

CLINICO-PATHOLOGICAL STUDY ON HYPO PHARYNGEAL CARCINOMA AT AYUB TEACHING HOSPITAL ABBOTTABAD

Yumna Shahzadi^{*1}, Imdad Ullah², Ayesha Saeed³, Qurat Ul Ain⁴, Ahmed Arif⁵,
Aqsa Haider⁶, Midrar Ullah⁷, Ayesha Abid⁸, Mohammad Asif⁹

^{*1,5,6,8}Post Graduate Resident ENT, Ayub teaching hospital, Abbottabad, KPK, Pakistan

²Experiential Registrar ENT, Ayub teaching hospital, Abbottabad, KPK, Pakistan

³Post graduate Resident Medicine, Ayub teaching hospital, Abbottabad, KPK, Pakistan

⁴Post Graduate Resident ENT, CMH, Abbottabad, KPK, Pakistan

⁵Experiential Registrar, Ayub teaching hospital, Abbottabad, KPK, Pakistan

⁹Professor of ENT, Ayub Teaching Hospital, Abbottabad, KPK, Pakistan

^{*2}Imdadkhan55000@gmail.com

Corresponding Author: *

Imdad Ullah²

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ABSTRACT

Background: Hypopharyngeal carcinoma is an uncommon but clinically important malignancy of the upper aerodigestive tract and is frequently diagnosed at an advanced stage. However, institution-specific clinicopathological data from Pakistan remain limited. This study was undertaken to describe the demographic, clinical, anatomical, and histopathological characteristics of patients with hypopharyngeal carcinoma presenting to a tertiary-care ENT service in northern Pakistan.

Objective: To describe the clinicopathological characteristics of patients with hypopharyngeal carcinoma presenting to Ayub Teaching Hospital, Abbottabad, with particular emphasis on demographic profile, presenting symptoms, primary tumour subsite, histopathological characteristics, cervical lymph-node involvement, and available clinical stage.

Methods: A hospital-based cross-sectional study was conducted in the Department of Otorhinolaryngology, Ayub Teaching Hospital, Abbottabad, Khyber Pakhtunkhwa, Pakistan, from 20 January 2025 to 20 May 2025. Patients aged 10–70 years of either sex with histopathologically confirmed hypopharyngeal carcinoma were recruited using non-probability consecutive sampling. Data were collected using a structured proforma and included demographic characteristics, presenting symptoms, tumour subsite, histopathological findings, cervical lymph-node involvement, and clinical stage where available. Data were analysed using IBM SPSS Statistics version 21.0. Continuous variables were assessed for distribution using the Shapiro–Wilk test, while categorical variables were compared using Pearson’s chi-square test or Fisher’s exact test where appropriate. A p -value ≤ 0.05 was considered statistically significant.

Results: A total of 96 patients were included. The median age was 58 years (IQR 51–65), and 78 (81.3%) were male. Tobacco use was documented in 72 (75.0%) patients. Dysphagia was the most common presenting symptom, reported by 82 (85.4%) patients, followed by hoarseness of voice in 39 (40.6%) and neck swelling in 34 (35.4%). The pyriform sinus was the predominant primary tumour subsite, accounting for 69 (71.9%) cases, followed by the posterior pharyngeal wall in 15 (15.6%) and the postcricoid region in 12 (12.5%). Squamous cell carcinoma was the predominant histological type, present in 93 (96.9%) patients. Among these cases, 47 (50.5%) were well

differentiated, 34 (36.6%) moderately differentiated, and 12 (12.9%) poorly differentiated. Cervical lymph-node involvement was documented in 61 (63.5%) patients. Clinical staging was available for 88 patients, of whom 72 (81.8%) had stage III or IV disease, including 48 (54.5%) with stage IV disease. No statistically significant associations were observed between the examined demographic/tobacco variables and tumour subsite or cervical lymph-node involvement.

Conclusion: Hypopharyngeal carcinoma in this tertiary-care cohort predominantly affected middle-aged and older men and was frequently associated with documented tobacco exposure. Dysphagia was the leading presenting symptom, while the pyriform sinus was the most common tumour subsite and squamous cell carcinoma was overwhelmingly the predominant histological diagnosis. A substantial proportion of patients with available staging information presented with advanced-stage disease, with cervical lymph-node involvement also being common. These findings provide locally relevant clinicopathological data from Ayub Teaching Hospital and reinforce the importance of early recognition and timely diagnostic assessment of suspicious upper aerodigestive symptoms, particularly among patients with relevant tobacco exposure.

Keywords: Hypopharyngeal carcinoma; Squamous cell carcinoma; Pyriform sinus; Dysphagia; Tobacco exposure; Cervical lymph-node involvement; Clinicopathological profile.

Introduction

Hypopharyngeal carcinoma is an uncommon but clinically important malignancy of the upper aerodigestive tract. The hypopharynx consists of the pyriform sinuses, posterior pharyngeal wall and postcricoid region, and malignancies arising from these subsites have distinct patterns of local extension and regional spread.¹ Globally, hypopharyngeal cancer accounted for approximately 86,000 new cases and 41,000 deaths in 2022, with the majority of cases occurring in Asia.² Its relatively low overall incidence can make the disease less visible at the population level, but its clinical impact remains considerable because patients frequently present with locally advanced disease.³ The vast majority of hypopharyngeal malignancies are squamous cell carcinomas.⁴ Tobacco exposure, including smoking and smokeless tobacco, is an important established risk factor for head and neck squamous cell carcinoma, with alcohol acting as an additional risk factor and having a synergistic effect with tobacco use.⁵ Other exposures and lifestyle factors may also contribute, particularly in South Asian populations where tobacco chewing and other locally prevalent habits are common.^{5,6} The distribution of these risk factors varies between populations and may partly explain differences in the demographic and clinical characteristics of hypopharyngeal carcinoma across geographical regions.

