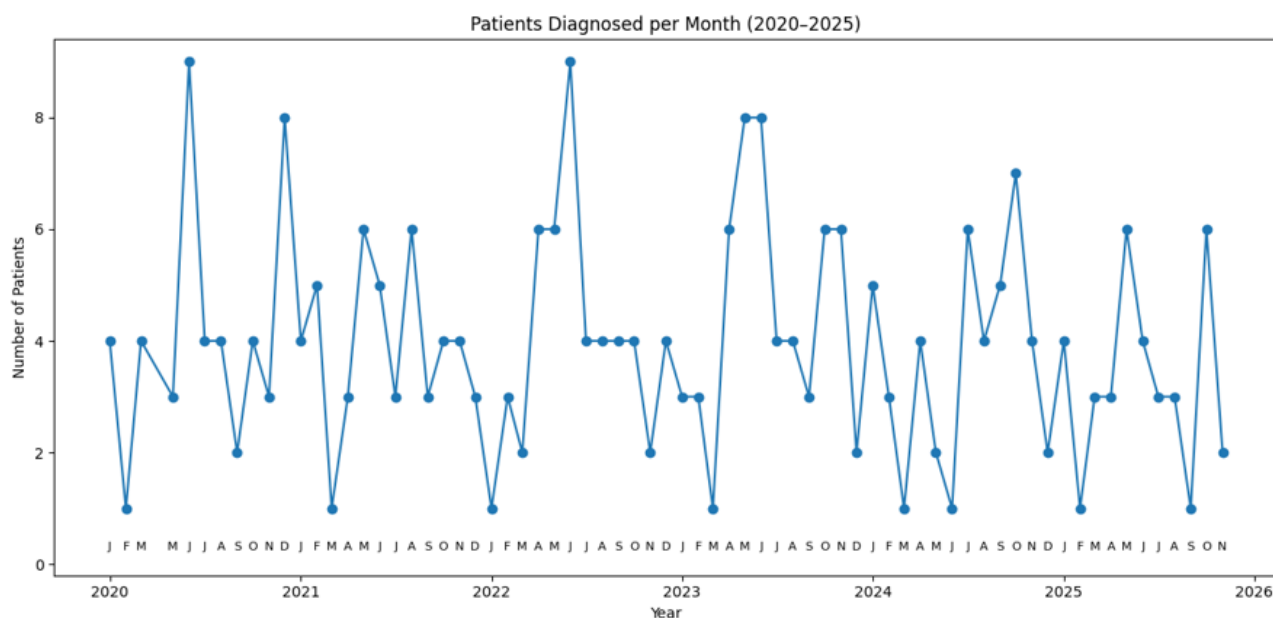
A total of 277 patients were included in this study, with a mean age of 63.49 years (SD 10.570), and 89.5% (n=248) were male. 45.8% of patients (n=127) were diagnosed during the pandemic years, while 54.2% (n=150) were diagnosed in the post-COVID years (Table 1). Diagnoses in 2020 included 48 patients; 46 in 2021; 49 in 2022; 54 in 2023; 44 in 2024; and 36 in 2025. The number of diagnosed patients did not significantly differ across years (p=0.446), as shown in Graph 1, which shows the number of patients diagnosed each month for each year included in the study. 48% (n= 133) of patients were first observed in the ED, with no statistically significant difference found in the route of first observation between COVID and Post-COVID years (p= 0.226). In patients for whom a referral had been placed, the mean waiting time was 45.48 days (SD 48.222), with this time being significantly shorter during the pandemic (40.93 versus 55.98 Non COVID, Z = -2.63, p = 0.009). In patients referred without a previous diagnosis, the average time from Clinical Observation to histological diagnosis was 29.22 days (SD 57.411), with no statistically significant difference observed between COVID and Non-COVID years (Z = -0.978, p = 0.328). The location of the diagnosed HNC is

Table 1
Demographic data of patients diagnosed with Head and Neck Malignancies

		Percentage (n)	
Sex	Feminine	10.5% (n= 29)	
	Masculine	89.5% (n= 248)	
Age		63.42 (DP 10.570)	
First Observation	Urgency	48.0% (n= 133)	
	Appointment	52.0% (n= 144)	
Time period of diagnosis	COVID	45.8% (n= 127)	2020: 17.3% (n= 48)
			2021: 16.6% (n= 46)
			2022: 17.7% (n= 49)
	Post-COVID	54.2% (n= 150)	2023: 19.5% (n= 54)
			2024: 15.9% (n= 44)
			2025: 13.0% (n= 36)

