CLINICAL VIGNETTE

Delayed Abnormal Thyroid Function Tests in Subacute Thyroiditis

Pouyan Famini, MD and Na Shen, MD

Case Presentation

A 32-year-old female without significant past medical history presented to Endocrinology for evaluation of anterior neck pain. Her history was notable for pharyngitis that had resolved following 10-day course of penicillin. She reported six days of external neck pain that worsened with deglutition. Neck movements also exacerbated her discomfort with one-day history of swelling and increase in the size of her neck. Furthermore, she had experienced panic attacks with worsening anxiety, fatigue, palpitations and shortness of breath. She also reported night sweats and episodes of tremors in the middle of the night. She did not have prior history of thyroid disease, and her thyroid stimulating hormone (TSH) was 1.0 (0.45-4.50 U/mL) 6 months prior to presentation. Family history was notable for her mother who had thyroid disease and had been treated with "iodine" in the past.

Physical examination was notable for normal vital signs with temperature 37.5 ^{o}C, blood pressure of 111/70 and pulse of 89. Thyroid was enlarged and tender on palpation without palpable nodules. She had a fine tremor of bilateral hands with outstretched arms. Cardiovascular, pulmonary, abdominal and extremity examination were otherwise normal.

Laboratory evaluation on the day of presentation demonstrated a slightly elevated sedimentation rate (ESR) of 33 (0-32 mm /hr). Otherwise thyroid function tests were normal with TSH 0.632, free thyroxine (T4) 1.50 (0.82-1.77 ng/dL) and total triiodothyronine (T3) 136 (71-180 ng/dL). Thyroid antibodies were normal with thyroid stimulating immunoglobulin 27% (0-139%), thyroid peroxidase antibody 12 (0-34 IU/mL) and thyroglobulin antibody <1.0 (0.0 to 0.9 IU mL). Thyroid ultrasound demonstrated diffusely heterogeneous thyroid echogenicity consistent with thyroiditis and an 8 mm hypoechoic, solid nodule in the isthmus without microcalcifications. She was prescribed ibuprofen for presumed thyroiditis.

Due to ongoing thyroid tenderness and thyroid ultrasound findings repeat thyroid function tests were performed one week later consistent with hyperthyroidism with TSH 0.022, free T4 3.39 and total T3 366. ESR was 39. She was advised to continue ibuprofen and prescribed propranolol for treatment of subacute thyroiditis. She was seen in follow up six weeks after initial presentation with resolution of her symptoms including thyroid tenderness. Physical examination was normal including a non-tender thyroid gland that was normal in size. There were no tremors with outstretched arms. Thyroid function tests also normalized with TSH 2.5 and free T4 index 5.5 (4.5–10.5). Further thyroid function tests two months after initial presentation remained normal with TSH 2.29, free T4 1.15 and total T3 107.

Discussion

Subacute granulomatous thyroiditis is a cause of thyrotoxicosis characterized by neck pain or discomfort and tender diffuse goiter. The disease is a self-limited, inflammatory thyroid disease associated with systemic symptoms. The hallmark of diagnosis is the triad of painful thyroid, elevated ESR and low radioiodine uptake.[1] Treatment is usually supportive and can be treated with nonsteroidal anti-inflammatory drugs (NSAIDs) or high dose corticosteroids in more severe cases. Beta-blockers may also be prescribed for systemic symptoms of hyperthyroidism.

Thyrotoxicosis in subacute thyroiditis occurs due damage to thyroid follicular cells and breakdown to stored thyroglobulin, leading to unregulated release of thyroid T4 and T3. The hyperthyroid stage typically lasts for two to six weeks and is typically followed by stages of euthyroidism, hypothyroidism and eventually restoration of normal thyroid function. Hypothyroidism is usually transient and occurs due to TSH suppression during hyperthyroid phase leading to inhibition of thyroid hormone synthesis. Treatment of hypothyroidism is usually not indicated unless symptoms are severe. Recovery of thyroid function occurs when inflammation subsides with thyroid follicle regeneration along with normal synthesis and secretion of thyroid hormone. However, approximately 15% of patients may develop permanent hypothyroidism requiring thyroid hormone replacement therapy.[2]

The pathogenesis of subacute thyroiditis is still uncertain although it is believed a viral infection or a postviral inflammatory process leads to thyroiditis.[3,4] Many patients typically have a history of upper respiratory infection two to eight weeks prior to presentation of thyroid disease. ESR is typically elevated with reports of > 60 mm/h in 80% and > 100 mmg/h in 25% of subjects.[5] Thyroid antibodies are not associated with the disease as they are usually undetectable or present at low titers. However, in some cases thyroid antibodies may appear after the onset of the illness, followed by gradual disappearance

after several months indicating that thyroid antibodies are the result and not cause of thyroid inflammation.[3]

Thyroid imaging may also be helpful in diagnosis. Thyroid radioiodine or technetium imaging study will typically demonstrate low uptake (usually less than 1 to 3 percent) or a faint heterogeneous pattern during the acute hyperthyroid phase. Thyroid ultrasonography commonly demonstrates heterogeneous echogenicity with focal hypoechoic areas.[6] Ill-defined thyroid nodules are often observed during the acute phase with spontaneous resolution of most of these nodules following resolution of subacute thyroiditis.[5] Fine-needle-aspiration biopsy may be delayed as most of these nodules are not malignant and some are not necessarily true nodules as aggressive treatment may result in unnecessary surgery.[7]

Our patient presented with six-day history of thyroid pain and typical systemic symptoms of thyrotoxicosis. Initial thyroid function tests were normal with non-specific slight elevation of ESR and negative thyroid antibodies. Due to high degree of suspicion repeat thyroid function tests were performed with finding of suppressed TSH, elevated T4 and elevated T3 that confirmed diagnosis of subacute thyroiditis. Thyroid ultrasound was consistent with thyroiditis and demonstrated a subcentimeter hypoechoic thyroid nodule. Thyroid uptake and scan was not ordered, as it was not deemed necessary to confirm the diagnosis. Her symptoms of thyroid pain and hyperthyroidism quickly resolved with NSAID therapy. Follow up thyroid function tests were normal on serial laboratory evaluations indicating resolution of thyroiditis without hypothyroid phase. She is scheduled to follow up to monitor thyroid function tests and thyroid ultrasound to monitor for changes of her previously identified thyroid nodule.

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