

## Tongue metastasis mimicking an abscess

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### ABSTRACT

Primary tumors metastasizing to the oral cavity are extremely rare. Lung is one of the most common primary sources of metastases to the tongue. Although the incidence of lung cancer is increasing, tongue metastasis as the initial presentation of the tumor remains uncommon. Due to the rarity of tongue metastasis, little is known about its imaging findings. Herein we report the magnetic resonance imaging and clinical findings of a lingual metastasis, mimicking an abscess, from a primary lung cancer.

**Key words:** • tongue • neoplasm metastasis • magnetic resonance imaging • abscess

**A**lthough primary carcinomas of the tongue accounts for nearly 50% of oral carcinomas, tongue metastasis with acute swelling of the tongue as the initial manifestation of a lung cancer is extremely rare (1, 2). The differential diagnosis of acute tongue swelling includes hemorrhage, infarction, abscess, tumor, and edema (3). Several imaging techniques, including ultrasonography, computed tomography (CT), and magnetic resonance imaging (MRI), can be used to evaluate tongue swellings (4, 5). CT is a useful tool for oral lesions, but MRI is superior in revealing the oral anatomy with excellent soft tissue detail and multiplanar capability (5); however, it is difficult to differentiate tongue abscess from malignancy on MRI because of the non-specific low signal intensity of the lesions on T1-weighted (W) images, and high signal intensity on T2W MR images (6).

Herein we report the case of a lingual metastasis from lung cancer that presented with acute tongue swelling and respiratory distress, and mimicked abscess on CT and MRI.

### Case report

A 58-year-old woman was referred to the emergency department with swelling and pain of the tongue, and difficulty in breathing. Her symptoms were present for three months prior to presentation, but there was a recent sharp increase in swelling and difficulty in breathing. On physical examination, it was difficult to open her mouth; the right side of the tongue was diffusely swollen and indurated. The overlying mucosa was intact and of normal color.

A CT examination was performed, and a hypodense lesion was seen on the right anterior tongue (Fig. 1). For further characterization of the lesion, nonenhanced and contrast-enhanced MRI examination was done. The lesion was hypointense on T1W precontrast images, and hyperintense on T2W images (Fig. 2a). There was an incomplete irregular, thick, hypointense rim on T2W images (Fig. 2b). This rim was not seen on T1W images. After contrast administration, the lesion showed marked peripheral contrast enhancement, but the central part did not enhance (Fig. 2c).

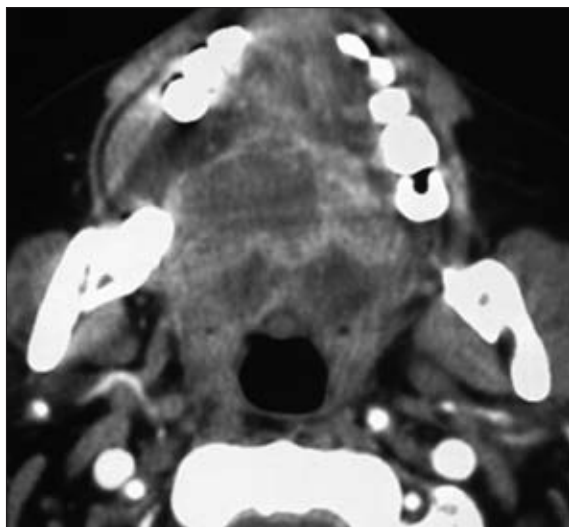
With these clinical and radiological findings, the lesion appeared to be an abscess. An attempt was made to drain the lesion, but it was unsuccessful. Therefore, the material obtained from this procedure was sent for cytological evaluation. Cytopathological examination revealed clusters of atypical cells showing cytoplasmic vacuolization and forming adenoid structures suggestive of metastatic adenocarcinoma.