Graph 1

Temporal distribution of monthly patient diagnoses from January 2020 to December 2025



represented in Table 2. 64.6% (n=173) of patients presented with Stage III or IV cancer, while 35.4% (n=95) presented with Stage I or II. No statistically significant difference was found between staging in COVID and non-COVID years ($p=0.191$). A comparison was also made between COVID years and the period from September 2022 to September 2023 (the first year after the state of alert was lifted), with no statistically significant difference observed in stage at diagnosis ($p=0.123$). In 2020, 63% (n=

29) of patients were diagnosed with stage III-IV cancer; in 2021, stage III-IV was observed in 56.8% (n= 25) of patients, with the percentage being of 52.1% (n= 25) in 2022; in 2023, 2024 and 2025 this percentage was of 61.1% (n= 33), 68.2% (n= 30) and 67.6% (n= 23) respectively. To evaluate temporal trends in Staging, a binary logistic regression with year of diagnosis as a continuous predictor was used: year of diagnosis was not significantly associated with advanced stage disease at presentation

Table 2

Location of diagnosed Head and Neck Malignancies

Site	Percentage (n)
Pharynx	42.9% (n= 119)
Larynx	41.5% (n= 115)
Nasal Cavity	7.6% (n= 21)
Unknown Primary	4% (n= 11)
Pharynx and Larynx	1.4% (n= 4)
Oral Cavity	0.7% (n= 2)
Nasal Vestibule	0.7% (n= 2)
Oral Cavity and Pharynx	0.4% (n=1)
Oral Cavity and Larynx	0.4% (n=1)
External Auditory Canal	0.4% (n=1)

(OR per year 0.93, 95% CI 0.80-1.08; p= 0.32). Of the 277 patients, 4% (n=11) did not begin any type of treatment: 3 died before a formal therapeutic approach was proposed; 4 refused treatment; and 4 missed their follow-up appointments. Of the patients with a formal treatment proposal, 87.2% (n= 232) began treatment with curative intent. Among these, 60.8% (n= 141) started with medical treatment, while 39.2% (n= 91) underwent surgery as their primary treatment. No statistically significant difference was found in the type of treatment (medical or surgical) between COVID and non-COVID years (p= 0.420).

The mean time between histological diagnosis and treatment initiation was of 49.44 days (SD 26.311) during COVID years and 53.50 days (SD 47.384) in Post-COVID years, with no statistically significant difference being found between values (p= 0.818).

Of the 266 patients who maintained follow-up, 35% (n=93) died, with 74.5% (n=70) of these deaths attributed to HNC. To better assess potential differences in mortality among patients diagnosed during COVID years, the percentage of patients who died within one year of diagnosis was calculated for both COVID and Post-COVID years, excluding patients diagnosed in 2025 due to insufficient follow-up. During COVID years, 54.7% of patients died before one year, compared to 45.3% during post-COVID years, and this difference was statistically significant (p=0.042). No statistically significant difference was found

between one-year mortality during COVID years and the first year after the state of alert ended (p=0.914). To evaluate temporal trends in 1-year mortality, a binary logistic regression with year of diagnosis as a continuous predictor was used: year of diagnosis was significantly associated with 1-year mortality (OR per year 0.70, 95% CI 0.50-0.98; p= 0.037), with the one-year mortality significantly decreasing over calendar time.

Pharyngeal Tumors

42.9% (n= 119) of patients were diagnosed with pharyngeal tumors. Demographic data and COVID and Post-COVID comparisons for patients with oropharyngeal and hypopharyngeal cancer are represented in Table 3., Table 4. and Table 5.

Laryngeal Tumors

Laryngeal tumors represented 41.5% (n=115) of all diagnosed HNC, with patients presenting a median age of 66.30 years (SD 10.382), and with 91.3% (n= 105) of patients being male. COVID and Post-COVID comparisons for patients with laryngeal cancer are represented in Table 6.

