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Laryngeal Cancer in Women: Experience of the Radiation Oncology Department of Marrakech

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Abstract **Original Research Article**

Introduction: Laryngeal cancer is rare in women and is frequently diagnosed at an advanced stage. Data specifically addressing this population remain limited. ***Objective:*** The objective of this study was to describe the epidemiological, clinical, histopathological, therapeutic, and outcome characteristics of laryngeal cancer in women treated at the Department of Radiation Oncology of CHU Mohammed VI of Marrakech. ***Materials and Methods:*** This retrospective descriptive study included 12 female patients treated for histologically confirmed laryngeal cancer between January 2019 and December 2024. Clinical, paraclinical, therapeutic, and outcome data were analyzed. Tumor staging was performed according to the AJCC/UICC 8th edition TNM classification. ***Results:*** The mean age was 63 years. Dysphonia was the main presenting symptom. Locally advanced stages (III–IVA) accounted for 83% of cases. Surgery was performed in six patients, and radiotherapy was administered in all patients using different modalities. Overall treatment tolerance was satisfactory. The best outcomes were observed in patients treated at an early stage and in those who underwent surgery followed by radiotherapy. ***Conclusion:*** Laryngeal cancer in women is often diagnosed at an advanced stage. Multidisciplinary management allows satisfactory locoregional disease control.

Keywords: Laryngeal cancer; Women; Surgery; Radiotherapy.

INTRODUCTION

Laryngeal cancer is a malignant tumor of the upper aerodigestive tract, classically predominating in men. In women, it remains uncommon, which explains the limited number of clinical series specifically dedicated to this population. However, several recent studies suggest a gradual increase in its incidence among women, related to changes in environmental, behavioral, and socioeconomic factors [1–3].

In women, laryngeal cancer presents particular characteristics, including predominantly indirect tobacco exposure, possible involvement of chronic irritative factors, and frequent diagnostic delay. Dysphonia, the most common initial symptom, is often underestimated, contributing to delayed consultation and diagnosis at a locally advanced stage [4,5].

Management of laryngeal cancer is based on a multidisciplinary approach combining surgery, radiotherapy, and chemotherapy, depending on tumor stage and the patient's general condition. The main objective of treatment is to achieve optimal oncological control while preserving laryngeal function and quality of life whenever possible [6,7].

The objective of this study was to describe the epidemiological, clinical, histopathological, therapeutic, and outcome profiles of laryngeal cancer in women managed at the Department of Radiation Oncology of CHU Mohammed VI of Marrakech.

MATERIALS AND METHODS

This was a retrospective descriptive study conducted at the Department of Radiation Oncology of CHU Mohammed VI of Marrakech. Female patients treated for histologically confirmed laryngeal cancer between January 2019 and December 2024 were included.

Data collected from medical records included epidemiological and clinical characteristics, endoscopic findings, radiological and histopathological data, tumor staging according to the AJCC/UICC 8th edition TNM

classification, treatment modalities (surgery, radiotherapy, chemotherapy), and patient outcomes.

All treatment decisions were discussed in a multidisciplinary tumor board meeting and were consistent with institutional protocols in use at the time of management.

RESULTS

❖ Patient Characteristics

During the study period, 12 female patients with laryngeal cancer were included. The mean age at diagnosis was 63 years, with a range of 50 to 84 years. Most patients originated from the Marrakech-Safi region, with a predominance of urban residence. All patients had a low socioeconomic status.

The mean delay between symptom onset and medical consultation was 9 months, reflecting a significant diagnostic delay, particularly among patients presenting with locally advanced tumors.

❖ Clinical and Endoscopic Findings

Chronic dysphonia was the main presenting symptom and was reported in all patients. It was associated with laryngeal dyspnea in 58% of cases, dysphagia in 33%, and cervical swelling in 25%. Two patients presented with acute laryngeal dyspnea requiring emergency tracheostomy.