A chest CT examination was performed to locate the primary source of this lesion. On CT, there was a 3.5 x 2.5 cm right hilar mass (Fig. 3), and small metastatic nodules in the lung parenchyma. Cytological examination of the specimen obtained by bronchial brushing performed during endoscopy revealed adenocarcinoma. Based on these findings,

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Received 19 February 2008; revision requested 13 April 2008; revision received 2 May 2008; accepted 19 May 2008.

Published online 19 October 2009  
DOI 10.4261/1305-3825.DIR.1728-08.1



**Figure 1.** On contrast-enhanced axial CT image, a central hypodense lesion in the anterior part of the tongue is seen.

the tongue lesion was diagnosed as a metastatic tumor from a primary lung cancer. The patient was transferred to the medical oncology department. She died two months later.

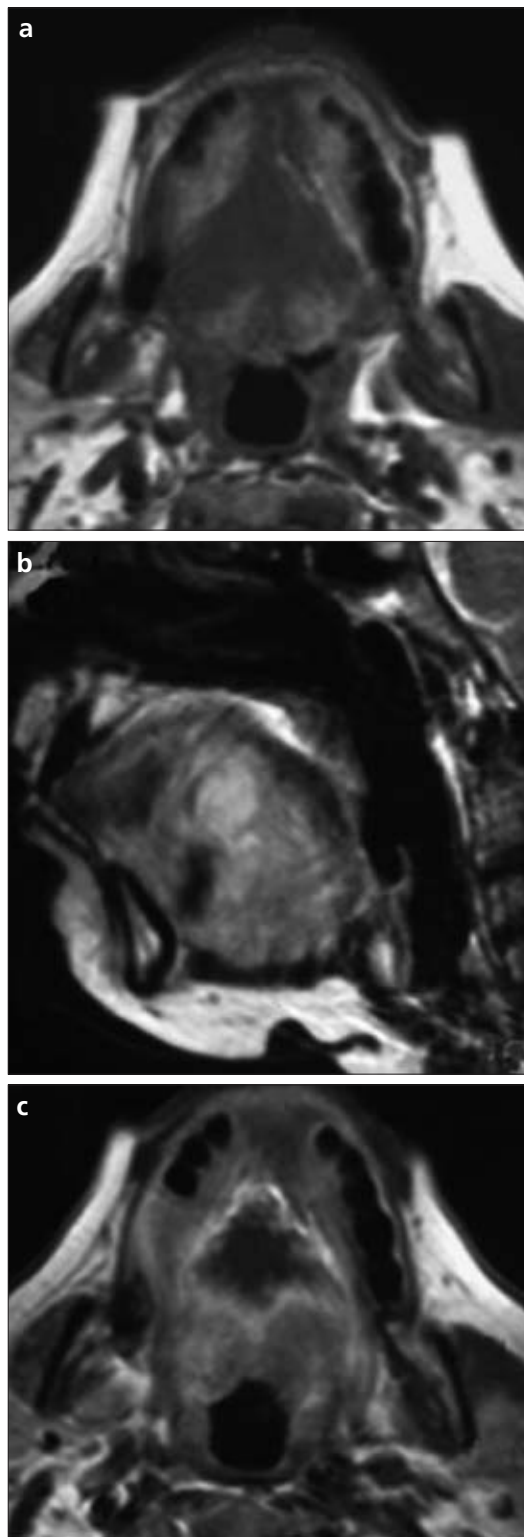
#### Discussion

Primary carcinomas of the tongue are fairly common, accounting for 50% of oral carcinomas (2); however, primary tumors metastasizing to the tongue are extremely rarely and mostly reported as case reports. Zegarelli et al. (7) reported 12 cases of tongue metastasis in 6881 necropsies performed on patients with malignancies. These investigators reported the overall incidence of tongue metastasis in disseminated malignancies to be 0.2%. The common primary sites resulting in lingual metastases are the lungs, pleura (mesothelioma), bronchus, esophagus, colon, breast, adrenal gland, kidney, endometrium, and skin (melanoma) (2). In our case, the metastasis was from a lung adenocarcinoma.