Table 3
Demographic data of patients with pharyngeal cancer

		Percentage (n)		
Sex	Feminine	10.1% (n= 12)		
	Masculine	89.9% (n= 107)		
Age				
First Observation	Urgency	54.6% (n= 65)	COVID: 56.4%	p= 0.784
	Appointment	45.4% (n= 54)	Post-COVID: 53.8%	
	Oropharynx	56.3% (n= 67)		
	Hypopharynx	29.4% (n= 35)		
	Nasopharynx	14.3% (n= 17)		

Table 4
COVID and Post-COVID comparison in patients diagnosed with Oropharyngeal Cancer

COVID		Post-COVID	
Urgency	Appointment	Urgency	Appointment
54.8% (n= 17)	45.2% (n= 14)	61.1% (n= 22)	38.9% (n= 14)
p= 0.606			
Stage I-II	Stage III-IV	Stage I-II	Stage III-IV
22.6% (n= 7)	77.4% (n= 24)	25% (n= 9)	75% (n= 27)
p= 0.817			
Time from Referral to Appointment			
18.17 (SD 12.067)		41.86 (DP 28.115)	
Mann–Whitney U = 18.0, Z = -2.030, p = 0.042			
Time from Appointment to Diagnosis			
22.48 (SD 40.722)		5.21 (SD 8.328)	
Mann–Whitney U = 344.5, Z = -1.575, p = 0.115			
Time from Diagnosis to Treatment			
55.30 (DP 25.882)		48.69 (DP 23.797)	
Mann–Whitney U = 265.0, Z = -0.682, p = 0.495			
1-Year Mortality			
52.4% (n= 25)		47.6% (n= 17)	
p= 0.386			

Table 5
COVID and Post-COVID comparison in patients diagnosed with Hypopharyngeal Cancer

COVID		Post-COVID	
Urgency	Appointment	Urgency	Appointment
62.5% (n= 10)	37.5% (n= 6)	47.4% (n= 9)	52.6% (n= 10)
p= 0.378			
Stage I-II	Stage III-IV	Stage I-II	Stage III-IV
6.3% (n= 1)	93.8% (n= 15)	10.5% (n= 2)	89.5% (n= 17)
p= 0.649			
Time from Referral to Appointment			
18.33 (SD 11.776)		26.71 (DP 24.226)	
Mann–Whitney U = 18.500, Z = −0.358, p = 0.721			
Time from Appointment to Diagnosis			
15.07 (SD 10.521)		24.88 (SD 28.805)	
Mann–Whitney U = 106.500, Z = −0.497, p = 0.619			
Time from Diagnosis to Treatment			
42.85 (DP 26.156)		77.44 (DP 101.986)	
Mann–Whitney U = 87.500, Z = −0.724, p = 0.469			
1-Year Mortality			
64.3% (n= 10)		35.7% (n= 7)	
p= 0.697			

Table 6
COVID and Post-COVID comparison in patients diagnosed with Laryngeal Cancer

COVID		Post-COVID	
Urgency	Appointment	Urgency	Appointment
47.1% (n= 24)	52.9% (n= 27)	31.3% (n= 20)	68.8% (n= 44)
p= 0.084			
Stage I-II	Stage III-IV	Stage I-II	Stage III-IV
62.7% (n= 32)	37.3% (n= 19)	45.3% (n= 29)	54.7% (n= 35)
p= 0.62			
Time from Referral to Appointment			
30.17 (SD 23.846)		70.71 (DP 61.999)	
Mann–Whitney U = 148.500, Z = -2.330, p = 0.020			
Time from Appointment to Diagnosis			
42.49 (SD 64.240)		43.32 (SD 75.045)	
Mann–Whitney U = 1468.500, Z = -0.364, p = 0.716			
Time from Diagnosis to Treatment			
43.17 (DP 22.016)		45.53 (DP 26.091)	
Mann–Whitney U = 955.500, Z = -0.711, p = 0.477			
1-Year Mortality			
77.8% (n= 7)		62.5% (n= 10)	
p= 0.441			

Discussion

The COVID-19 pandemic remains an unprecedented global health crisis, with its impact still being studied. The effects of the pandemic on HNC have been reported inconsistently, with significant differences between countries. However, studies indicate that patients are often presenting with more advanced stages and that there have been disruptions in the timing of initial clinical observation, diagnosis, and/or treatment initiation¹³. These changes could have long-term effects on HNC, potentially leading to more patients presenting with later-stage disease and higher mortality rates.

