

# The Value of Fine Needle Aspiration Cytology in Differentiation of Zenker's Diverticulum from A Thyroid Nodule

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## Abstract

Zenker's diverticulum is rarely seen in a clinical setting and may mimic a thyroid nodule. Fine needle aspiration cytology (FNAC) is effective in differentiating neck masses, and rarely has complications. FNAC of Zenker's diverticulum presents with both squamous cells and bacteria while FNAC of thyroid nodular typically presents with follicular cells and colloid. (J Intern Med Taiwan 2016; 27: 338-341)

**Key Words:** Fine needle aspiration cytology, Zenker's diverticulum, Thyroid nodule

## Introduction

Zenker's diverticulum is a type of esophageal diverticulum. The classification of esophageal diverticulum depends on its location or etiology.<sup>1</sup> The three types of esophageal diverticula are Zenker's (upper, pulsion), parabronchial (middle, traction), and epiphrenic (lower, pulsion).<sup>1</sup> Zenker's is the most common type, accounting for almost two thirds of esophageal diverticula.<sup>1</sup> The clinical presentations of Zenker's diverticulum are a neck mass, dysphagia, regurgitation of food into the mouth, and foul breath. Zenker's diverticulum is difficult to differentiate from a thyroid nodule on ultrasonography only. We can distinguish an esophageal diverticulum from a thyroid nodule using fine needle aspiration cytology (FNAC). We review the risks of FNA for Zenker's diverticulum. Six case reports in the lit-

erature using FNA for Zenker's diverticula had been misdiagnosed as thyroid nodules<sup>2-7</sup>. No obvious complication was noted on fine needle aspiration of Zenker's diverticula.

## Case Report

A 33-year-old female without systemic disease presented to the endocrine outpatient department with a history of sudden onset of a nontender left neck nodule for one day. She also had common cold symptoms about two weeks prior and took an oral antibiotic (amoxicillin). There was no radiation exposure history or fever. On physical examination, a grade II goiter was noted, with a well-circumscribed, nontender, firm, 2 X 2 cm mass in the left neck at the level of the hyoid. No palpable cervical lymph node was detected. The impression was a solitary thyroid nodule. The patient subsequently

underwent FNAC. Her thyroid function was normal (free T4 1.86 ng/dL [normal range 0.8–2 ng/dL], TSH 0.866 uIU/mL [normal range 0.4–4 uIU/mL]).

Thyroid ultrasound showed a left hypoechoic and heterogeneous mass 2.33 x 2.47 x 1.66 cm in size (Figure 1).

The first FNAC showed polymorphonuclear neutrophils, fungal elements, and necrotic debris, but colloid was absent (Figure 2A). Oral fluconazole was prescribed for suspected acute thyroiditis with fungal infection. We repeated FNAC and performed bacterial and fungal cultures. The second FNAC showed some mature squamous cells, inflammatory cells, and bacteria, but no follicular cells were found (Figure 2B, 2C, 2D). Due to both FNAC had no typical appearance of thyroid origin cells such as follicular cells or colloid but had seen squamous cells and fungus, these hints lead us think the left neck mass was not from thyroid but from esophagus. For further neck mass confirmation and differenti-

ation, imaging studies were performed. Computed tomography (CT) showed an air pocket containing a small amount of fluid adjacent to the posterior aspect of the left thyroid lobe, and a Zenker's diverticulum was suspected (Figure 3A). Zenker's

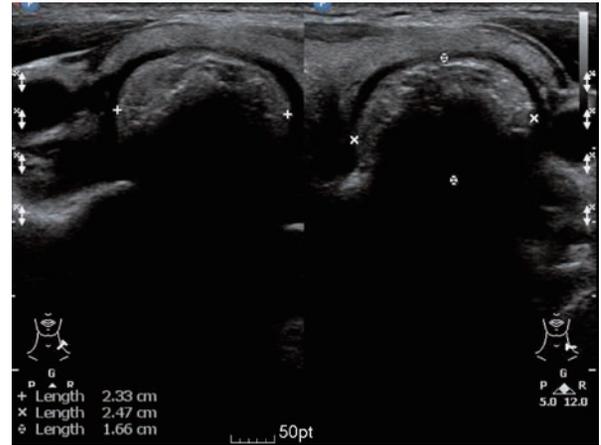


Figure 1. Thyroid ultrasound revealed a heterogeneous nodule, size 2.33 x 2.47 x 1.66 cm, well-defined and regular margin in left lower neck but ill defined margin at the lower part nodule.