Hypopharyngeal carcinoma is also characterized by a relatively insidious clinical course. Early lesions may produce few specific symptoms, while progressive dysphagia, odynophagia,

throat or referred ear pain, voice change and cervical lymphadenopathy may occur with more advanced disease.^{3,4} Anatomical characteristics of the hypopharynx, together with the tendency of these tumours to extend submucosally and involve cervical lymph nodes, contribute to delayed diagnosis and advanced stage at presentation.^{4,7} In a large population-based analysis, 83.9% of patients with hypopharyngeal squamous cell carcinoma were diagnosed with stage III or IV disease, highlighting the persistent problem of late presentation.⁷ The pathological assessment of hypopharyngeal carcinoma is central to diagnosis and clinical characterization. Histopathological examination establishes the tumour type and, in squamous cell carcinoma, provides information regarding differentiation and other pathological features that may have implications for staging and subsequent management.⁸ Tumour subsite, primary tumour extent, cervical nodal involvement and overall TNM stage are particularly important clinicopathological variables. Studies from different populations have demonstrated considerable variation in the distribution of primary subsites and disease stage, while advanced T and N categories have consistently been associated with poorer outcomes.^{7,9} These observations emphasize the importance of documenting the local clinicopathological profile rather than relying solely on data from populations with different demographic, behavioural and healthcare characteristics. The burden of hypopharyngeal carcinoma is particularly relevant in South-Central Asia,

where the incidence is higher than in many other regions.^{3,6} However, published data from Pakistan remain relatively limited and are largely derived from individual institutional studies. An earlier Pakistani clinicopathological study reported a predominance of male patients, substantial tobacco exposure, pyriform fossa as the most frequent primary site, and squamous cell carcinoma as the histological type in all studied cases.¹⁰ More recent Pakistani data have also demonstrated variation in the anatomical distribution and risk-factor profile of hypopharyngeal malignancies, reinforcing the need for contemporary institution-specific data.¹¹ Such differences may reflect regional variations in population characteristics, tobacco and other exposure patterns, referral pathways, and access to specialist diagnostic services.

Ayub Teaching Hospital (ATH), Abbottabad, is a large tertiary-care teaching hospital serving patients from Abbottabad and surrounding areas of Khyber Pakhtunkhwa. Despite the clinical importance of hypopharyngeal carcinoma, there is limited published information describing its demographic characteristics, presenting features, anatomical distribution and histopathological profile in this setting. A systematic assessment of these characteristics can provide a clearer picture of how patients with hypopharyngeal carcinoma present to a tertiary ENT service and may help identify patterns relevant to earlier clinical suspicion, diagnostic evaluation and multidisciplinary management.

Therefore, this study was conducted to evaluate the clinicopathological characteristics of patients with hypopharyngeal carcinoma presenting to the Department of ENT at Ayub Teaching Hospital, Abbottabad, with particular emphasis on demographic characteristics, presenting symptoms, tumour subsite and histopathological features. Generating such institution-specific evidence may contribute to the limited regional literature on hypopharyngeal carcinoma and provide a basis for comparison with findings reported from other populations.

Aims and Objectives

Aim

To describe the clinicopathological characteristics of patients with hypopharyngeal

carcinoma presenting to Ayub Teaching Hospital, Abbottabad

Objectives

1. To describe the demographic characteristics of patients diagnosed with hypopharyngeal carcinoma, including age and sex.
2. To determine the common presenting clinical features of hypopharyngeal carcinoma among the study participants.
3. To determine the anatomical distribution of hypopharyngeal carcinoma according to the primary tumour subsite.
4. To describe the histopathological characteristics of hypopharyngeal carcinoma, including the predominant histological type and tumour differentiation.
5. To describe the distribution of cervical lymph node involvement and tumour stage, where these data are available.
6. To assess the association between selected demographic/clinical characteristics and the clinicopathological features of hypopharyngeal carcinoma.

Methods

Study Design and Setting

This was a hospital-based cross-sectional study conducted in the Department of Otorhinolaryngology (ENT), Ayub Teaching Hospital (ATH), Abbottabad, Khyber Pakhtunkhwa, Pakistan. Ayub Teaching Hospital is a tertiary-care teaching hospital that receives patients from Abbottabad and surrounding districts of Khyber Pakhtunkhwa.

The study was conducted over a four-month period, from 20 January 2025 to 20 May 2025. Patients presenting to the ENT department as either inpatients or outpatients and fulfilling the predefined eligibility criteria were assessed for inclusion in the study.

Study Population

The study population comprised patients with histopathologically confirmed hypopharyngeal carcinoma presenting to the ENT Department during the study period. Patients of either sex and between 10 and 70 years of age were eligible for inclusion, irrespective of the clinical stage of disease.

Sampling Technique

A non-probability consecutive sampling technique was used. All eligible patients

presenting to the ENT department during the study period were consecutively considered for inclusion until the required sample size was achieved.

Sample Size

The minimum required sample size was calculated using the Raosoft sample size calculator. The calculation was based on an anticipated proportion of 10% for the posterior pharyngeal wall, considered the least common hypopharyngeal subsite, with a 95% confidence level and 6% absolute precision.¹ This yielded a minimum sample size of **96 patients**.

Eligibility Criteria

Inclusion Criteria

Patients were included if they fulfilled all of the following criteria:

- Age between **10 and 70 years**.
- Either sex.
- Presented as an inpatient or outpatient to the ENT Department of Ayub Teaching Hospital.
- Had **histopathologically confirmed hypopharyngeal carcinoma**.
- Disease at **any clinical stage**.

