



RESEARCH ARTICLE

LARYNGEAL CANCER IN YOUNG PATIENTS: A RETROSPECTIVE STUDY AT HASSAN II UNIVERSITY HOSPITAL, FEZ

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Abstract

Background: The majority of laryngeal cancer cases occur in adults aged 50–70, where alcohol and tobacco use are established risk factors. In patients under 40, laryngeal cancer is uncommon, and both its clinical profile and therapeutic outcomes are not well characterized.

Objective: To describe the epidemiological, histological, therapeutic, and evolutionary features of laryngeal cancer in young patients treated at Hassan II University Hospital, Fez.

Methods: A retrospective descriptive study was conducted from January 2012 to December 2024. Inclusion criteria were patients ≤ 40 years, histologically confirmed laryngeal cancer, and complete clinical records.

Results: Among 272 patients, 6 (2.2%) were ≤ 40 years (mean age 34.3, 66.7% male). Two patients (33.3%) reported smoking, while none consumed alcohol. Most tumors were glottic (83.3%), ulceroproliferative (50%), and squamous cell carcinoma (100%), with T3 and T4 equally distributed. Laryngeal preservation by chemoradiotherapy was achieved in 50%, while two patients underwent total laryngectomy followed by adjuvant radiotherapy. At a mean follow-up of 8.5 years, 50% achieved complete remission and 50% experienced recurrence (mean 68.3 months).

Conclusion: Laryngeal cancer in young patients is rare. Despite lower exposure to traditional risk factors, clinical, histological, and therapeutic characteristics mirror those of older patients.

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Introduction:-

As one of the most frequent head and neck cancers, laryngeal carcinoma peaks in incidence between the ages of 50 and 70, with alcohol and smoking as major etiologic factors [1,2]. In contrast, young adults (≤ 40 years) constitute a small fraction ($\approx 2\text{--}5\%$) of cases [3,4], a pattern recognized since early reports in the 1980s [5]. It remains unclear if younger individuals present with more aggressive stages or experience different prognoses, as recent studies report conflicting findings [6,7]. Current management emphasizes organ preservation when oncologically safe, alongside a continued role for surgery in advanced or refractory disease [8–11]. For clinical background and therapeutic

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principles used in practice, we also refer to the EMC chapter on laryngeal cancers [12]. The aim of this study was to characterize the epidemiological profile, histopathological findings, therapeutic approaches, and treatment outcomes of laryngeal cancer in patients ≤ 40 years old treated at Hassan II University Hospital, Fez.

Materials and Methods:-

This was a retrospective descriptive study performed at the Department of Radiotherapy and Brachytherapy, CHU Hassan II, Fez, covering a 13-year period from January 2012 to December 2024.

Inclusion criteria:

- Age ≤ 40 years
- Histologically confirmed laryngeal carcinoma
- Received treatment at Hassan II University Hospital
- Complete and analyzable medical records

Data collection:

Collected data covered demographics, potential risk exposures, tumor location and morphology, histology, TNM staging, therapeutic strategies, and clinical outcomes such as remission, recurrence, and survival. Follow-up duration was recorded from the end of treatment to the last consultation.

Analysis:

Descriptive statistics were applied. Categorical data were expressed as frequencies and percentages; continuous variables as means and ranges.

Results:-

Among 272 patients diagnosed with laryngeal carcinoma, 6 (2.2%) were aged ≤ 40 years. The mean age was 34.3 years, with a male-to-female ratio of 2:1. None of the patients reported a family history of cancer. Tobacco exposure was present in two patients (33.3%), while none reported alcohol consumption.

The primary tumor site was predominantly glottic (5/6 patients, 83.3%), with one supraglottic case (16.7%). This distribution is shown in Figure 1.

