

World Journal of *Clinical Cases*

World J Clin Cases 2022 June 26; 10(18): 5934-6340



MINIREVIEWS

- 5934** Development of clustered regularly interspaced short palindromic repeats/CRISPR-associated technology for potential clinical applications
Huang YY, Zhang XY, Zhu P, Ji L
- 5946** Strategies and challenges in treatment of varicose veins and venous insufficiency
Gao RD, Qian SY, Wang HH, Liu YS, Ren SY
- 5957** Diabetes mellitus susceptibility with varied diseased phenotypes and its comparison with phenome interactome networks
Rout M, Kour B, Vuree S, Lulu SS, Medicherla KM, Suravajhala P

ORIGINAL ARTICLE

Clinical and Translational Research

- 5965** Identification of potential key molecules and signaling pathways for psoriasis based on weighted gene co-expression network analysis
Shu X, Chen XX, Kang XD, Ran M, Wang YL, Zhao ZK, Li CX
- 5984** Construction and validation of a novel prediction system for detection of overall survival in lung cancer patients
Zhong C, Liang Y, Wang Q, Tan HW, Liang Y

Case Control Study

- 6001** Effectiveness and postoperative rehabilitation of one-stage combined anterior-posterior surgery for severe thoracolumbar fractures with spinal cord injury
Zhang B, Wang JC, Jiang YZ, Song QP, An Y

Retrospective Study

- 6009** Prostate sclerosing adenopathy: A clinicopathological and immunohistochemical study of twelve patients
Feng RL, Tao YP, Tan ZY, Fu S, Wang HF
- 6021** Value of magnetic resonance diffusion combined with perfusion imaging techniques for diagnosing potentially malignant breast lesions
Zhang H, Zhang XY, Wang Y
- 6032** Scar-centered dilation in the treatment of large keloids
Wu M, Gu JY, Duan R, Wei BX, Xie F
- 6039** Application of a novel computer-assisted surgery system in percutaneous nephrolithotomy: A controlled study
Qin F, Sun YF, Wang XN, Li B, Zhang ZL, Zhang MX, Xie F, Liu SH, Wang ZJ, Cao YC, Jiao W

- 6050** Influences of etiology and endoscopic appearance on the long-term outcomes of gastric antral vascular ectasia

Kwon HJ, Lee SH, Cho JH

Randomized Controlled Trial

- 6060** Evaluation of the clinical efficacy and safety of TST33 mega hemorrhoidectomy for severe prolapsed hemorrhoids

Tao L, Wei J, Ding XF, Ji LJ

- 6069** Sequential chemotherapy and icotinib as first-line treatment for advanced epidermal growth factor receptor-mutated non-small cell lung cancer

Sun SJ, Han JD, Liu W, Wu ZY, Zhao X, Yan X, Jiao SC, Fang J

Randomized Clinical Trial

- 6082** Impact of preoperative carbohydrate loading on gastric volume in patients with type 2 diabetes

Lin XQ, Chen YR, Chen X, Cai YP, Lin JX, Xu DM, Zheng XC

META-ANALYSIS

- 6091** Efficacy and safety of adalimumab in comparison to infliximab for Crohn's disease: A systematic review and meta-analysis

Yang HH, Huang Y, Zhou XC, Wang RN

CASE REPORT

- 6105** Successful treatment of acute relapse of chronic eosinophilic pneumonia with benralizumab and without corticosteroids: A case report

Izhakian S, Pertzov B, Rosengarten D, Kramer MR

- 6110** Pembrolizumab-induced Stevens-Johnson syndrome in advanced squamous cell carcinoma of the lung: A case report and review of literature

Wu JY, Kang K, Yi J, Yang B

- 6119** Hepatic epithelioid hemangioendothelioma after thirteen years' follow-up: A case report and review of literature

Mo WF, Tong YL

- 6128** Effectiveness and safety of ultrasound-guided intramuscular lauromacrogol injection combined with hysteroscopy in cervical pregnancy treatment: A case report

