

# Tongue Ultrasonography in the Diagnosis of a Submucosal Tongue Infection Mimicking a Neoplasm: a Case Report

## Neoplazmayı Taklit Eden Submukozal Dil Enfeksiyonunun Tanısında Dil Ultrasonografisi: Olgu Sunumu

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### ABSTRACT

A 44-year-old-man presented with submucosal tongue swelling with a duration of one week. Upon physical examination, a submucosal mass lesion on the right side of the tongue was detected. An initial magnetic resonance imaging (MRI) study showed a tongue mass thought to be a tongue neoplasm. Before a biopsy, intraoral tongue ultrasonography (USG) was performed and edema formation within the tongue muscle fibres was detected without any mass or abscess formation. After empirical antibiotic treatment, a subsequent MRI showed complete resolution of the lesion. In the diagnostic work-up of a suspicious submucosal tongue lesion, USG imaging is helpful and should be considered. (*Gazi Med J 2012; 23: 65-8*)

**Key Words:** Tongue, infection, glossitis, ultrasonography, magnetic resonance imaging

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### ÖZET

Bir haftadır dilde şişlik şikayeti ile başvuran kırk dört yaşında erkek hastanın fizik muayenesinde dilinin sağında submukozal kitle lezyonu tespit edildi. Yapılan manyetik rezonans görüntüleme (MRG) tetkikinde neoplazm ile uyumlu kitle saptandı. Biyopsi planlanmadan önce intraoral dil ultrasonografisi (USG) yapıldı ve kas lifleri arasında ödem saptandı ancak kitle ya da apse formasyonu yoktu. Ampirik antibiyotik tedavisi sonrası yapılan kontrol MRG tetkikinde kitlenin tamamen kaybolduğu görüldü. Şüpheli submukozal dil lezyonlarının görüntülemesinde USG yararlı bir modalite olarak akılda tutulmalıdır. (*Gazi Med J 2012; 23: 65-8*)

**Anahtar Sözcükler:** Dil, enfeksiyon, glossit, ultrasonografi, manyetik rezonans görüntüleme

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### INTRODUCTION

Tongue infections are almost always seated superficially. In such infections, pain, tenderness on palpation, fever, mucosal edema and eating difficulties are the common symptoms. Typical presentation makes diagnosis easy so that imaging studies are not necessary in most cases. Submucosal infections affect only a small area and usually present as an abscess in immunocom-

promised patients or in healthy subjects with a tongue piercing or fish bone impaction (1-3). In the case of a tongue infection with an intact and healthy-appearing overlying mucosa and without typical symptoms and findings, it would be difficult to distinguish an infection from a neoplastic process. Fortunately, spontaneously developing submucosal tongue infections in an immunocompetent patient without foreign body impaction has not, to our knowledge, been reported to date in

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the English literature. In this article, we present the first case of spontaneously developing submucosal tongue infection and the results of ultrasonography (USG) and magnetic resonance imaging (MRI) studies in a diagnostic dilemma.

