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Determine the Incidence of Subclinical Lymph Node Metastases in Laryngeal Cancer

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Objective: Lymph node metastases in laryngeal cancer are an important prognostic factor. The aim of our work is to determine the incidence of subclinical lymph node metastases in laryngeal cancer, their therapeutic and prognostic impact, the lymph node territories involved and the usefulness of retrospinal curage in laryngeal cancer.
Materials and Methods: A retrospective study that took place over a 9-month period between January and September 2022 included 40 cases of glotto-sus-glottic cancer initially classified as N0 and presenting with lymph node invasion.
Results: Occult metastases were found in 15 patients, with 28.54% of cases cN0 converted to pN2b in over 50% of cases in ipsilateral territory III.

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Conclusion: High rate of occult lymph node metastases in glotto-sus-glottic cancers, involvement of sectors IIa and IV in laryngeal cancers is infrequent and often associated with other sectors, hyper-selective cervical curage (IIa and III) seems justified for glottic and/or supra-glottic tumors classified as T1N0 or T2N0. In the case of advanced tumours (T3 or T4), involvement of the HTE lodge or cartilage infiltration, occult lymph node invasion is more frequent, necessitating functional curage.

Keywords: Regional lymph; laryngeal supraglottic; laryngeal carcinoma.

1. INTRODUCTION

The management of laryngeal supraglottic NO neck SGLC remains controversial. The supraglottic part of the larynx is characterized by a rich lymphatic network, and a carcinoma of this region has a strong predilection for cervical metastases. Appropriate treatment of the lymph nodes is, in fact, crucial to the management and prognosis of these patients. It has been reported that the incidence of metastases varies from 12% to 52%, with around 30% being occult. Consequently, many institutions advocate elective treatment of the N0 neck of patients with SGLC. Functional dissection is associated with significant nerve and lymphatic morbidity, especially when dissecting sectors IIb and IV [1]. The latter are the least frequently affected sectors, which calls into question their dissection, especially with the progress of various diagnostic techniques.

The probability of both survival and regional control is dramatically decreased in the presence of lymph node metastases from laryngeal cancer. [2-4] In cases when there are neck nodes that are clinically positive, a thorough neck dissection is generally accepted as necessary throughout the initial course of treatment. [5] On the other hand, opinions about the usefulness of doing an elective thorough neck dissection in patients with laryngeal cancer are divided. [3,6,7,8,9] Strong justifications for elective node dissection include the high rate of lymph node metastases in carcinomas affecting the supraglottis and the unreliability of cervical palpation. [2,6,10,11], When there is a considerable chance of nodal metastasis, other writers support routine elective radiation as a treatment for clinically negative necks. [12,13] For individuals who do not have metastases, both types of elective neck surgery lead to needless increases in costs and morbidity (true-negative instances). On the opposite side, the efficacy of the adoption of a wait-andsee attitude remains unproved [14].

We conducted a retrospective study of 40 patients with N0 glotto-sus-glottic cancer to determine the incidence of subclinical lymph node metastases in laryngeal cancer, their therapeutic and prognostic impact, and the lymph node territories involved. And consequently determine the usefulness of retro-spinal curage.

2. MATERIALS AND METHODS

This is a retrospective study which took place over a 9-month period between January and September 2022, involving patients operated on for partial or total laryngectomy with bilateral lymph node curage, and classified at the time of diagnosis as N0.Our series included 40 patients, all of whom were male, with an average age of 61.5 years (range, 54-73 years), and a pathological history of smoking (90%), alcoholism (43%) and diabetes (31%).

Preoperatively, all our patients were classified as N0. The N0 stage is defined by the absence of cervical adenopathy on physical examination and imaging (CT or ultrasound).

We performed systematic bilateral lymph node curage for all patients included in this study, removing territories II, III and IV.

All lymph nodes were examined in their entirety, without immunohistochemical study. This analysis made it possible to determine the presence or absence of metastases, their number and location.

Several tumor-related factors were investigated as possible predictors of subclinical lymph node involvement. The factors studied were tumour type, tumour site, involvement of the HTE compartment, extra-laryngeal extension and histological type.

Statistical analysis was performed using SPSS13.0 software. The study was of two types: a univariate analysis and a multivariate analysis.

3. RESULTS

All our patients underwent bilateral lymph node dissection, covering sectors II, III and IV. Occult

metastases were found in 15 patients (38%). 54% of cN0 cases were converted to pN2b, 27% to pN1, and 20% to pN2c.The frequency of ipsilateral sector III involvement was over 50% vs. 13% contralateral, ipsilateral sector II involvement was 33% vs. 6% contralateral, and finally ipsilateral sector IV involvement was 26% vs. 0% contralateral.Statistical study in search of factors predictive of lymph node involvement showed that T3 and T4 tumor stages, HTE compartment involvement and cartilage involvement were significantly correlated with the presence of lymph node involvement, with p-values of 1×10-37, 7×10-5 and 5×10-3 respectively. This relationship was not demonstrated for involvement of the suprasternal floor.Glottic level (p = 0.06), extra-laryngeal extension (p = 0.05) and histological type (tumor differentiation) (p=1).After treatment, in patients with occult lymph node metastases, tumour relapse occurred in 2 cases (12.5%), lymph node relapse in two cases (6.25%) and no distant metastases. The mean survival of pN- patients was 12 years, while that of pN+ patients was nine years. Multivariate analysis using the Cox model showed that lymph node involvement had a significant prognostic impact (p = 0.01).

