

MINI REVIEW

PARTICULAR DIAGNOSTIC ASPECTS IN INFLAMMATORY THYROID PATHOLOGY – MINI REVIEW

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ABSTRACT

Inflammatory lesions of the thyroid gland may be described morphologically as generalised hypertrophy of the tissue (simple, diffuse goiter) or as localised hypertrophy (nodular goiter). Functionally, thyroid dysfunction can manifest as hyper or hypothyroidism. Generally, inflammatory thyroid conditions are accurately diagnosed using specific methods.

Thyroid diseases are some of the most common endocrine disorders, predominantly encountered in females. Their aetiology is not fully elucidated, but acute thyroiditis is generally infectious, while chronic forms are autoimmune. Although most clinical entities evolve to full resolution of symptoms, there are also forms that may lead to the occurrence of complications or malignant degeneration in the absence of a correct and fully-established treatment.

Keywords: thyroiditis, functional diagnosis, serologic testing.

RÉSUMÉ

Aspects diagnostiques particuliers dans la pathologie inflammatoire de la thyroïde – courte revue

Les lésions inflammatoires de la glande thyroïde peuvent être décrites du point de vue morphologique sous forme d'hypertrophie généralisée (goitre simple, diffus) ou hypertrophie localisée (goitre nodulaire). Le dysfonctionnement de la thyroïde peut se manifester comme hyper ou hypothyroïdie. Généralement, les maladies inflammatoires de la thyroïde sont diagnostiquées avec précision à l'aide de méthodes spécifiques. Les thyroidites représentent un des plus fréquentes maladies autoimmunes, avec prédominance chez les femmes. Leur étiologie n'est pas encore bien déterminée, mais d'une manière générale, les thyroidites aiguës sont d'origine infectieuse et celles chroniques de nature auto-immune. Bien que la plupart des entités cliniques évolue vers la résolution complète des symptômes, il y a des formes qui peuvent conduire à des complications où la dégénérescence maligne en l'absence d'un traitement approprié et complet.

Mots-clés: thyroidites, diagnostic fonctionnel, tests sérologiques.

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Thyroid pathology is one of the most common endocrine pathologies, with a prevalence in Europe of 3.82% and an incidence of 259 cases per 100,000 inhabitants per year, with a clear predominance among female patients¹. Thyroidites are a group of pathologies that share the inflammation of the thyroid gland, of infectious or non-infectious cause.

Thyroiditis can be acute, subacute or chronic. Acute thyroiditis has an infectious cause and is known as suppurative acute thyroiditis, a rare condition characterized by the presence of signs of local and systemic inflammation. Aetiology encompasses any infectious agent, except viral infections, that define subacute thyroiditis de Quervain. Chronic thyroiditis is a group of autoimmune disorders, which is the main cause of hypothyroidism and thyroid goiter. These include Hashimoto's thyroiditis and Riedel's thyroiditis.

The clinical presentation is highly variable, from thyrotoxicosis to thyroid insufficiency or even euthyroiditis and it is therefore necessary to know and differentiate thyroiditis subtypes in order to choose an appropriate therapeutic regimen.

Acute suppurative thyroiditis is the inflammation of the thyroid gland of infectious cause. Aetiology includes bacterial, fungal or parasitological invasion, except for viral causes. This pathology is rare, between 0.1% and 0.7% of all thyroid dysfunctions². This is attributed to the strong defence mechanisms against infections, such as rich vascularization, lymphatic drainage, the presence of large amounts of iodine in the thyroid tissue, hydrogen peroxide formed at this level during thyroid hormone synthesis and the existence of the thyroid capsule, which separates the organ of the neighbouring structures³. Among paediatric patients and young adults, the most common cause is the presence of a fistula in the pyriform sinus, an embryological remnant, joining the oropharynx and the thyroid gland^{4, 5}. 90% of the acute suppurated thyroiditis in patients with sinus fistula are located in the left thyroid lobe⁶. The explanation for this localization is given by the atrophy of the last right branchial arch in humans and the lack of its development during embryological development⁶. Old patients with old multinodular goiter and immunocompromised patients are at risk for acute suppurative thyroiditis. Symptomatology includes glandular asymmetry associated with classic signs of inflammation. Anterior cervical pain is the dominant symptom.

The onset of the condition is sudden, with general signs of infection, 39-40 degrees fever, tachycardia, chills. The patient may also experience dysphagia, otalgia or in extreme cases sepsis. The local examination reveals superficial erythematous skin, local warmth, laterocervical adenopathy and in case

of an abscess, fluctuation at palpation, even the exteriorization of a collection. The patient cannot perform extension of the head and often has an antalgic position, with the head flexed⁷.

