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Sentinel Node Biopsy detecting occult Metastasis on early stage Tongue Cancer: Case Report and Surgical technique

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Abstract

Introduction: The sentinel node biopsy (SNB) technique is rapidly gaining recognition in the field of oncology, particularly for head and neck carcinomas in the detection of occult cervical metastases, with the potential to avoid unnecessary neck dissections. Tongue carcinoma has a high capacity for metastasis and a greater potential for the application of this technique.

Presentation of case: A 57-year-old woman presented with a tongue lesion without evident clinically node metastasis, compatible with an early squamous cell carcinoma. She was submitted to a sentinel node biopsy with identification of a metastasis in the sentinel node.

Discussion: The implementation of SNB in tongue carcinoma faces significant resistance, as there are no sustained data regarding its validation and reproducibility in the head and neck. The gold-standard treatment consists of elective neck dissection, which is associated with a large number of unnecessary neck dissections and consequent morbidity.

Conclusion: This study case supports the validity of the SNB technique as an effective method for detecting occult metastases in early-stage tongue carcinoma.

Keywords: Sentinel node biopsy; Early tongue cancer; Occult neck metastases; Case report; Head and neck

Introduction

The tongue represents the most frequent location of oral cavity carcinoma. Early-stage tongue carcinoma has a good prognosis; however, the presence of cervical lymph node metastases significantly worsens it, with a decrease of approximately 50% in the 5-year survival rate [1,2] Tongue carcinoma typically presents a high rate of nodal metastasis, being associated with an incidence of occult cervical lymph node metastases of 30-50% [3]. Considering this fact, the nodal status of patients is crucial in the approach and treatment of this carcinoma, with early and accurate identification of occult nodal metastases being important. Currently, the gold-standard approach for the neck in early-stage tongue carcinoma involves performing elective neck dissection. This procedure allows for the treatment of 20-30% of patients, which means 70-80% unnecessary dissections and consequent morbidity and decreased quality of life [4]. Thus, SNB has emerged as a viable alternative to END, showing similar oncological outcomes on one hand, and significantly lower morbidity rates on the other hand. However, there has been some skepticism regarding the implementation of the technique due to its reproducibility.

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Presentation of Case

Woman, age 57, originally from South Africa, residing in Portugal for the past 20 years. She was previously independent in her daily life activities, with a medical history of non-ST elevation acute myocardial infarction in 2016, arterial hypertension, and dyslipidemia. She denied the use of tobacco, alcohol, and substance abuse habits, and had no history of oral infections and poor oral hygiene. The patient reported being apparently stable until December 2023, when she mentioned discomfort in the oral cavity, having observed a lesion on the right side of the tongue that prompted her to see her dentist. She denied bleeding, exudate, pain, dysphagia, speech changes, or other alterations in the oral cavity. At that time, a biopsy of the lesion was performed, which revealed severe dysplasia. She was subsequently referred to the Head and Neck Surgery appointment. There, a new biopsy was performed, which revealed squamous cell carcinoma of the tongue. On the physical examination, there was evidence of an ulcerated and infiltrative lesion on the right border of the tongue, measuring approximately 1.5 cm, with no palpable cervical lymphadenopathy.

Upon this diagnosis, staging of the neoplasm was carried out with a CT scan of the head and neck, which showed a lesion on the right border of the tongue, without apparent extension to the base of the tongue or transgression of the midline, with no evidence of mandibular invasion or lateral cervical adenopathy. For further characterization, transoral ultrasound was additionally performed, identifying a lesion in the posterior third of the right border of the tongue, measuring 18 mm in anteroposterior extension, with an estimated invasion depth of 4.9 mm. No evidence of lateral cervical adenopathy was found.

Given this situation, the patient was refered for right hemiglossectomy with sentinel lymph node biopsy. The patient first underwent preoperative lymphoscintigraphy for mapping of the lymphatic system and determination of the sentinel node. This involved the perilesional intradermal administration of 59 MBq of a radiopharmaceutical composed of albumin molecules coupled with technetium ([99mTc] Tc-albumin nanocolloids) [Figure 1a]. Subsequently, images of the cervical region were acquired in anterior and right lateral incidences, followed by tomographic (SPECT) study of the cervical region, co-registered with low-dose CT for anatomical referencing of the sentinel lymph node. [Figure 1b].

