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Epidemiological, Clinical and Therapeutic Profiles of Nasopharyngeal Cancer in the Department of Radiation Oncology at Mohammed VI Hemato-Oncology Hospital, Marrakech

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Abstract **Original Research Article**

Background: Nasopharyngeal carcinoma [NPC] is a distinct head and neck malignancy characterized by specific epidemiological, histological, and geographical features. It is particularly prevalent in endemic areas such as Southeast Asia and North Africa. This study aimed to describe the epidemiological, clinical, and therapeutic profiles of NPC patients treated at the Department of Radiation Oncology, Mohammed VI Hemato-Oncology Hospital, Marrakech. ***Methods:*** We conducted a retrospective descriptive study including 105 patients with histologically confirmed NPC treated between January 2020 and December 2025. Epidemiological, clinical, histological, staging, treatment, toxicity, and survival data were analyzed. ***Results:*** The median age was 47.5 years [range: 19–73], with a marked male predominance [male-to-female ratio: 4.2]. Toxic habits were reported in 27.9% of patients, and a family history of cancer was present in 30.2%. Diagnosis was often delayed, with a mean consultation time of 9 months. Cervical lymphadenopathy was the most frequent presenting symptom [72.5%], followed by rhinological [65.1%] and otological symptoms [55.8%]. Undifferentiated non-keratinizing carcinoma represented 98.6% of cases. Most patients presented with locally advanced disease. According to the AJCC 8th edition staging system, T3 and T4 tumors accounted for 34.3% and 26.7%, respectively, while N2 and N3 stages represented 34.9% and 26.4%. Distant metastases at diagnosis were observed in 17.9% of patients. Radiotherapy was delivered in 88 patients using three-dimensional conformal radiotherapy, with a total dose of 70 Gy to the primary tumor. Concurrent chemoradiotherapy was the standard treatment for stage II–IVB disease. Induction chemotherapy with cisplatin and gemcitabine was administered in selected locally advanced cases. In metastatic settings, systemic platinum-based chemotherapy was used. Acute grade II mucositis occurred in 36.5% of patients, and grade III toxicity in 3 cases. Late toxicities mainly included xerostomia, hearing impairment, and chronic mucositis. With a median follow-up of 30.7 months, the 4-year overall survival rate for non-metastatic disease was 97%, and the 4-year disease-free survival was 79.4%. Recurrence occurred in 16.1% of patients, mainly as distant metastases. ***Conclusion:*** NPC in our population predominantly affects middle-aged men and is frequently diagnosed at advanced stages. Combined platinum-based chemotherapy and radiotherapy provides encouraging survival outcomes, even in resource-limited settings. Earlier diagnosis and improved access to advanced radiotherapy techniques such as IMRT, as well as EBV-based monitoring, are essential to further improve prognos.

Keywords: Nasopharyngeal carcinoma, Epidemiology, Radiotherapy, Marrakech, Survival outcomes, Undifferentiated carcinoma.

1-INTRODUCTION

Nasopharyngeal carcinoma [NPC] differs from other head and neck malignancies by its distinct histological features, unique epidemiological profile, and characteristic geographical distribution. It is particularly prevalent in certain regions, including Southeast Asia and North Africa.

The aim of this study was to investigate the epidemiological, clinical, and therapeutic characteristics of nasopharyngeal carcinoma in patients treated at the Department of Radiation Oncology, Hematology–Oncology Hospital, Mohammed VI University Hospital, Marrakech.

2-PATIENTS AND METHODS

2-1 Study design and population

This was a retrospective descriptive study including 105 patients diagnosed with histologically confirmed nasopharyngeal carcinoma between January 2020 and December 2025 and treated at our institution.

2-2 Inclusion criteria

All patients admitted to the Hematology–Oncology Hospital of Marrakech with histologically confirmed nasopharyngeal carcinoma were included, regardless of age.

2-3 Exclusion criteria

Patients with incomplete clinical or therapeutic data were excluded from the analysis.

3-RESULTS

3-1 PATIENT CHARACTERISTICS

During the study period, the median age was 47.5 years [range: 19–73]. The most affected age group was between 41 and 50 years. The male-to-female ratio was 4.2, reflecting a strong male predominance.

3-2 MEDICAL HISTORY

3-2-1 TOXIC HABITS

Twenty-eight patients [27.9%] reported toxic habits, including tobacco use in 20 patients and combined alcohol and tobacco consumption in 9 patients.

