Thyroid Abscess: About Two News Cases

Ali el mahdi haddam 1, Djamila Meskine 1, Farida Chentli 2, Nora Soumey Fedala 2
Department of endocrinology Bologhine hospital Algiers, Algeria
 Corresponding author email: haddam25@yahoo.fr

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Abstract
The abscess of the thyroid is a very rare condition. In adults, it usually occurs on a pre-existing thyroid lesion, in a context of immunosuppression. In children, it is often associated with an embryonic defect. We report two cases about this pathology. The first one is about a girl of six years old with a left cervical mass with fever. Ultrasound and CT scans have shown the existence of an abscess in contact with the left thyroid lobe and fistula of the fourth branchial cleft. After appropriate antibiotic therapy and surgical drainage, she was oriented for fistulectomy.

The second is a case of an adult with anaplastic thyroid carcinoma revealed by an abscess. Staging assessment showed diffuse metastases. After large spectrum antibiotic therapy and surgical drainage, the patient was sent for radiotherapy and chemo-therapy.

Keywords Abscess; Imaging; Fistula; Thyroid carcinoma; Antibiotic; Surgical drainage

Introduction
The thyroidal abscess is a very rare condition. It represents only 0.1% of surgical pathologies of this gland. Its unusual occurrence is due to its resistance to infection assured by a number of anatomical and physiological properties (Berger et al., 1983).

In adults, it usually occurs on a pre-existing thyroid pathological lesion, in a context of immunosuppression or by direct trauma of the thyroid. In children, it is often associated with embryonic malformations as a thyroglossal duct fistula, and fistulas of the 4th endobrachial pocket (Ducable et al., 1979)

We report in these two new observations.

Observation 1
M.K is a child of 6 years old, issue from a non-consanguineous marriage. Without specific personal medical history and with a family history of: type 2 diabetes, hypertension and primary hypothyroidism. She was admitted for exploration and management of a thyroid abscess, at the left lobe, evolving for four days.

The first symptoms had appeared a week earlier at the waning of an uninfected viral sore throat: appearance of a swelling gene, asthenia and breathing difficulty.

The evolution is marked by the rapid appearance of anterior cervical swelling increasing in size, associated to dyspnea which gets worse at decubitus, dysphagia, in a context of impaired general condition and fever.

On admission, the child had a preserved state, febrile to 38.6 °C with tachycardia at 101 B/min, who reports a basi-cervical pain associated to dysphagia without respiratory distress. We found a limitation of the mobility of the neck and head (analgesic position).

Figure 1 (A and B): At admission: voluminous, heterogeneous and echogenic thyrtoide nodule. We noted a central and peripheral vasculature.

Physical examination found a median mass at the lower neck, predominantly on the left, measuring 5 cm long axis, tense and renitente, very painful on
palpation, inflammatory, mobile on swallowing however, with it a painful limitation of motion of the neck and head. Clinical examination revealed the presence of many left cervical nodes, lower cervical. The rest of the exam was with no other abnormalities.

Hormonal balance was normal; however we noted inflammatory and infectious syndromes (Table I).

Table I Biological results

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Patient 1 results</th>
<th>Patient 2 results</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>TSH (μui/L)</td>
<td>0.34</td>
<td>0.42</td>
<td>0.34 to 5.6</td>
</tr>
<tr>
<td>ATPO (iu/mL)</td>
<td>1.40</td>
<td>2</td>
<td>&lt;9</td>
</tr>
<tr>
<td>leukocytes /mm³</td>
<td>14160</td>
<td>20000</td>
<td>4000-10000</td>
</tr>
<tr>
<td>CRP mg/L</td>
<td>192</td>
<td>200</td>
<td>&lt; 6</td>
</tr>
<tr>
<td>- VS: mm/L.H</td>
<td>93/106</td>
<td>80</td>
<td>&lt;15</td>
</tr>
</tbody>
</table>

Despite a probabilistic systemic antibiotic therapy instituted at admission, clinical, biological and ultrasonographic evolution was unfavorable: there is an increase in the size of the abscess and fistula with the beginning of cellulite, a larger local pain with an increase of inflammation (Table I). The abscess is externally drained under general anesthesia 48 hours after admission. Intra-operative bacteriological samples were used to adapt the antibiotic therapy. The isolated germ was Streptococcus sp. Daily dressings were carried twice a day out for 2 weeks at hospitalization and 1 week at ambulatory until depletion of the infection. A magnetic resonance imaging of the cervical region allowed to objectify a left anterolateral fistula located in the lower cervical region a few centimeters of the pharyngo-esophageal sphincter without radiopaque foreign body visualized at this level (Figure 4). Careful crossroads aero digestive endoscopy is then programmed and demonstrates the existence of a fistula at the fourth gill slit opening a sluice at the antero-medial corner of left piriform sinus. The diagnosis of superinfected fistula of the fourth gill slit is then retained.
local inflammation and fever amounted to 39 °C. The patient was quickly hospitalized endocrinology department.