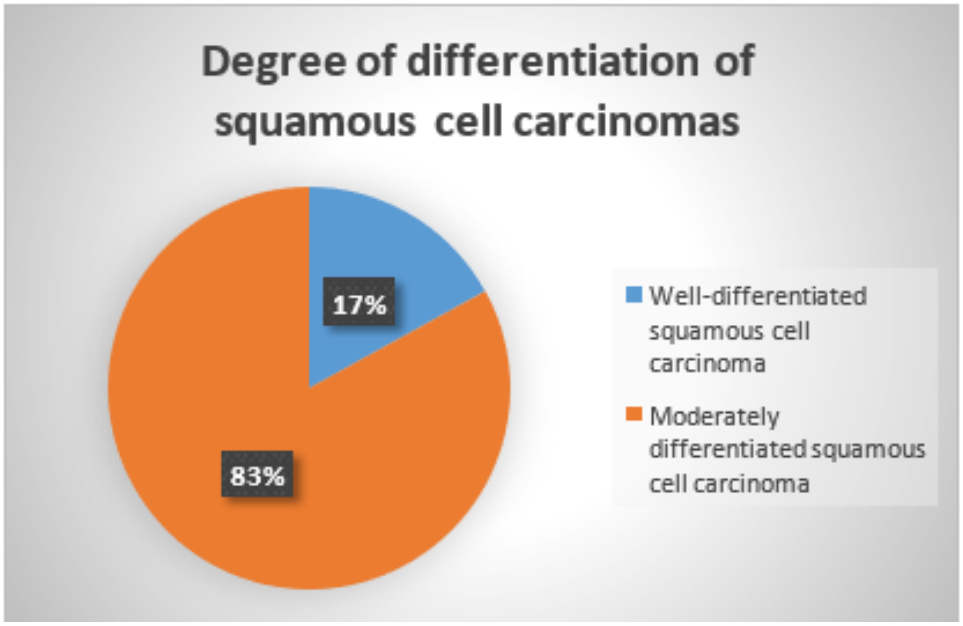
Table I: Presenting symptoms at diagnosis

Symptom	Number of patients (n)	Percentage (%)
Dysphonia	12	100
Laryngeal dyspnea	7	58
Dysphagia	4	33
Cervical swelling	3	25
Acute dyspnea requiring emergency tracheostomy	2	17

Endoscopic examination revealed an ulcerative-budding lesion in 67% of cases and a budding lesion in 33%. Glotto-supraglottic and transglottic involvement predominated, indicating advanced disease at diagnosis.

❖ Histopathological and Radiological Findings

All tumors were squamous cell carcinomas. Histological differentiation was moderate in 83% of cases and well differentiated in 17%.



Cervical computed tomography was performed in all patients and allowed accurate assessment of local extension, including cartilaginous invasion, extralaryngeal spread, and cervical lymph node involvement in 25% of cases.

Figure 1: Tumor extension into the right paraglottic space with obliteration of the fatty plane along the inner surface of the thyroid ala