3-2-2 EAR, NOSE, AND THROAT [ENT] INFECTIONS

A history of recurrent ENT infections was found in 14 patients [13.9%], including chronic sinusitis [n = 3], recurrent otitis [n = 5], and recurrent tonsillitis [n = 6].

3-2-3 FAMILY HISTORY OF CANCER

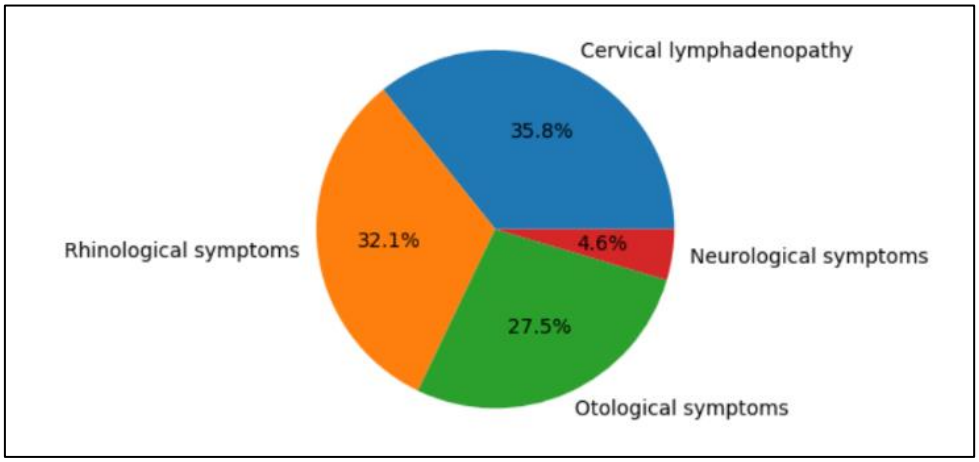
Twenty-six patients [30.2%] had a family history of cancer, including nasopharyngeal carcinoma in 7 cases and other cancers in 19 cases.

3-3 CLINICAL PRESENTATION

Diagnosis was often delayed, with a mean consultation delay of 9 months. The most frequent presenting symptom was cervical lymphadenopathy [72.5%].

Other presenting symptoms included:

- Rhinological symptoms [nasal obstruction, epistaxis]: 65.1%
- Otological symptoms [hearing loss, otalgia, otorrhea]: 55.8%
- Neurological symptoms: 9.3%, mainly oculomotor nerve palsy.



Clinical presentation of patients with nasopharyngeal carcinoma

3-4 CLINICAL EXAMINATION

Cervical lymph node examination revealed unilateral lymphadenopathy in 60 patients [72.2%] and bilateral involvement in 20 patients. Tumor size between 3 and 6 cm was observed in 40 patients [45.2%].

All patients underwent a comprehensive ENT examination, including nasopharyngoscopy, which was systematically performed. Biopsy was obtained from the nasopharynx in all cases.

The predominant histological subtype was undifferentiated non-keratinizing carcinoma [UCNT] in 98.6% of patients. Three cases of poorly differentiated squamous cell carcinoma were identified.

3-5 STAGING WORKUP

Locoregional extension was assessed using CT and/or MRI of the nasopharynx and neck.

All patients underwent thoraco-abdomino-pelvic CT scanning, which revealed distant metastases in 16 cases. Bone scintigraphy was also systematically performed and identified bone metastases in 14 patients.

Epstein–Barr virus [EBV] serology was not performed due to limited availability and socioeconomic constraints.

3-6 TNM CLASSIFICATION

Most patients presented with locally advanced disease. According to the AJCC 8th edition staging system, T3 and T4 tumors accounted for 34.29% and 26.67% of cases, respectively, while T1 and T2 tumors represented 24.76% and 14.29%.

Similarly, advanced nodal disease was frequent. N2 and N3 stages accounted for 34.91% and 26.42% of cases, respectively, whereas 24.53% of patients were classified as N0.

Eighteen patients [17.9%] had distant metastases at diagnosis

4-TREATMENT

4-1 Dental care

All patients eligible for radiotherapy underwent dental evaluation and management before treatment.

4-2 Treatment strategy according to stage:

Stage I–II

Eighteen patients had stage I disease and seven had stage II disease. Stage I patients were treated mainly with radiotherapy alone, while stage II patients received concurrent chemoradiotherapy.