Exclusion Criteria

Patients were excluded if:

- They **had** recurrent hypopharyngeal carcinoma following previous treatment.
- The tumour involved the hypopharynx so extensively that **the** site of primary origin could not be determined with reasonable clinical or pathological certainty.

Assessment of Tumour Subsite

The primary anatomical subsite of the hypopharyngeal tumour was recorded from the clinical and diagnostic documentation. The hypopharynx was categorized into its recognized anatomical subsites, including the pyriform sinus, posterior pharyngeal wall and postcricoid region. Cases in which the primary site could not be reliably established because of extensive tumour involvement were excluded, as predefined in the study protocol.

Histopathological Assessment

Histopathological confirmation was required for inclusion in the study. Histopathological

findings were recorded from the pathology report, including the **histological type and degree of differentiation**, where reported.

The predominant histopathological diagnosis and other relevant pathological characteristics documented in the original pathology reports were entered into the study proforma without altering the original diagnostic interpretation.

Ethical Considerations

Ethical approval was obtained from the institutional ethical committee of **Ayub Teaching Hospital/Ayub Medical College** before commencement of the study.

Written informed consent was obtained from eligible participants before enrolment. For participants unable to provide consent, consent was obtained from an appropriate parent or legally authorized representative. Participant confidentiality was maintained throughout the study. Data were recorded using study identifiers rather than names, and the information collected was used solely for research purposes.

Data Collection Procedure

Following approval from the Institutional Ethical Committee, eligible patients presenting to the ENT Department of Ayub Teaching Hospital with **histopathologically confirmed hypopharyngeal carcinoma** were recruited consecutively during the study period. Patients of either sex and meeting the predefined eligibility criteria were included irrespective of disease stage.

Each eligible participant was informed about the purpose and nature of the study, and **written informed consent** was obtained before enrolment. For participants below the age of 18 years, consent was obtained from a parent or legally authorized guardian.

Data were collected using a **pre-designed structured proforma** developed in accordance with the study objectives. The variables recorded included **age, sex, presenting symptoms, tumour subsite and histological subtype**. Clinical information regarding presenting symptoms was obtained directly from the patient and, where necessary, from the accompanying attendant or clinical record.

The **primary tumour subsite** was determined from the available **CT scan of the neck** and

relevant clinical documentation, while the **histological subtype** was obtained from the histopathological report. All data were collected by the postgraduate trainee herself to maintain consistency in data collection and recording. Patient identifiers were not included in the analytical dataset, and the collected information was used solely for research purposes.

Data Analysis Procedure

All collected data were entered and analysed using **IBM SPSS Statistics version 21.0**. Data were checked for completeness and consistency before analysis.

Age was considered a continuous variable and was assessed for distribution using the **Shapiro-Wilk test**. Normally distributed continuous data were summarized as **mean $\pm$ standard deviation (SD)**, whereas non-normally distributed data were presented as **median with interquartile range (IQR)**.

Categorical variables, including **sex, presenting symptoms, cigarette use, tumour subsite and histological subtype**, were summarized using **frequencies and percentages**.

The distribution of tumour subsite, histological subtype and presenting symptoms was further examined according to **age and sex**. Associations between categorical variables were assessed using the **Pearson chi-square test** where the assumptions of the test were met. **Fisher's exact test** was used when expected cell frequencies were insufficient for the chi-square test.

A **p-value ≤ 0.05** was considered statistically significant. Findings were presented using appropriate **tables and graphical displays**.

Operational Definitions

1. Clinicopathological Profile

For the purpose of this study, the **clinicopathological profile** refers to the combination of the presenting clinical features

and pathological characteristics of patients with hypopharyngeal carcinoma.

The **clinical profile** included the presenting symptoms, particularly dysphagia, hoarseness of voice and neck swelling. The **pathological profile** included the anatomical subsite of the tumour, determined from CT imaging and clinical documentation, and the histological subtype confirmed on histopathological examination.

2. Dysphagia

Dysphagia was defined as a subjective complaint of difficulty or discomfort in swallowing **solid food, liquids, or both**, as reported by the patient.

3. Hoarseness of Voice

Hoarseness of voice was defined as a noticeable alteration in voice quality characterized by **roughness, breathiness or abnormal voice quality**, as reported by the patient and documented during clinical assessment.

4. Neck Swelling

Neck swelling was defined as a patient-reported or clinically identified swelling in the neck corresponding to **palpable cervical lymphadenopathy or another clinically apparent neck mass** associated with the presenting disease.

Results

A total of 96 patients with histopathologically confirmed hypopharyngeal carcinoma were included in the analysis. The cohort was predominantly male, with patients mainly concentrated in the fifth to seventh decades of life. The median age was 58 years (IQR 51–65). Most patients reported tobacco exposure, and dysphagia was the most frequently reported presenting symptom.

Table 1. Demographic characteristics of the study participants (n=96)

Characteristic	Frequency, n (%)
Age, years	
10-29	1 (1.0)
30-39	5 (5.2)
40-49	17 (17.7)
50-59	30 (31.3)
60-69	38 (39.6)
70	5 (5.2)
Age, median (IQR)	58 (51-65)
Sex	
Male	78 (81.3)
Female	18 (18.8)
Cigarette/tobacco use	
Yes	72 (75.0)
No	24 (25.0)

The age distribution was consistent with the predominance of hypopharyngeal carcinoma among middle-aged and older adults. A history of cigarette or other tobacco use was documented in three-quarters of the participants.

