Right-Sided Acute Suppurative Thyroiditis Caused by Infectious Endocarditis

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Abstract

Acute suppurative thyroiditis is a rare disorder that is mostly found in the left lobe of the thyroid gland of children due to congenital patency of the pyriform sinus fistula. Here, we report a 61-year-old man with acute right-sided suppurative thyroiditis without pyriform sinus fistula. He also showed infectious hip arthritis, spondylitis and Roth’s spots. He presented with heart failure and was diagnosed with infectious endocarditis by sequential transesophageal echocardiography. A replacement with a prosthetic valve was performed and cured him. It is important to recognize that infectious endocarditis can be a focus of acute suppurative thyroiditis.

Key words: acute suppurative thyroiditis, infectious endocarditis, infectious spondylitis, infectious hip arthritis, congenital pyriform sinus fistula

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Introduction

Acute suppurative thyroiditis is a rare but potentially life-threatening endocrine emergency. Therefore, physicians should keep this disease in mind for the differential diagnosis of an acute and painful swelling in the neck. The incidence of acute suppurative thyroiditis is low and represents about 0.1-0.7% of all thyroid disease because the thyroid gland is relatively resistant to bacterial infection (1, 2). Acute suppurative thyroiditis is found primarily in children. Approximately, 90% of the lesions develop in the left lobe of the thyroid gland. Congenital pyriform sinus fistula, which is a remnant of the fourth pharyngeal pouch, is proposed to be a common route of infection (3, 4). In addition to the pyriform sinus fistula, trauma, aspiration biopsy and thyroid cancer are causes of suppurative thyroiditis (1, 5-7).

Acute suppurative thyroiditis is sometimes fatal, especially in adult onset when the route of infection can not be identified (1). Here, we report a case of right-sided acute suppurative thyroiditis that was caused by infectious endocarditis, which was cured by antibiotic and surgical therapy.

Case Report

A 61-year-old man presented with sore throat, dysphasia, swollen neck and fever with chills. He also complained of posterior cervical pain, right coxalgia and gait disorder. His symptoms had progressed for 20 days and dietary intake was remarkably reduced. He was treated for dental caries one month before admission. He had no chronic disease except for mild glucose intolerance for several years.

On examination, his temperature was 37.3°C, his heart rate was 96 beats per minute, blood pressure was 140/70 mmHg and respiratory rate was 24 breaths per minute. A swollen mass was palpable on his right neck with an erythematous change, heat, and tenderness on palpation. Some small ulcers, blood spots and dull red nodules were detected.
on his left fingers and toes. Cardiovascular and respiratory examinations were unremarkable. Both legs showed mild pitting edema. He presented with limitations of flexure of neck and right hip joint. Laboratory tests revealed leukocytosis with elevated levels of C-reactive protein and low serum albumin level. He also showed findings of thyrotoxicosis with elevated levels of thyroglobulin. Thyroid autoantibodies were negative (Table 1). Immunodeficiency, including human immunodeficiency virus (HIV) infection, was not present.

Neck computed tomography revealed a low density lesion in the right thyroid gland (Fig. 1A). Chest and abdominal computed tomography revealed no abnormal lesion. Neck ultrasonography also revealed an avascular and hypoechoic lesion with heterogeneous content (Fig. 1B). Fine needle aspiration yielded brown pus, and cytological examination revealed an abundance of inflammatory cells. Culture of the thyroid aspirate and blood culture yielded methicillin-sensitive staphylococcus aureus (MSSA). Cytological examination of the aspirate revealed no malignancy. We diagnosed the patient with acute suppurative thyroiditis and started treatment with cefazolin (6 g/day).

On day 8, hip magnetic resonance imaging showed right suppurative hip arthritis (Fig. 2A). Culture of the hip joint aspirate also yielded MSSA, but infection parameters (e.g., general condition, fever, WBC count and CRP) were gradually improved by antibiotic therapy.

On day 10, the patient suddenly fell into heart failure and the fever spiked to 39°C again. Diastolic heart murmur was slightly auscultated at the left sternal border. A slight thickening of the aortic valve was detected using transesophageal echocardiography (Fig. 3A). Because hyperthyroidism worsens heart failure, potassium iodine (50 mg/day) was started. Hyperthyroidism improved within a few days, but heart failure was progressive. On day 17, cervical spine magnetic resonance imaging showed infectious spondylitis at the fifth and sixth cervical vertebrae (Fig. 2B), and treatment with clindamycin (1,800 mg/day) was added.

Acute suppurative thyroiditis commonly occurs with congenital pyriform sinus fistula. An esophagogram was per-

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RBC, red blood cells; Hb, hemoglobin; WBC, white blood cells; Plt, platelets; TP, total protein; Alb, albumin; Cr, creatinine; AST, aspartate aminotransferase; ALT, alanine aminotransferase; γGTP, γ-glutamyl transpeptidase; CRP, C-reactive protein; Na, sodium; K, potassium; Cl, chlorine, TSH, thyroid stimulating hormone; FT3, free triiodothyronine; FT4, free thyroxine; TRAb, thyroid stimulating hormone receptor antibody; TgAb, thyroglobulin antibody; TPOAb, antithyroid peroxidase antibody; CEA, carcinoembryonic antigen
Figure 1. Neck computed tomography on day 1 revealed a low density lesion in the right thyroid gland (A). Ultrasonography on day 1 also revealed a hypoechoic lesion, 41.4×47.0×26.4 mm in size with heterogeneous content in the right lobe (B).