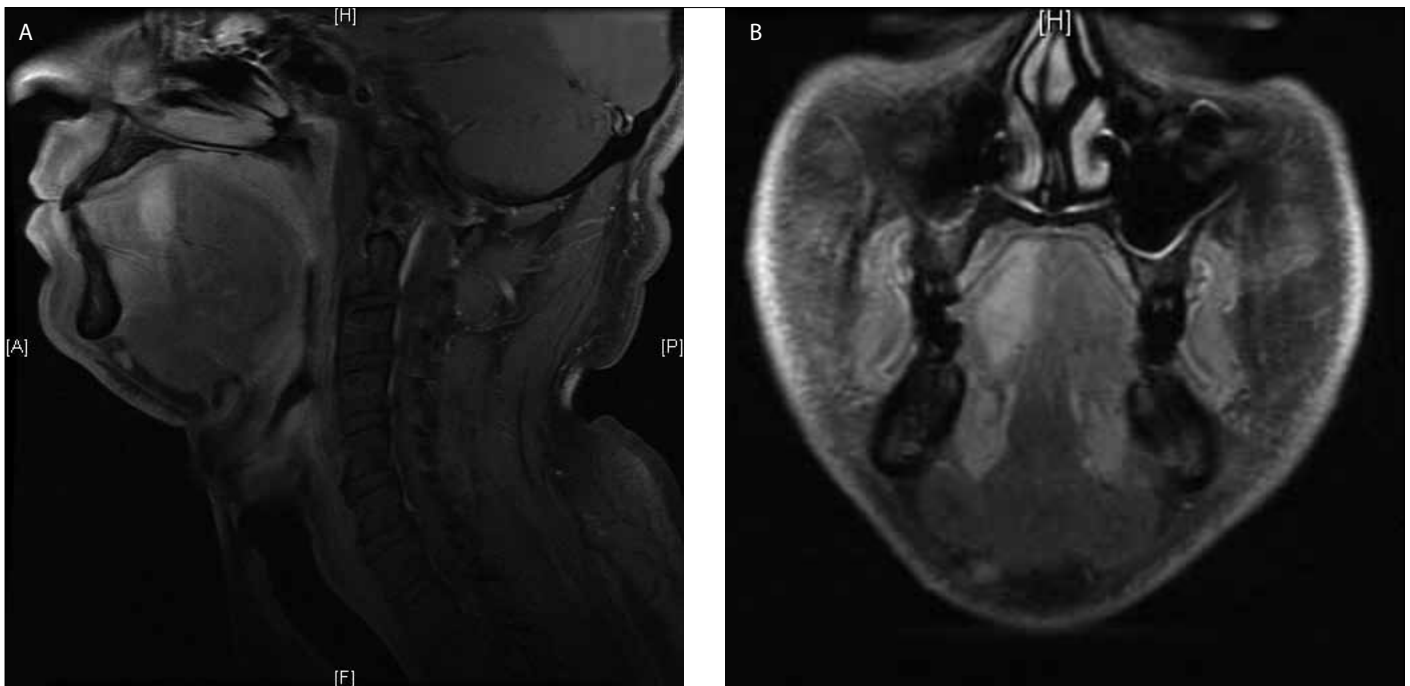
### CASE REPORT

A 44-year-old male was admitted to our clinic with right-sided submucosal tongue swelling and slight pain with a duration of almost one week. History revealed no apparent infection or trauma and the patient's medical history was unremarkable. The patient's body temperature and other vital signs were normal. Upon physical examination, a slightly tender, fixed and stiff right-sided submucosal mass lesion was detected with a diameter of 1.5 cm located 3 cm behind the tip of the tongue. The mucosa overlying the mass appeared healthy. The patient's mucosal ear-nose-throat examination and neck palpation were normal. The patient was an anxious dentist and his own diagnosis was a tongue cancer. The patient was evaluated by MRI with suspicion of a neoplasm.