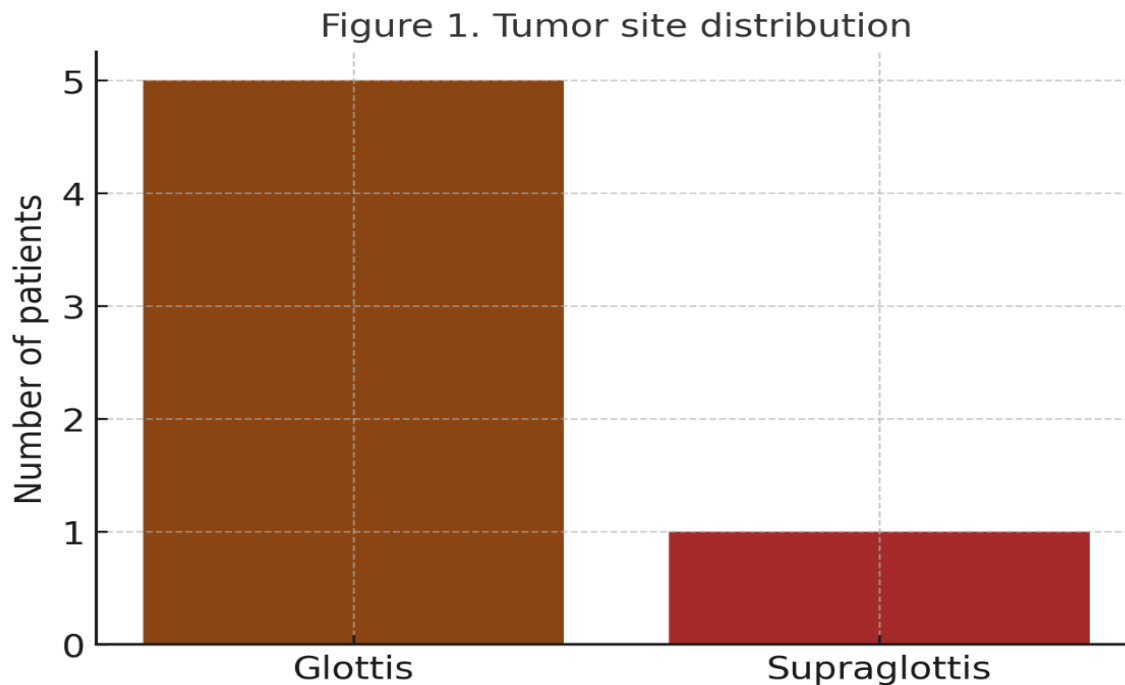


Figure 1. Tumor site distribution

Histopathologically, all tumors were squamous cell carcinomas, with well-differentiated histology in two cases (33.3%). Half of the patients were staged T3 and the other half T4, with nodal involvement in one case (16.7%). Macroscopically, half of the tumors exhibited an ulceroproliferative pattern.

Regarding treatment, three patients (50%) underwent organ-preserving concurrent chemoradiotherapy, one patient (16.7%) received radiotherapy alone, and two patients (33.3%) underwent total laryngectomy with bilateral neck dissection followed by adjuvant radiotherapy. The distribution of treatment modalities is illustrated in Figure 2.

Figure 2. Treatment modalities

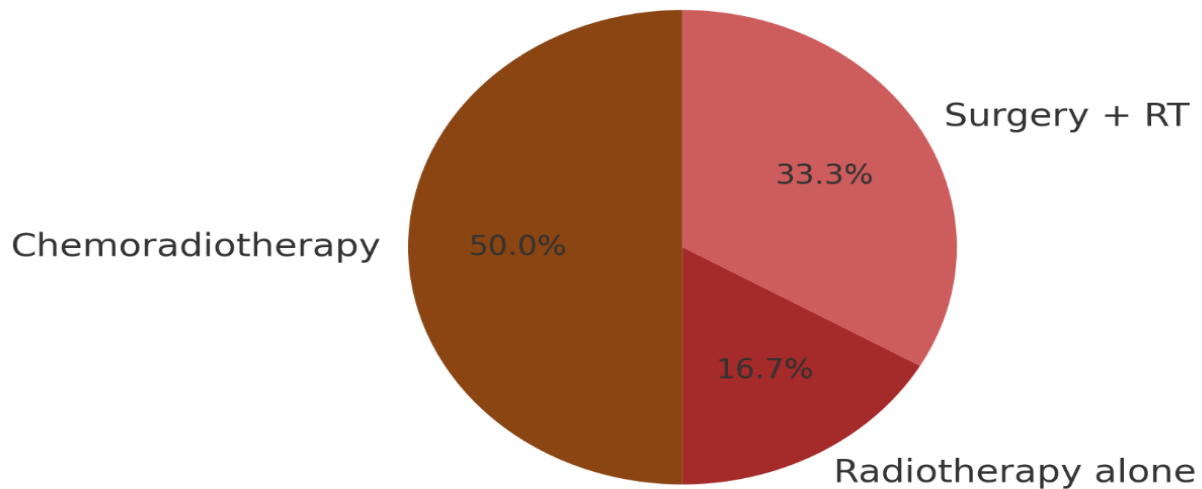


Figure 2. Treatment modalities

Both surgical cases had negative margins, no perineural invasion, and no vascular emboli. The mean interval between surgery and adjuvant radiotherapy was three months. After a mean follow-up of 8.5 years (range: 4–13 years), three patients (50%) achieved complete remission, while three patients (50%) experienced recurrence, with a mean recurrence interval of 68.3 months (range: 12–136 months). Recurrence-free survival is depicted in Figure 3.