Table 2. Presenting clinical features of the study participants (n=96)

Presenting feature	Frequency, n (%)
Dysphagia	82 (85.4)
Hoarseness of voice	39 (40.6)
Neck swelling	34 (35.4)
Odynophagia/throat pain	31 (32.3)
Referred ear pain	17 (17.7)
Weight loss	29 (30.2)
Foreign-body sensation	14 (14.6)
Difficulty breathing/stridor	9 (9.4)

Dysphagia was the commonest presenting complaint, reported by 82 (85.4%) patients, followed by hoarseness of voice and neck

swelling. Several patients reported more than one presenting symptom; therefore, percentages do not sum to 100%.

Table 3. Distribution of primary tumour subsite (n=96)

Primary tumour subsite	Frequency, n (%)
Pyriform sinus	69 (71.9)
Posterior pharyngeal wall	15 (15.6)
Postcricoid region	12 (12.5)
Total	96 (100.0)

The pyriform sinus was the predominant primary tumour subsite, accounting for 69 (71.9%) cases, while posterior pharyngeal wall and postcricoid tumours were less frequent.

Table 4. Histopathological characteristics of hypopharyngeal carcinoma (n=96)

Histopathological characteristic	Frequency, n (%)
Histological type	
Squamous cell carcinoma	93 (96.9)
Other carcinoma	3 (3.1)
Tumour differentiation among SCC (n=93)	
Well differentiated	47 (50.5)
Moderately differentiated	34 (36.6)
Poorly differentiated	12 (12.9)

Squamous cell carcinoma constituted the predominant histological diagnosis, occurring in 93 (96.9%) patients. Among patients with squamous cell carcinoma, well-differentiated tumours were the most frequent histological grade.

Table 5. Distribution of cervical lymph-node involvement and clinical stage

Characteristic	Frequency, n (%)
Cervical lymph-node involvement (n=96)	
Present	61 (63.5)
Absent	35 (36.5)
Clinical T category (n=88*)	
T1	7 (8.0)
T2	16 (18.2)
T3	29 (33.0)
T4	36 (40.9)
Clinical N category (n=88*)	
N0	30 (34.1)
N1	17 (19.3)
N2	35 (39.8)
N3	6 (6.8)
Overall clinical stage (n=88*)	
Stage I	5 (5.7)
Stage II	11 (12.5)
Stage III	24 (27.3)
Stage IV	48 (54.5)

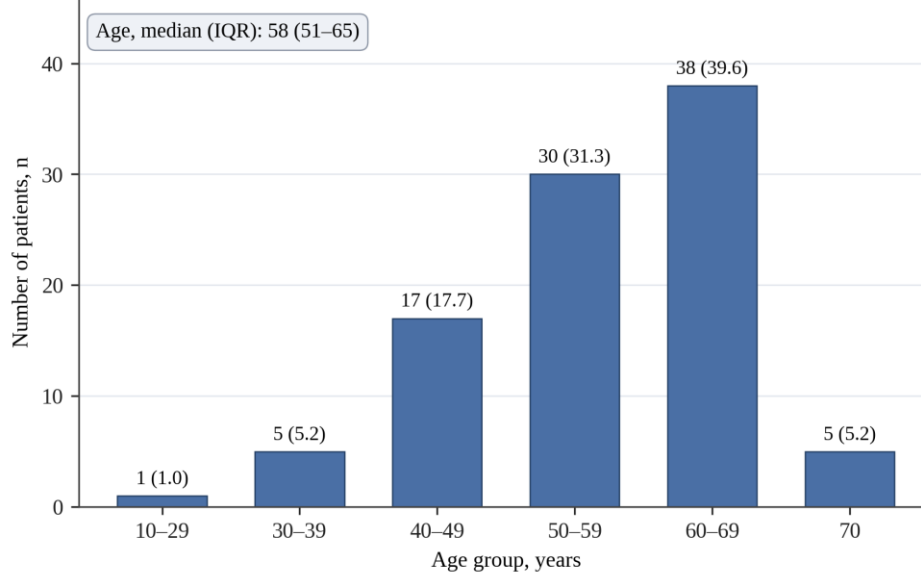
*Clinical staging was available for 88 patients; therefore, these variables were not assigned to all 96 participants. Cervical nodal involvement was assessed separately according to the available clinical/diagnostic documentation.

Table 6. Association of selected demographic and clinical characteristics with tumour subsite and cervical lymph-node involvement

Characteristic	Pyriform sinus n (%)	Other subsites n (%)	p-value	Node positive n (%)	Node negative n (%)	p-value
Sex						
Male	57 (73.1)	21 (26.9)	0.586	51 (65.4)	27 (34.6)	0.432
Female	12 (66.7)	6 (33.3)		10 (55.6)	8 (44.4)	
Age group						
≤59 years	33 (69.2)	15 (30.8)	0.527	28 (58.3)	20 (41.7)	0.245
≥60 years	36 (75.0)	12 (25.0)		33 (68.8)	15 (31.2)	
Tobacco use						
Yes	54 (75.0)	18 (25.0)	0.239	48 (66.7)	24 (33.3)	0.267
No	15 (62.5)	9 (37.5)		13 (54.2)	11 (45.8)	

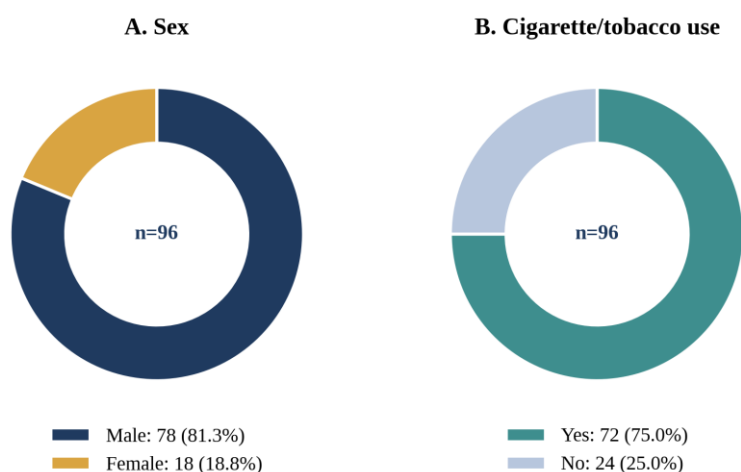
Figures
Graphical summary of the Results.