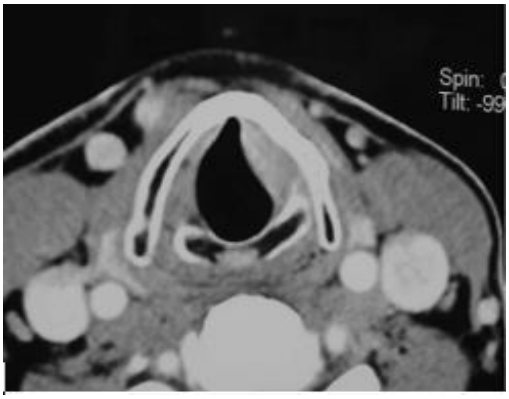


Figure 2: Left-sided subglottic extension

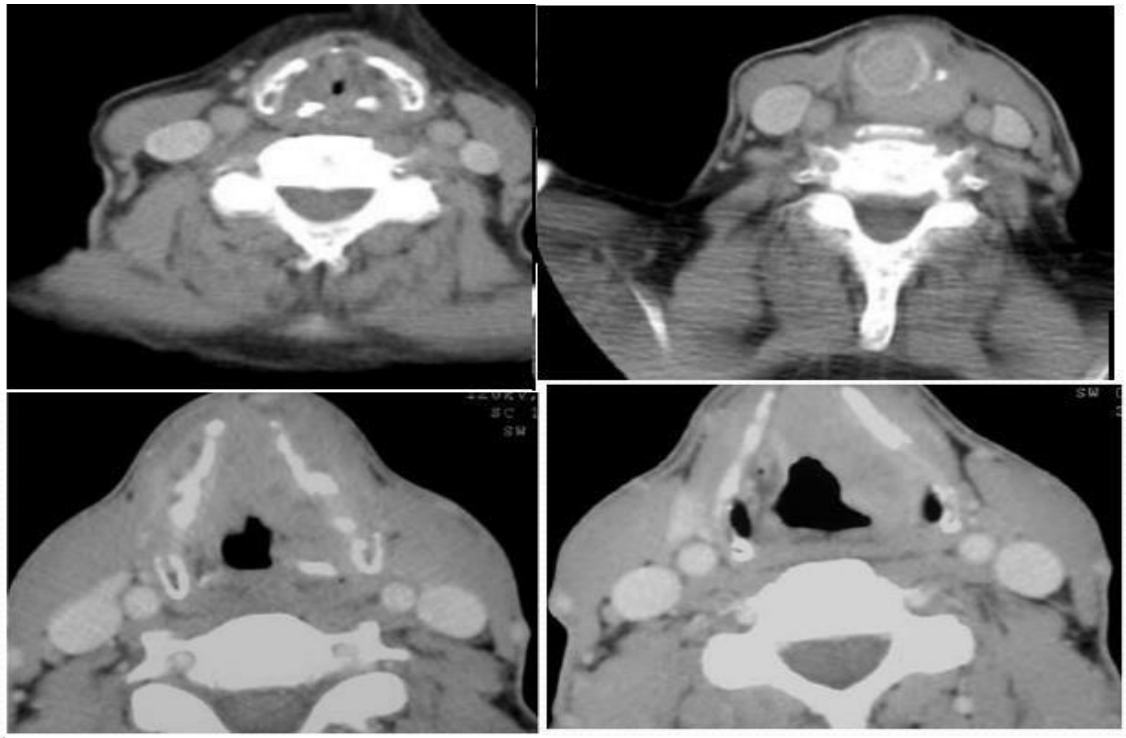


Figure 3: Laryngeal tumor invading the left aryepiglottic fold, the pre-epiglottic space, the paralaryngeal fat, the thyroid cartilage, and the anterior soft tissues

Figure 4: Subglottic tumor with cartilaginous involvement

❖ **Tumor Staging**

According to the AJCC/UICC 8th edition TNM classification, locally advanced stages (III– IVA) accounted for 83% of cases, confirming the predominance of advanced disease at presentation.

Table II: Distribution of patients according to TNM stage (AJCC/UICC 8th edition).

TNM Stage	Tumor characteristics	n (%)
T1 N0 M0	Tumor confined to the larynx	2 (16.7)
T3 N0 M0	Vocal cord fixation/paraglottic extension	5 (41.7)
T4a N0 M0	Cartilaginous or extralaryngeal extension	2 (16.7)
T4a N1 M0	Cartilaginous extension with ipsilateral nodes	2 (16.7)
T4a N2 M0	Cartilaginous extension with bilateral/multiple nodes	1 (8.3)
Total		**12 (100)**

❖ **Therapeutic Management**

➢ ***Surgical Treatment***

Surgery was performed in six patients. One patient underwent partial laryngectomy using a conservative approach, while five patients underwent total laryngectomy associated with cervical lymph node dissection. Surgical margins were negative in all operated patients.

Postoperative morbidity included surgical site infection in three patients and one persistent pharyngostoma requiring surgical revision. Partial laryngectomy allowed satisfactory functional preservation, with recovery of natural voice following speech therapy.

