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Case Report

Conservative treatment of thyroid abscess in a child with thyroglossal duct cyst

[Tratamiento conservador de absceso tiroideo en una niña con quiste del conducto tirogloso]

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Abstract

Thyroid abscesses (TA) are a rare clinical entity in adult and pediatric patients. Less than 50 pediatric cases have been described. While inherently resistant to infection, various risk factors may predispose to thyroidal infection and abscess. This report details the incidental discovery of a thyroglossal duct cyst presenting as TA in a child who presented with a 1-week history of worsening pain and swelling of the right neck along with remittent fever. After clinical examination, laboratory examination, and ultrasound, a diagnosis of TA was made. The patient was administered antibiotics and antithyroid medication alongside supportive care. Surgery was considered in case of deterioration or absence of improvement. After two days of treatment, the patient improved and was discharged after two weeks of treatment. This article reports the incidence of TA, which was precipitated by congenital anatomical abnormality. The conservative treatment of TA using antibiotics was also highlighted.

Keywords: pediatric; thyroglossal duct cyst; thyroid abscess.

Resumen

Los abscesos tiroideos (AT) son una entidad clínica poco frecuente en pacientes adultos y pediátricos. Se han descrito menos de 50 casos pediátricos. Aunque son intrínsecamente resistentes a la infección, diversos factores de riesgo pueden predisponer a la infección y el absceso tiroideos. Este informe detalla el descubrimiento incidental de un quiste del conducto tirogloso que se presenta como AT en una niña que acudió con una historia de 1 semana de empeoramiento del dolor y la hinchazón del cuello derecho junto con fiebre remitente. Tras un examen clínico, de laboratorio y ecográfico, se diagnosticó AT. A la paciente se le administraron antibióticos y medicación antitiroidea junto con cuidados de apoyo. Se consideró la cirugía en caso de deterioro o ausencia de mejoría. Tras dos días de tratamiento, la paciente mejoró y fue dado de alta tras dos semanas de tratamiento. Este artículo informa de la incidencia de AT precipitada por una anomalía anatómica congénita. También se destaca el tratamiento conservador de la AT con antibióticos.

Palabras Clave: absceso tiroideo; pediátrico; quiste conducto tirogloso.

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INTRODUCTION

Thyroid abscesses (TA) are a rare clinical entity in both adult and pediatric patients. Only less than 50 pediatric cases have been described at the time of writing (Céspedes et al., 2013; Lafontaine et al., 2021). Owing to its anatomy and physiology, the thyroid is inherently resistant to infection. Its capsulated structure, rich vascularization, good lymphatic drainage, and high iodine content all contribute to this trait (Paes et al., 2010; Yedla et al., 2018). Various risk factors, which is discussed later, may predispose to this condition. Herein, the incidental discovery of a thyroglossal duct cyst (TGDC) presenting as TA in a child is reported.

CASE HISTORY

A 45-month-old girl was presented to the hospital outpatient clinic with a 1-week history of worsening pain and swelling of the right neck, accompanied by remittent fever. The parents had also started to notice the child's reluctance to turn her head side-to-side, along with the hoarsening of her voice. The child's intake had been decreasing since a week ago, but she had refused to eat in the last two days. There was no significant medical or family history. On examination, the child seemed irritable. Moderate tachycardia and a fever of 38.5°C were also present. Local examination revealed a diffusely enlarged nodule on the right neck, which was erythematous and tender. Other physical examinations were within normal limits. Laboratory examinations showed leukocytosis (19 × 10^3 cells/µL) with absolute neutrophilia (13.98 × 10^3 cells/µL); elevated c-reactive protein (170.34 mg/L), FT4 (37.89 pmol/L), and low TSH (0.062 µIU/mL). Immunoglobulin release assay and thyroid receptor antibody levels were insignificant; however, thyroglobulin levels were highly elevated (1699 ng/mL).

