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Recurrent acute suppurative thyroiditis in pediatrics: a case report

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ABSTRACT

Acute suppurative thyroiditis (AST) is a rare endocrinological emergency in pediatrics that may require immediate infectious disease and surgical intervention. It is generally associated with bacterial infections and, in some cases, congenital malformations of the branchial arch. We present the case of a 7-year-old girl with recurrent AST, in both episodes with cervical abscess formation, requiring intravenous antibiotics and surgical drainage. From the outset, a piriform sinus fistula was suspected, which was confirmed by direct laryngoscopy in the operating room during the hospitalization for the second episode. Chemical sclerosis of the fistulous tract was performed, with favorable evolution and no recurrence at follow-up.

Although rare, this case highlights the importance of considering AST in the differential diagnosis of cervical masses in the pediatric population. It also encourages investigation of underlying causes such as congenital anomalies, which allows for early diagnosis and definitive treatment.

Keywords: *suppurative thyroiditis; piriform sinus, abnormalities; subacute thyroiditis; pediatrics.*

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INTRODUCTION

Acute suppurative thyroiditis (AST) is a rare condition in pediatrics, but one of significant clinical relevance due to its potential morbidity and mortality. Its incidence is estimated to be between 0.1% and 0.7% of thyroid diseases.[1,2] In some cases, AST may be related to congenital malformations of the branchial arch, such as piriform sinus fistula (PSF), a rare condition that can be difficult to diagnose. Although AST mainly affects children under 10 years, early diagnosis is crucial to avoid severe complications, such as recurrent abscesses, multidrug-resistant infections, and irreversible thyroid damage.[3] This report describes the case of a 7-year-old girl with recurrent AST, whose definitive diagnosis was PSF, confirmed by direct laryngoscopy.

CLINICAL CASE

A previously healthy 7-year-old female patient presented with anterior cervical swelling that had developed over the previous 48 hours, associated with fever (38 °C), general malaise, and one episode of vomiting. A painful tumor was evident on palpation in the middle and left cervical region, with its point of origin in the suprasternal region, and reduced cervical mobility. No respiratory or swallowing symptoms were observed.

Cervical radiography revealed soft tissue enlargement and a slight deviation of the trachea to the right, without mediastinal involvement.

Soft tissue and thyroid ultrasound revealed enlargement of the left thyroid lobe and isthmus, with heterogeneous parenchyma that is predominantly hypoechoic, poorly defined, and characterized by areas of mixed vascularization, as well as a collection in proximity, without involvement of the right lobe (*Figure 1*).

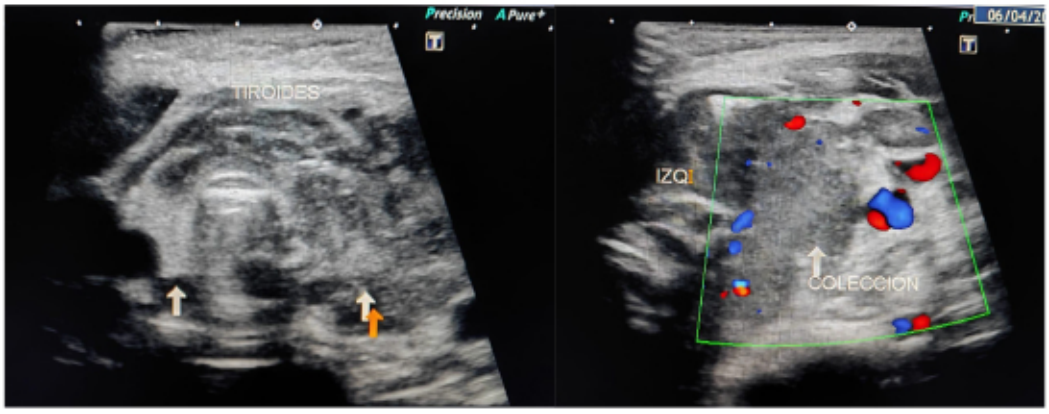
Biochemical studies revealed leukocytosis (WBC 23,100/mm³) with neutrophilia (82%), mild anemia, thrombocytosis (494,000/mm³), elevated C-reactive protein (CRP) (161 mg/L), and procalcitonin (63.7 ng/mL). Thyroid-stimulating hormone and free T4 values were normal. Contrast-enhanced computed tomography (CT) of the neck revealed a hypodense collection with peripheral enhancement and internal air bubbles, located in the left laterocervical region, involving the left thyroid lobe (LTL), extending into the retropharyngeal space, and causing airway displacement.