Ye JP, Gao Y, Lu LW, Ye YJ

- 6136** Carcinoma located in a right-sided sigmoid colon: A case report

Lyu LJ, Yao WW

- 6141** Subcutaneous infection caused by *Mycobacterium abscessus* following cosmetic injections of botulinum toxin: A case report

Deng L, Luo YZ, Liu F, Yu XH

- 6148** Overlapping syndrome of recurrent anti-N-methyl-D-aspartate receptor encephalitis and anti-myelin oligodendrocyte glycoprotein demyelinating diseases: A case report
Yin XJ, Zhang LF, Bao LH, Feng ZC, Chen JH, Li BX, Zhang J
- 6156** Liver transplantation for late-onset ornithine transcarbamylase deficiency: A case report
Fu XH, Hu YH, Liao JX, Chen L, Hu ZQ, Wen JL, Chen SL
- 6163** Disseminated strongyloidiasis in a patient with rheumatoid arthritis: A case report
Zheng JH, Xue LY
- 6168** CYP27A1 mutation in a case of cerebrotendinous xanthomatosis: A case report
Li ZR, Zhou YL, Jin Q, Xie YY, Meng HM
- 6175** Postoperative multiple metastasis of clear cell sarcoma-like tumor of the gastrointestinal tract in adolescent: A case report
Huang WP, Li LM, Gao JB
- 6184** Toripalimab combined with targeted therapy and chemotherapy achieves pathologic complete response in gastric carcinoma: A case report
Liu R, Wang X, Ji Z, Deng T, Li HL, Zhang YH, Yang YC, Ge SH, Zhang L, Bai M, Ning T, Ba Y
- 6192** Presentation of Boerhaave's syndrome as an upper-esophageal perforation associated with a right-sided pleural effusion: A case report
Tan N, Luo YH, Li GC, Chen YL, Tan W, Xiang YH, Ge L, Yao D, Zhang MH
- 6198** Camrelizumab-induced anaphylactic shock in an esophageal squamous cell carcinoma patient: A case report and review of literature
Liu K, Bao JF, Wang T, Yang H, Xu BP
- 6205** Nontraumatic convexal subarachnoid hemorrhage: A case report
Chen HL, Li B, Chen C, Fan XX, Ma WB
- 6211** Growth hormone ameliorates hepatopulmonary syndrome and nonalcoholic steatohepatitis secondary to hypopituitarism in a child: A case report
Zhang XY, Yuan K, Fang YL, Wang CL
- 6218** Vancomycin dosing in an obese patient with acute renal failure: A case report and review of literature
Xu KY, Li D, Hu ZJ, Zhao CC, Bai J, Du WL
- 6227** Insulinoma after sleeve gastrectomy: A case report
Lobaton-Ginsberg M, Sotelo-González P, Ramirez-Renteria C, Juárez-Aguilar FG, Ferreira-Hermosillo A
- 6234** Primary intestinal lymphangiectasia presenting as limb convulsions: A case report
Cao Y, Feng XH, Ni HX
- 6241** Esophagogastric junctional neuroendocrine tumor with adenocarcinoma: A case report
Kong ZZ, Zhang L