Stage III–IVB

Fifty-eight patients had stage III–IVB disease. Among them, 20 patients with T4 tumors or bulky nodal disease received induction chemotherapy followed by concurrent chemoradiotherapy. The remaining patients were treated with concurrent chemoradiotherapy.

Stage IVC

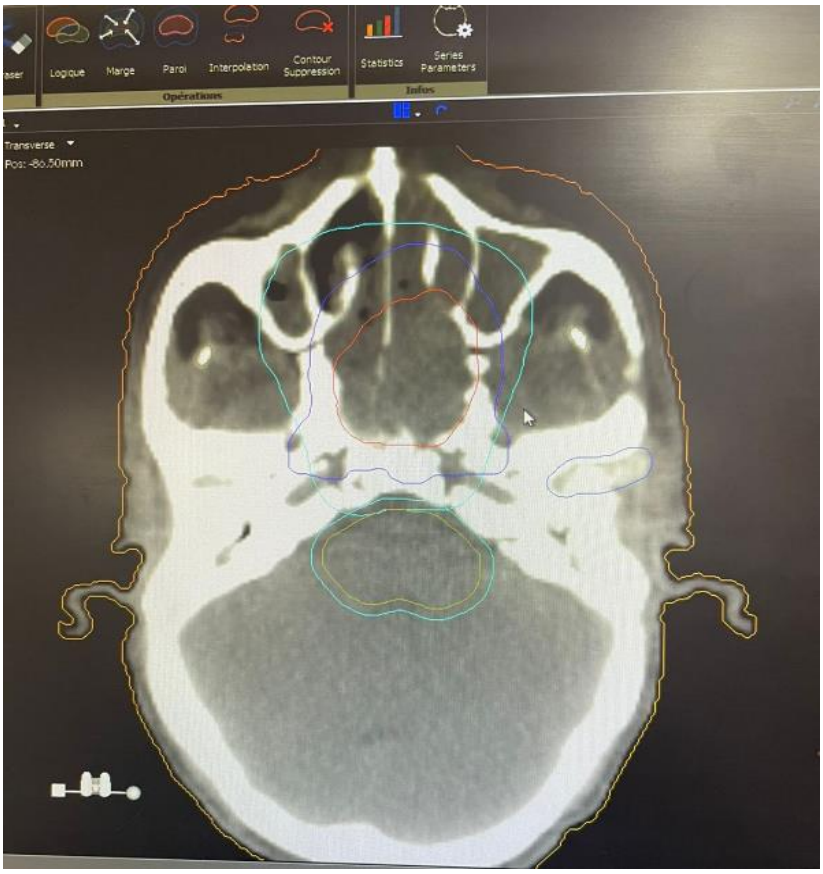
Eighteen patients had metastatic disease at presentation. Fifteen received systemic chemotherapy alone, while three patients underwent chemotherapy followed by chemoradiotherapy after reassessment.

4-3 RADIOTHERAPY

Radiotherapy was delivered in 88 patients. All patients were treated using three-dimensional conformal radiotherapy [3D-CRT].

The standard fractionation schedule consisted of 1.8–2 Gy per fraction, five days per week, delivering:

- 70 Gy to the gross tumor volume
- 50–60 Gy to prophylactic regions, including elective nodal areas.



Axial CT image illustrating the delineation of the GTV, CTV, and PTV for a left posterolateral nasopharyngeal carcinoma

4-4 CHEMOTHERAPY

Induction chemotherapy

Fifty-eight patients received induction chemotherapy with three cycles of cisplatin [80 mg/m², day 1] and gemcitabine [1000 mg/m², days 1 and 8, every 21 days], followed by concurrent chemoradiotherapy.

Concurrent chemotherapy

Seventy-six patients received weekly cisplatin [40 mg/m²], with a median of 5.7 cycles.