The diagnosis of acute suppurative thyroiditis (AST) with left thyroid lobe abscess was established. Empirical antibiotic therapy with ampicillin-sulbactam and intravenous vancomycin was initiated. Given the suspicion of a piriform sinus fistula, we decided to schedule an outpatient evaluation once the initial treatment was completed.

The clinical course was favorable, with a gradual decrease in inflammatory markers and sustained improvement. Serial ultrasound scans showed a persistent purulent collection of approximately 30 mL, which did not require surgical drainage.

The patient was discharged on the ninth day of hospitalization in good general condition, afebrile, with good oral tolerance, and continued oral

Figure 1. Cervical ultrasound. First episode



An increase in the size of the left thyroid lobe is observed, with heterogeneous, hypoechoic parenchyma and poorly defined margins. An adjacent hypoechoic collection consistent with an abscess is identified.

antibiotic treatment (amoxicillin-clavulanic acid and trimethoprim-sulfamethoxazole). The patient did not complete the clinical and ultrasound follow-up after discharge.

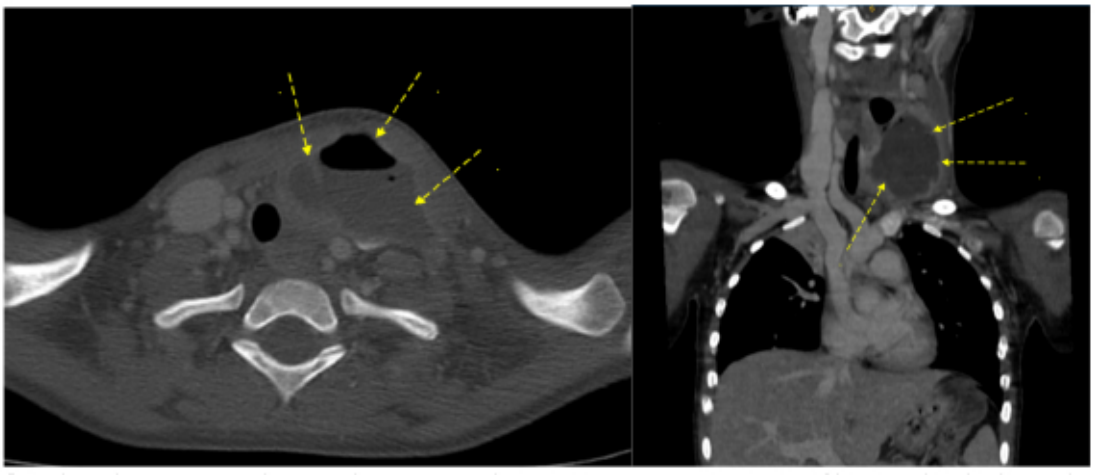
Eleven months later, she returned to the emergency room with a fever that had persisted for 72 hours and a progressively enlarging, painful mass in the left lateral cervical region, in the exact location as the previous episode. On examination, she was febrile, with general weakness, no signs of stridor, dyspnea, or dysphagia, and presented with a firm mass, painful on palpation, with poorly defined edges, in the left lateral cervical region. Initial laboratory tests showed WBC 16,000/mm^3 (77% segmented neutrophils) and CRP 173 mg/L. Cervical Doppler ultrasound revealed a heterogeneous collection with air bubbles in the deep planes of the left neck. Contrast-enhanced neck CT confirmed the presence of a 75 × 46 × 40 mm left lateral cervical abscess with air-fluid level, peripheral enhancement, displacement of vascular structures, upper airway, larynx, trachea, and esophagus to the right, with apparent involvement of the LTI and extension to the retropharyngeal space (*Figure 2*).

Empirical antibiotic treatment was started with clindamycin, vancomycin, and ceftriaxone. Initial surgical drainage was performed by placing a rubber drain. Given the persistence of the tumor and the elevation of inflammatory parameters at 72 hours, a second surgical drainage was performed. Gram-negative bacilli and *Enterobacter cloacae* producing extended-spectrum beta-lactamases (ESBL) were isolated from the culture of the purulent material. The antibiotic treatment was changed to meropenem and clindamycin.