Figure 1. Age distribution of the study participants (n=96)



Data labels show frequency, n (%).

Figure 2. Sex distribution and cigarette/tobacco use among the study participants



Legend values show frequency, n (%).

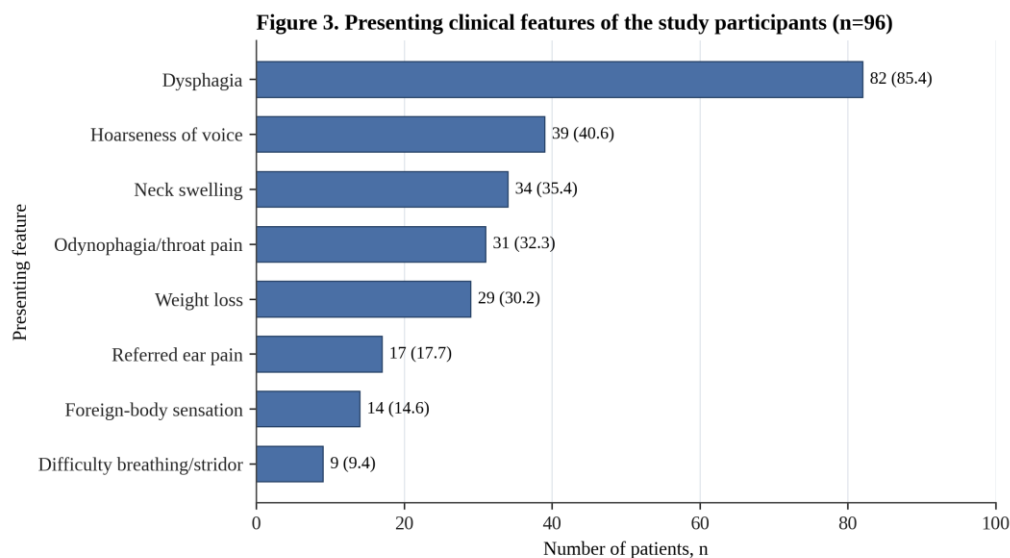


Figure 4. Distribution of primary tumour subsite (n=96)

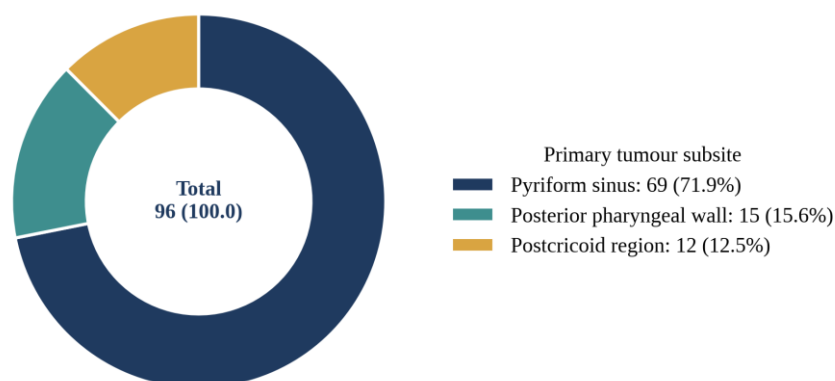
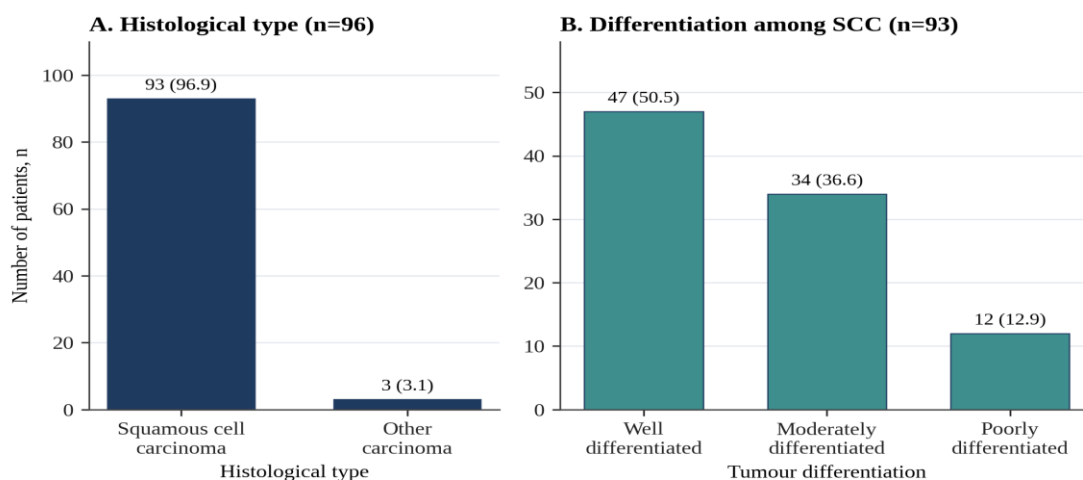
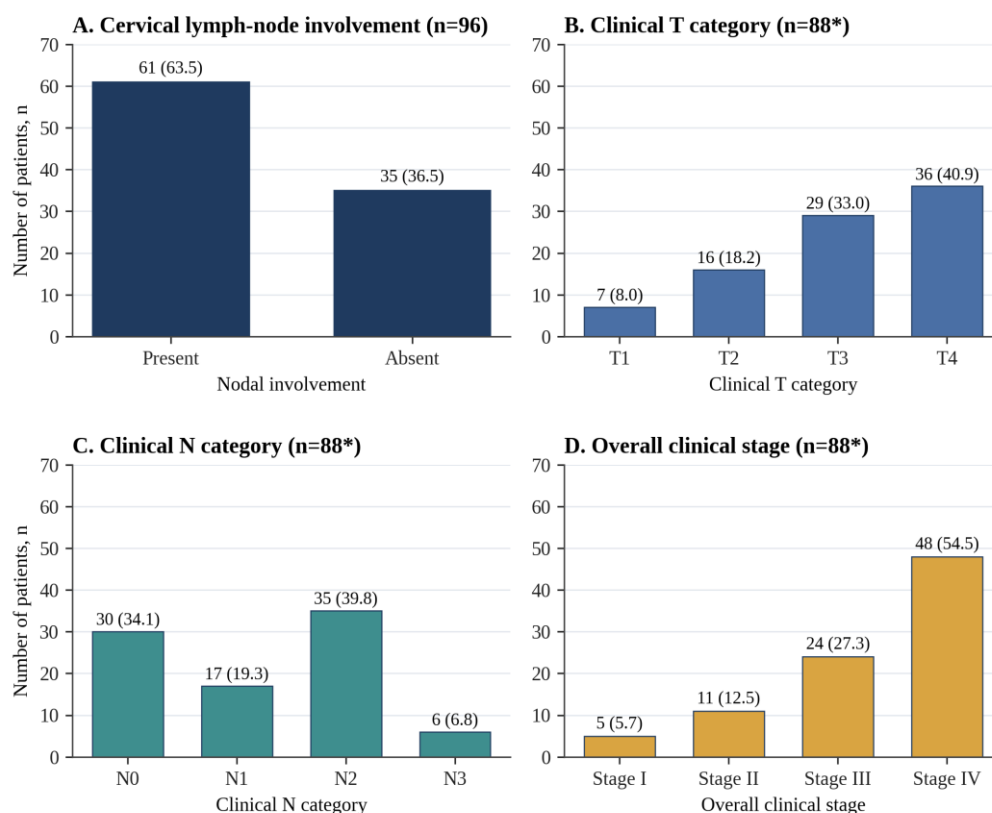


