

## Case report

### Thyroid abscess resulting from esophageal foreign body

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#### **Abstract:**

#### **Introduction**

Thyroid abscess is an uncommon and rare condition. It represents < 1% of thyroid diseases that could potentially become a life-threatening emergency. This is because the thyroid gland is highly resistant to infection due to high iodine content, capsular encasement, and rich vascularity. Infection can occur from direct infection in the neck region or from inoculation due to direct trauma in case of fine needle aspiration, or from penetration through the esophagus or skin. This report presents a 52 year-old woman who had fever, odynophagia, and anterior painful neck mass. Thyroid abscess was diagnosed. An X-ray revealed esophageal foreign body and confirmed esophageal migration. The foreign body was removed via rigid esophagoscope and she underwent incision and drainage of thyroid gland. She had no adverse effect.

**Keywords:** ● Thyroid abscess ● Esophageal foreign body

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## รายงานผู้ป่วย

# โรคผิวที่ต่อมไตรอยด์จากสิ่งแผลกปลอมในหลอดอาหาร

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### บทคัดย่อ

### บทนำ

โรคผิวที่ต่อมไตรอยด์จัดเป็นภาวะดุจเดินที่พบได้ไม่บ่อย โดยพบจำนวนน้อยกว่า 1% ของโรคต่อมไตรอยด์ เนื่องจากภายในต่อมไตรอยด์มีกลไกป้องกันการติดเชื้อ เช่น การมีปริมาณไอโอดีนจำนวนมาก การมีปลอกหุ้มต่อมแยกจากอวัยวะอื่นๆ การมีปริมาณเลือดมากถึงเยื่อยะเม็นตัน การติดเชื้อที่ต่อมไตรอยด์อาจเกิดได้จากการติดเชื้อโดยตรงจากบริเวณคอ การพักเขี้ยวจากการบาดเจ็บโดยตรง การเจาะชี้นื้อ หรือจากการแทงทะลุของสิ่งแผลกปลอมจากหลอดอาหาร รายงานฉบับนี้นำเสนอผู้ป่วยหญิงอายุ 52 ปีมีอาการไข้ กลืนเจ็บและเจ็บบริเวณคอด้านหน้า ได้รับการวินิจฉัยว่าเป็นผิวที่ต่อมไตรอยด์ ภาพเอกซเรย์พบสิ่งแผลกปลอมในหลอดอาหาร และแสดงภาวะสิ่งแผลกปลอมหลุดออกนอกหลอดอาหาร ผู้ป่วยได้รับการรักษาโดยการล่องกล้องหลอดอาหารเพื่อนำสิ่งแผลกปลอมออก และได้รับการผ่าตัดระบายนองบริเวณต่อมไตรอยด์ ไม่พบภาวะแทรกซ้อนหลังการผ่าตัด

**คำสำคัญ:** ● ผิวที่ต่อมไตรอยด์ ● สิ่งแผลกปลอมในหลอดอาหาร

เวชสารแพทย์ทหารบก 2563;73(4):253-9.