The aim was to facilitate the drainage of the radiopharmaceutical into the right lateral-cervical region and subsequent accumulation in a lymph node, considered the sentinel lymph node. In this specific case, the sentinel lymph node was located at level IIa, jugulo-digastric. With this information, the skin marking of the previously identified sentinel lymph node was subsequently performed. [Figure 2]

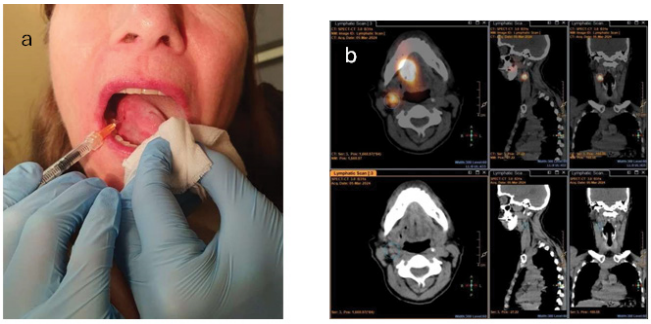

Figure 1: **(a)** Intradermal peri-lesional injection of [^{99m}Tc] Tc-albumin nanocolloids; **(b)** Identification of the sentinel lymph node on CT/SPECT.

Figure 2: Skin marking of the sentinel lymph node location

The next step involved the patient being transferred to the operating room. There, a dye (patent blue) was administered in the tumour region [Figure 3], which migrated to the sentinel lymph node. In addition to this, a gamma probe was also used, which in combination with the patent blue, allowed for the intraoperative identification of the sentinel lymph node. Following that, the sentinel node biopsy was performed [Figure 4], with the identification and excision of a single sentinel lymph node, which was subsequently sent to pathology [Figure 5]. Additionally, during the same surgical procedure, excision of the primary lesion was also carried out. The postoperative period was uneventful, and the patient was discharged the following day.

The histopathological examination concluded that the sentinel lymph node measured 1.4 cm in its largest axis and exhibited intranodal metastasis measuring 0.6 cm. Regarding the tongue lesion, it was confirmed to be an invasive, moderately differentiated squamous cell carcinoma, measuring 1.9 cm in its largest axis. It showed invasion of submucosal soft tissues, with a depth of invasion of 7 mm, without lymphovascular or perineural invasion, and surgical margins of 2 mm between the tumour and the nearest margin. In conclusion, it is a moderately differentiated squamous cell carcinoma of the tongue, staged as pT2pN1(sn).

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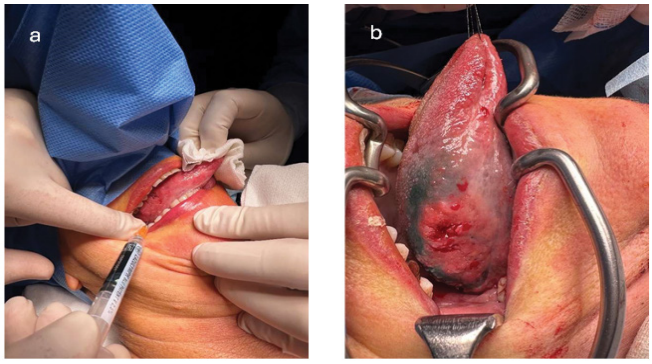

Figure 3: (a) Intraoperative peri-lesional injection of the blue dye patent; (b) Lesion on the lateral border of the tongue.

Figure 4: Intraoperative identification of the sentinel lymph node.

Figure 5: Intraoperative identification of the sentinel lymph node

Discussion

Approximately 48% of head and neck neoplasms originate in the oral cavity, with squamous cell carcinoma being the most frequent histological type [5], as in our clinical case. The tongue is the most common site for oral cavity carcinomas (25-40%) [6].