- 6247** Foreign body granuloma in the tongue differentiated from tongue cancer: A case report
Jiang ZH, Xu R, Xia L
- 6254** Modified endoscopic ultrasound-guided selective N-butyl-2-cyanoacrylate injections for gastric variceal hemorrhage in left-sided portal hypertension: A case report
Yang J, Zeng Y, Zhang JW
- 6261** Management of type IIb dens invaginatus using a combination of root canal treatment, intentional replantation, and surgical therapy: A case report
Zhang J, Li N, Li WL, Zheng XY, Li S
- 6269** Clivus-involved immunoglobulin G4 related hypertrophic pachymeningitis mimicking meningioma: A case report
Yu Y, Lv L, Yin SL, Chen C, Jiang S, Zhou PZ
- 6277** De novo brain arteriovenous malformation formation and development: A case report
Huang H, Wang X, Guo AN, Li W, Duan RH, Fang JH, Yin B, Li DD
- 6283** Coinfection of *Streptococcus suis* and *Nocardia asiatica* in the human central nervous system: A case report
Chen YY, Xue XH
- 6289** Dilated left ventricle with multiple outpouchings – a severe congenital ventricular diverticulum or left-dominant arrhythmogenic cardiomyopathy: A case report
Zhang X, Ye RY, Chen XP
- 6298** Spontaneous healing of complicated crown-root fractures in children: Two case reports
Zhou ZL, Gao L, Sun SK, Li HS, Zhang CD, Kou WW, Xu Z, Wu LA
- 6307** Thyroid follicular renal cell carcinoma excluding thyroid metastases: A case report
Wu SC, Li XY, Liao BJ, Xie K, Chen WM
- 6314** Appendiceal bleeding: A case report
Zhou SY, Guo MD, Ye XH
- 6319** Spontaneous healing after conservative treatment of isolated grade IV pancreatic duct disruption caused by trauma: A case report
Mei MZ, Ren YF, Mou YP, Wang YY, Jin WW, Lu C, Zhu QC
- 6325** Pneumonia and seizures due to hypereosinophilic syndrome – organ damage and eosinophilia without synchronisation: A case report
Ishida T, Murayama T, Kobayashi S
- 6333** Creutzfeldt-Jakob disease presenting with bilateral hearing loss: A case report
Na S, Lee SA, Lee JD, Lee ES, Lee TK

LETTER TO THE EDITOR

- 6338** Stem cells as an option for the treatment of COVID-19
Cuevas-González MV, Cuevas-González JC

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Foreign body granuloma in the tongue differentiated from tongue cancer: A case report

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Abstract

BACKGROUND

Embedded foreign bodies in the tongue are rarely seen in clinical settings. An untreated foreign body can cause a granuloma which often presents as an enlarged tongue mass. However, if foreign body ingestion status is unknown, physical examination and magnetic resonance imaging (MRI) tend to lead to suspicion of tongue cancer, especially in older patients. Thus, differential diagnosis of an enlarged tongue mass is important, especially because it is closely related to the choice of treatment method.

CASE SUMMARY

A 61-year-old woman was admitted to the hospital with pain and noticeable swelling in the tongue that had persisted for over 1 mo. She had no previous medical history. MRI revealed abnormal signal intensities that were indicative of a neoplasm. Thus, the oral surgeon and radiologist arrived at a primary diagnosis of tongue cancer. The patient visited the Ear Nose and Throat Department for further consultation and underwent an ultrasound examination of the tongue. The ultrasonography was consistent with a linear hyperechoic foreign body which was indicative of an embedded foreign body (bone) in the tongue, even though the patient denied any history of foreign body ingestion. Complete surgical enucleation of the lesion was conducted. The mass which included a fish bone was completely removed. The post-operative pathological examination confirmed that the mass was a granuloma containing collagen fibers, macrophages and chronic inflammatory cells. The patient recovered without complications over a 2 mo follow-up period.

CONCLUSION

We report a rare case of foreign body granuloma in the tongue that was primarily diagnosed as tongue cancer. The MRI and ultrasound examinations revealed a

piece of bone in the left lateral aspect of the tongue. The granuloma, which contained a fish bone, was completely removed *via* surgery and confirmed *via* biopsy. Differential diagnosis of the enlarged tongue mass was critical to the selection of treatment method.

Key Words: Tongue; Foreign body; Granuloma; Cancer; Differential diagnosis; Case report

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Core Tip: This case report concerns an older adult referred to our Ear Nose and Throat Department with an enlarged tongue mass and a primary diagnosis of tongue cancer after magnetic resonance imaging (MRI). A review of the MRI data and oral ultrasound examination diagnosed a foreign body granuloma, confirmed by surgery and postoperative pathological examination. Oral ultrasound and/or computed tomography are critical in terms of differential diagnosis; certain MRI features may provide clues guiding diagnosis of a foreign body granuloma.