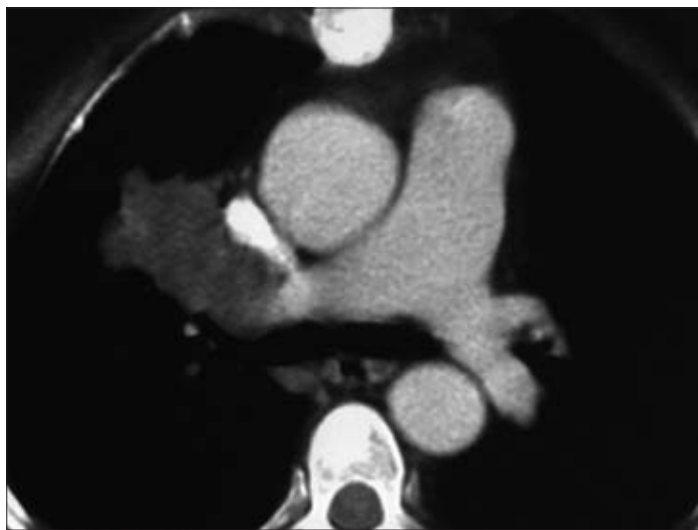
Metastases of pulmonary tumors may be seen months after the diagnosis of the primary disease, or on autopsy. Presentation with symptoms caused by metastatic disease without pulmonary symptoms may also be seen. But tongue metastasis as the presenting manifestation is extremely rare (1, 8). It is reported that differentiation of metastases from primary lesions is difficult. The gross appearance of a metastatic lesion may be identical to that of the primary tumor, and may vary from ulcerated to polypoid.

Sparing of the mucosa, as in our case, strongly suggests metastasis (1). Metastasis mostly involves the base of the tongue. This might be due to rich lymphatic and blood vessels or the relative immobility of the tongue base (9). In our case the lesion was in the anterior tongue.

The differential diagnosis of acute tongue swelling includes a number of entities such as tumor, cyst, infarction, edema, infection, hemorrhage, and metabolic disease (amyloidosis, hypothyroidism, acromegaly, B12 vitamin deficiency, and iron deficiency) and developmental processes (3, 5).



**Figure 2. a–c.** On precontrast axial T1-weighted MR image (a), a hypointense, and on sagittal T2-weighted MR image (b), a hyperintense lesion with an incomplete hypointense rim is seen. After administration of contrast (c), strong peripheral enhancement is seen.



**Figure 3.** Contrast-enhanced chest CT reveals a 3.5 x 2.5 cm right hilar mass.

Presentation with acute symptoms is uncommon for tongue tumors, but hemorrhage into the lesion may cause acute symptoms. On the other hand, abscess generally presents with swelling or a lump in the deep tissues of the tongue, pain radiating toward the ears, throbbing local pain, fever, difficulty in swallowing, voluntary fixation of the tongue because of pain, and, later, difficulty in breathing (3, 4, 10).

Several imaging techniques, including sonography, CT, and MRI, can be used to evaluate the tongue swellings (4). Dental amalgam artifacts and beam-hardening artifacts are the main obstacles to CT examinations, but with advanced CT scanners, it is possible to reduce these artifacts. With multidetector CT; one can get excellent reformat images (5). MRI is superior to CT in revealing the anatomy of the oral cavity (4, 5, 10, 11). Moreover, diffusion-weighted MRI may be used to help in the characterization of head and neck lesions, and its findings may provide useful supplementary information before surgery or biopsy (12). The typical presentation of an abscess is a T1 hypointense, T2 hyperintense lesion surrounded by a T1 hyperintense–T2 hypointense rim that enhances diffusely after contrast injection (5). The target sign and edema pattern are ancillary

findings that suggest the diagnosis of abscess, but an abscess may also present as a mass-like lesion that enhances diffusely or peripherally (5).