### Introduction

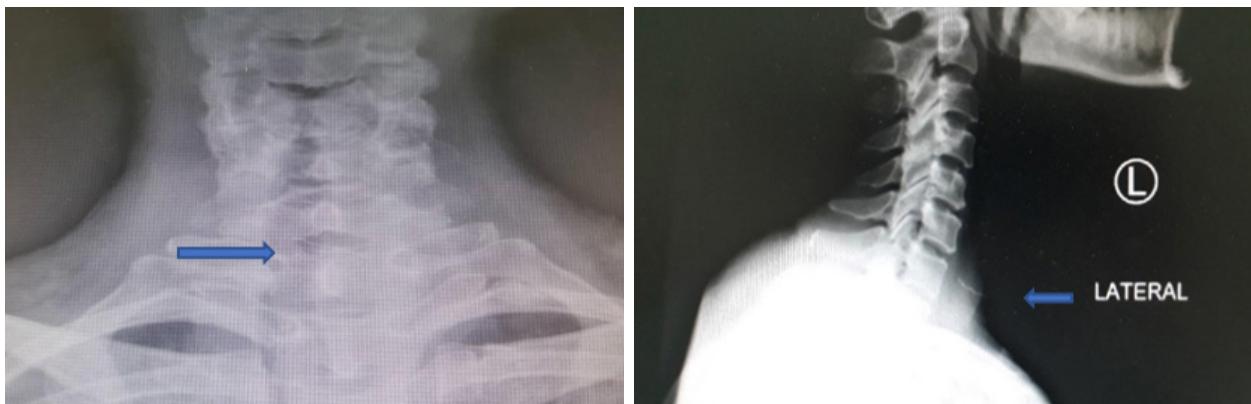
Thyroid abscess is a rare disease with incidence being in approximately 0.1-0.7% of all thyroid disease<sup>1</sup>, owing to different defense mechanisms of the thyroid gland such as high iodine level, abundant vascularization, lymphatic drainage, and the presence of a capsule that separates the gland from other organs<sup>1-4</sup>. These provide protection by hindering the invasion of bacteria and its subsequent growth. Infection can occur from direct extension in the neck region or from inoculation due to direct trauma - either iatrogenically in the case of fine needle aspiration, or from foreign body penetrate through the esophagus or skin<sup>5-8</sup>. Hematogenous spread is usually the most likely mechanism by which bacteria reach the thyroid gland<sup>3-4</sup>, although there is a persistence of a thyroglossal duct remnant, trauma, or a piriform fistula predisposing to develop this disease. Diagnosis is based on clinical finding, laboratory, and imaging finding. It can be present with fever, odynophagia, dysphonia with unilateral, and anterior neck pain. On physical examination, a fluctuant, tender, and warm bulge can be observed<sup>1,2,4</sup>. Thyroid hormones may be normal or elevated, but they do not aid in diagnosis or management<sup>9</sup>. Ultrasound of the thyroid is the suggested imaging modality of choice. CT scan may allow for the identification of inflammatory changes and abscess formation, and also of a fistula (a tract with air)<sup>10</sup>. Differential diagnosis is subacute or chronic thyroiditis, neck trauma, thyroid cyst rupture, aggressive thyroid cancer, or thyroid lymphoma<sup>11-12</sup>. FNA can be used to rule out subacute thyroiditis or malignancy. Treatment is surgical drainage together with antibiotic therapy, as inadequate treatment of abscesses can result in mortality rates of 12% or more<sup>13-14</sup>. We report the case of a 52-year-old woman with a thyroid abscess due to migration of an accidentally ingested foreign body.

### Case report

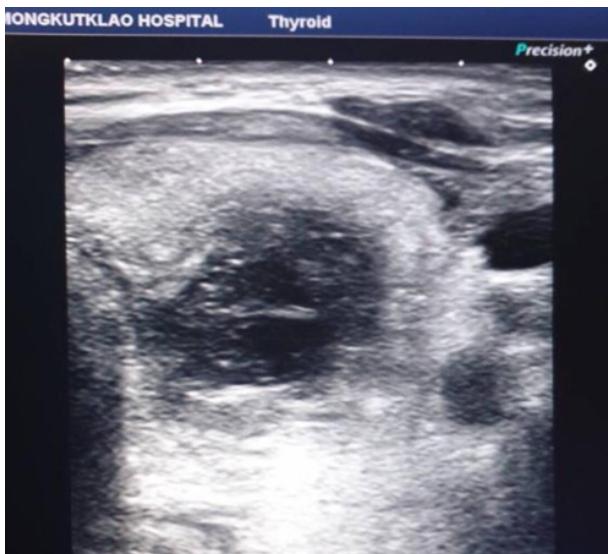
A 52-year-old woman had odynophagia and pricking sensation for one month after eating 1 package of pork rind. She had no fever, neck swelling, or obstructive symptoms. At that point she had X-ray and the results showed no foreign body, and no abnormalities were detected. Four days before admission she had high grade fever, increasing painful and enlarged mass in the anterior of neck (Figure 1). On physical examination, the vital sign showed BT 38.9C RR 18/min PR 92 bpm BP 138/82 mmHg. The intraoral findings were normal. Laryngoscopy showed no evidence of foreign body in the oropharynx, hypopharynx, or larynx. The neck revealed marked tender, firm consistency 2 cm on the left, warm, mild erythema, movement by swallowing. Soft tissue radiography demonstrated linear radio-opaque foreign body in the esophagus at c-7 level (Figure 2). Ultrasonography of left thyroid showed 2.1\*2.4\*2.9 cm ill-defined heterogenous multiloculated hypoechoic solid-cystic mass without internal vasculature (Figure 3) and right thyroid nodule. Needle aspiration showed pus collection (Figure 4). Laboratory data were as