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INTRODUCTION

The introduction of a foreign body into the tongue can occasionally occur as food is being chewed. In most situations this can lead to pain, swelling and irritation[1]. Such foreign bodies can usually be identified and diagnosed *via* visual inspection, especially if they are not buried in the muscle layer[2]. A clear history of foreign body introduction into the mouth, as well as a timely visit to the physician, can be conducive to the diagnosis[3]. Penetration of the tongue by a foreign substance can cause an acute inflammatory response and foreign bodies that remain in place may elicit a granulomatous inflammatory response[4]. The cause of granuloma in the tongue can be difficult to ascertain, especially without a clear history of foreign body ingestion. In this paper, we describe the case of a foreign body granuloma in the tongue of a Chinese woman. The initial diagnosis was tongue cancer but further examination revealed a foreign body in the tongue which was removed *via* surgery.

CASE PRESENTATION

Chief complaints

A 61-year-old woman was admitted to the Ear Nose and Throat (ENT) Department of our hospital complaining of pain and noticeable swelling of the tongue.

History of present illness

The patient sought out a general practitioner because of pain and noticeable swelling in the tongue that persisted for over 1 mo. She was given a short course of antibiotics which provided no symptom relief. The patient was referred to the Department of Stomatology, where an oral surgeon prescribed oral maxillofacial magnetic resonance imaging (MRI). The imaging revealed abnormal signal intensities, as shown in **Figure 1**, which are indicative of tongue cancer. The patient then visited the ENT Department for further consultation.

History of past illness

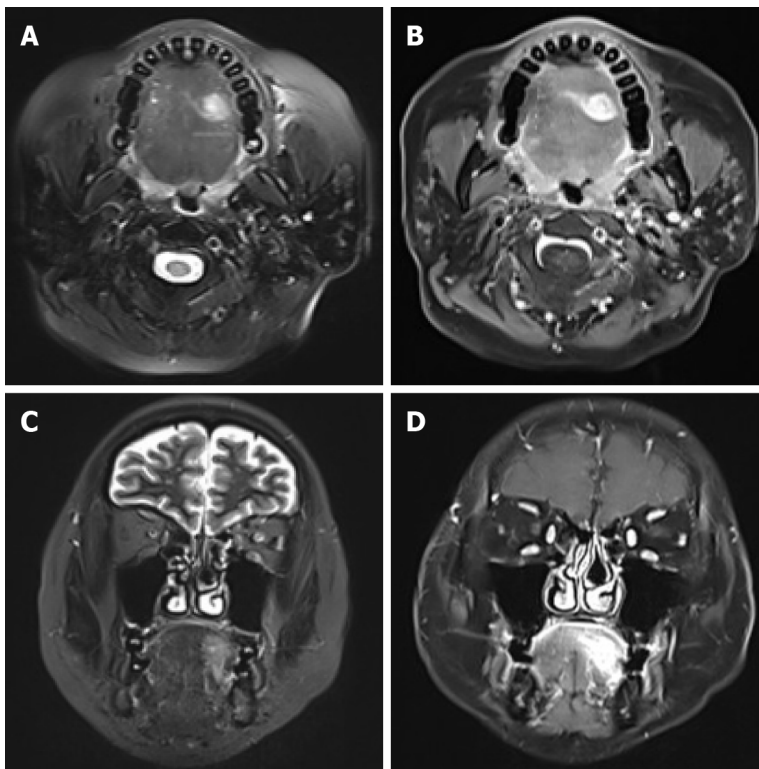
The patient had no previous medical history.

Personal and family history

There was no specific personal and family history.

Physical examination

Intraoral examination showed mild swelling in a longitudinal 2 cm × 1.5 cm area on the left lateral aspect of the tongue. A hardened nodule with an ill-defined margin was found on the tongue. The nodule was the same color as the surrounding tongue tissue (normal color) and no clearly identifiable



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Figure 1 Magnetic resonance imaging indicated an abnormal signal intensity on the left side of the tongue. A-D: T2-weighted magnetic resonance imaging (MRI) revealed a hyperintense shadow and contrast-enhanced T1-weighted MRI obvious enhancement of the mass in the transverse (A and B) and coronal planes (C and D). Scale bar: 2 cm.

foreign bodies were observed on the tongue as shown in [Figure 2](#).

