



Thyrotoxicosis due to Atypical Subacute Thyroiditis Scintigraphically Presented as Toxic Adenoma – Case Report

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Abstract

Subacute thyroiditis (SAT), also known as DeQuervain's or granulomatous thyroiditis is an inflammatory condition of the thyroid gland, which is usually fully affected. Severe pain and tenderness in the thyroid bed occur typically and are followed by weakness, fatigue, pain in muscles and joints, and light to moderate fever and symptoms of thyrotoxicosis - nervousness, sweating and rapid heart beat and trembling. Temporary elevated serum thyroxin, suppressed TSH and elevated serum markers of inflammation in the acute phase are pathognomonic for the SAT, with diffusely absent binding of radioactive iodine or technetium-pertechnetate in the thyroid gland due to thyrocytes destruction. Rare cases of atypical SAT - painless or with minimal pain, SAT limited to one thyroid lobe or focal thyroiditis, are reported in literature. We report a rare case of a minimally painful SAT associated with functional adenoma in the right lobe of the thyroid gland, which was, in thyrotoxic, acute phase, scintigraphically presented as toxic adenoma, in fact representing a functional adenoma tissue unaffected by destructive thyroiditis.

Keywords: Atypical subacute thyroiditis; Autonomously functioning thyroid nodule; Toxic adenoma

Introduction

Subacute thyroiditis (SAT), also known as DeQuervain's or granulomatous thyroiditis is an inflammatory condition of the thyroid gland, which is usually affected as a whole. It can last from several weeks to several months, probably of viral origin, also occasionally described as epidemic illness, resolve spontaneously, and it can recur. The most commonly affects women between the fifth and sixth decades of life. Typically it presents with severe pain and tenderness in the thyroid bed followed by weakness, fatigue, pain in muscles and joints, light to moderate fever and symptoms of thyrotoxicosis - anxiety, sweating, rapid heart beat and trembling. Rare cases of atypical SAT: painless or with minimal pain, SAT limited to one lobe of the thyroid, or focal thyroiditis are described in literature as well [1].

Case Presentation

Seventy two-year-old female patient was hospitalized at the Infectious diseases department with fever of unknown origin and fatigue, which lasts about a month back. In the personal history there was a high blood pressure treated with ACE inhibitor and multiple sclerosis. Palpatory finding of the thyroid gland on admission was normal, and markers of inflammation, fibrinogen, and CRP were positive. The treatment with antibiotics for suspected urinary infection has been started, due to a finding of a positive urine culture. Given that the pain persisted, the tenth day of hospitalization thyroid hormones analyses were done, showing increased free fraction of thyroid hormones and suppressed TSH, with, still elevated fibrinogen. At this point, the patient was clinically moderately thyrotoxic with palpable, uneven, movable on swallowing thyroid gland, with slightly painful left lobe. On echosonography, thyroid gland was slightly diffusely enlarged, diffusely very heteroehogenous, predominantly hypoechogenic, with predominantly isoechogenic nodal formation distally in the right lobe, with diameter around 15,8x12,5x15,8 mm. Pertechnetate scan indicated the existence of a functional tissue in the lower half of the right lobe, with total suppression of surrounding thyroid tissue (Figure 1a). Thyroid scintigraphy with methoxy-isobutyl-

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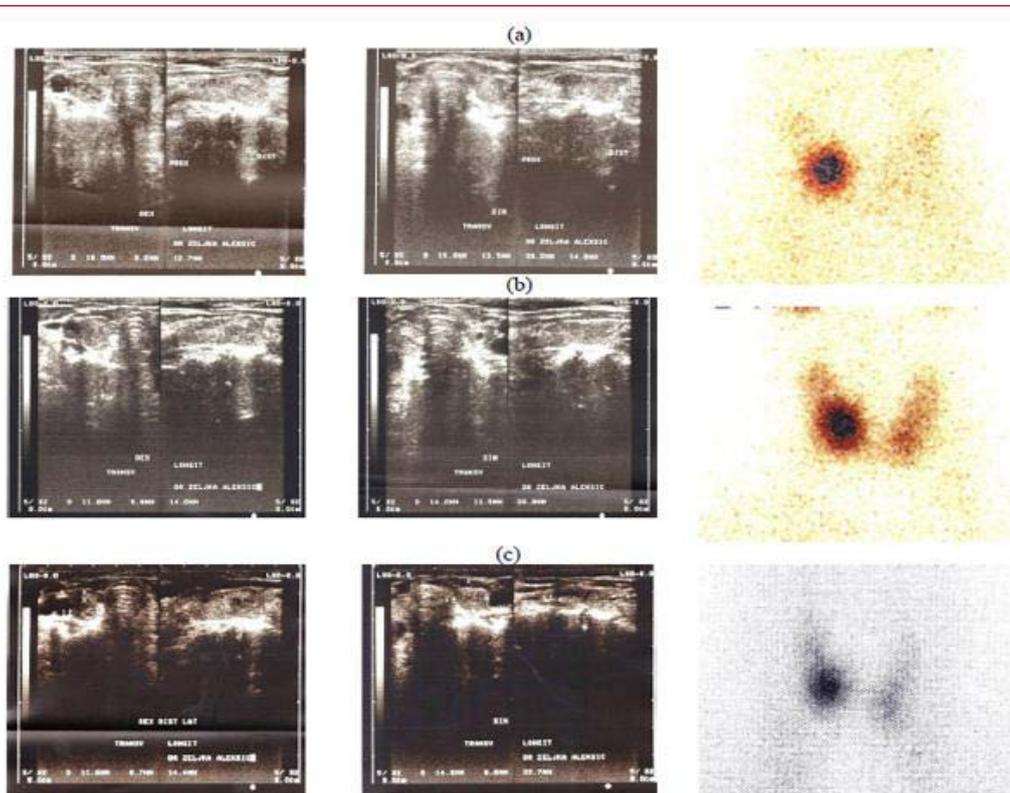