Metastatic setting

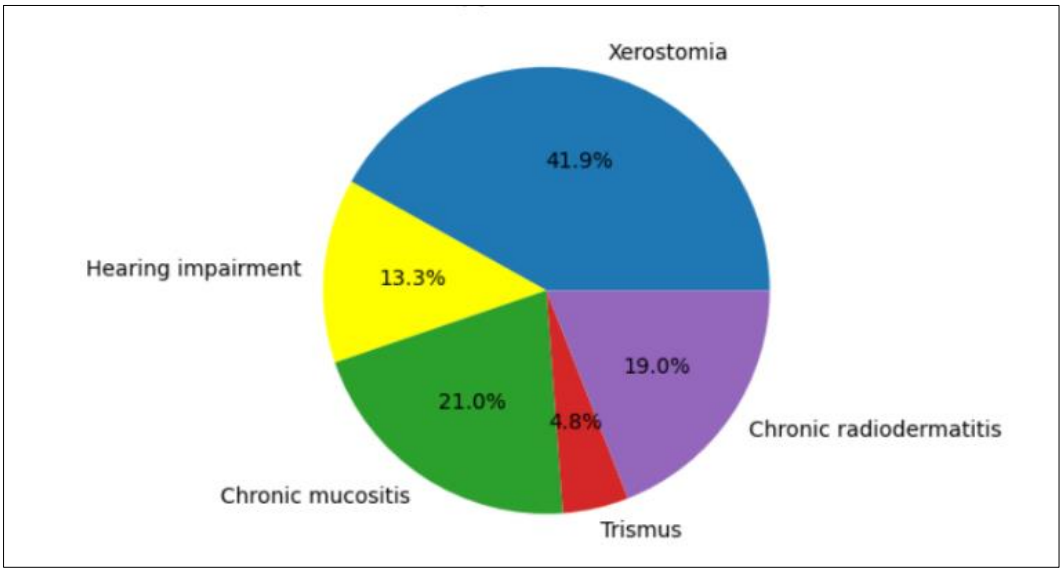
The standard first-line regimen consisted of cisplatin plus gemcitabine for up to six cycles or until progression or unacceptable toxicity.

5-TOXICITIES

Acute grade II mucositis was observed in 38 patients [36.5%]. Grade III toxicity occurred in 3 patients and required temporary treatment interruption.

Late toxicities mainly related to radiotherapy included:

Xerostomia [n = 44]
Hearing impairment [n = 14]
Chronic mucositis [n = 22]
Trismus [n = 5]
Chronic radiodermatitis [n = 20]



Late toxicities following radiotherapy

6-FOLLOW-UP AND SURVIVAL

None of the patients were lost to follow-up. The median follow-up was 30.7 months [range: 5–49 months]. Among patients with stage I–IVB disease [n = 87], the 4-year overall survival was 97%. Fourteen patients [16.1%] experienced disease recurrence. Cervical nodal relapse occurred in 6 patients and was successfully salvaged with chemotherapy followed by neck dissection. Eight patients developed distant relapse.

The 4-year disease-free survival was estimated at 79.4%, with a mean time to recurrence of 9.25 months. Three patients died from disease progression despite chemotherapy. Among the 18 patients with metastatic disease at diagnosis, 15 were alive at the time of analysis and continued systemic treatment or maintenance therapy.

7-CONCLUSION

Nasopharyngeal carcinoma represents a distinct clinical and biological entity among head and neck cancers. The prognosis remains compromised due to the high frequency of locally advanced and metastatic disease at diagnosis.

According to our results and published literature, platinum-based chemotherapy combined with curative-intent radiotherapy for non-metastatic disease, and systemic chemotherapy for metastatic stages, leads to significant objective response rates and prolonged survival.

Improving outcomes in nasopharyngeal carcinoma requires earlier diagnosis and a multidisciplinary management approach

8-DISCUSSION

Nasopharyngeal carcinoma [NPC] is a distinct entity among head and neck cancers, characterized by its unique epidemiological distribution, histological profile, biological behavior, and therapeutic management. The present retrospective study provides a comprehensive overview of the epidemiological, clinical, therapeutic,

and outcome characteristics of NPC patients treated at our institution over a five-year period.

Epidemiological and Clinical Characteristics

In our cohort, NPC predominantly affected middle-aged adults, with a median age of 47.5 years, which is consistent with data reported in endemic and intermediate-risk regions, where NPC often presents one to two decades earlier than other head and neck squamous cell carcinomas [5]. The strong male predominance observed in our study [sex ratio 4.2] aligns with previously published series, reporting male-to-female ratios ranging from 2:1 to 4:1 [2,3]. This gender disparity is likely related to differences in environmental exposures, lifestyle factors, and possibly hormonal influences.

A notable proportion of patients in our cohort reported toxic habits, particularly tobacco and alcohol consumption. Although NPC is classically less strongly associated with smoking than other head and neck cancers, tobacco use has been implicated as a cofactor that may worsen prognosis and treatment tolerance [4]. Additionally, a history of chronic ENT infections was reported in a subset of patients, supporting the hypothesis that chronic inflammation of the nasopharyngeal mucosa may contribute to carcinogenesis in predisposed individuals.