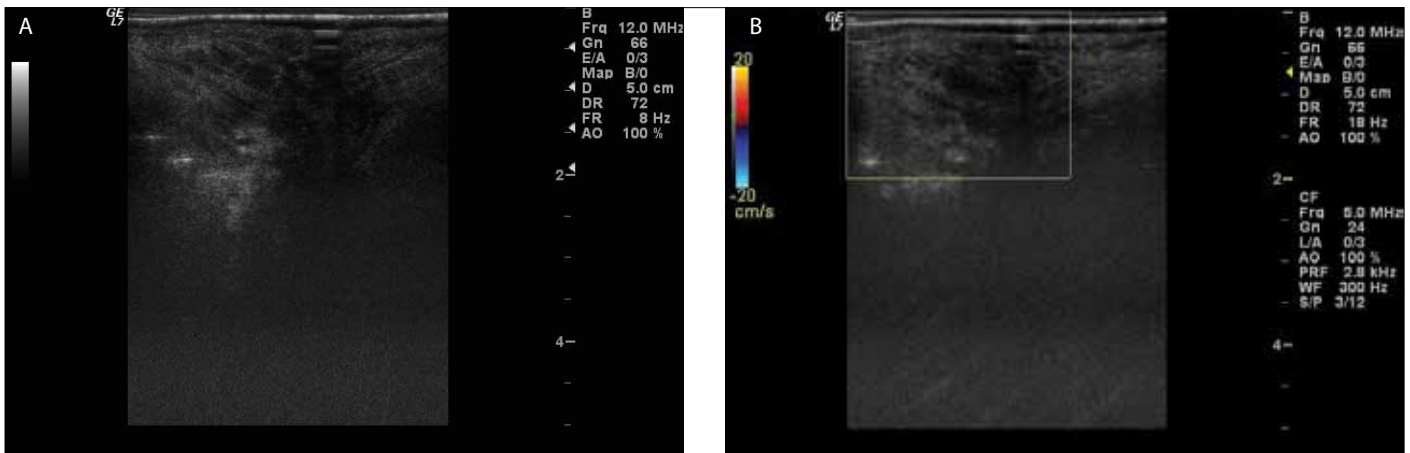
MRI showed a 1.5x1.5x3 cm submucosal and unencapsulated mass with irregular borders which could not be discriminated from the surrounding muscle tissue on T1-weighted images. The mass extended to the floor of the mouth and contrast accumulation was observed after contrast injection in T2-weighted images (Figure 1). Before taking a biopsy, a tongue USG was considered as a non-invasive and basic diagnostic tool for differential diagnosis. Tongue USG revealed edema formation within the tongue muscle fibres and there was neither a mass lesion nor an abscess (Figure 2). Empirical antibiotic treatment with 1 g of amoxicillin+clavulonic acid twice daily for 10 days was given with a presumptive diagnosis of a tongue infection. Complete resolution of the tongue mass was observed both clinically and radiologically upon subsequent MRI three weeks after the initiation of treatment (Figure 3).

### DISCUSSION

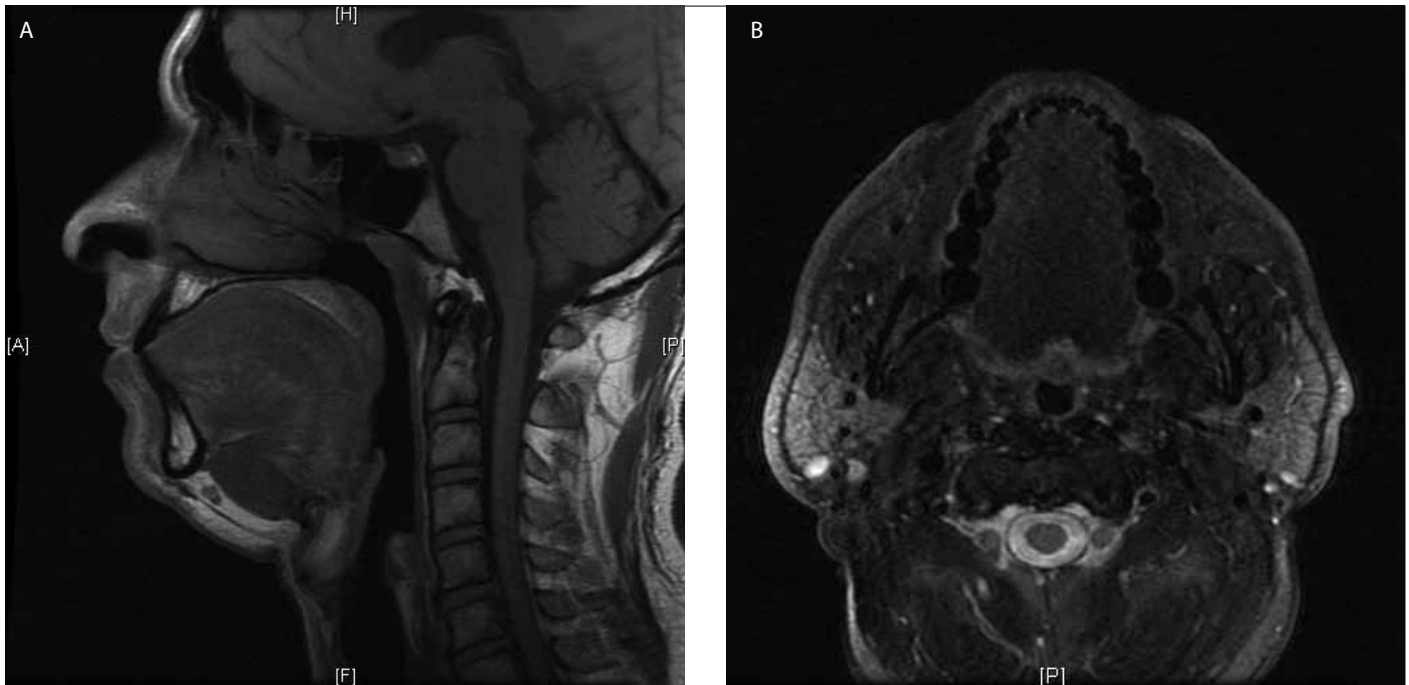
The differential diagnosis of an acute tongue swelling includes various conditions such as neoplasm, cyst, infarction, edema, infec-