Figure 3. Recurrence-free survival (Kaplan–Meier estimate)

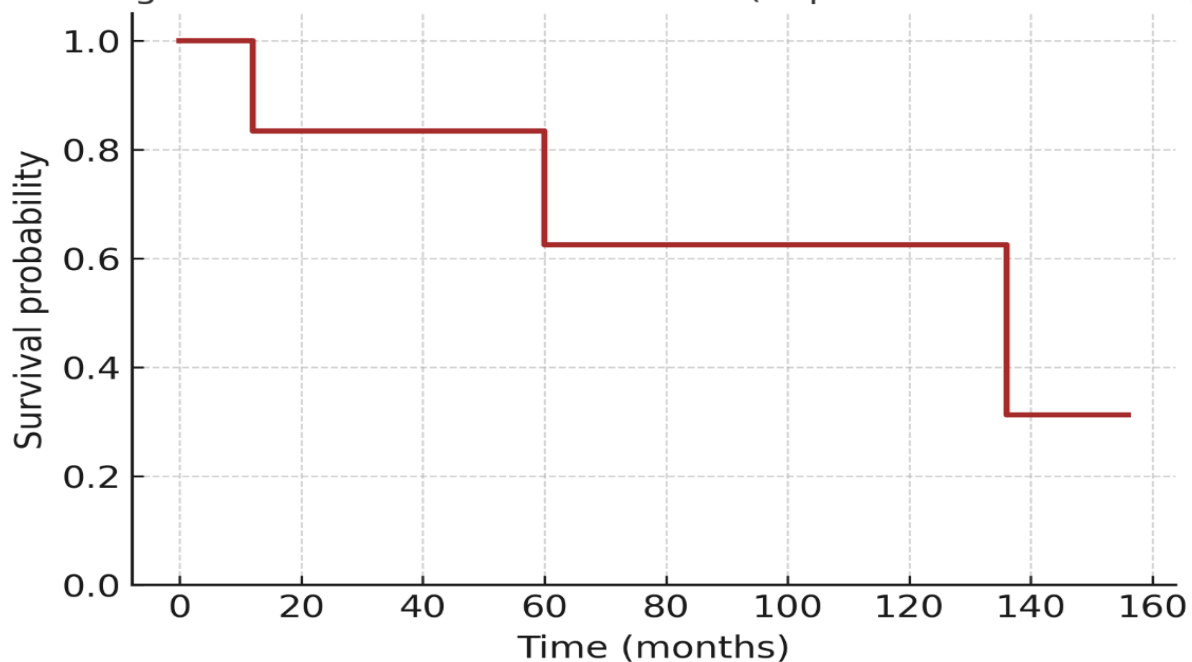


Figure 3. Recurrence-free survival (Kaplan–Meier estimate)

No patient developed a second primary tumor during follow-up.

Discussion:-

Rarity and epidemiology. Young adults represented 2.2% of our laryngeal cancer population, in line with reported ranges of 2–5% across series and reviews [3,4]. Classic epidemiologic overviews also reaffirm the overall burden in older adults and the central role of lifestyle exposures [1]. Risk profile. Only one-third of our young patients smoked and none reported alcohol use, echoing findings that classical risk factors may be less prevalent in younger cohorts [3,4,6]. Nonetheless, The combined carcinogenic influence of alcohol and smoking is well documented, and probably contributes significantly to disease characteristics in older patients[2].

Clinicopathologic pattern. The glottic predominance (83.3%) mirrors prior observations in young patients [3,4,6]. Histology showed conventional squamous cell carcinoma without distinctive features versus older cohorts, as also noted in historical and modern series [5–7]. Treatment and organ preservation. In practice, organ-preserving chemoradiotherapy was offered when appropriate, while total laryngectomy was reserved for advanced or non-eligible cases, consistent with the findings of pivotal organ-preservation trials and subsequent practice analyses [8–11]. These data caution against over-generalizing randomized trial results to all patients, emphasizing individualized decision-making [10]. Comprehensive clinical references such as EMC continue to support pragmatic management choices in daily practice [12].

HPV and alternative etiologies. Given the attenuated exposure to classical carcinogens among young patients, HPV-related oncogenesis warrants consideration. Meta-analyses and focused reviews suggest an association between HPV infection and laryngeal cancer, though the magnitude and clinical implications are still being refined [13,14]. Further studies incorporating viral and molecular analyses are needed to better understand tumor biology and refine treatment approaches in this younger subgroup. Limitations. Small sample size, retrospective design, and potential under-reporting of exposures limit inference. Nevertheless, the long follow-up adds value to outcome estimates. Implications. Despite lower exposure to traditional risks, young-adult disease resembles that in older patients regarding site, histology, stage, treatment, and recurrence. Vigilant surveillance and multidisciplinary care remain essential.