Tuberculous thyroiditis is the acute inflammation of the thyroid gland in the context of pulmonary tuberculosis. It is an extremely rare condition and can affect the thyroid gland diffusely, miliary and less frequently, through focal tuberculosis, by a superficial cold abscess, a multinodular goiter or an abscess associated with classic inflammatory signs⁸. The symptomatology is similar to that of subacute thyroiditis. In case of focal tuberculous thyroiditis, the ultrasound examination may reveal a heterogeneous, hypoechogenic mass, similar to a cancerous lesion. Computed tomography can detect lesions with central caseous necrosis. Imaging examination did not prove to be very useful because of the very low incidence of the disease. Fine needle aspiration cytology or the histopathological examination of the specimen are gold standard for diagnosis⁸. Differential diagnosis includes subacute thyroiditis de Quervain or other infectious forms of acute thyroiditis.

Subacute thyroiditis, also known as de Quervain thyroiditis or granulomatous thyroiditis, represents a subacute, non suppurative inflammation of the thyroid gland, with viral aetiology, over 50% of patients presenting with upper respiratory tract infection in their immediate history⁹. Among the viruses involved, there is the urlian virus, coxsackie, influenza, adenoviruses and echoviruses, but the identification of the virus involved is difficult and doesn't influence the treatment. Subacute thyroiditis has a peak incidence between 30-50 years and is more common in female patients, with a 3:1 ratio^{7, 9}. The clinical manifestations are similar to that of acute suppurated thyroiditis, but the onset is not brutal and includes pain in the thyroid gland, that extends to the mandibular angle and the lobe of the ear, unilaterally or bilaterally, and is associated with a moderate increase in the volume of the gland and fever¹⁰.

Post-partum thyroiditis, silent or painless thyroiditis, is a condition that presents common elements with both autoimmune thyroid diseases and subacute thyroiditis. It affects about 5% of women, within 3 to 6 months after birth⁷. Typically, the patient presents a painless goiter accompanied by a slight severe phase of thyrotoxicosis, which lasts 2 to 4 weeks and is followed by a 4 to 12-week period of hypothyroidism, with complete resolution and return to euthyroid state^{7, 9}. Laboratory findings include low-level radioactive iodine uptake in the initial phase, because of TSH suppression and release in circulation of thyroid hormones¹¹.

Radiation induced thyroiditis is the inflammation of the thyroid gland secondary to radiotherapy applied to the neck, both for thyroid hyper function pathology and for head and neck cancers. The most common complication of radiotherapy is hypothyroidism, but it can rarely cause acute thyroiditis and more often chronic thyroiditis. These complications may occur from 6 months after irradiation to 40 years¹².

Hashimoto's thyroiditis (chronic lymphocytic thyroiditis or autoimmune chronic thyroiditis) is the most common cause of chronic thyroiditis and goiter in children and young adults. It is an autoimmune disease characterized by the presence of diffuse lymphocyte infiltration in the thyroid gland and thyroperoxidase antibodies in the serum¹⁰. It is associated with other autoimmune diseases including myasthenia gravis, vitiligo, rheumatoid arthritis or with type I diabetes and adrenal idiopathic insufficiency, known as Schmidt's syndrome (polyglandular autoimmune syndrome)¹¹. Hashimoto's thyroiditis is characterized by a painless, firm thyroid, that can remain unknown until it causes compression of surrounding structures¹³. Symptomatology varies with thyroid function, so the clinical presentation may include signs of hyperthyroidism (hashitoxicosis), hypothyroidism (thyroid insufficiency, myxoedema), but there are also cases when the thyroid function is normal¹⁴.

Riedel's thyroiditis or fibroid thyroiditis is a rare condition that occurs predominantly among middle-aged female patients. It is a chronic thyroiditis defined by a process of intra-thyroid fibrosis with extension to adjacent tissues. The symptomatology has a slow development and the patient presents with a voluminous, unilateral or symmetrical, of woody consistency and painless goiter, accompanied by signs of compression of surrounding structures, such as dyspnoea, dysphagia, venous turgidity, in most cases the thyroid function being normal. The aetiology is not fully understood, some authors consider Riedel's thyroiditis a stage in the evolution of de Quervain thyroiditis or a severe form of Hashimoto's thyroiditis^{9,15}.