Figure 5. Histopathological characteristics of hypopharyngeal carcinoma



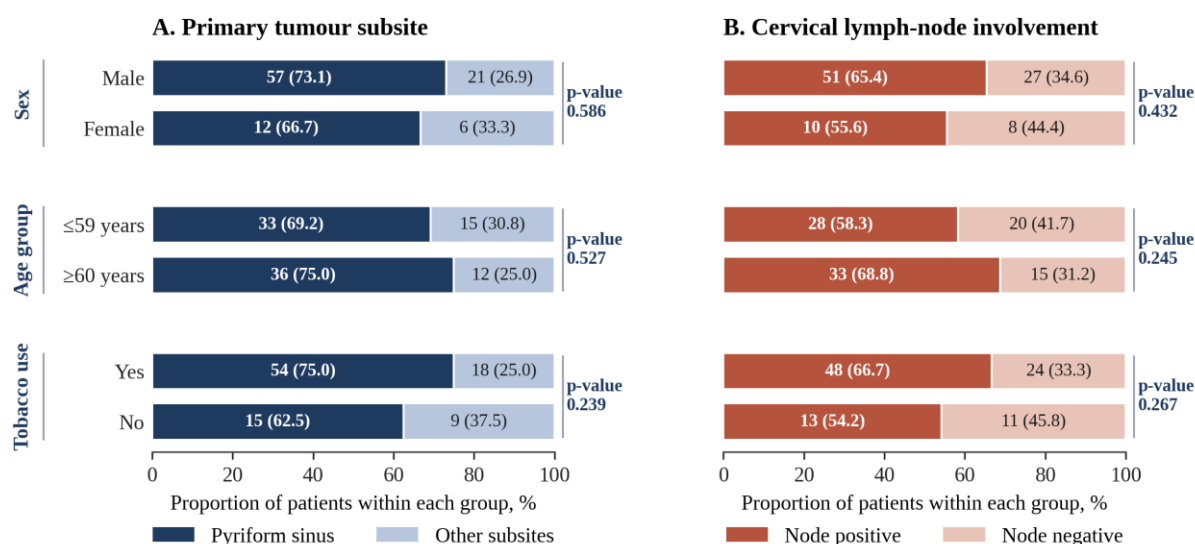
Data labels show frequency, n (%). SCC, squamous cell carcinoma.

Figure 6. Distribution of cervical lymph-node involvement and clinical stage



Data labels show frequency, n (%). *Clinical staging was available for 88 patients in this simulated dataset; therefore, these variables were not assigned to all 96 participants.

Figure 7. Association of selected demographic and clinical characteristics with tumour subsite and cervical lymph-node involvement



Data labels show frequency, n (%). Grouped characteristics: Sex (Male, Female), Age group (≤59 years, ≥60 years), Tobacco use (Yes, No).