Thyroid ultrasonography (USG) was performed and revealed heterogenous mass of the right thyroid

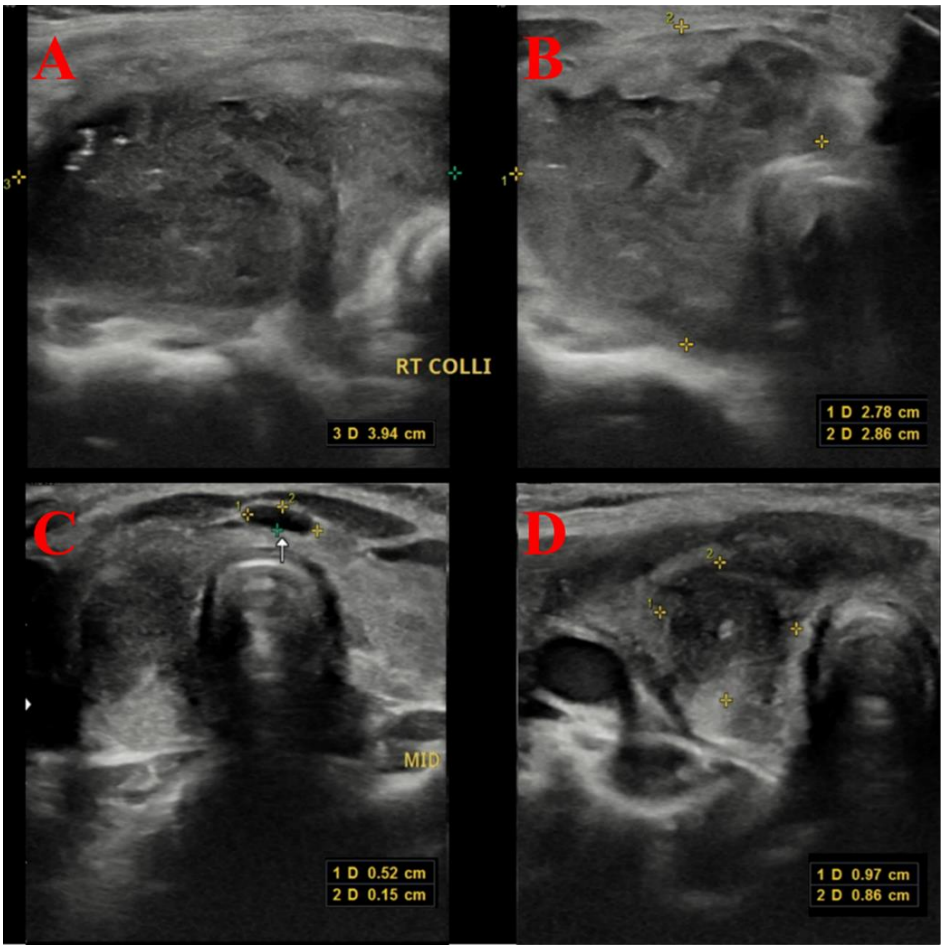

Figure 1. (A) and **(B)** Initial ultrasound imaging of the right thyroid region revealing a heterogenous, calcified, and poorly circumscribed mass of the right thyroidal parenchyma measuring approximately 3.94 × 2.78 × 2.86 cm. Doppler ultrasound did not show any significant vascular signs. The left thyroid (not shown) was normal and homogenous without any nodular or cystic intraparenchymal lesion. **(C)** Identification of a thyroglossal duct cyst measuring 0.52 × 0.15 cm. **(D)** Further reduction of the abscess, measuring 0.97 × 0.86 cm.

(Fig. 1A-B). Hence, a diagnosis of TA was made. A regiment of meropenem 3 × 480 mg, vancomycin 4 × 240 mg, and propylthiouracil 4 × 60 mg was started along with supportive treatment. Surgery was considered in case of deterioration or absence of improvement. Two days later, the patient had shown clinical improvement and USG showed a reduction in the mass size to 2.73 × 1.98 × 1.86 cm. Approximately two weeks later, USG revealed the presence of a TGDC (Fig. 1C). The mass was also noted to be further reduced (Fig. 1D). The patient was discharged without complaints.