Figure 2. Hip magnetic resonance imaging showed right suppurative hip arthritis on day 8 (A). Cervical spine magnetic resonance imaging showed infectious spondylitis at the fifth and sixth cervical vertebrae on day 17 (B).

formed on days 21 and 47 and revealed no anatomic abnormality, including pyriform sinus fistula, in the pharynx. The patient had a spiked fever again on day 26, and hemorrhagic and exudative changes, which corresponded to Roth’s spots, were observed in the bilateral ocular fundus (Fig. 3C). Diastolic heart murmur became stronger on day 26. A second transesophageal echocardiography revealed vibrated growing vegetation at the aortic valve (Fig. 3B). The patient was diagnosed with infectious endocarditis and acute aortic regurgitation. The heart failure was progressive, and he underwent aortic valve replacement on day 49. The aortic valve was accompanied by an erosive change with necrosis, fibrinous extraction, neutrophilic infiltration and gram-positive coccus infection. This change was compatible with infectious endocarditis. The presence of gram-positive cocci corresponding to bacterium detected in aspirate of thyroid and hip joint suggested that the infectious endocarditis was the cause of multiple organ infections. The patient’s heart failure improved after the operation, and suppurative thyroiditis and spondylitis were well controlled. The treatment of cefazolin and clindamycin was discontinued on day 72. A summary of the clinical course is shown in Fig. 4. Neck ultrasonography after discharge on day 118 showed the diminished size of the right swollen lobe of the thyroid gland and detected a heterogeneous lesion like a nodule in this lobe. The patient is currently being closely followed.

Discussion

This is the first report of a case of right-sided acute suppurative thyroiditis, spondylitis and hip joint arthritis that were caused by infectious endocarditis. The thyroid gland is resistant to infection because of its encapsulation, its extensive lymphatic drainage and the iodine and hydrogen pero-
Figure 3. Transesophageal echocardiography revealed a slight thickening of the aortic valve on day 16 (A). On day 35, vibrated growing vegetation was detected at the aortic valve using transesophageal echocardiography (B). Hemorrhagic and exudative changes, which corresponded to Roth’s spots, were shown in the bilateral ocular fundus on day 28 (C).

Figure 4. Summary of the clinical course. SMX/TMP: Sulfamethoxazole/Trimethoprim

The present case was atypical in the following aspects: 1) the onset was in a 61-year-old adult, 2) the abscess was in the right lobe, 3) he presented with destructive thyrotoxicosis, 4) aggressive infectious lesions in many places of the body were observed, 5) pyriform sinus fistula was not found using an esophagogram and 6) there was no history of trauma or aspiration biopsy of the thyroid gland, which can contribute to the pathogenesis of acute suppurative thyroiditis. Repeated transesophageal echocardiography revealed a
growth of vegetation in the aortic valve, and the patient was
diagnosed with infectious endocarditis. Because of the pro-
gressive heart failure due to acute aortic regurgitation, the
patient underwent aortic valve replacement. After the sur-
gery, the infection was well controlled.

Acute suppurative thyroiditis complicated with infectious
endocarditis has only been reported in 3 cases (one report in
English) (8, 21, 22). All 3 patients were adults, and at least 2
of these patients presented with thyrotoxicosis. Various cy-
tokines derived from sepsis might cause thyrotoxicosis. Al-
though thyroid function tests are usually normal in patients
with acute suppurative thyroiditis, thyrotoxicosis has been
reported in cases without a pyriform sinus fistula infection
(23). Infectious endocarditis should be considered as a
cause of acute suppurative thyroiditis in adult cases with
thyrotoxicosis. Septic embolization from vegetation of aortic
valve was thought to be a cause of acute suppurative thy-
oritis, infectious hip arthritis and spondylitis in the present
case. However, the reason why the suppurrative lesion oc-
curred in thyroid gland, which is relatively resistant to bac-
terial infection, remains unknown. One possible mechanism
may be an abnormal blood supply penetrating the barrier of
the thyroid gland in this patient. Angiographical diagnosis
will be necessary to confirm this point. Another possible
cause was the presence of a thyroid nodule in the right lobe,
which might lead to an increased risk of hematoegously
infection of thyroid gland. Alternatively, the pathogenic
MSSA in this case might have a high power to generate
suppurative lesions in multiple spaces of the body, including
thyroiditis, osteomyelitis and hip arthritis.

In an atypical case of acute suppurative thyroiditis which
is resistant to antibiotics and occurs without pyriform sinus
fistula, infectious endocarditis should be considered as a
cause because the removal of the infectious cardiac valve
might be necessary to control the systemic infection. Acute
suppurative thyroiditis may occur in elderly persons with a
severe systemic infection.

The authors state that they have no Conflict of Interest (COI).

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