Regarding HNC as a whole and specifically pharyngeal and laryngeal tumors, our study showed that the waiting time from referral to appointment was significantly shorter during COVID years compared to post-COVID years. Although healthcare services were highly disrupted by the emerging pandemic, oncologic patients remained a priority for

healthcare providers. Despite cancellations or postponements of appointments for non-urgent patients, those referred with suspected cancer, concerning symptoms, or risk factors for HNC were seen in a timely manner. The results of this study suggest alignment with these norms, with the shorter waiting times explained by initial appointment slots being available from non-emergent patients and allocated to those with suspicion of HNC. The return to normal clinical activity in the post-COVID years likely explains the increased time from referral to appointment. These findings are consistent with Stevens et al¹⁴, who observed a reduction in wait time from referral to appointment during COVID years compared to pre-pandemic years. It is also worth noting that there was no statistically significant difference in the number of patients admitted through the ER during COVID or post-COVID years, which supports the relative normalcy of appointment availability for this subset of patients during the pandemic.

Additionally, there wasn't a statistically significant difference in terms of time from appointment to diagnosis and from diagnosis to treatment. These results are in accordance with a recent Systematic Review by Simonsen et al. showing that, in most studies included, only marginal changes in time to treatment were observed during the pandemic and that most included patients actually had a decrease in time to treatment¹³.

Despite not finding any statistically significant differences in terms of timings between COVID and Post-COVID periods, the time between referral, appointment, diagnosis and treatment surpassed the recommended times for each step, in both periods. While caution should be taken when analyzing these numbers, as they include patients referred from primary care with non-urgent referrals, patients who had to undergo further evaluation before a treatment decision could be done and patients who had to be stabilized before treatment could be started, these numbers further highlight the need to educate primary care services for the recognition of patients at risk for HNC and for healthcare services to streamline access to exams and evaluations to these patients. While these nuances have the potential to deeply affect the timing numbers obtained and, possibly, the one-year mortality, the existence of a statistically superior one-year death rate in patients diagnosed during the COVID years sustains the effect the pandemic had on the survival of HNC patients.

Regarding staging, our results show that most HNC presented at more advanced stages, during COVID and Post-COVID years. HNC are typically diagnosed at later stages, with 58.5% of HNC diagnosed at stages III or IV in the UK, and with only 29% being deemed localized tumors in the USA^{15,16}. These patients are, therefore, typically diagnosed later in the disease progression, even without the constraints of the pandemic. The lack of a statistically significant difference in staging between COVID and Post-COVID years, even when considering each year alone, only

reinforces the idea that these patients are mostly observed when disease progression has already occurred.

One year mortality was significantly higher for patients diagnosed during COVID years, with results also showing a significant decrease in short-term mortality over time. While no difference was found in terms of appointment, diagnosis and treatment timings in the present study, healthcare services and resources were still heavily constrained by the pandemic. The difference in mortality rates is a probable reflection of those constraints, more so than a reflection of the disease itself, as indicated by the lack of a significant difference in Cancer related deaths. This is a probable reflection of the increased mortality rates of the general population during 2020 and 2021, with the oncology population representing an even more vulnerable subset of patients when considering the Sars-CoV2 infection and its complications¹⁷.

There are several limitations to the present study. First and foremost, its retrospective nature relies on written data collection. Secondly, it would be of interest to include a pre-pandemic group to have a better understanding of the pandemic effects and if the post-COVID numbers are similar to the pre-pandemic numbers. Additionally, the present study is single-center and thus these findings may not reflect a broader reality.

Nonetheless, the current study provides a clearer understanding of how adaptation occurred during the pandemic, with cancer patients being prioritized at a time when healthcare was heavily disrupted and non-urgent care was largely postponed. This adaptation, carried out by healthcare professionals, helped minimize the potential negative and long-lasting effects of COVID-19.

Conclusion

The COVID-19 pandemic remains one of the biggest healthcare challenges worldwide, with its effects still lingering. The present study highlights the adaptations that occurred during the pandemic, with appointment times

actually being shorter during COVID years and the time to treatment remaining the same between the two periods. This allowed for a relatively normal follow-up of HNC patients, preventing an increase in advanced-stage disease and mortality in the post-COVID years.

Conflito de Interesses

Os autores declaram que não têm qualquer conflito de interesse relativo a este artigo.

Confidencialidade dos dados

Os autores declaram que seguiram os protocolos do seu trabalho na publicação dos dados de pacientes.

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Declaração de IA generativa e tecnologias assistidas por IA no processo de redação

Durante a preparação deste trabalho, o(s) autor(es) não utilizou(aram) Inteligência Artificial, assumindo total responsabilidade pelo conteúdo da publicação.

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