Conclusion:-

- Laryngeal carcinoma in young adults is rare, accounting for only 2.2% of cases in our institution. Although traditional exposures are less frequent in young patients, their disease course regarding stage, histology, and prognosis resembles that of older cohorts. Early detection, organ-preserving strategies, and vigilant follow-up remain crucial. Future research should focus on molecular and viral factors, particularly HPV, to better understand the etiology in this population.

Ethics Statement:

This retrospective study was conducted in accordance with the ethical standards of the institutional research committee and with the principles of the Declaration of Helsinki (1964) and its later amendments. Given the retrospective nature of the analysis and the anonymization of patient data, formal ethical approval and individual patient consent were waived by Hassan II University Hospital.

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Conflict of Interest:

The authors declare that they have no conflict of interest.

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References:-

1. Hoffman HT, et al. Epidemiology of laryngeal cancer. *Otolaryngol Clin North Am.* 2008;41(4):761–769. doi:10.1016/j.otc.2008.01.001.
2. Hashibe M, Brennan P, Chuang SC, et al. Interaction between tobacco and alcohol use and the risk of head and neck cancer: pooled analysis in the International Head and Neck Cancer Epidemiology Consortium. *Cancer EpidemiolBiomarkersPrev.* 2009;18(2):541–550. doi:10.1158/1055-9965.EPI-08-0347.
3. Lechien JR, Fakhry N, Zelenik K, et al. Epidemiological, clinical and oncological outcomes of young patients with laryngeal cancer: a systematic review. *Eur Arch Otorhinolaryngol.* 2022;279(12):5635–5652. doi:10.1007/s00405-022-07466-9.
4. Nachalon Y, Cohen O, Alkan U, Shvero J, Popovtzer A. Characteristics and outcome of laryngeal squamous cell carcinoma in young adults. *OncolLett.* 2017;13(3):1393–1397. doi:10.3892/ol.2016.5528.
5. Shvero J, Hadar T, Segal K, Abraham A, Sidi J. Laryngeal carcinoma in patients 40 years of age and younger. *Cancer.* 1987;60(12):3092–3095. doi:10.1002/1097-0142(19871215)60:12<3092::AID-CNCR2820601239>3.0.CO;2-H.
6. Yang A, Tanamal P, Tibbetts K, et al. Characteristics and outcomes of young patients with laryngeal cancer: national hospital-based retrospective cohort analysis. *Head Neck.* 2022 ;44(10):2095–2108. doi :10.1002/hed.27120.
7. Li R, Yu S, Zhu W, Wang S, Yan L. Studying the impact of young age on prognosis and treatment in laryngeal squamous cell carcinomas using the SEER database. *PeerJ.* 2019;7:e7368. doi :10.7717/peerj.7368.
8. Forastiere AA, Goepfert H, Maor M, et al. Concurrent chemotherapy and radiotherapy for organ preservation in advanced laryngeal cancer. *N Engl J Med.* 2003;349(22):2091–2098. doi :10.1056/NEJMoa031317.
9. Forastiere AA, Zhang Q, Weber RS, et al. Long-term results of RTOG 91-11: three nonsurgical strategies to preserve the larynx. *J Clin Oncol.* 2013;31(7):845–852. doi:10.1200/JCO.2012.43.6097.
10. Sanabria A, Chaves ALF, Kowalski LP, et al. Organ preservation with chemoradiation in advanced laryngeal cancer: generalizing results from randomized controlled trials. *Auris Nasus Larynx.* 2017;44(1):18–25. doi: 10.1016/j.anl.2016.06.005.
11. Bozec A, Culié D, Poissonnet G, Dassonville O. Current role of total laryngectomy in the era of organ preservation. *Cancers (Basel).* 2020;12(3):584. doi :10.3390/cancers12030584.
12. Prades JM, Rey E. *Cancers du larynx. EMC – Oto-rhino-laryngologie.* 2013;8(4):1–20. doi :10.1016/S0246-0351(13)58510-2.
13. Li X, Gao L, Li H, et al. Human papillomavirus infection and laryngeal cancer risk: a systematic review and meta-analysis. *J Infect Dis.* 2013;207(3):479–488. doi:10.1093/infdis/jis698.
14. Torrente MC, Rodrigo JP, Haigentz M Jr, et al. Human papillomavirus infections in laryngeal cancer. *Head Neck.* 2011;33(4):581–586. doi:10.1002/hed.21421.