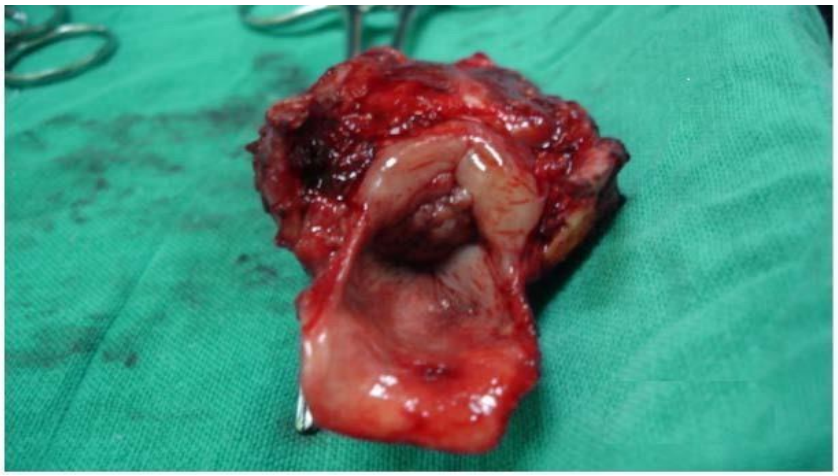


Figure 5: Total laryngectomy surgical specimen (Department of Otolaryngology, University Hospital of Marrakech)

➢ **Radiotherapy**

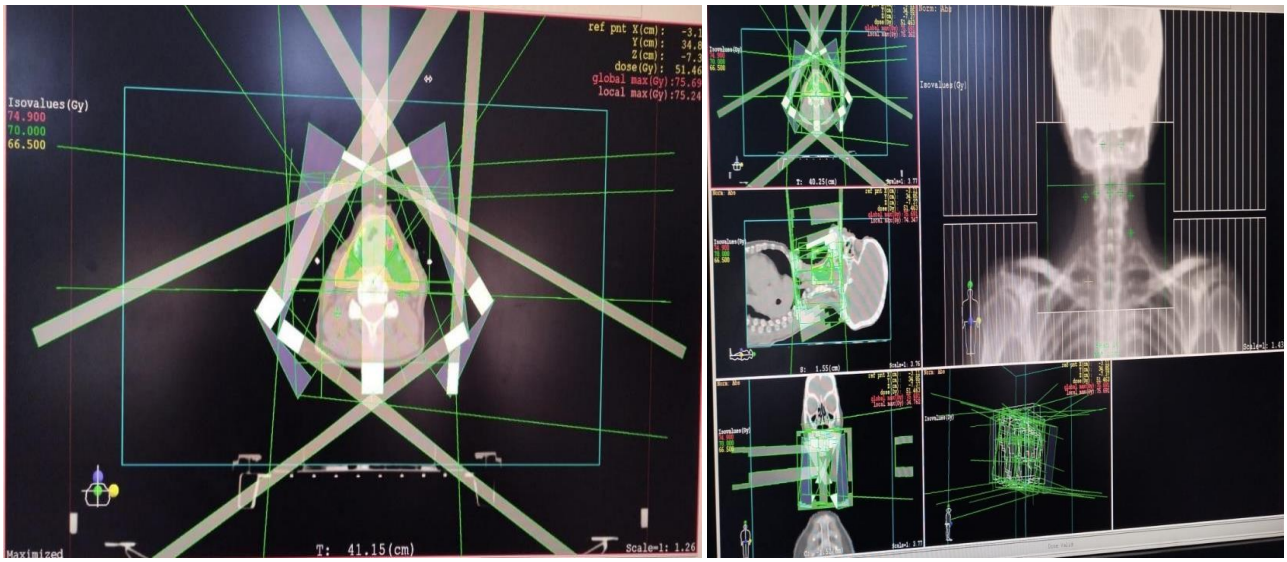
Radiotherapy was administered to all patients using three-dimensional conformal radiotherapy with conventional fractionation of 1.8–2 Gy per session, five days per week. Treatment planning and dosimetric distribution are illustrated in Figure 6.

Exclusive radiotherapy was delivered to one patient with early-stage disease and a contraindication to

surgery, with a total dose of 70 Gy to the primary tumor and 50 Gy to cervical lymph node areas. After six years of follow-up, no recurrence was observed, indicating durable tumor control.

Postoperative radiotherapy was administered to all patients who underwent total laryngectomy, with doses ranging from 50 to 54 Gy to the surgical bed and 50 Gy to cervical lymph node areas.

