

Clinicopathological Profile and Management Outcomes of Oropharyngeal Carcinoma: A Two-Year Observational Cohort study from a Tertiary Care Center in Delhi

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Abstract

Background: Oropharyngeal carcinoma (OPC) remains a significant health concern in India, particularly driven by tobacco use. While human papillomavirus (HPV)-associated OPC is increasingly common in Western countries, the Indian clinical landscape presents a distinct pattern.

Aim: Evaluation of the clinical presentation, risk factors, treatment modalities, and short-term outcomes of 50 OPC patients treated at a tertiary care center in Delhi over two years.

Methods: This is a cohort study on patients diagnosed with OPC between January 2023 and December 2024. Data included demographics, risk exposures, staging, treatment, and follow-up.

Results: Of the 50 patients, 76% were male, with a median age of 57 years. Tobacco use was present in 88% of cases. Only 12% of tested cases were HPV-positive. The majority (74%) presented with advanced-stage disease. Most were treated with concurrent chemoradiotherapy (62%), followed by surgery with adjuvant therapy (20%). At a median follow-up of 18 months, the overall response rate was 72%, with 46% achieving complete response.

Conclusion: OPC in Delhi is predominantly tobacco-related and often presents at an advanced stage. Chemoradiotherapy remains the cornerstone of treatment, though early detection and prevention strategies are essential for improving outcomes.

Conflicts of Interest: The Authors declare no conflicts of interest.

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Introduction

Oropharyngeal carcinoma (OPC) represents a substantial proportion of head and neck cancers globally. In India, OPC remains predominantly linked to conventional risk factors such as tobacco and alcohol consumption (1-3).

The National Cancer Registry Programme (NCRP) indicates that oropharyngeal cancers rank among the top ten malignancies affecting Indian males (4). Despite the implementation of awareness campaigns, late-stage presentation continues to be the prevailing pattern. (5, 6).

Methods

This is an observational cohort study conducted at a tertiary care teaching hospital in Delhi, India. Fifty adult patients diagnosed with histologically confirmed squamous cell carcinoma of the oropharynx between January 1, 2023, and December 31, 2024, were included. Inclusion criteria: adults ≥ 18 years, histological confirmation, complete records. Exclusion criteria: distant metastasis, recurrent tumors, or incomplete treatment. The study was approved by the Institutional Ethics Committee of the hospital dated January 1, 2023, Ref No.:

sdhec/jan-23/090. Patients' participation consent and publication of data were obtained. This study adhered to the ethical principles of the Declaration of Helsinki, as revised in 2013 (7). Data included demographics, clinical presentation, risk factors, HPV (p16) status, TNM staging (AJCC 8th ed.), treatment modality, and response. Descriptive statistics were used; survival estimates were done using Kaplan-Meier analysis.

Results

Of the 50 patients, 76% were male (n=38), with a mean age of 57 years. Tobacco use was

present in 88% of patients (smoking: 54%, smokeless: 70%). HPV testing was done in 20 patients, with only 3 (15%) testing p16-positive (8).

Common presenting symptoms included sore throat (60%), dysphagia (52%), and neck mass (48%). The most frequently involved subsites were the tonsillar region (42%), base of tongue (28%), soft palate (20%), and pharyngeal wall (10%). Stage III–IV disease was observed in 74% (n=37), with the remainder presenting in Stage I–II (Figures 1 and 2).



Figure 1. Oropharyngeal tumor with extranodal extension



Figure 2. Stage 4 Oropharyngeal tumor with erosion of the mandible

Treatment varied according to staging: Early-stage (I–II) cancers were primarily managed with surgery (transoral robotic or open approaches) followed by risk-adapted adjuvant therapy. In advanced stages (III–IV), patients received definitive concurrent chemoradiotherapy or induction chemotherapy followed by surgery or CCRT, contingent upon the feasibility of resection and performance status. A total of 10 patients (20%) underwent surgical intervention, including 5 patients who underwent transoral robotic surgery (TORS), 3 patients who underwent mandibulotomy with composite resection, and 2 patients who

underwent lateral pharyngotomy. Neck dissection was performed in 9 of these cases. Postoperative histopathology revealed extracapsular nodal spread in 4 cases, perineural invasion in 2, and close/positive margins in 3, necessitating adjuvant radiotherapy or chemoradiotherapy.

