

Inflammation Spreading from Subacute Thyroiditis Following Fine-needle Aspiration: A Case Report

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Abstract: Ultrasound guided fine-needle aspiration (FNA) is well-accepted in the evaluation of thyroid nodules. Though local pain and minor hematomas are the most common complications, other adverse events following FNA are rare. In this case report, we described a complication showing inflammation spreading in a healthy woman after FNA. We presented the case to make physicians aware of the potential complication.

Key Words: Thyroid; Biopsy, Fine-Needle; Thyroiditis, Subacute; Complication; Inflammation

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Ultrasound guided fine-needle aspiration (FNA) is primarily recommended for evaluation of thyroid nodules and has been well-accepted due to its simplicity, reliability and safety [1]. Local pain and minor hematomas are the most common complications [1-3]; while serious complications seem to be extremely rare. Other reported adverse events following thyroid FNA include swelling of thyroid, infection, recurrent laryngeal nerve palsy, vasovagal reaction, tracheal puncture, dysphagia, needle track seeding, needle track sinus, nodule volume alteration, and post-aspiration thyrotoxicosis [1]. Here we encountered a case of complication following FNA, showing inflammation spreading in the thyroid in a healthy woman. We presented the case to make physicians aware of the potential complication.

Case Presentation

A 37-year-old woman was referred for an incidental thyroid nodule in the right lobe. No fever, upper airway infection or local pain was noted. Her medical history was not remarkable for any radiation exposure to the cervical area or for a family history of thyroid disease.

Laboratory examinations revealed slightly elevated thyroglobulin (TG) antibody (5.07IU/ml, N: <4.11) and decreased thyroid stimulating hormone (0.062uIU/ml, N: 0.35-4.94), while the results of thyroxine, thyroid peroxidase antibody, erythrocyte sedimentation rate and complete blood count were within normal ranges. The US showed a heterogeneous hypoechoic nodule of 17×8×24mm in size in the right lobe of thyroid, with indistinct margin. Color Doppler showed lack of color flow in the nodule (Fig. A and B). The clinical diagnosis was thyroiditis [4,5], which was scored as TI-RADS category 4 [6], without regional lymphadenopathy. US-guided FNA, using a 25 G needle by lateral approach was performed to rule out malignancy. The skin was cleaned with compound iodine. The needle was inserted through the surrounding thyroid into the targeted nodule. Five passes were performed systematically to ensure adequate specimen for cytological analysis. The result was reported as Bethesda II (benign), which showed benign follicular cells in the background of erythrocyte and inflammatory cells (Fig. C). Thyroiditis was considered as a possible diagnosis and US follow-up was advised.

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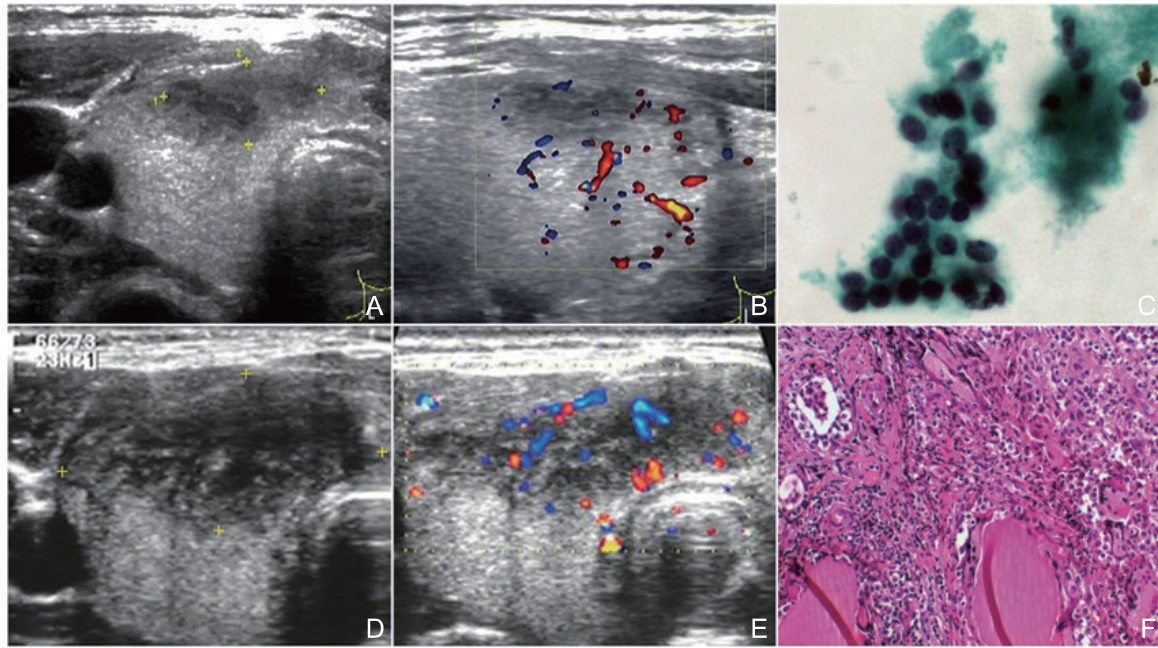