Figure 1: Echosonographic findings and pertechnetate thyroid scan in a patient during follow-up (a) the 1st visit. (b) Four months after 1st visit. (c) One year after 1st visit.

isonitrile (MIBI) was performed and showed slightly decreased and inhomogeneous uptake with the parts of more intensive uptake into the lower parts of both lobes (Figure 2). Glucocorticoid therapy was started with a gradually decreasing doses on five days, with a total length of about a month, along with monitoring of thyroid status. Clinical and biochemical thyroid status normalized about 6 weeks after diagnosis (Table 1). Control echosonography about 3 months after diagnosis, showed the existence of slightly hypoechoic nodule in the distal part of right lobe with diameter around 16x9x12 mm, with moderately heteroechoic parenchyma outside the nodule. Control pertechnetate scan confirmed the existence of functioning adenoma in the distal part of right lobe and the recovery of uptake in the surrounding tissue of the thyroid gland (Figure 1b). The last check-up, about a year from the acute phase showed normal functional thyroid status (Table 1), echosonographically, finding was similar to the previous one, and on a thyroid pertechnetate scan functional adenoma with slightly decreased uptake in the surrounding tissue was present (functional adenoma of the right lobe) (Figure 1c).

Discussion and Conclusion

The cause of subacute thyroiditis is rarely possible to determine. Given that it often occurs after a respiratory infection, it is assumed that it causes infectious agent. In some patients the serological analysis or cultured thyroid tissue sample confirmed the presence of the virus mumps, and recorded the occurrence of the epidemic occurrence [2]. Other viruses that have been isolated in some patients, including measles virus, influenza virus, H1N1 influenza virus, adenovirus, Epstein-Barr virus, coxsackie virus B4, and even cytomegalo virus [3-10]. It is believed that there is a genetic pre disposition to an inflammatory response to infection with different thyroid viruses

[10]. There are cases of subacute thyroiditis described in patients treated with immunomodulatory therapy (interleukin 2, TNF- α and interferon- γ) [11] as well as in patients after administration of contrast media for radiological tests [12].

SAT is rare in children [13]. Several times more common in women than in men, usually from the third to fifth decade of life [14,15]. It is rare in pregnancy [16]. The incidence of the disease is about five times lower than the incidence of Graves' disease [1].

It is typically presented with severe pain and tenderness in the thyroid bad, which can spread to the jaw or ear, accompanied by weakness, fatigue, pain in muscles and joints and light to moderate fever, and symptoms of thyrotoxicosis - anxiety, sweating, rapid heart and trembling. Difficulty with swallowing, even transient vocal cord paresis were described also [17]. Thyroid gland is usually enlarged, firm and painfully sensitive to palpation. The symptoms may culminate in the third and fourth days of the onset of the disease, and then gradually weaken and disappear in one week. However, the most common symptoms develop gradually over one to two weeks, and in the next 3-6 weeks after fluctuating weight and representation. In some patients, during many months after of the onset of the disease, many exacerbations of symptoms may occur until full recovery [1,18].

There are rare cases of atypical SAT described: painless, or with minimal pain [19], SAT limited to one thyroid lobe, or focal thyroiditis [20,21], and the thyroid storm caused by subacute thyroiditis as well [22]. In the available literature we found one case report of SAT coexisting with autonomously functioning nodule, similar to our own described case [23].

Recovery after subacute thyroiditis is accompanied by transient

Table 1: Findings of serum biochemical indicators of thyroid status and markers of inflammation as well as clinical status in patient during follow-up. EU-clinically euthyroid; MB-palpable, minimally painful thyroid; BB – painless, non-palpable thyroid.

Serum Analysis (units)	Date						Reference range
	1 st visit	8 th day	16 th day	45 th day	4.5 month after 1 st visit	1 year after 1 st visit	
TSH (mIU/L)	0,01	0,01		1,2	0,3	1,4	0,4-3,5
FT4 (pmol/L)		36,91	23,72	9,99	8,55	13,77	7,8-14,3
FT3 (pmol/L)	5,33	8,03	3,71	5,36		6,2	3,8-6
Tg (ng/ml)			10,27				1,59-50,3
TgAb (IU/ml)			0,2				<4
TPOAb (IU/ml)			1				<9
SE (mm)			3	72			
FIBRINOGEN (g/L)		8,6	3,0	4,7			2,5-5
Clinical status	EU MB	EU BB	EU BB	EU BB	EU BB	EU BB	

hypothyroidism in about quarter of patients, but in less than 10% it may result in permanent hypothyroidism [24].

