

## Thyroid Abscess Due to a Mixed Anaerobic Infection with *Fusobacterium mortiferum*

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**A rare case of a thyroid abscess due to mixed anaerobic flora containing *Fusobacterium mortiferum* in an immunocompetent patient is described. The patient was successfully treated with immediate surgical intervention and appropriate antimicrobial agents.**

### CASE REPORT

A 27-year-old white male patient was admitted with an enlarging, painful neck mass accompanied by high fever. He reported a viral upper respiratory tract illness 3 weeks prior to admission, which 10 days later was complicated by pain in the area of the thyroid. After extensive investigation that included ultrasound, a computed tomography scan, and nuclear scanning, he was diagnosed with subacute thyroiditis. He was initially treated with prednisone, and his symptoms improved. However, 5 days into treatment, he developed high fever and a painful neck mass, resulting in odynophagia and dysphagia. This did not respond to a course of antibiotics and the patient was admitted. He was acutely ill with a temperature of 38.4°C and tachycardia. Examination of the neck revealed a large tender, warm, and fluctuant mass occupying the region of the left lobe of the thyroid gland and no further extension. The trachea was shifted to the right. Laboratory investigations revealed a leukocyte count of 17,600 with 84% polymorphonuclear cells and a hemoglobin value of 9.5 g/dl. Plain radiographs of the neck and chest in frontal and lateral views showed a homogenous soft-tissue density anterior to the trachea, displacing it to the right. The retropharyngeal space had normal dimensions on radiographs. Computed tomography revealed cystic areas in both lobes of the thyroid gland. The larger was nonhomogeneous and extended into the superior mediastinum without any distortion of the mediastinal structures (Fig. 1). Needle aspiration of this lesion disclosed thick yellow pus. Free triiodothyronine and free thyroxine levels were mildly elevated, and thyroid-stimulating hormone levels were within normal range. The ear, nose, and throat (ENT) service intervened with incision and drainage of the affected area. The patient was treated with intravenous meropenem at a dose of 2 g three times a day and clindamycin at a dose of 900 mg three times a day. In the first few days of his admission, he

developed pneumonia of the left lung and pericardial effusion. Cultures of the drained pus yielded *Fusobacterium mortiferum*, *Streptococcus constellatus*, and *Prevotella melaninogenica*. An API 20A kit (bioMérieux, Marcy-l'Etoile, France) was used for the identification of the anaerobic bacteria. *F. mortiferum* was identified with 99.9% certainty with the unique number 44204200 that corresponded to negative testing for indole, urease, catalase, gelatin liquefaction, and esculin hydrolysis; positive testing for fermentation of glucose, sucrose, salicin, mannose and raffinose; and no fermentation of mannitol, lactose, maltose, xylose, arabinose, glycerol, cellobiose, melezitose, sorbitol, rhamnose, or trehalose. No further molecular or susceptibility testing was used since the patient was clinically improving.

Further work-up did not reveal septic thrombosis of the jugular vein. The patient completed a 4-week course of intravenous antibiotics; he symptomatically improved and was discharged home 30 days after the initial episode. A barium esophagogram disclosed an anterior fistulous tract originating from the left pyriform sinus (Fig. 2), for which further ENT follow-up and surgery were arranged. He did not suffer any relapses and continues to do well.

Acute suppurative thyroiditis is a rare condition even in patients with impaired host defenses (5). Progression to thyroid abscess is also rare (12, 13) and carries the inherent dangers of advanced suppuration in the neck. Thyroid abscess and acute suppurative thyroiditis represent only 0.1 to 0.7% of surgically treated thyroid pathologies (14). Acute suppurative thyroiditis especially affects patients with preexisting thyroid gland pathology, and in childhood it is associated with local anatomic defects (13). The pyriform sinus fistula is the route of infection and is the most common underlying abnormality in acute suppurative thyroiditis cases (13). Fistulectomy may be necessary in order to prevent recurrent infections. Acute suppurative thyroiditis now rarely progresses to abscess formation due to the widespread use of antibiotics (11). The left side of the thyroid is more commonly involved than the right in cases