Physical examination found a very tired patient having a predominant left neck mass measuring 8 cm long axis, tense and renitente, very painful on palpation, inflammatory, mobile swallowing with dyspnea, slight dysphonia and multiple cervical lymphadenopathy. Two days after admission, the abscess has fistulized on skin (Figure 3A and B).

Table II Clinical evolution of the patient

<table>
<thead>
<tr>
<th>Hospitalization day</th>
<th>D1</th>
<th>D3</th>
<th>D6</th>
<th>D8</th>
<th>D10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Antibiotic therapy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cloran</td>
<td></td>
<td></td>
<td>Cloran</td>
<td></td>
<td>Cloran</td>
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<tr>
<td>Gentamycine</td>
<td></td>
<td></td>
<td>Gentamycine</td>
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<td>Gentamycine</td>
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<tr>
<td>Flagyl</td>
<td></td>
<td></td>
<td>Flagyl</td>
<td></td>
<td>Flagyl</td>
</tr>
<tr>
<td><strong>Clinic</strong></td>
<td></td>
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</tr>
<tr>
<td>Fever + dysphagia + neck pain + Thyroid Swelling at the expense of the left lobe</td>
<td>Appyrexia dysphagia - neck pain + (lower intensity) Fistula to the skin next to the center of the swelling</td>
<td>Appyrexia neck pain + Red and hot collection of 1 cm long axis with centered point fistulisation</td>
<td>Appyrexia neck pain - Clean scar drainage</td>
<td>Good clinical evolution in the process of healing</td>
<td></td>
</tr>
<tr>
<td>ADP -</td>
<td>ADP +</td>
<td>ADP +</td>
<td>ADP +</td>
<td>ADP +</td>
<td></td>
</tr>
<tr>
<td><strong>Biology</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GB (mm³)</td>
<td>17600</td>
<td>19580</td>
<td>13300</td>
<td>5860</td>
<td></td>
</tr>
<tr>
<td>CRP (mg/L)</td>
<td>192</td>
<td>48</td>
<td>&gt;48</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>VS (mm/h)</td>
<td>111/119</td>
<td>111/119</td>
<td>111/119</td>
<td>111/119</td>
<td></td>
</tr>
<tr>
<td>cytocariobiological review of pus: streptococcus sp</td>
<td>cytocariobiological review of pus: streptococcus sp</td>
<td>cytocariobiological review of pus: streptococcus sp</td>
<td>cytocariobiological review of pus: streptococcus sp</td>
<td></td>
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<tr>
<td><strong>Thyroid ultrasound</strong></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Asymmetric goiter Total left lobe nodule echogenic Heterogeneous by the presence of cystic areas Central and peripheral vasculature.</td>
<td>No individualized thyroid tissue replaced by a broad inflammatory collected reshuffle irregular boundaries, hypoechoic, heterogeneous, inside of cellulitis.</td>
<td>Inflammatory realignment of the left lobe Hypoechoic heterogeneous by the presence of hyperechoic area limited well without visualization of thyroid tissue Hyperechoic thickening of the next soft parts Multiple ADP in upper cervical areas. Right lobe without anomalies</td>
<td>Left lobe is increased in volume measuring 37X21X15 mm heterogeneous hypoechoic Small intra-lobar collection with collapsed wall measuring 14X13X7 mm Lateral jugular lymphadenopathy 13mm inflammatory appearance</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Supports</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Triple antibiotics Cloran gentamycin Flagyl Surveillance</td>
<td>Drainage with pressure without incision.</td>
<td>Surgical drainage with installation of a drainage blade at D7</td>
<td>Removal of the drainage blade</td>
<td>Relay per os by the Oroquen for a period of 10 days Cervical MRI current</td>
<td></td>
</tr>
</tbody>
</table>
Cervical ultrasound and cervical-thoracic CT requested in emergency disclosed a huge heterogeneous thyroid process located at the left lobe centered by a fluid collection of 5 cm, with mass effect on the upper aerodigestive tract, and pushing the right jugular-carotid axis laterally. The infiltration of the pre-vertebral and cervical soft parts was important. We noted the presence of multiple cervical lymphadenopathy, pulmonary opacities adrenal and bones metastases (Figure 5, 6, 7 and 8).

The laboratory tests performed showed inflammatory and infectious syndrome. The thyroid hormonal investigations were normal (Table I).

There was improvement in dyspnea and infectious syndrome using three large pectrum antibiotherapy. However, immunohistochemical study of thyroid biopsy performed during surgical drainage confirmed the diagnosis of undifferentiated thyroid cancer by showing the presence of cytokeratin proteins and negativity of other conventional tumor markers of thyroid cancer (TG, TCT, ACE). The patient was oriented afterwards for Cure of radiotherapy and chemotherapy.

**Discussion**

The infection of the thyroid gland is rare. This is due to a large capacity for resistance to pathogens, largely attributed to its isolated anatomical location assured by its fibrous capsule and rich and widely anatomizing vasculature, lymphatic drainage and to its important high iodine concentration (Schweitzer et al., 1981; Leclerc et al., 1986).