Discussion

This study describes the demographic, clinical, anatomical and histopathological characteristics of patients with hypopharyngeal carcinoma

presenting to a tertiary ENT service at Ayub Teaching Hospital, Abbottabad. The main findings were a predominance of male patients, presentation mainly in the fifth to seventh

decades of life, frequent tobacco exposure, dysphagia as the leading presenting symptom, predominance of the pyriform sinus as the primary tumour site, and squamous cell carcinoma as the overwhelming histological diagnosis. Among patients for whom staging information was available, most had advanced-stage disease. Taken together, these findings are broadly consistent with the established clinicopathological pattern of hypopharyngeal carcinoma, while also providing institution-specific information from northern Pakistan.^{12,13} The predominance of males in our study (81.3%) is in keeping with the recognised epidemiology of hypopharyngeal carcinoma. Hypopharyngeal cancer has historically been more common among men, particularly in populations with high levels of tobacco exposure.¹² A large population-based analysis from the United States reported that 80.6% of patients with hypopharyngeal squamous cell carcinoma were male, which is very similar to the proportion observed in the present study.¹⁴ Earlier Pakistani data have shown a comparable pattern, with 24 of 30 patients being male in a study from Combined Military Hospital Kharian.¹⁵ The somewhat lower degree of male predominance in our cohort may reflect differences in study population, referral patterns and local exposure patterns, but the overall sex distribution remains consistent with previously reported literature.

The age distribution in our study also follows the usual pattern of disease occurrence. The median age was 58 years, with most patients between 50 and 69 years of age. Previous studies have similarly shown that hypopharyngeal carcinoma is mainly diagnosed in middle-aged and older adults.^{12,13} In the Peshawar study by Wahid et al., the mean age was 57.26 years, with the sixth and seventh decades being the most frequently affected age groups.¹⁶ These similarities are of particular relevance because the Peshawar population is geographically and socially closer to the population served by Ayub Teaching Hospital than many international cohorts. A separate study from Khyber Teaching Hospital also found that patients presenting with hypopharyngeal carcinoma were predominantly older adults, further supporting the relevance of this age pattern in the regional setting.¹⁷

Tobacco exposure was documented in 75.0% of our participants. This finding supports the important contribution of tobacco exposure to the local burden of hypopharyngeal malignancy. Tobacco smoking and other forms of tobacco exposure are well-established risk factors for hypopharyngeal and other upper aerodigestive tract cancers, and their effect may be particularly important in populations where these habits are common.¹² In the earlier Pakistani study from Kharian, tobacco use was reported in 87% of patients, slightly higher than the proportion observed in our cohort.¹⁵ This difference may reflect variations in the populations studied and in the way tobacco exposure was recorded. Importantly, the cross-sectional design of the present study and absence of a non-cancer comparison group mean that the observed proportion of tobacco users should be interpreted as a characteristic of the study population rather than as a measure of attributable risk.

Dysphagia was the most frequent presenting symptom in our cohort, reported by 85.4% of patients. This is clinically understandable because progressive swallowing difficulty becomes more prominent as a hypopharyngeal lesion enlarges and interferes with the passage of food. Our finding is very similar to the 92% prevalence of progressive dysphagia reported by Wahid et al. among patients with hypopharyngeal carcinoma presenting to a tertiary hospital in Peshawar.¹⁶ Hoarseness was present in 40.6% of our patients, again broadly comparable with the 37.3% reported in the same Pakistani study.¹⁶ Neck swelling was also relatively common in our cohort, reflecting cervical lymph-node involvement and the tendency of these tumours to spread through the regional lymphatic system. Hypopharyngeal cancers are known to remain clinically silent for relatively long periods, and their anatomical characteristics and submucosal spread may delay the appearance of specific symptoms until the disease is more advanced.¹³

The anatomical distribution in our study showed a clear predominance of the pyriform sinus, which accounted for 71.9% of primary tumours. This is consistent with the established distribution of hypopharyngeal malignancies.^{12,20} In a large series of 386 patients, Cao et al. reported the pyriform sinus

as the primary site in 76.7% of cases, followed by the posterior hypopharyngeal wall and postcricoid region.¹⁸ An earlier Pakistani study reported a lower but still clear predominance of the pyriform fossa, accounting for 53% of cases.¹⁵ The higher proportion observed in our cohort may reflect differences in referral patterns, sample size and local case mix. Nevertheless, the consistent predominance of the pyriform sinus across different populations supports the validity of the anatomical pattern observed in the present study.

The histopathological findings were similarly consistent with previous reports. Squamous cell carcinoma accounted for 96.9% of all cases, confirming that it is overwhelmingly the dominant histological type of hypopharyngeal carcinoma. Large population-based data from the United States have likewise shown that squamous cell carcinoma accounts for the great majority of hypopharyngeal cancers.¹⁴ Pakistani and regional studies have reported similarly high proportions, including 100% in the 30-patient Pakistani series by Ahmed and Khan and 97.3% in the Peshawar study by Wahid et al.^{15,16} Within the squamous cell carcinoma group, well-differentiated tumours were the most frequent histological grade in our study, followed by moderately and poorly differentiated tumours. This distribution is also comparable with the earlier Pakistani experience, in which well-differentiated tumours constituted the largest subgroup.¹⁵

Cervical lymph-node involvement was documented in 63.5% of the patients in our study. This finding is consistent with the known lymphatic behaviour of hypopharyngeal carcinoma and supports the clinical importance of careful neck assessment at presentation. The rich lymphatic drainage of the hypopharynx contributes to relatively early regional metastatic spread, and cervical nodal disease is frequently present even when the primary tumour is not extensive clinically.¹³ In a large institutional series, nodal involvement was also common, while other studies have demonstrated that increasing N category is associated with poorer disease outcomes.^{18,19} Our study was not designed to assess survival or treatment outcomes, so these prognostic implications should not be directly extrapolated to our patients; however, the high frequency of nodal

involvement emphasizes the importance of appropriate staging at diagnosis.