Postoperative rehabilitation focused on early tracheostomy decannulation, swallowing therapy, and nutritional support. Within one week of the operation, speech and swallowing rehabilitation was commenced, utilizing fiberoptic endoscopic evaluation of swallowing (FEES) and modified barium swallow (MBS)

as necessary. At a median follow-up of 18 months (range: 6–24 months), the overall response rate (ORR) was 72%. A complete response (CR) was achieved in 23 patients (46%), partial response in 13 (26%), stable disease in 6 (12%), and progressive disease in 8 patients (16%). (Table 1).

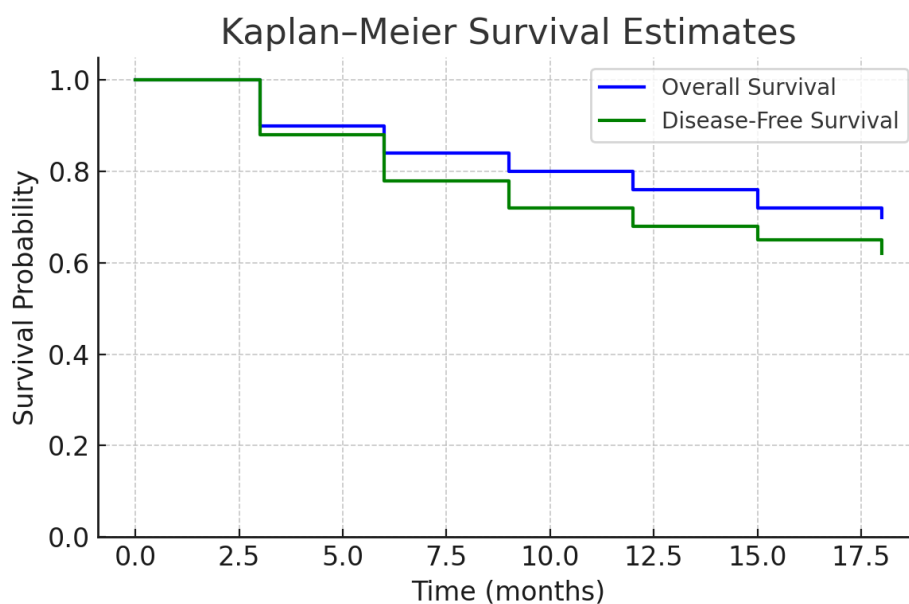
Table 1. Summary of Clinicopathological and Treatment Outcomes

Parameter	Value
Total Patients	50
Median Age	57 years
Male: Female Ratio	3.2:1
HPV Positivity	15%
Stage III–IV at Presentation	74%
Complete Response Rate	46%
1-year DFS	68%
1-year OS	76%

Oncological outcomes: Locoregional recurrence occurred in 9 patients (18%) and distant metastases in 4 patients (8%). The estimated 1-year disease-free survival (DFS) was 68%, and overall survival (OS) was 76%, as calculated using Kaplan–Meier analysis (Graph 1). Median DFS was not reached during the study period.

Functional outcomes: Of the 10 patients who underwent surgery, 80% were successfully decannulated within 4 weeks. Post-treatment dysphagia was noted in 22% of patients, with 5 requiring prolonged nasogastric feeding for >6 weeks and 2 requiring Percutaneous Endoscopic Gastrostomy (PEG) tube placement. Speech intelligibility was preserved in 92% of patients. No treatment-related mortality was reported.

Graph 1: Kaplan–Meier Estimates for Overall Survival (OS) and Disease-Free Survival (DFS).



Kaplan–Meier estimates of 1-year overall survival (OS) and disease-free survival (DFS) among OPC patients.

Discussion

This study presents a contemporary clinicopathological profile of oropharyngeal carcinoma (OPC) in an Indian tertiary care setting. The majority of patients presented at an advanced stage (74%), a pattern consistent with previous Indian studies (3, 5, 9) and suggestive of persistent delays in diagnoses and referrals.