Epidemiologically, tongue carcinoma more frequently affects males and those over 50 years of age. The risk factors most strongly associated with tongue carcinoma are tobacco and alcohol exposure, which are absent in our case. Given the high metastatic potential of this carcinoma (30-50%) and the fact that imaging methods for staging have a sensitivity of about 70% for detecting metastases [7], elective neck dissection is currently the gold standard for neck management in a selected group of patients. However, this strategy is not consensual as it is associated with significant morbidity and considerable costs in patients who would not benefit from this approach. Thus, SNB emerged in this context as a method capable of selecting patients who would benefit most from neck dissection. This technique is based on the premise that neoplastic disease migrates from the primary tumour to the sentinel lymph node and from there to the rest of the regional lymphatic network. In this sense, the sentinel lymph node seems to reflect the status of the entire regional lymphatic network. If the sentinel lymph node is positive, then neck dissection would be indicated; conversely, if it is negative, no additional strategy would be recommended. It should be noted that several studies have compared SNB with elective node dissection. In fact, various authors have found oncological equivalence between SNB and elective neck dissection, with the former showing a sensitivity of 80-93%, a negative predictive value of 70-100%, and a false-negative rate of 9.8-14%. Additionally, SNB shows sentinel lymph node detection rates of 92-100% [8].

The objective of this case report is to support SNB as a safe, easy-to-handle technique that is, above all, valid and highly accurate for detecting occult metastases in early-stage tongue carcinomas. In our case, the patient did not have clinically evident metastases. Nonetheless, after performing SNB, the presence of a single metastasis in the sentinel node was detected, demonstrating the existence of occult nodal metastases and confirming the high sensitivity of the technique for their detection. Thus, the patient would benefit from undergoing subsequent neck dissection.

Resistance to the implementation of this technique has been related to some limitations, particularly concerning the location of the lesion, with the tongue being the site with the greatest potential for its application, and the experience of the surgeon and the nuclear medicine team with the technique. In our case, SNB was performed by a team of surgeons belonging to a reference center for the performance of SNB in breast cancer and cutaneous melanoma.

Conclusion

We reported a case of early-stage tongue carcinoma that underwent SNB, resulting in the identification of occult nodal metastasis. Given the considerable skepticism regarding its implementation and the growing clinical evidence about the oncological safety, applicability, and reliability of this technique, this case report helps to support and validate SNB.

References

1. Hingsammer L, Seier T, Zweifel D, et al. Sentinel lymph node biopsy for early stage tongue cancer-a 14-year single-centre experience. Int J Oral Maxillofac Surg 48 (2019): 437-442.

Mendes T, et al., J Surg Res 2024
DOI:10.26502/jsr.10020375

2. Svg B, Mirea D. Elective Neck Dissection in patients with stage T1-T2N0 carcinoma of the anterior tongue. Hippokratia 18 (2014).

3. Ernani V, Saba NF. Oral cavity cancer: Risk factors, pathology, and management Oncology (Switzerland). S. Karger AG 89 (2015): 187-195.

4. Cramer JD, Sridharan S, Ferris RL, et al. Sentinel Lymph Node Biopsy Versus Elective Neck Dissection for Stage I to II Oral Cavity Cancer. Laryngoscope 129 (2019): 162-169.

5. Irani S. New insights into oral cancer-risk factors and prevention: A review of literature. International Journal of Preventive Medicine 15 (2020): 182-190.

6. Bello IO, Soini Y, Salo T. Prognostic evaluation of oral tongue cancer: Means, markers and perspectives (I). Oral Oncology 46 (2010): 630-635.

7. Obayashi F, Koizumi K, Ito N, et al. A Study of the Prognostic Factors for Late Cervical Lymph Node Metastasis and Distant Metastasis in Patients with cT1-2N0 Tongue Cancer. J Clin Med 13 (2024): 35.

8. Crocetta FM, Botti C, Pernice C, et al. Sentinel node biopsy versus elective neck dissection in early-stage oral cancer: a systematic review. European Archives of Oto-Rhino-Laryngology. Springer Science and Business Media Deutschland GmbH 277 (2020): 3247-3260.