Laboratory examinations

The results of routine tests of complete blood count, kidney function and liver function were normal.

Imaging examinations

The oral maxillofacial MRI showed abnormal and ill-defined signal intensities on the left side of the tongue (size: 1.6 cm × 1.2 cm × 2.0 cm; [Figure 1](#)) and multiple swollen cervical lymph nodes (up to 0.7 cm in size, in the submaxillary region and carotid sheath). The primary diagnosis was tongue cancer as reported by the specialists in the Department of Radiology. However, the doctors in the ENT Department reviewed the MRI images and considered the possibility of foreign body granuloma for two reasons. First, granuloma and cancer can have similar imaging features; and second, the shadow seemed to indicate that the tongue tissue was protected from foreign bodies, as shown by images taken in the transverse plane. During the initial clinical interview the patient denied a history of foreign body ingestion. To differentiate between the two possibilities, further examinations were conducted.

Further diagnostic work-up

The patient was referred for ultrasound examination of the tongue. The ultrasound device used a linear probe with a 13-MHz transducer. The acoustic picture was consistent with a linear hyperechoic foreign body, specifically a piece of bone, as shown in [Figure 3](#). When asked about the possibility of fish bone ingestion or another foreign body in the tongue, the patient could not recall whether she had recently eaten fish. However, her daughter recalled that a meal containing fish (with bones) might have been served to the patient 2 mo prior to seeking medical assistance. Complete surgical enucleation of the lesion was then conducted. The mass with the fish bone was completely removed without compromising the capsule ([Figure 4A](#)), and no hemorrhagic accident occurred. The fish bone was 1.5 cm in length ([Figure 4B](#)). Post-operative pathological examination showed that the lesion was a granuloma containing collagen fibers, macrophages and chronic inflammatory cells.

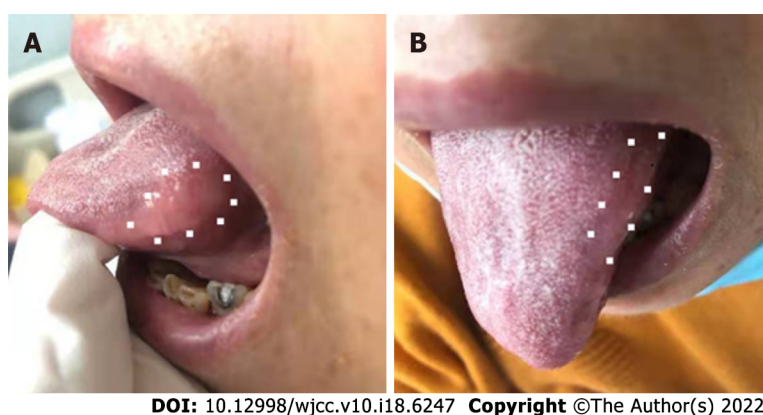


Figure 2 Irregular ill-defined nodule on the left side. A-B: The tongue was of normal color on visual clinical examination in sagittal section (A) and transverse section (B). The dots indicate the margins of the nodule.



Figure 3 Ultrasound examination of the tongue. Ultrasonography revealed an object of hyperechoic linear density, suggestive of an embedded foreign body (stars).