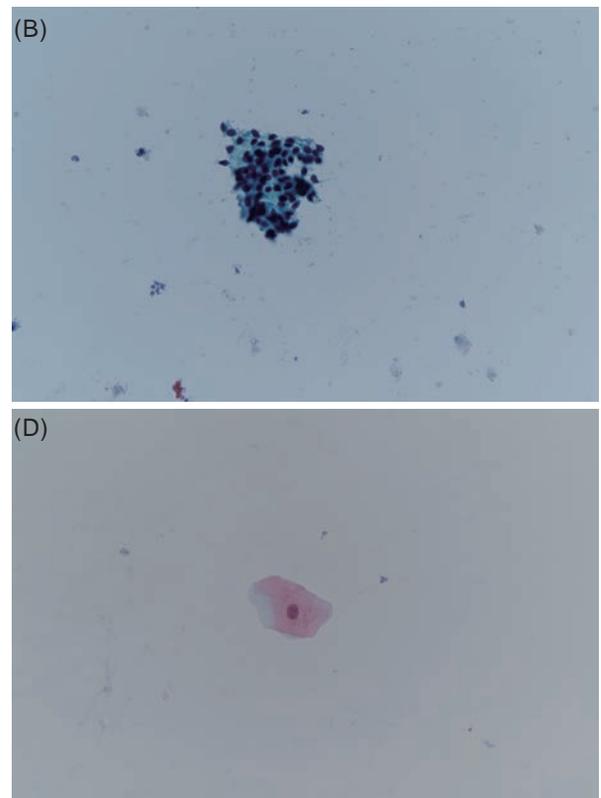
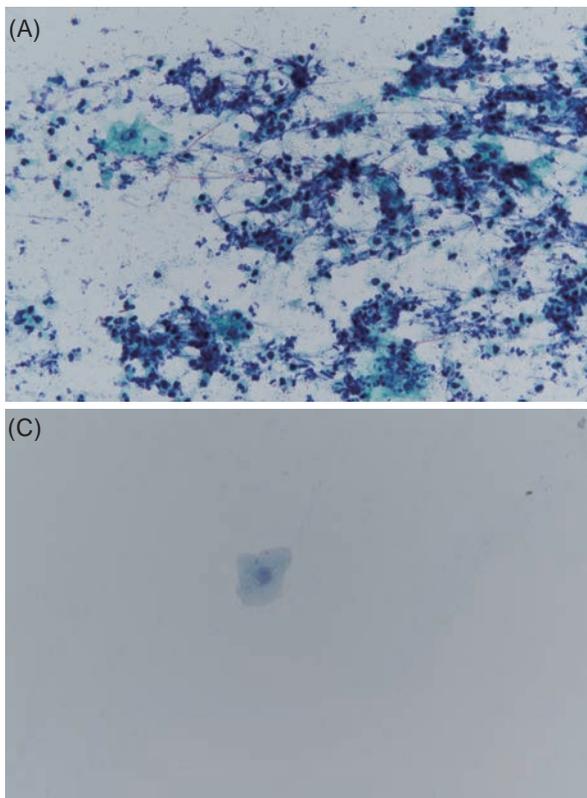


Figure 2. Histological findings of FNA sample in the nodule. (A) fungus, yeast, bacteria, and polymorphonuclear neutrophils. (B) squamous-like cells, no follicular cells. (C) and (D) mature squamous cell.