**Figure 1** Marked tender, firm consistency 2 cm on the left, warm, mild erythema



**Figure 2** soft tissue technique AP / Lateral view : FB in the esophagus at c7 level



**Figure 3** Ultrasonography of thyroid showed 2.1\*2.4\*2.9 cm ill-defined heterogenous multiloculated hypo-echoic solid-cystic mass without internal vascularity

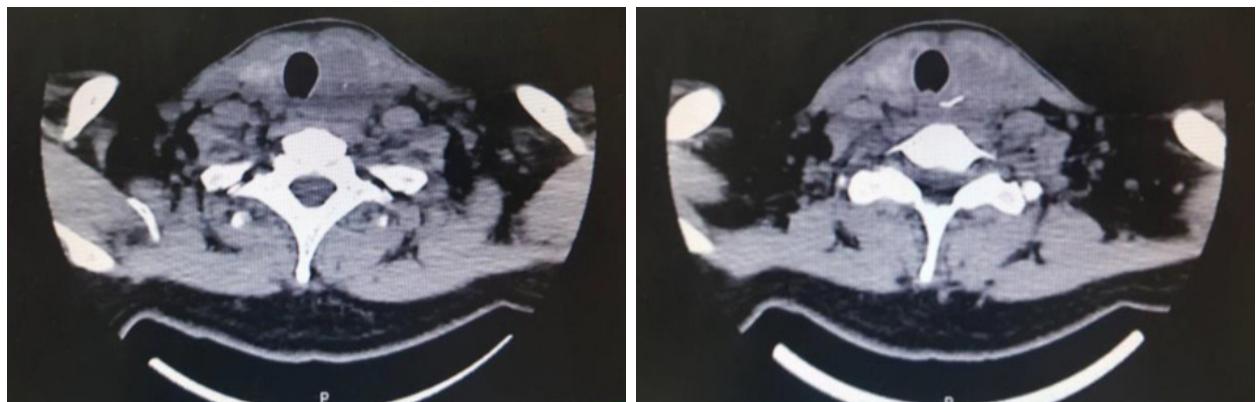


**Figure 4** Pus from needle aspiration

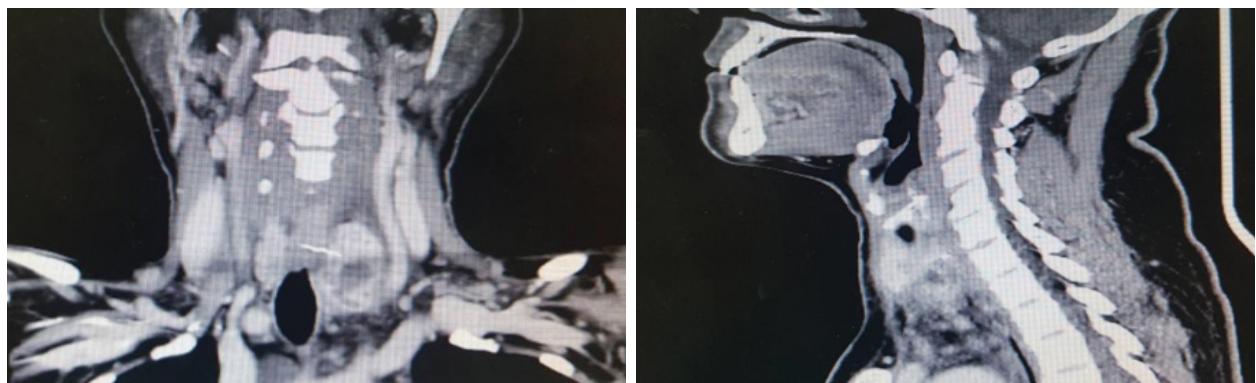
followed: White blood cell count 14,700 /mm<sup>3</sup> PMN 83.7%, lymphocyte 6.8%, monocyte 9.3%, and basophil 0.2%. Thyroid function test reflected euthyroid state.