Radiotherapy combined with chemotherapy was used in patients with locally advanced inoperable tumors, in cases of surgical refusal, or as part of laryngeal preservation strategies.



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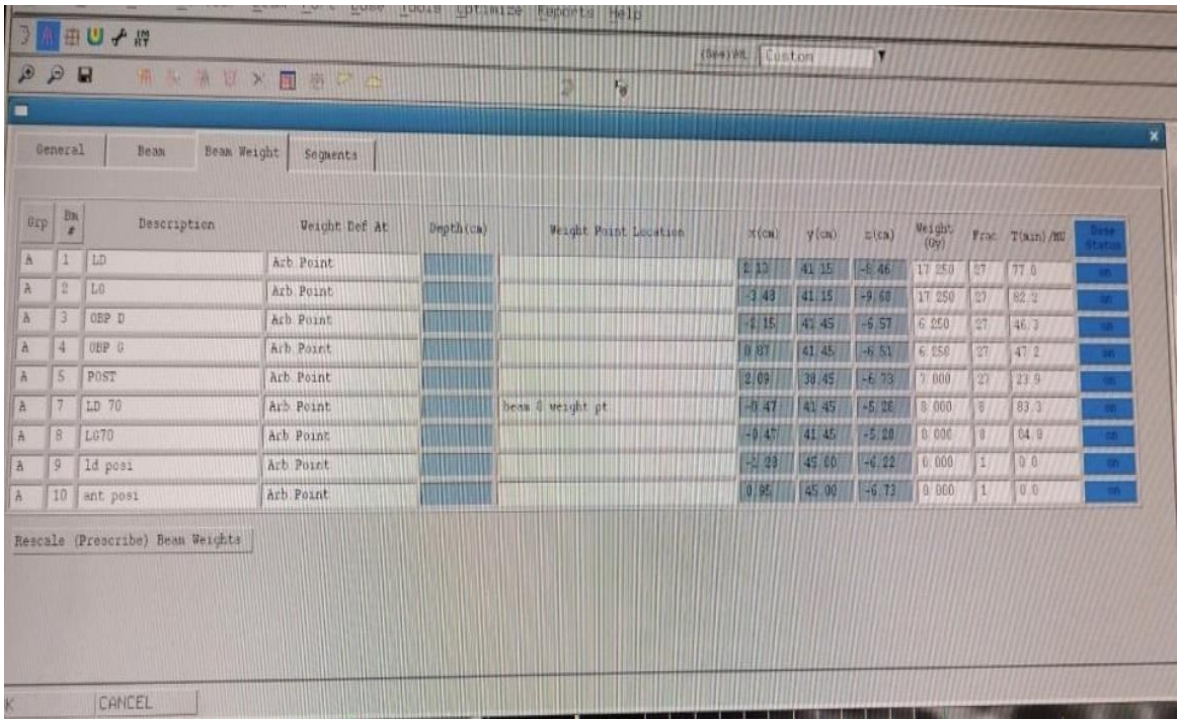

(C)

Figure 6: Three-dimensional conformal radiotherapy (3D-CRT) planning for laryngeal cancer (Department of Radiation Oncology, University Hospital of Marrakech)

a. **Axial CT slice illustrating beam arrangement and isodose distribution.**
b. **Treatment planning overview showing axial, sagittal and coronal CT reconstructions with digitally reconstructed radiograph (DRR).**
c. **Beam configuration and weighting parameters used for 3D-CRT planning.**

Chemotherapy

Chemotherapy was administered concomitantly with radiotherapy in patients with locally advanced disease. Treatment regimens were mainly based on cisplatin at a dose of 100 mg/m² every three weeks. In cases of contraindication to cisplatin, carboplatin combined with 5- fluorouracil was used.

Outcomes following chemoradiotherapy were heterogeneous, with satisfactory initial tumor control but higher rates of recurrence and distant metastases compared with surgical strategies.

- **Treatment Tolerance and Outcomes**

Overall treatment tolerance was satisfactory. Radiodermatitis was observed in five patients. No severe acute toxicity or definitive treatment interruption was reported.