**Figure 1.** T2-weighted MRI demonstrating the submucosal tongue lesion with contrast accumulation



**Figure 2.** USG images showing edema formation within tongue muscle fibres



**Figure 3.** T2-weighted MRI images show complete resolution of the lesion three weeks after the initiation of antibiotic treatment

tion, abscess, haemorrhage and metabolic disorders such as amyloidosis, hypothyroidism, acromegaly, B<sub>12</sub> vitamin deficiency and iron deficiency (4, 5). Sudden and painful onset of an intraoral swelling suggests an infectious aetiology. In case of a tongue infection, clinicians generally do not have difficulty in recognising the situation and rarely need an imaging study.

Tongue swelling is also one of the most common presentations of tongue tumours. The tongue is a frequent location of head and neck tumours with an annual prevalence of 4.5 per 100,000 (6). Among the neoplasms, benign tumours and tumour-like conditions of the tongue are not rare. Haemangioma, fibroma, granular cell tumours, neurofibroma, lipoma, teratoma and leiomyoma are common benign neoplasms (7). Malignant tongue neoplasms are almost always epithelial in origin and most of them are squamous cell carcinomas (6). Submucosal cancers are derived from the minor salivary glands and the most frequent histologic forms are adenoid cystic carcinoma and mucoepidermoid carcinoma (6).

Computed tomography (CT) and MRI are the most common modalities used for imaging oral cavity lesions. The benefit of CT in oral cavity tumours is well-documented; however, dental amalgam artefacts and beam hardening artefacts caused by attenuated mandibular bone may obscure the CT findings. MRI produces superior soft tissue detail without artefacts from the mandible or dental amalgams, but has a low specificity. Although radiological findings for submucosal neoplasms are non-specific, CT and MRI can play an important role in the diagnostic evaluation of these unusual tumours.

Besides these techniques, ultrasonography (US) is an invaluable method for the diagnosis of soft tissue pathologies. It does not involve ionising radiation and can be performed quickly without delay and with minimal discomfort to the patient. In soft tissue pathologies, US is commonly used to differentiate acute or chronic infection from tumours or non-infective inflammatory conditions with a similar clinical presentation, to localise the site and extent of the infection, to ascertain the form of infection (e.g. cellulitis, pre-abscess,

abscess), to identify precipitating factors (e.g. foreign bodies, fistulation) and to provide guidance for diagnostic or therapeutic aspiration, drainage or biopsy. In the head and neck, US is helpful in the diagnosis of neck pathologies such as thyroid nodules and tumours, lymph node metastases, congenital masses, infections and abscesses. But, traditionally, US has limited value in intraoral diagnostic intentions. With all these properties and its high accessibility, US would be a wise choice for the evaluation of lingual lesions as well. Among the tongue lesions, the most valuable use of US is for the identification and diagnosis of tongue abscesses (8). In cases of tongue cancer, US often used to accurately detect tumour size, extension or thickness, to control resection margin safety and to predict neck metastasis (9-13). For oral cancers, it has been shown that US is superior to CT and MRI in the assessment of primary lesions (14). Despite some data regarding the value of US in the assessment of mucosal squamous cell carcinoma of the tongue, the value of US in the differential diagnosis of submucosal lesions is scarce.