Computed Tomography (CT) scan with contrast demonstrated ill-defined hypodense lesion with rim enhancement at left thyroid gland 2.2\*2.1\*2.6 cm, likely thyroid abscess. The 2.4 cm linear metallic foreign body that was suspected to penetrate from esophagus to the left lobe of thyroid gland (tip of the lesions is in the thyroid gland) at C6-7 vertebral bodies is detected (Figure 5). She was admitted and had been given Ceftriaxone 2 gm IV OD and Clindamycin 600 mg IV q 8 hr.

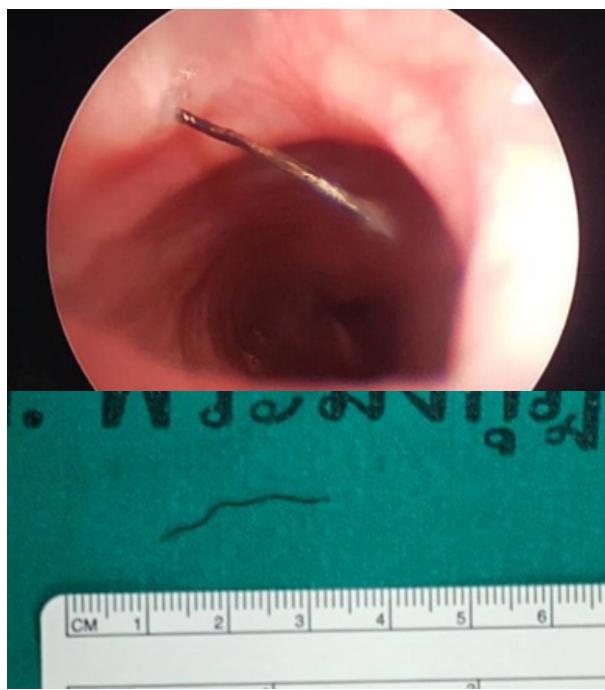
Under the impression of a penetration foreign body from esophagus complicating as thyroid abscess, rigid esophagoscopy was performed under general anesthesia. The metallic foreign body was found 15 cm long from incisor and was removed (Figure 6). The thyroid exploration was done for draining abscess (Figure 7). Gram stain of pus showed few PMN, few gram-negative bacilli, few gram-positive cocci. Pus culture revealed moderate *Streptococcus oralis*, few *Enterobacter cloacae*. The drain was left for 24 hours. Post-operative course was uneventful, and the patient was discharged 3 days after.