In contrast, developed nations, particularly in North America and Europe, have seen a shift toward earlier-stage presentation attributed to increased awareness of HPV-related OPC and robust screening infrastructure (1, 2).

Our study revealed a significantly lower prevalence of human papillomavirus (HPV) positivity (15%) compared to Western cohorts

(60–80%), as reported by Gillison et al. and Ang et al. (1, 10,11). This disparity is likely attributed to multifaceted factors, including variations in sexual behavior patterns, inadequate utilization of HPV testing, and limited uptake of HPV vaccination in India (14, 15). These findings underscore the imperative for routine p16/HPV testing in cases of ovarian cancer, particularly for prognostic stratification and treatment de-intensification trials. Treatment strategies in our cohort aligned with international guidelines, emphasizing concurrent chemoradiotherapy for advanced cases and surgery for early stages. Our complete response rate of 46% is comparable to outcomes from similar Indian studies such as Sarin et al. reporting 40–50% outcome (9), though still lags behind HPV-positive OPC cohorts from the Europe and USA where complete response exceeds 60–70% (1, 10). The integration of transoral robotic surgery (TORS) for early-stage disease demonstrated favorable functional outcomes, supporting its adoption in high-volume centers (12, 13). Functional rehabilitation is frequently underreported in Indian literature. In our study, early decannulation and speech/swallowing recovery were encouraging, reinforcing the benefits of early multidisciplinary rehabilitation (14). PEG dependency was limited to 4%, which compares favorably to the reports in Europe and USA. (~5–10%) (12). Our study highlights the predominantly tobacco-associated and late-stage nature of OPC in the Indian setting, consistent with prior regional data (3,5,9). The high rate of advanced disease at diagnosis (74%) underscores the urgent need for earlier detection and public health interventions. Notably, our functional outcomes following surgery with adjuvant therapy were encouraging. Eighty percent of surgically treated patients were decannulated within 4 weeks, and over 90% regained intelligible speech. These results support previous findings that early postoperative

rehabilitation can significantly improve quality of life in OPC patients (12, 13).

The oncological outcomes were modest. With a median follow-up of 18 months, the 1-year DFS and OS were 68% and 76%, respectively. These figures are comparable to national data but lower than HPV-associated OPC cohorts in Western populations, where OS exceeds 85% (1,10). Only 15% of our tested cohort was HPV-positive, which may explain the disparity. Our Kaplan-Meier survival analysis confirms the importance of multimodal treatment strategies but also exposes the limitations in current practice, especially in the absence of early diagnosis and routine HPV testing. We reiterate the recommendations of Basu et al. and Sankaranarayanan et al. regarding the importance of national HPV vaccination and tobacco cessation initiatives (15-17).

This aligns with the MACH-NC meta-analysis by Lacas et al. (2021), which reported a 6.5% absolute 5-year overall survival benefit with concurrent chemoradiotherapy over radiotherapy alone, particularly in HPV-negative patients (HR: 0.65), underscoring the importance of tailoring treatment strategies based on HPV status and treatment modality (18).

Limitations include the retrospective design, small sample size, and short follow-up, which limits survival extrapolation beyond 24 months. Nonetheless, this study contributes valuable real-world evidence and underscores key priorities: HPV testing, early diagnosis, and integration of functional rehabilitation in treatment pathways. Future directions include prospective studies with longer follow-up and stratified analysis of HPV-positive versus HPV-negative OPC outcomes.

Conclusion

Oropharyngeal carcinoma in urban Indian populations continues to be a tobacco-related disease, showing high rates of advanced-stage presentation. Multimodal therapy offers reasonable control, but outcomes are

suboptimal without early detection and prevention. Consequently, there is an urgent need to expand screening, HPV testing, and preventive vaccination to improve long-term outcomes.

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None to declare.

Conflicts of Interest

The authors declare no conflicts of interest.

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Ethics

Institutional ethics committee clearance obtained from Swami Dayanand Hospital, Delhi and study carried out in compliance with Ethical Standards, approval no. sdhec/jul-23/090 on July 26, 2023.

Authors Contributions

Gautam Kumar Arora- conception, design, writing, critical review. Gunjan Verma- data collection and processing. Alok Kumar- supervision and literature review.

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