The best outcomes were observed in patients treated at an early stage and in those who underwent surgery followed by radiotherapy. Patients treated with exclusive chemoradiotherapy for stage IVA disease had a poorer prognosis, with higher rates of recurrence and pulmonary metastases

DISCUSSION

Laryngeal cancer in women remains a rare entity, which explains the limited number of patients included in our series despite a six-year inclusion period. This rarity is consistently reported in the literature, where a strong male predominance persists. Nevertheless, several epidemiological studies have described a gradual increase in the incidence of laryngeal cancer among women over recent decades, likely related to changes in environmental exposure, lifestyle factors, and improved diagnostic awareness [1–3].

The mean age at diagnosis in our study was 63 years, which is in line with published data reporting a later age of onset in women compared with men [2,8]. Diagnostic delay appears to be multifactorial. Dysphonia, the most frequent initial symptom, is often underestimated or attributed to benign causes, leading to delayed referral to specialized care [4,5]. In our series, the mean consultation delay of nine months clearly illustrates this issue and largely explains the high proportion of locally advanced tumors at diagnosis.

Clinically, dysphonia was the predominant presenting symptom in all patients, confirming its role as a major warning sign of laryngeal malignancy. However, the relatively high frequency of dyspnea and dysphagia reflects advanced local tumor extension at the time of diagnosis.

Similar findings have been reported in other female series, in which glotto-supraglottic and transglottic involvement predominates [8,9].

Histopathological analysis revealed exclusive predominance of squamous cell carcinoma, mainly moderately differentiated, which is consistent with the literature [10]. No specific histological features related to female sex were identified, suggesting that sex-related differences in laryngeal cancer are more likely linked to epidemiological factors and diagnostic delay rather than tumor biology itself.

Tumor staging according to the AJCC/UICC 8th edition showed a predominance of locally advanced stages (III–IVA), accounting for more than 80% of cases. This distribution is comparable to reports from low- and middle-income countries and contrasts with data from high-income settings, where earlier diagnosis is more common [11]. These findings highlight the importance of public health strategies aimed at early detection and awareness, particularly among women.

From a therapeutic perspective, our study emphasizes the importance of multidisciplinary management. Surgery, particularly total laryngectomy associated with cervical lymph node dissection followed by postoperative radiotherapy, remains a cornerstone in the treatment of operable locally advanced laryngeal cancer. This approach has been shown to provide satisfactory locoregional control and survival outcomes in several studies [6,12].

Radiotherapy played a central role in the management of our patients, being used either as exclusive treatment, as adjuvant therapy, or in combination with chemotherapy. In early-stage disease, exclusive radiotherapy achieved durable tumor control in our series, in agreement with international guidelines that consider radiotherapy a curative alternative to surgery for selected early glottic cancers [7,13].

Postoperative radiotherapy contributed to improved locoregional control in patients undergoing total laryngectomy, even in the absence of major adverse pathological features. This finding is consistent with previous reports demonstrating the benefit of adjuvant irradiation in reducing local recurrence rates in advanced-stage disease [14].

Concurrent chemoradiotherapy was reserved for patients with locally advanced inoperable tumors, those refusing surgery, or within laryngeal preservation strategies. Although initial tumor control was acceptable, long-term outcomes were more heterogeneous, particularly in stage IVA disease, with higher rates of recurrence and distant metastases. These results are consistent with large randomized trials and meta-analyses [15,16].

Overall treatment tolerance in our study was satisfactory, with predominantly moderate acute toxicities, mainly radiodermatitis. No severe acute toxicity or treatment interruption was observed. These

findings are comparable to those reported in the literature and may be explained by adherence to standard dose fractionation schedules and appropriate supportive care [14].

This study has several limitations, including its retrospective design, small sample size, and loss to follow-up in some patients, which limit survival analysis and generalizability.

However, it provides valuable insight into real-world management of laryngeal cancer in women, a population that remains underrepresented in the literature.

CONCLUSION

Laryngeal cancer in women is a rare disease and is often diagnosed at a locally advanced stage. Multidisciplinary management combining surgery, radiotherapy, and chemotherapy provides satisfactory locoregional control. Early diagnosis remains essential to improve outcomes in this population.

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