Case 12015

Papillary thyroid carcinoma of lingual thyroid presenting as protruding mass of the tongue base
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Section: Head & neck imaging
Area of Interest: Ear / Nose / Throat
Procedure: Contrast agent-intravenous
Procedure: Molecular imaging
Imaging Technique: CT
Imaging Technique: MR
Imaging Technique: PET-CT
Special Focus: Neoplasia Case Type: Clinical Cases
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Patient: 83 years, female

Clinical History:
A previously healthy, 83-year-old woman presented with a 1-month history of throat discomfort and dysphagia. Laryngoscopic examination revealed a roughly 2 cm sized tongue base mass bulging towards the oropharyngeal cavity, which suggested a tongue base tumour.

Imaging Findings:
A contrast-enhanced CT revealed a 2.4 x 1.7 cm well-defined, strongly enhancing, solid mass in the central tongue base, extending to the central posterior tongue and foramen caecum. This tumour markedly projected into the oropharyngeal cavity and closely abutted on the posterior oropharyngeal wall without definite invasion (Fig. 1a, b). There was no calcification in the tumour. Orthotopic thyroid glands were normally visualized in the lower neck. On MRI, the protruding mass showed high signal intensity on T2-weighted images and homogenously iso-signal intensity on T1-weighted images (Fig. 1c, d). After enhancement, the protruding mass showed strong enhancement except for partial eccentric poor enhancing areas in the left postero-lateral aspect of the mass (Fig. 1e, f). PET-CT showed intense localized FDG activity (up to 6.5 SUV uptake) at the midline of the tongue base (Fig 1g, h). The patient received robot-assisted trans-oral surgical excision to aim for minimal invasiveness. Histopathological results confirmed the diagnosis of ectopic thyroid origin papillary carcinoma.

Discussion:
Malignant tumour arising from lingual thyroid is extremely rare, with an incidence of only 1%. To date, only 45 cases have been reported in the international literature [1-4]. The imaging features of papillary thyroid cancer (PTC) in orthotopical thyroid tissues are well documented by the previous papers. It is well known that ultrasound is the best modality for detection and diagnosis of thyroid cancer, but ectopic thyroid tissue evaluation is limited to ultrasound alone. CT and MRI could be an option of detection of ectopic thyroid and its malignancy.
Only 11 studies have described the imaging finding of the lingual thyroid PTC [1-9]. In all studies, masses were located within the tongue base, not protruding, with a well-defined round shape, except for one case with a right-sided mass in the floor of the mouth and tongue [6]. Lingual thyroid carcinomas have a low attenuation on pre-contrast CT, unlike lingual tonsil that shows high density. Lingual thyroid carcinomas are strongly enhanced after infusion of the contrast media. In only two papers, MR findings of the lingual PTC have been mentioned as mixed
solid and cystic mass with heterogeneous enhancement in the median mouth floor and strongly enhancing mass in the central tongue base [4, 10].

In our case the mass is located in the midportion of the tongue base and mainly protruding to the oropharyngeal cavity without extension toward vallecula and lateral pharyngeal mucosal wall. We didn’t realize that this mass had originated in the lingual tonsil because it showed low attenuation on pre-contrast CT. So, our first impression was haemangioma of the tongue base because the mass showed low attenuation on a pre-contrast CT and high signal intensity on T2-weighted images and strong enhancement - more pronounced than squamous cell carcinoma on enhanced images. This strong enhancement of the mass is similar to that of reported cases of lingual thyroid PTC.

Hot-uptake at the tumour on PET-CT represents malignant tumour.

The present report was the first case using the imaging of PET-CT and also the first case with simultaneous description of the use various different imaging modalities: CT, MRI, and PET-CT in the lingual PTC.

In conclusion, lingual thyroid cancer would be considered if the mass of the tongue base is in the mid portion regardless of protrusion, is strongly enhanced after infusion of contrast with low attenuation on pre-contrast CT, and demonstrates hot uptake on a PET CT.

**Differential Diagnosis List:** Ectopic thyroid origin papillary carcinoma., Squamous cell carcinoma arsing from tongue base, Haemangioma of the tongue base

**Final Diagnosis:** Ectopic thyroid origin papillary carcinoma.

**References:**


**Figure 1**

*Description:* CT shows a well-defined and pedunculated solid mass based at the tongue base. This mass shows low density on pre-contrast CT. *Origin:* Department of Radiology, Seoul St. Mary's Hospital, College of Medicine
Description: The mass shows strong enhancement after contrast administration with anterior extension to the foramen caecum (arrow). There are eccentric, less enhancing portions in the left posterolateral aspect of the mass (arrowhead). Origin: Department of Radiology, Seoul St. Mary's Hospital, College of Medicine
Description: On MRI, the mass shows high signal intensity on T2-weighted image. Origin: Department of Radiology, Seoul St. Mary's Hospital, College of Medicine
**Description:** The sagittal T1-weighted image shows intermediate signal intensity of the mass, which extends to the foramen caecum (arrow). **Origin:** Department of Radiology, Seoul St. Mary's Hospital, College of Medicine
Description: After administration of contrast, the mass homogeneously enhanced, except for an eccentric less enhancing area at the left lateral aspect of the mass (arrow head). Origin: Department of Radiology, Seoul St. Mary's Hospital, College of Medicine
Description: There is a strong uptake in the midline of the tongue base without evidence of distant metastases on PET CT. Origin: Department of Radiology, Seoul St. Mary's Hospital, College of Medicine