An equal distribution between the sexes is observed. The thyroid abscess can occur at any age with a predilection in children (Berger et al., 1983). This is attributed to the existence of birth defects such thyroglossal duct fistulas, and fistulas of the 4th endobrachiale pocket which are due to the abnormal persistence of a canal linking the bottom of the piriform sinus deep to a thyroid lobe. Patients with these embryological abnormalities often have recurrent episodes of cervical abscess often down the left side and are only diagnosed after opacification of the upper gastrointestinal tract showing the fistula or at magnetic resonance imaging (Gan et al., 2004).

Among latero-cervical congenital malformations, those developed at the expense of the fourth branchial cleft
among the rarest. Fistula of the fourth branchial cleft clearly dominates the left side (93% of reported cases), which is due to the asymmetric development of the fourth gill arch. Fistula arises at the apex of the pyriform sinus and passes between the thyroid and the cricoid cartilages. It then descends between the trachea and the recurrent nerve and bypasses left aortic arch and right sub-clavian artery. It goes back to the common carotid artery and crosses the XII nerve and down to its external opening to the anterior edge of the sternocleidomastoid at the lower neck (Takimoto et al., 1990; Mankekar et al., 1993; Schneider et al., 1995; Hamoir et al., 1998).

Abnormalities of the fourth branchial cleft occur during early childhood. The opening at the apex of the piriform sinus passage leads food and liquid to cause frequent and early infections. The clinical presentation is usually that of a recurrent cervical abscess. Rarely, the fistula is revealed at birth by high respiratory distress symptoms with stridor and swallowing disorders due to repression of the laryngo-tracheal axis and the obstruction of the upper airway swelling cervical.

In adults, several causes may be responsible for a thyroid abscess. Infection can result from a direct breaking by a foreign body, such as thyroid fine needle aspiration, esophagus perforation or a secondary hypopharynx. However, often it is a blood or lymphatic spread from a remotely infected site. The extension of the infection can be from adjacent cervical tissue or thyroglossal fistula (Schweitzer et al., 1981; Leclerc et al., 1986).

Clinically, thyroid abscess appears as of a painful cervical swelling. The clinical presentation is compounded by the onset of dyspnea, hoarseness or dysphonia, dysphagia, and fever (Menegaux et al., 1991). Paucy-symptomatic tables can be observed (Parida et al., 2014).

The diagnosis is confirmed by needle aspiration that brings franc pus. The cytobacteriological study can isolate the causative microbial agent. Antibiotherapie established systemically must be adapted. If local or general trend is unfavorable, surgical drainage should be considered (Herndon et al., 2007).

Principal differential diagnoses are represented by viral subacute thyroiditis and chronic thyroiditis, intra cystic hemorrhage, primitive neoplasia or metastasis and amylase (Farwell et al., 1996).

Bacteriologically, the more target bacteria are Staphylococcus aureus, Streptococcus, and anaerobes. These germs are found in 70% of cases. Other species were isolated: Escherichia coli bacteremia due to urinary or gastrointestinal starting point (Menegaux et al., 1991). Other pathogens have been isolated and reported in the literature: Klebstaella, Salmonella typhi, Acinetobacter, Mycobacterium tuberculosis, Pseudomonas, Eikenella corrodens, Clostridium, Fusobacterium mortiferum, Pneumocystis carinii, Haemophilus (Hamoir et al., 1998; Herndon et al., 2007) and fungal agents such as Candida albicans, and aspergillosis are identified in immunocompromised patients (Wang et al., 1997; Basilio-De-Oliveira, 2000).

Laboratory tests are often disrupted. It shows an increase in CRP, and leukocytosis. The hormonal balance is often normal (Ducable et al., 1979; Berger et al., 1983).

Ultrasound and computed tomography allow the diagnosis of thyroid abscess and set its properties: structure, size, relation with adjacent anatomical structures including vascular structures, neurological and respiratory one (Leclerc et al., 1986; Cassagneau et al., 2011).

After disappearance of the abscess, the computed tomography is useful to look for birth defects such fistula opening in the piriform sinus (Leclerc et al., 1986; Gan et al., 2004; Cassagneau et al., 2011), after ingestion of a hydrosoluble product (Miller et al., 1983; Herman et al., 1992; Som et al., 2002; Cassagneau et al., 2011).

In the absence of effective treatment, the abscess of the thyroid can have serious complications as destruction of the glandular thyroid parenchyma and parathyroid glands, thrombophlebitis of the jugular vein, abscess fistulisation in the esophagus or the trachea light, external fistulisation to the skin, sepsis and blood spread to remote organs. Treatment should not forget to treat the underlying etiologic factor to prevent a recurrence: malformation surgery, treatment of...
neoplasia, immunosuppression (Miller et al., 1983; Jacobs et al., 2003; Herndon et al., 2007).

**Conclusion**

The thyroid abscess is a rare entity that must be recognized and treated precociously. The systematic search for a malformation or neoplastic lesion is necessary.

**Declaration of Interest**

The authors declare there is no conflict of interest.

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