On the tenth day of hospitalization, a broncholaryngoscopy was performed under general anesthesia, revealing a fistulous tract originating in the left piriform recess with an outlet to the cervical region, confirming the diagnosis of piriform sinus fistula. Chemical sclerosis of the tract was performed using trichloroacetic acid, and a double-lumen catheter drain was connected to an aspiration system.

Following the procedure, based on clinical progress and the antibiogram results, meropenem was discontinued and replaced with oral ciprofloxacin. Six days after the procedure, the drain was closed, with minimal purulent discharge. The follow-up ultrasound showed no residual collections. The drainage remained closed for the following four days, with no clinical complications, and was removed on the eleventh postoperative day. The patient was discharged in good general condition, with outpatient follow-up scheduled for a possible new session of chemical sclerosis. The patient did not return for subsequent clinical check-ups.

Figure 2. Contrast-enhanced computed tomography of the neck. Second episode



A multilocular hypodense collection is visible, with peripheral enhancement and internal air bubbles, located in the left laterocervical region. The lesion involves the left thyroid lobe and extends into the retropharyngeal space, resulting in the displacement of adjacent structures.

DISCUSSION

Acute suppurative thyroiditis (AST) is a rare pediatric emergency, with an estimated incidence of between 0.1% and 0.7% of all thyroid diseases.[1,2] In immunocompetent patients, it is usually secondary to congenital anatomical defects, mainly PSF, which is rare but potentially severe. The left thyroid lobe is the most affected.[1]

Although uncommon in pediatrics, AST occurs most frequently during the first decade of life. A review of cases (2000-2020) revealed a mean age of diagnosis of 37 years (range, 1-87), with a female predominance, consistent with our case.[3] Clinical suspicion is essential for early diagnosis, because of the risk of severe complications, with reported morbidity and mortality between 3.7% and 12%.[1,3]

In immunocompetent individuals, 75% of cases are bacterial, predominantly *Staphylococcus aureus*, *Streptococcus pyogenes*, *S. epidermidis,* and *S. pneumoniae*.[3,4] The rest are attributed to tuberculosis (24%) and, to a lesser extent, fungal infections.[4] During the second episode, ESBL-producing *E. cloacae* was isolated, a germ rarely reported in the literature.[3-5] Its appearance could be related to previous exposure to antimicrobials, and it may condition the use of broad-spectrum antibiotic regimens, such as meropenem, with subsequent rotation according to sensitivity.

Clinically, it presents with a painful anterior cervical mass, fever, dysphagia, odynophagia, and sometimes dysphonia. It may be accompanied by neck stiffness, general malaise, and regional lymphadenopathy.[1,2]

Studies show that leukocytosis, an elevated erythrocyte sedimentation rate, and thyrotoxicosis occur in 42% of cases, which can complicate the differential diagnosis with subacute thyroiditis.[5] Other diagnoses to consider include ruptured thyroid cyst, hemorrhagic nodule, or painful Hashimoto's thyroiditis.[2-4]

The time to diagnosis varies depending on the etiology: bacterial (7 days), fungal (21 days), and tuberculosis (more than 30 days).[3] In this case, the first hospitalization was 3 days after the onset of symptoms, but the underlying anatomical defect was only identified after recurrence.

Direct laryngoscopy under general anesthesia is the test of choice to confirm PSF. However, ultrasound, CT, magnetic resonance imaging, or esophagography are initially used for diagnosis.[1]

Initial treatment consists of antibiotics and surgical drainage of the abscess. Some series propose percutaneous drainage with lavage, although its efficacy is limited.[6] Recurrence is usually due to the persistence of the anatomical defect, which can lead to multiple abscesses, the need for lobectomy, multidrug-resistant infections, sepsis, or death.[7] In the first episode, surgical drainage was not performed in the hospital with the intention of doing so on an outpatient basis. However, this approach, coupled with the lack of follow-up, may have contributed to the recurrence of the condition.

Chemical sclerosis of the fistulous tract using endoscopic cauterization is considered an effective alternative in selected cases, with fewer complications than open surgery.[8]

Complications described include thrombophlebitis of the internal jugular vein, mediastinitis, pericarditis, esophageal perforation, Horner's syndrome, and multiple organ failure.[3] It is essential to highlight the potential severity of expansive lesions extending into the retropharyngeal space, given their proximity to vital structures and the risk of airway obstruction.[2]

In conclusion, pediatricians must maintain a high index of suspicion when encountering painful cervical masses. A timely approach enables adequate treatment and surgical resolution of the causative defect, thereby preventing recurrences and complications. ■

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