Pathognomonic for the SAT is temporary elevated serum thyroxin level, suppressed TSH and elevated erythrocyte sedimentation rate and other serum markers of inflammation (CRP, fibrinogen) in the acute phase, with diffusely absent uptake of radioactive iodine or technetium-pertechnetate in thyroid gland because of the destruction thyrocytes. The serum concentration of thyroglobulin is increased for the same reason, while the anti-thyroglobulin antibody and anti-TPO antibody levels are usually negative [1]. In half of the patients the increase of liver enzymes in the serum may be found, which may be persist for up to several months [25].

Pertechnetate thyroid scan is cheap and convenient diagnostic method to confirm SAT, where there is an absent uptake of radiotracer due destructive process in the thyroid [26]. Thyroid scintigraphy with fat soluble radiopharmaceuticals, such as MIBI or tetrofosmin may in acute, thyrotoxic phase of the disease, show increased uptake of the tracer in the thyroid, probably as a result of hyperemia caused by inflammation [27,28]. In our experience in the present case, the binding of MIBI in thyroid in the acute phase is rather impaired than enhanced, which can be interpreted as a result of destructive changes in the thyroid also, knowing that MIBI is taken by viable cells. In the acute, thyrotoxic phase, color flow Doppler sonography (CFDs) of thyroid can be helpful in the differential diagnosis to other thyrotoxic states (autoimmune or autonomous hyperthyroidism), because in SAT there is absent CD signal in the affected thyroid [29]. Standard gray scale sonography shows characteristic irregular hypoechoic fields of affected thyroid parenchyma, whose extensiveness is usually a measure of severity of clinical manifestations [30].

Conditions which may be similarly clinically manifested as SAT and come into consideration as a differential diagnosis entities are pharyngitis [31], temporal arteritis [32], pain in the jaw teeth of origin [33], bleeding in thyroid cysts [22], less often Hashimoto's thyroiditis. In atypical, painless or minimally painful cases SAT, this should be distinguished from the autoimmune painless thyroiditis, lymphocytic thyroiditis variants, in which no systemic inflammatory signs and symptoms are present [34]. Focal SAT can mimic suppurative thyroiditis, and thyroid cancer as well [29].

The therapeutic approach depends on the severity of the clinical picture. In some patients, there is no need for any medical therapy. Some times it is necessary to apply non-steroidal anti-inflammatory drugs and aspirin to reduce pain. In cases of severe symptoms

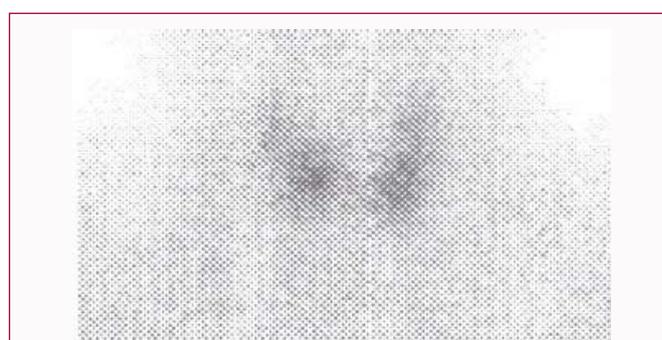


Figure 2: MIBI thyroid scan in patient at acute phase of the disease 19. 12. 2914.

glucocorticoid therapy could be indicated [35]. It is usually given in a single daily dose of 40 mg of prednisone and at 7 days the dose is gradually reduced by 5 mg for 6 weeks. An oral therapy with cholecystography agents (sodium ipodate or sodium iopanoate) were reported as safe and effective in controlling thyrotoxicosis induced by subacute thyroiditis [36]. In the case of the development of permanent hypothyroidism after an episode of SAT, levothyroxine substitution is indicated.

We present an unusual case of a minimum painful SAT associated with functional adenoma in the right lobe of the thyroid gland, which scintigraphy presented as a toxic adenoma in thyrotoxic phase, and in fact was a functional adenoma tissue unaffected with destructive thyroiditis. On the standard sonography adenoma tissue was more echogenic than the surrounding thyroid parenchyma, which showed a typical heterogeneous hypoechoic appearance, and the MIBI scan showed moderately intense tracer binding in the thyroid gland. Serum markers of inflammation were typically high, with suppressed TSH and elevated serum thyroxin in the acute phase, with a gradual normalization during follow-up, but without transient hypothyroid phase, probably as a consequence of the existence of regional autonomy. Pertechnetate scan during follow-up showed the functional recovery of the previously affected gland parenchyma with destructive thyroiditis.

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