Diagnosis of thyroid inflammatory pathology may prove difficult, taking into account the variability of symptoms depending on the evolution phase or the form of presentation. The diagnosis includes clinical examination and paraclinical investigations.

Acute suppurated thyroiditis is a rare disease. The paraclinic examination reveals the specific changes of inflammation, such as elevated ESR and significant leukocytosis. Most commonly, the thyroid function is preserved, but in case of significant destruction of thyroid tissue, thyrotoxicosis may be encountered^{6,16}. Fine needle aspiration can highlight a purulent aspirate and polymorphonuclear leukocyte infiltration, being able to guide the treatment in the case of bacterial

aetiology, by sending the aspirate for bacterial cultures and antibiotic susceptibility tests¹⁷. Special attention should be paid to immunosuppressed patients, because in this case the aetiology may be fungal, mycobacterial, or with pneumocystis. Subacute thyroiditis is mainly considered for differential diagnosis, this being more common and presenting similar manifestations¹⁸. The brutal onset of the symptomatology and glandular asymmetry generally leans the diagnosis towards acute thyroiditis. It can cause compression in the trachea, oesophagus and recurrent nerves, causing dyspnoea, dysphagia and dysphonia.

Subacute thyroiditis has a triphasic clinical course, over approximately 6 months: the thyrotoxic, hypothyroid and recovery phase. Laboratory tests evaluating the thyroid function vary according to the stage of the disease⁷. Initially, T4 and T3 hormones exhibit elevated levels, with TSH suppression, a very low radioactive iodine uptake, increased erythrocyte sedimentation rate, sometimes above 100 mm/h, and negative thyroid autoantibodies¹⁰. During the hypothyroid phase, these values are reversed, with the increase of TSH and the decrease of T4 and T3 levels, followed by an increasing radioactive iodine uptake in the recovery phase. Differential diagnosis includes other viral diseases involving the thyroid gland and Graves' disease, which present low levels of radioactive iodine uptake, suppressed TSH, elevated levels of thyroid hormones and the absence of thyroid antibodies¹⁹. Clinically, it resembles acute thyroiditis, but it lacks adenopathy. It generally has a self-limited evolution (1-3 months) with complete healing, yet it can rarely become chronic²⁰.

Post-partum thyroiditis is characterized, similar to subacute thyroiditis, by a thyrotoxicosis phase and a hypothyroid phase^{21,22}. Biphasic evolution is not mandatory, thus this condition can only manifest through one of the two phases⁷. It differs from subacute thyroiditis by normal ESR values and the presence of antithyroid serum antibodies¹⁴.

In chronic thyroiditis, the diagnosis is confirmed by histopathological examination, for both Hashimoto's thyroiditis and Riedel's thyroiditis. Increased levels of thyroperoxidase antibodies, along with elevated α -2 globulins and antimicrosomal antibodies, are specific for chronic lymphocytic thyroiditis²⁰. Hashimoto's thyroiditis is the most common form of thyroiditis and it presents a genetic component. The clinical manifestations do not include inflammatory signs, fever, dysphagia or adenopathy⁹. It is commonly associated with other autoimmune diseases (systemic lupus erythematosus, rheumatoid arthritis, myasthenia gravis) and may degenerate malignantly²³. There are a number of other disorders with high serum levels of antithyroid antibodies

such as Graves' disease, idiopathic myxoedema and in 20-40% of patients with normal thyroid function, but with lower values^{7,9}. Thyroid hormone, TSH and radioactive iodine uptake values vary with the evolution phase, of hyperthyroidism or hypothyroidism.

Extra thyroid extension and invasion of surrounding tissues differentiate Riedel's thyroiditis from other thyroiditis. Chronic inflammation of the gland determines a sclerotic transformation that includes the adjacent structures²⁴. The onset is insidious, with firm, generally unilateral thyroid mass, with smooth, regular and well-contoured margins, painless, profound, non-inflammatory, non adenopathic woody goiter. Complications are due to proximity compression. The evolution is generally slow, with signs of hypothyroidism.

CONCLUSIONS

Thyroid inflammatory pathology is characterized by a large variability of both aetiology and symptomatology. Thyroiditis may manifest with hypothyroidism or hyperthyroidism, but there are cases when the thyroid function is preserved, so the diagnosis may be difficult. The clinical presentation of each disease should be complemented by a series of paraclinical examination, including laboratory investigations, functional explorations, serological tests, histological or cytological examinations, and imaging explorations in some situations.

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