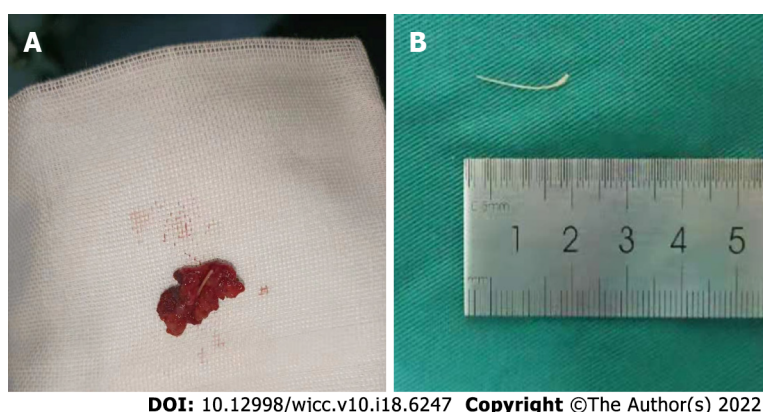


Figure 4 The foreign body. A: Total enucleation without removal of the fish bone; B: The fish bone after removal.

FINAL DIAGNOSIS

Foreign body (fish bone) granuloma in the tongue.

TREATMENT

After the surgery, the patient received antibiotics (ceftriaxone) with systemic steroids and the post-operative recovery was uneventful. The patient was discharged on the third post-operative day.

OUTCOME AND FOLLOW-UP

The patient recovered well and there were no complications during the 2-mo follow-up period.

DISCUSSION

A diagnosis of tongue cancer is often considered in older adults with an enlarged tongue nodule/mass and localized pain[5]. The many differential diagnoses of a tongue mass include an inflammatory lesion and schwannoma[1]. A diagnosis of a granuloma attributable to an embedded foreign body is rare when there is no clear history of foreign body ingestion or oral trauma[6]. In the present case, the differential diagnosis of an irregular nodule with a smooth surface included cavernous hemangioma, anaplastic large-cell lymphoma, endophytic squamous cell carcinoma and Kaposi sarcoma of the tongue[7-10]. Differential diagnosis is important as cancer treatment and enucleation of a foreign body granuloma differ greatly in terms of surgical preparation, operation, tongue reconstruction and patient consultation [11-13].

MRI is the preferred diagnostic modality for evaluating tongue cancer because abnormal MRI signals have been strongly associated with pathological findings[14]. However, MRI is not an ideal modality for differentiating tongue cancer from embedded foreign body granuloma with foreign body[15]. The signals associated with tongue cancer are hyperintensity in a T2-weighted image (WI) and heterogeneous enhancement in an enhanced T1 WI, similar to granuloma[14,16]. In the present case, the fish bone (shown by hypointense signals in both the T1 and T2 WIs) was difficult to detect by MRI[17], and not surprisingly the primary diagnosis of tongue cancer was consistent with the abnormalities found in the tongue by MRI and with the swollen cervical lymph nodes. Besides this, shifting of metal fragments under the effects of MRI can result in potential damage of vital structures. If the doubt of a metal foreign body is present, the contraindications of MRI should be considered[18].

Several studies used ultrasound to detect a suspected embedded foreign body in the tongue[3,4,6]. The foreign bodies, which included a pequi spine, metal wire, and fish bone were visualized and localized accurately, demonstrating the utility of ultrasound for guiding therapeutic interventions. Multislice computerized tomography (CT) and cone beam CT also seem useful for visualizing embedded foreign bodies, although CTs have poor performance in terms of detecting wood[15]. Thus, when an embedded foreign body is suspected in a patient with an enlarged tongue mass, ultrasonography and CT can play an important role in the differential diagnosis[19].

In our case, the lesion was “walled off” on transverse images (Figure 2). This might indicate that the mass was “delimited” by a capsule. A similar sign was observed in an early case report of a patient with foreign body granuloma[16]. Thus, this sign might be a useful indicator of the need for further examinations (other than MRI). However, this issue requires further investigation.

CONCLUSION

We reported the case of a woman with an enlarged tongue mass initially diagnosed with tongue cancer. The ENT specialists reviewed the MRI data and corrected the diagnosis to ‘foreign body in the tongue’ based on oral ultrasound examination. The granuloma containing the fish bone was completely removed during surgery and post-operative pathological examination confirmed that the lesion was a granuloma. In cases with an enlarged tongue mass, oral ultrasound and/or CT examinations are important for differential diagnosis, to facilitate selection of the appropriate treatment method.

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