4. DISCUSSION

“In the case of laryngeal cancers classified as N0, the initial procedure was to perform a complete lymph node dissection covering sectors I to V. However, given the rarity of involvement of sectors I and V, dissection was limited to sectors II, III and IV (selective neck dissection II-IV of the Committee for Head and Neck Surgery and Oncology of the American Academy of Otolaryngology-Head and Neck Surgery” [1]). Some authors have even suggested that sectors IIb and IV should no longer be dissected for N0 tumors, in order to reduce the morbidity associated with dissection of these sectors, which involve the spinal nerve, the deep cervical plexus and the thoracic duct. Others have considered that the number of occult lymph node metastases is not negligible - 37% in Shah's series [15] - and that functional curage is the appropriate treatment to prevent regional recurrence. “The question is how to identify selection criteria for patients in whom we will be able to preserve sectors IIb and IV” [16].

M. Mnejjaa, et al .TUNISIA analyzed data from a study including 164 patients who had undergone bilateral cervical curage involving sectors II, III and IV. Occult metastases were found in 41 curages (12.5%) in 32 patients (19.5%). Capsular rupture was mentioned in 10 specimens (3%). These metastases were bilateral in nine patients (5.5%) and homolateral to the tumor in the remaining cases (23 patients), i.e. 14%. Of the 328 curage operations performed, sectors IIa, IIb, III and IV were affected in 7% (23/328), 2.4% (8/328), 4.2% (14/328) and 2.7% (9/328) respectively. For the 32 patients with occult lymph node metastases, the tumor was never classified as T1 or T2; it was T3 or T4 in all cases. The tumor was transglottic in 15 cases (47%), supraglottic in 11 cases (34%) and glotto-susglottic in six cases (19%). The frequency of involvement of sector IIb for tumor stages T3 and T4 was 2.7% (4/146) and 3.6% (4/110) respectively. Sector IV was invaded in 1.36% (2/146) for stages T3 and 6.

Rinaldo et al [17] and Bolzoni et al [18] analyzed “data from several prospective multicenter studies involving patients with laryngeal cancers classified as N0, and found sector IIb involvement in 1.4% of cases”. Paleri et al [19], “in a review of the literature, found sector IIb involvement in 0.4% of cases of laryngeal squamous cell carcinoma classified clinically and radiologically as N0”. “All these authors recommend that sector IIb dissection be avoided in patients without palpable cervical adenopathy”. [16].

In our study, IIb involvement was found in 2.4% of cases. Such involvement was always associated with IIa involvement.

Several authors have concluded that dissection of sector IV is not always necessary, including Van der, Brekel et al [20], who found no involvement of sector IV, and Khalif et al, in a retrospective study of 71 patients, found involvement of sector IV in only one case, associated with involvement of sector II. In our study, involvement of this sector was found in 4 patients.

Alvaro Sanabria et al. Colombia, conducting a literature review including 36 patients the incidence of supraglottic lymph node metastases was 19.9% and glottic tumors was 8% and the incidence of occult lymph node metastases: Territory I: 2.4%, IV: 2%, V: 0.4% and IIB: 0.5.

D. Riviere et al. France, found after a study including 78 cases operated on for laryngeal cancer, that the incidence of occult lymph node metastases was 14%.

Most of the data in the literature are in favour of hyper-selective curage, involving only sectors IIa and III. This curage should be reserved for supraglottic tumors classified as T1 or T2 and without palpable cervical adenopathy.

Burcia et al. have recommended sentinel lymph node biopsy with immunohistochemical study as the technique of choice for detecting micro-metastases, with a sensitivity of 100% [21].as anatomopathological analysis can diagnose metastases larger than 2 or even 5mm [21]. This suggests that lymph node micro-metastases are still underestimated.

The presence of occult lymph node metastases did not increase the risk of locoregional recurrence or distant metastases in our study.

Planning for therapy may be affected by our multivariate method findings. Individuals who exhibit clinically positive nodes may be candidates for postoperative irradiation and comprehensive neck dissection, either traditional or modified. If the tumor is transglottic or supraglottic and involves the epiglottis, at the very least, a staging procedure is recommended for the contralateral side of the neck. Others have suggested an anterolateral neck dissection in this case as well.s,s The initial tumor site and histologic grade alone should not be the only factors used to determine the indications for elective neck dissection. The possibility of delayed metastases is a serious worry. When an acceptable clinical assessment cannot be made or when social and geographic reasons would preclude appropriate follow-up, a staging procedure—and occasionally an elective comprehensive neck dissection—must be carried out. Under these conditions, it is best to undertake a thorough neck dissection rather than taking a chance on missing radicality by using extremely selective methods. More conservative treatment is only appropriate for low-risk patients who are able to be properly monitored.

5. CONCLUSION

High rate of occult lymph node metastases in glotto-sus glottic carcinoma, involvement of sectors IIa and IV in laryngeal cancer is rare and often associated with other sectors. For glottic and/or supraglottic tumours classified as T1N0 or T2N0, superselective lymph node curage (IIa and III) seems reasonable. This approach limits morbidity without increasing the risk of failure. In the case of advanced tumours (T3 or T4), HT invasion or cartilage invasion, occult lymph node invasion is more frequent, and functional curage remains necessary.

CONSENT

As per international standards or university standards, respondents' written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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