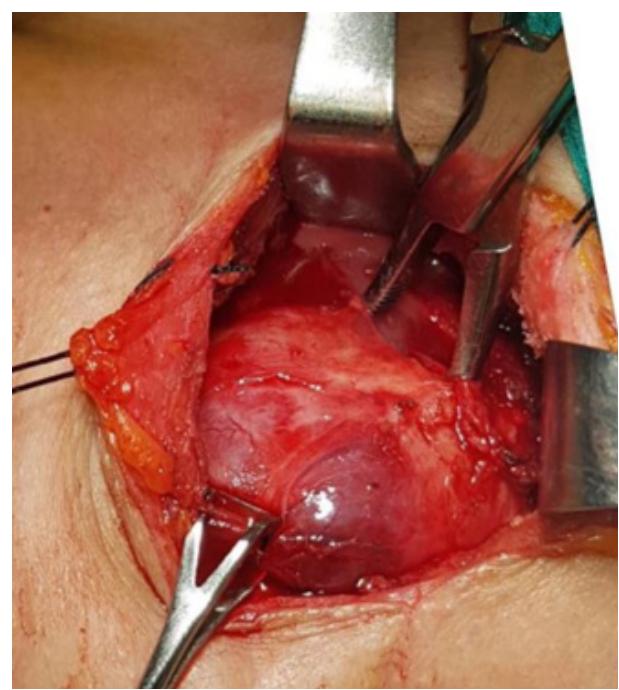
**Figure 5.1** CT Neck - Axial view



**Figure 5.2** CT neck with contrast - Coronal view ( left ) and Sagittal view ( Right ) shows ill-defined hypodense lesion with rim enhancement at left thyroid gland  $2.2*2.1*2.6$  cm and 2.4 cm linear metallic foreign body which suspected penetrated from esophagus to the left lobe of thyroid gland



**Figure 6** The metallic foreign body was found 15 cm long from incisor



**Figure 7** Thyroid exploration was done to drain abscess

### Discussion

The thyroid gland is rarely the site of acute bacterial infection. The development of abscess secondary to direct trauma from foreign bodies as well as extension from adjacent anatomical structures occupies a minority of etiologies. Nonetheless, an extraluminal migration of the foreign bodies to adjacent structures are well documented in the literature. In the review of Remson et al<sup>10</sup>, of 321 esophageal foreign bodies, 43 were recorded as penetrating extraluminal. A search of the Medline database using the method set out by Hohman et al<sup>11</sup> revealed 22 cases of foreign bodies that had migrated to the level of the thyroid gland. The diagnosis of extraluminal foreign body is facilitated by a high index of suspicion. It is important that if a foreign body is not found or missed by oral examination or a flexible endoscopic examination, then this should not exclude their presentation. The lateral neck radiograph is a very useful first line investigation, however, interpretation of the lateral neck plain film is occasionally difficult because ingested foreign bodies are often mistaken for calcified normal structures in the neck<sup>12</sup>. Several studies showed that the sensitivity of plain radiography was only 32%, and the false-negative rate was as high as 47%<sup>12-14</sup>. Computed tomography (CT) scan of the neck is also helpful to determine the cause of unexplained neck abscess. It can show the size, length, shape, position, direction, and the relationship of the foreign body with the surrounding tissue, and it can tell the extent of damage and the surrounding condition can be determined, thereby, providing important information to guide the surgical approach. Our patient presented with fever, painful and enlarged anterior neck mass with the history of foreign body ingestion one month before. A plain lateral neck X-ray and CT play important roles in detecting esophageal foreign body and confirming esophageal migration. Ultrasonography helps differentiate solid or cystic lesion.

The rarity of involvement of the thyroid gland during esophageal foreign body migration may be attributed to two important factors. The first is the high resistance of the anterior (trachea) and posterior (cervical vertebra) region of the esophageal wall and the extent of thyroid lobe coverage laterally, particularly between the C4 to C7 level<sup>15</sup>. The moving is attributed by several factors such as the orientation and pointed shape of the foreign body<sup>21</sup>, the contraction of the cricopharyngeus muscle during swallowing<sup>17</sup>, neck muscles during neck movement, local inflammation of the esophageal or pharyngeal wall, and direct pressure necrosis<sup>15</sup>. The complication rate of foreign bodies in the esophagus was 7.3%. The mortality rate was 0.73%<sup>18</sup>. Known complications of esophageal foreign body migration include deep neck abscess (retropharyngeal, parapharyngeal abscess), vascular complications including vascular esophageal fistula (aorta esophageal, innominate artery esophageal fistula) and puncture of carotid artery, thromboembolism, brachial plexus injury, and thyroid gland retention<sup>19-21</sup>.

### Conclusion

Thyroid abscess is rare as the gland is resistant to infection. This must be differentiated from congenital anatomical defect, infection, or direct trauma. It should be high index of suspicious when the clinical history is consistent with foreign body ingestion, having persistent symptoms despite negative physical examination, laryngoscopy, or rigid esophagoscopy. The persistence of pain may indicate extraluminal migration of the foreign body. Diagnosis is made based on imaging and the initial treatment consists of an early intravenous antibiotics with surgical drainage as soon as possible to prevent life-threatening consequences.

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