The available staging data further support the impression of substantial disease burden at presentation. Among the 88 patients for whom clinical stage was available, 72 (81.8%) had stage III or IV disease, with stage IV accounting for 54.5%. This finding is in keeping with the well-recognised tendency of hypopharyngeal carcinoma to present at an advanced stage.^{13,14} In the large US SEER-based analysis, 83.9% of patients with hypopharyngeal squamous cell carcinoma were diagnosed with stage III or IV disease.¹⁴ Similarly, reviews of the natural history of hypopharyngeal cancer have described frequent stage IV presentation and relatively few patients being diagnosed with truly localised early-stage disease.¹³ These observations are clinically important because advanced T and N categories have been associated with worse outcomes in larger treatment cohorts.^{18,19} In our study, however, staging was included only where data were available and no outcome assessment was undertaken; therefore, the present findings should be interpreted as a description of disease stage at presentation rather than as a prognostic analysis.

The association analysis showed a statistically significant relationship between sex and tobacco use, with tobacco exposure being more frequently documented among male patients. This finding is biologically and epidemiologically plausible and is consistent with the established association between tobacco exposure and hypopharyngeal cancer, particularly in predominantly male populations.¹² At the same time, no statistically significant association was observed between sex and tumour subsite, cervical lymph-node involvement or hoarseness, and no significant association was identified between tobacco exposure and either tumour subsite or nodal involvement. These negative findings should be interpreted cautiously because the study was conducted at a single centre with a relatively small sample size and was not powered specifically for multiple subgroup comparisons. The absence of statistical significance therefore does not establish the absence of a clinically meaningful relationship.

The findings of this study have practical relevance for tertiary ENT services in the region.

The combination of dysphagia, tobacco exposure, cervical swelling and persistent upper aerodigestive symptoms in middle-aged and older adults should maintain a high level of clinical suspicion for hypopharyngeal malignancy. Early recognition is particularly important because the anatomical and biological behaviour of hypopharyngeal tumours can permit substantial local and regional spread before diagnosis.¹³ The present study cannot determine whether diagnostic delay contributed directly to advanced presentation, as duration of symptoms and referral intervals were not among the predefined study variables. Nevertheless, the predominance of advanced disease suggests that improving awareness and maintaining timely diagnostic evaluation remain relevant areas for clinical practice.

Strengths

A major strength of this study is that it provides institution-specific clinicopathological data on hypopharyngeal carcinoma from a tertiary-care ENT service in Abbottabad, where published local data remain limited. The study included histopathologically confirmed cases and used predefined eligibility criteria with consecutive sampling, helping to maintain a consistent approach to patient recruitment.

The study also assessed several clinically relevant components of hypopharyngeal carcinoma, including demographic characteristics, presenting symptoms, primary tumour subsite and histopathological findings. Tumour subsite was determined using available CT imaging and clinical documentation, while histological findings were obtained directly from the original pathology reports. Data collection was performed using a structured proforma by the postgraduate trainee, which helped maintain consistency in recording the study variables. Another strength is that the study included an analytical component in addition to descriptive reporting. Selected demographic and clinical characteristics were compared with clinicopathological findings using appropriate statistical tests, allowing potentially relevant patterns within the study population to be explored while remaining within the objectives of the study.

Limitations

The study has several limitations. First, it was conducted at a single tertiary-care teaching hospital over a relatively short four-month period, and therefore the findings may not be generalisable to the wider population of Khyber Pakhtunkhwa or Pakistan. The use of non-probability consecutive sampling also limits the representativeness of the sample.

Second, the relatively small sample size of 96 patients limits the statistical power of subgroup analyses and may explain why some potentially relevant associations did not reach statistical significance. In addition, clinical stage and cervical lymph-node status were dependent on the availability of relevant clinical and diagnostic information, and staging data were therefore not available for all participants.

Finally, the cross-sectional design allows description of the clinicopathological characteristics and identification of associations but does not permit conclusions regarding causality, treatment outcomes, recurrence or survival. The study also did not assess longitudinal outcomes following diagnosis. These limitations should be considered when interpreting and generalising the findings.

Conclusion

This study provides an institution-specific profile of hypopharyngeal carcinoma among patients presenting to the ENT Department of Ayub Teaching Hospital, Abbottabad. The disease was predominantly observed among middle-aged and older adults and showed a marked male predominance, with tobacco exposure documented in a substantial proportion of patients. Dysphagia was the most common presenting symptom, while the pyriform sinus was the predominant tumour subsite and squamous cell carcinoma was the principal histopathological diagnosis.

A considerable proportion of patients with available staging information presented with advanced disease, with cervical lymph-node involvement also being common. These findings highlight the clinical importance of early recognition and timely diagnostic assessment of suspicious upper aerodigestive symptoms, particularly in patients with relevant tobacco exposure.

Overall, the study adds locally relevant clinicopathological data to the limited Pakistani literature on hypopharyngeal carcinoma and provides a baseline for comparison with other regional populations. Larger multicentre studies with longer follow-up would be useful to further characterise the disease pattern and evaluate outcomes in the wider population.

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Authors contribution

Concept & Design of Study; Yumna Shahzadi ¹, Imdad Ullah ²

Data collection, Analysis & drafting- Ayesha Saeed ³, Qurat Ul Ain ⁴, Ahmed Arif ⁵, Aqsa Haider ⁶, Midrar Ullah ⁷, Ayesha Abid ⁸, Mohammad Asif ⁹, Yumna Shahzadi ¹, Imdad Ullah ²

Critical Review & Final Approval; Mohammad Asif ⁹, Yumna Shahzadi ¹

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