DISCUSSION

Due to the rare occurrence of TA, most of the literature is case reports and case series. This also translates to a lack of evidence-based guidelines in its management, both in the adult and pediatric populations (Paes et al., 2010). Lafontaine et al. (2021) have previously published a systematic review and guide for acute suppurative thyroiditis. However, of the 200 cases included in the review, 168 were adults. While current literature does not differentiate management in adults and children, it is unknown whether specific distinctions should be made for pediatric patients. A case of TA has also been previously reported in a 3-week-old neonate (Tapasak et al., 2022).

An immunocompromised state is a risk factor for TA, albeit still rare in such population. In the immunocompetent child, preexisting thyroidal disease, trauma, and the existence of congenital anatomic defects such as piriform sinus fistula, anomalies of the third or fourth pharyngeal arch, or the persistence of a thyroglossal duct remnant, also increases the risk of TA (Céspedes et al., 2013; Maldhure et al., 2023). It is estimated that around 35–40% of cases are caused by *Staphylococcus aureus* and streptococci, 25% by gram-negative bacteria, around 9–12% by anaerobes, and a small percentage by fungi (Falhammar et al., 2019).

Hematogenous and lymphatic spread, tuberculosis, and iatrogenic infection (trauma from biopsy or aspiration) should also be considered (Céspedes et al., 2013; Falhammar et al., 2019). Colonization—facilitated by anatomic and immunologic abnormalities—and subsequent infection by these organisms first induce suppurative inflammation, which then progresses to TA. While commonly described as a life-threatening emergency, our case was relatively stable throughout our care (Céspedes et al., 2013; Maldhure et al., 2023).

Diagnosis of TA can be made by USG, computed tomography, fine needle aspiration, and incision and drainage. USG is the preferred imaging modality in the early stage of the disease, i.e., before the formation of an abscess. Meanwhile, computed tomography (CT) is preferred after the abscess has formed as it can better evaluate the surrounding anatomy and the extent of the abscess. Magnetic resonance imaging with contrast can also be performed to study nearby structures. A walled-cystic mass, which is hyperintense, may be observed in T1 and T2-weighted MRI. TGDC can also be detected by MRI, typically presenting with high T1 signal intensity due to high protein content. Hyperintensity in T2-weighted MRI can also outline the thyroglossal duct. However, in most cases, CT or MRI are reserved for inconclusive USG results. Treatment is usually by drainage and administration of antibiotics. Surgery, on the other hand, is preferred for patients who do not respond to extended-spectrum antibiotics (Akdemir et al., 2015; Céspedes et al., 2013; Lafontaine et al., 2021; Lesh et al., 2023; Ogunkeyede and Ogundoyin, 2019; Yedla et al., 2018).

Potential complications of TA include thyrotoxicosis and thyroid storm; abscess rupture with subsequent sepsis; abscess extension to the neck, thorax, or mediastinum; airway obstruction; and internal jugular vein thrombosis (Céspedes et al., 2013; Deaver et al., 2009; Lesh et al., 2023). Meanwhile, the infected cyst may grow rapidly and cause airway compromise. After the resolution of the abscess, removal of any anatomic defects, such as thyroglossal duct (cyst), is usually performed and may be offered to prevent recurrence (Céspedes et al., 2013; Deaver et al., 2009).

Thyroid abscess is a rare clinical entity that may occur in adults and children. Numerous risk factors are associated with it, which may predispose individuals to TA despite its natural resistance to infection. Management of TA should include close monitoring for potential complications along with treatment with broad-spectrum antibiotics. In our case, neither drainage nor surgery were required. When possible, primary prevention by eliminating risk factors should be done to prevent recurrence.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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AUTHOR CONTRIBUTION:

Contribution	Ronny R	Sutrisno S
Concepts or ideas	x	
Design	x	x
Experimental studies		x
Data acquisition		x
Manuscript preparation	x	x
Manuscript editing	x	
Manuscript review	x	x

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