It is not difficult to diagnose a superficial tongue infection but when it appears atypically and submucosally, imaging studies may be necessary for a differential diagnosis. In our case, MRI was chosen as the first-step imaging modality because of its excellent soft tissue resolution in case of a suspicion of a neoplasm. The initial MRI raised a suspicion of malignancy in our case. At that point, before taking a biopsy, tongue ultrasound was performed and the correct diagnosis could be made. Our experience shows that tongue US may be more helpful than some other advanced imaging modalities such as MRI for the evaluation and differential diagnosis of submucosal tongue masses. In the diagnostic work-up of a suspicious submucosal lingual lesion, US imaging should be considered and it should be kept in mind that even a sophisticated imaging study such as MRI can confuse the diagnosis.

#### Conflict of Interest

No conflict of interest was declared by the authors.

## REFERENCES

1. 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: 570-3. [\[CossRef\]](#)
2. Olsen JC. Lingual abscess secondary to body piercing. *J Emerg Med* 2001; 20: 409. [\[CossRef\]](#)
3. Kim HJ, Lee BJ, Kim SJ, Shim WY, Baik SK, Sunwoo M. Tongue abscess mimicking neoplasia. *AJNR Am J Neuroradiol* 2006; 27: 2202-3.
4. Renehan A, Morton M. Acute enlargement of the tongue. *Br J Oral Maxillofac Surg* 1993; 31: 321-4. [\[CossRef\]](#)
5. Rubin MM, Gatta CA, Cozzi GM, Rogerson KC. Painful tongue mass. *J Oral Maxillofac Surg* 1990; 48: 728-31. [\[CossRef\]](#)
6. Blomquist E. Chapter 9: Head and Neck Tumors. In: Annico M, Bernal-Sprekelsen M, Bonkowsky V, Bradley P, Lurato S, editors. *Otolaryngology Head and Neck Surgery*, Springer-Verlag 2010: p 679, Berlin Heidelberg. [\[CossRef\]](#)
7. Ganly I, Ibrahimasic T, Patel SG, Shah J. Chapter 11: Tumors of the oral cavity In: Montgomery PQ, Rhys Evans PH, Gullane PJ. *Principles and practice of head and neck surgery and oncology*. Informa Healthcare 2009; p. 163, London.
8. Osammor JY, Cherry JR, Dalziel M. Lingual abscess: the value of ultrasound in diagnosis. *J Laryngol Otol* 1989; 103: 950-1. [\[CossRef\]](#)
9. Kodama M, Khanal A, Habu M, Iwanaga K, Yoshioka I, Tanaka T, et al. Ultrasonography for intraoperative determination of tumor thickness and resection margin in tongue carcinomas. *J Oral Maxillofac Surg* 2010; 68: 1746-52. [\[CossRef\]](#)
10. Mark Taylor S, Drover C, Maceachern R, Bullock M, Hart R, Psooy B, et al. Is preoperative ultrasonography accurate in measuring tumor thickness and predicting the incidence of cervical metastasis in oral cancer? *Oral Oncol* 2010; 46: 38-41. [\[CossRef\]](#)
11. Yuen AP, Ng RW, Lam PK, Ho A. Preoperative measurement of tumor thickness of oral tongue carcinoma with intraoral ultrasonography. *Head Neck* 2008; 30: 230-4. [\[CossRef\]](#)
12. Yamane M, Ishii J, Izumo T, Nagasawa T, Amagasa T. Noninvasive quantitative assessment of oral tongue cancer by intraoral ultrasonography. *Head Neck* 2007; 29: 307-14. [\[CossRef\]](#)
13. Natori T, Koga M, Anegawa E, Nakashima Y, Tetsuka M, Yoh J, et al. Usefulness of intra-oral ultrasonography to predict neck metastasis in patients with tongue carcinoma. *Oral Dis* 2008; 14: 591-9. [\[CossRef\]](#)
14. Shintani S, Yoshihama Y, Ueyama Y, Terakado N, Kamei S, Fijimoto Y, et al. The usefulness of intraoral ultrasonography in the evaluation of oral cancer. *Int J Oral Maxillofac Surg* 2001; 30: 139-43. [\[CossRef\]](#)