Family history of cancer was present in nearly one-third of our patients, including several cases of familial NPC. This observation is consistent with the recognized genetic susceptibility associated with NPC, particularly in relation to HLA haplotypes and inherited immune response variations [1].

Diagnostic Delay and Disease Presentation

The diagnosis of NPC in our series was frequently delayed, with a mean consultation delay of nine months. This delay likely explains the high proportion of patients presenting with locally advanced disease and cervical lymphadenopathy. Cervical lymph node involvement was the most common presenting symptom, observed in more than 70% of patients, which is in agreement with the literature describing lymphadenopathy as the initial manifestation in up to 80% of cases [3].

Rhinological and otological symptoms were also frequent, reflecting tumor extension to the nasal cavity and Eustachian tube. Neurological involvement, although less common, was observed in patients with advanced skull base invasion, highlighting the aggressive locoregional spread characteristic of NPC.

Histologically, undifferentiated carcinoma of nasopharyngeal type [UCNT] accounted for the vast majority of cases in our study. This finding is consistent with the predominance of WHO type III NPC in endemic and intermediate regions and reinforces the strong association between UCNT and Epstein–Barr virus [EBV] infection [2]. Unfortunately, EBV serology and plasma EBV DNA were not available in our institution, representing a limitation of the present study, as EBV DNA is now recognized as a major prognostic and surveillance biomarker [6].

Therapeutic Strategies and Treatment Outcomes

Radiotherapy remains the cornerstone of curative treatment for NPC due to the intrinsic radiosensitivity of the disease and the anatomical constraints of the nasopharynx. In our cohort, all patients treated with curative intent received conformal radiotherapy, mainly using three-dimensional conformal radiotherapy [3D-CRT]. While intensity-modulated radiotherapy [IMRT] is currently considered the standard of care due to its superior target coverage and reduced toxicity, the use of 3D-CRT in our setting reflects resource limitations commonly encountered in low- and middle-income countries [5].

For early-stage disease [stages I–II], radiotherapy alone or combined with concurrent chemotherapy achieved excellent outcomes, consistent with published series reporting 5-year overall survival rates exceeding 90% [3]. In locally advanced stages [III–IVB], the majority of patients received concurrent chemoradiotherapy [CCRT], with or without induction chemotherapy. Induction chemotherapy based on cisplatin and gemcitabine was administered in patients with bulky tumors or extensive nodal disease. This approach is supported by randomized trials demonstrating improved failure-free survival and distant control with the addition of induction chemotherapy to CCRT [8,10].

Patients presenting with metastatic disease at diagnosis [stage IVC] were managed primarily with platinum-based combination chemotherapy. The cisplatin–gemcitabine regimen used in our cohort is currently considered the standard first-line treatment, following evidence of superior survival compared with other platinum-based doublets [9]. A subset of metastatic patients benefited from locoregional chemoradiotherapy after favorable response to systemic treatment, an approach increasingly supported by emerging data suggesting improved survival in selected patients with oligometastatic disease [11].

Survival and Toxicity

With a median follow-up of over 30 months, survival outcomes in our series were encouraging. The 4-year overall survival rate of 97% for non-metastatic stages compares favorably with results from large contemporary series, despite the absence of IMRT and EBV-guided management [3]. Patterns of failure were predominantly distant, emphasizing the need for effective systemic therapy and long-term surveillance.

Acute toxicities were mainly mucositis, with acceptable rates of grade III events. Late toxicities,

including xerostomia, hearing loss, and chronic mucositis, were primarily radiation-induced and are consistent with historical data from 3D-CRT techniques. The transition to IMRT is expected to significantly reduce these sequelae, particularly salivary gland dysfunction and ototoxicity [7].

Limitations and Perspectives

The retrospective nature of this study, the absence of EBV biomarkers, and the lack of IMRT represent important limitations. Nevertheless, our data reflect real-world practice in a resource-constrained environment and demonstrate that satisfactory oncological outcomes can still be achieved with adapted multidisciplinary management. Future improvements should focus on earlier diagnosis, broader access to IMRT, integration of EBV DNA monitoring, and the incorporation of immunotherapy in recurrent or metastatic settings, as recent trials with immune checkpoint inhibitors have shown promising results [12].

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