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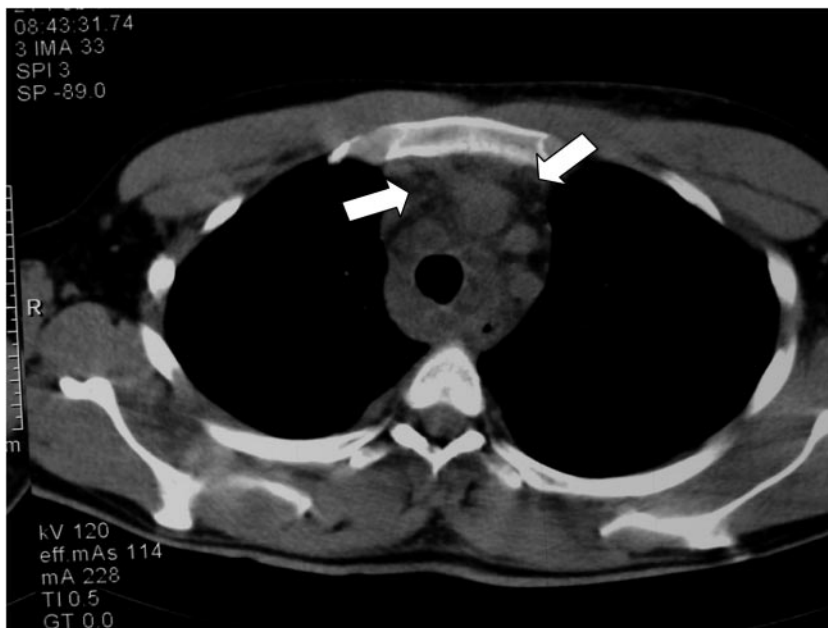


FIG. 1. Computed tomography image revealing cystic areas in both lobes of the thyroid gland extending in the anterior mediastinum (white arrows).

with an abscess (16), and the usual treatment includes intervention of the ENT service with incision and drainage of the abscess or partial thyroidectomy, depending upon the presence or absence of underlying thyroid pathologies, together with intravenous antibiotics.

In the rare cases where a thyroid abscess is formed, the offending organisms include gram-positive pathogens such as *Staphylococcus aureus* and anaerobes of the oropharyngeal area (12, 13). *S. constellatus* and *P. melaninogenica* are classic

mouth flora microorganisms and could have contributed to the presented infection. *F. mortiferum*, on the other hand, has rarely been isolated as a cause for an infection in mixed bacterial populations with other anaerobes (2, 10). The closely related *Fusobacterium necroforum* is implicated in the potentially life-threatening Lemmiere's syndrome (7). Our patient had no history or laboratory evidence of immunodeficiency and was only immunocompromised by virtue of the short antecedent steroid regimen. We were not able to find any other



FIG. 2. A barium esophagogram disclosing an anterior fistulous tract originating from the left pyriform sinus.

reports of *F. mortiferum*-associated acute suppurative thyroiditis and thyroid abscess in the literature.

Fusobacteria are obligately anaerobic non-spore-forming, nonmotile, pleomorphic rod-shaped bacilli. Morphological differences between various fusobacterial species exist. For example, *F. necrophorum* and *F. mortiferum* have extremely pleomorphic microscopic characteristics, with large cells frequently exhibiting bizarre shapes. On the other hand, *Fusobacterium nucleatum* is characterized by long, slender, and filamentous needle-shaped cells with tapered ends. *Leptotrichia* species can be confused with *Fusobacterium* spp. since they exhibit a similar needle-shaped cell appearance on Gram stain; but the cells are much larger, and colonies are large and gray, sometimes spreading and showing a "brain surface" texture. However, definitive identification of fusobacteria to species level requires additional biochemical testing. *Fusobacterium* spp. are resistant to vancomycin (5 µg) but susceptible to both colistin (10 µg) and kanamycin (1,000 µg) disk identification tests. *F. mortiferum* and *Fusobacterium varium* grow in the presence of bile, as do some strains of *F. necrophorum*. On the other hand *F. nucleatum* does not grow in 20% bile, and during biochemical testing, it will not show significant reactions except for positive-indole and negative-nitrate testing. The API 20A (bioMérieux, Marcy-l'Étoile, France) kit used in this case is an established system for identification of anaerobic bacteria (8, 15). Newer molecular techniques such as 16S RNA gene sequencing and 16S-23S rRNA gene spacer region sequencing help in further differentiating closely related fusobacterial species (9). Antimicrobial susceptibility testing was not performed in the present case. Such testing is not usually indicated unless a patient is not responding to therapy or is in critical condition. *Fusobacterium* spp. are usually susceptible to penicillin, clindamycin (except for *F. varium*), metronidazole, and chloramphenicol (3, 4). Resistance to macrolides is usual (6). The production of β-lactamase, especially from *F. nucleatum* and *F. necrophorum* (1), has led to recommendations to use β-lactamase-resistant antibiotics with anaerobic activity such as intravenous ampicillin-sulbactam, ticarcillin-clavulanate, metronidazole, or clindamycin for treatment of such infections.

In conclusion, we describe a rare case of subacute thyroiditis complicated by the development of acute suppurative thyroiditis and a thyroid abscess due to mixed anaerobic flora con-

taining *F. mortiferum*. This was successfully treated with immediate surgical intervention and appropriate antimicrobial agents. Physicians should be aware of this rare complication of subacute thyroiditis and its association with mixed anaerobic bacterial populations.

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