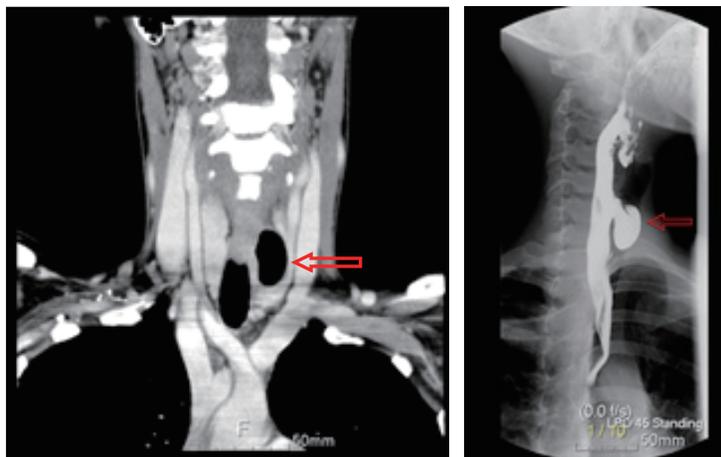


Figure 3. Imaging findings of the nodule. (A) neck CT: an air pocket containing a small amount of fluid adjacent to the posterior aspect of the left thyroid lobe. (B) esophagography revealed a Zenker's diverticulum.

diverticulum was confirmed with esophagography (Figure 3B) and panendoscopy.

The patient was referred to a chest surgeon for further management, but she preferred observation after discussion with the surgeon.

## Discussion

The patient's first cytology suggesting fungal infection was not compatible with her clinical condition (she was not immunocompromised, and had no fever or neck pain, and had normal thyroid function)<sup>8,9</sup>. Infectious thyroiditis is an uncommon condition and fungal infection of the thyroid gland is also rare<sup>8</sup>. *Aspergillus* infection is by far the most common cause of fungal thyroiditis<sup>9</sup>. Thus, we doubted acute fungal infection, and arranged a second FNAC, which revealed squamous cells, inflammatory cells, and bacteria. The presence of squamous cells in thyroid FNA sample is an unusual finding. The thyroid gland lacks squamous epithelium. Squamous cells seen in the thyroid suggest some rare conditions such as cystic goiter, squamous thyroid carcinoma, or embryonic remnants (ultimobranchial body)<sup>10,11,12</sup>. According to the FNAC of our patient, cystic goiter, squamous thyroid carcinoma, and embryonic remnants were not favored. Squamous cells are rarely seen in the thyroid but are common in the esophagus<sup>2,8</sup>.

Thyroid ultrasound can also give us a hint

about the origin of left neck mass. In normal anatomy, esophagus is at left thyroid bed and can be seen easily by thyroid ultrasound. If the neck mass originated from esophagus, the typical appearance of esophagus in ultrasound would be absent and the lower margin of the mass would also be absent. In our patient, the typical esophagus is not seen in the ultrasound and her left neck mass has ill defined margin at the lower part. Neck mass from esophagus could have these patterns. Zenker's diverticulum appears connected with the adjacent upper esophageal wall.

Besides, the absence of follicular cells but presence of squamous cells, as well as bacteria, fungi, or food components on FNA sample, should raise the suspicion of a neck lesion not of thyroid origin. An upper esophageal origin should be considered, such as Zenker's diverticulum. FNAC smears of Zenker's diverticulum present with both mature squamous cells and bacteria (cocci and bacilli) as that was observed in this patient<sup>2</sup>.

Finally, these clues enabled us to suspect that the left neck mass was from the esophagus and further imaging was arranged. Thus, Zenker's diverticulum was diagnosed.

Thyroid ultrasound of Zenker's diverticulum mimicking as a thyroid nodule rarely reported in the literature<sup>2-7</sup>. We reported a patient with Zenker's diverticulum mimicking as a thyroid nodule in

thyroid ultrasound examination. Atypical FNAC findings, including the presence of squamous cells and fungus led to the suspicion of an esophageal lesion. Neck CT and esophagography confirmed the diagnosis of Zenker's diverticulum.

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# 細針穿刺細胞學在區分贊克氏憩室 (Zenker's diverticulum) 與甲狀腺結節的價值地位

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## 摘要

贊克氏憩室 (Zenker's diverticulum) 在臨床上並不常見且一開始常被誤認為是甲狀腺結節，細針穿刺可以鑑別診斷這二者且很少發生併發症。