On the other hand, the radiological features of lingual metastases are non-specific (13). Tumors have low signal intensity on T1W MR images, and usually have a high signal intensity on T2W images. Tumors enhance with gadolinium. Lesions with a central necrosis may also be seen and these lesions are hard to differentiate from abscesses (6, 9). It is reported that diffusion-weighted imaging is useful for differentiating brain abscess from necrotic or cystic brain tumor (14). We suggest that this is also true for tongue lesions; however, to the best of our knowledge, there are no published data on this subject. In our case, the absence or incompleteness of T2 hypointense, T1 hyperintense rim might have aided in the differentiation of malignant and benign lesions (5).

In conclusion, tongue metastasis as the initial presentation of lung cancer is extremely rare. As is true of primary tongue tumors, its differentiation from an abscess on MRI can be difficult, but the absence of a T1 hyperintense–T2 hypointense rim, or the presence of an incomplete rim, may aid in this distinction.

## References

1. Terashima T, Matsuzaki T, Kawada I, et al. Tongue metastasis as an initial presentation of a lung cancer. *Intern Med* 2004; 43:727–730.
2. Marioni G, Gaio E, Poletti A, Derosas F, Staffieri A. Uncommon metastatic site of renal adenocarcinoma: the oral tongue. *Acta Otolaryngol* 2004; 124:197–201.
3. Antoniadis K, Hadjipetrou L, Antoniadis V, Antoniadis D. Acute tongue abscess. Report of three cases. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod* 2004; 97:570–573.
4. Ozturk M, Durak AC, Ozcan N, Yigitbasi OG. Abscess of the tongue: findings on MR imaging. *AJR Am J Roentgenol* 1998; 170:797–798.
5. Ozturk M, Mavili E, Erdogan N, Cagli S, Guney E. Tongue abscesses: MR imaging findings. *AJNR Am J Neuroradiol* 2006; 27:1300–1303.
6. Richard H, Wiggins SC. 3rd. Oral tongue. In: Harnsberger HR, ed. *Diagnostic imaging: head and neck*. Salt Lake City: Amirsys, 2004; III:4–34–37.
7. Zegarelli DJ, Tsukada Y, Pickren JW, Greene GW Jr. Metastatic tumour of the tongue. Report of twelve cases. *Oral Surg Oral Med Oral Pathol* 1973; 35:202–211.
8. Gupta S, Shahid N, Fouracres M. Uncommon metastatic site from vulval carcinoma: the tongue. *J Obstet Gynaecol* 2005; 25:733–734.
9. Kim HJ, Lee BJ, Kim SJ, Shim WY, Baik SK, Sunwoo M. Tongue abscess mimicking neoplasia. *AJNR Am J Neuroradiol* 2006; 27:2202–2203.
10. Jungell P, Asikainen S, Kuikka A, Malmström M. Acute tongue abscess: report of two cases. *Int J Oral Maxillofac Surg* 1996; 25:308–310.
11. Ozturk M, Yorulmaz I, Guney E, Ozcan N. Masses of the tongue and floor of the mouth: findings on magnetic resonance imaging. *Eur Radiol* 2000; 10:1669–1674.
12. Wang J, Takashima S, Takayama F, et al. Head and neck lesions: characterization with diffusion-weighted echo-planar MR imaging. *Radiology* 2001; 220:621–630.
13. Kim SH, Han MH, Park SW, Chang KH. Radiologic-pathologic correlation of unusual lingual masses: Part II: benign and malignant tumors. *Korean J Radiol* 2001; 2:42–51.
14. Kim YJ, Chang KH, Song IC, et al. Brain abscess and necrotic or cystic brain tumor: discrimination with signal intensity on diffusion-weighted MR imaging. *AJR Am J Roentgenol* 1998; 171:1487–1490.