Figure 1 US showed a 17×8×24mm nodule in the right lobe of thyroid showing a heterogeneous, hypoechoic area with indistinct margin (A, +) and lack of color flow (B) before fine-needle aspiration (FNA). Cytological analysis reported Bethesda II (benign), showing benign follicular cells (C). US showed obviously enlargement of the right-sided nodule (34×13×33mm) spreading to the isthmus (D, +), with increased of color flow (E) 12 days after FNA. Histological examination revealed subacute thyroiditis (F).

12 days after the FNA, the patient was admitted to hospital with complaints of pain, swelling and palpable firm mass in the right neck. Physical examination indicated a hard and swollen mass in the right lobe of thyroid without erythema or skin temperature arisen. Body temperature and complete blood count were within normal ranges, while the neutrophil percentage increased (78.9%, N:40.0%-75.0%) and lymphocyte percentage decreased (14.7%, N:20.0%-50.0%). US examination of the thyroid showed obvious enlargement of the right-sided nodule (34×13×33mm), which spread to the isthmus, with increasing color flow (Fig. D-E). Though inflammation spreading related to FNA was suspected first, the patient was anxious for malignancy and required surgery. The partial thyroidectomy was then performed and the histological examination revealed subacute thyroiditis (SAT) in the right lobe, which showed disrupted follicles infiltrated by inflammatory cells including multinucleated giant cells (MNGCs), lymphocytes, and neutrophils (Fig. F).

Discussion

This is a rare case of complication, showing inflammation spreading in SAT after FNA in a healthy individual.

SAT is an inflammatory condition of the thyroid with characteristic presentations and clinical course, which includes classic painful SAT (PFSAT), and

painless SAT (PLSAT) [7]. Unlike PFSAT showing a tendency to follow upper respiratory tract infections or sore throats, which has suggested a viral infection, PLSAT occurs spontaneously or following pregnancy. It is histologically similar to Hashimoto's thyroiditis and shows thyroid enlargement usually without discomfort, positive anti-thyroid antibodies, and thyroid function test abnormalities. Though PLSAT is less common than PFSAT, it should be considered in the differential diagnosis of a solitary, painless nodule [8].

However, PLSAT appearing as painless solid nodules indeed generates challenges in differentiating from malignancy [9]. FNA may provide assistance, particularly in excluding other thyroid lesions [10], as it shows characteristic for SAT, including the presence of multiple MNGCs, a dirty background accompanied by mild-moderate cellularity, degenerated-proliferated follicular epithelium cells, rare epithelioid granulomas and mixed type inflammatory cells [9,11]. Although SAT is usually diagnosed clinically, the assessment of US and cytological findings in conjunction with clinical findings will assist in the achievement of an accurate diagnosis [9].

The inflammation spreading in SAT following FNA hasn't been reported and the reasons of the inflammation spreading remain unclear. One possible explanation is that an autoimmune reaction, which has already existed in PLSAT as these patients are frequently thyroid peroxidase (TPO) or TG antibody

positive [7], may be intensified by FNA which is a kind of mechanical stimulation, to cause more immune cells to infiltrate and spread [12] in this present case. FNA-related infection may be another explanation. Unlike those reported cases of post-FNA infection showing acute suppurative thyroiditis or thyroid abscess [13–15], there wasn't sufficient evidence, such as high fever, leukocytosis, or abscess formation, to support common bacterial secondary infection following FNA, like *Propionibacterium acnes* [14] in the present case. However, infection caused by uncommon bacteria might exist, since the patient showed increased neutrophil percentage and decreased lymphocyte percentage after FNA.

This study describes a case of inflammation spreading developed in a healthy individual with PLSAT after FNA. The possibility of such an extremely rare complication should be kept in mind.

Conflicts of Interest

The authors declare that they have no competing interests.

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