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## CLINICAL VIGNETTE

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# Thyroiditis after Fine Needle Aspiration of a Thyroid Nodule: A Rare Complication of a Common Procedure

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### Introduction

Incidental thyroid nodules are a common clinical problem, diagnosed with increased frequency in recent years with the use of newer and highly sensitive imaging techniques. Since approximately 19%-67% of healthy, asymptomatic individuals will eventually be diagnosed with nodular disease of the thyroid, thyroid fine needle aspiration biopsy (FNA) has become a commonly performed procedure.<sup>1</sup> Thyroid ultrasound can best characterize whether a nodule should be biopsied based on several criteria including size, shape, vascularity, and calcifications. FNA biopsy is the gold standard diagnostic tool for thyroid nodules, with a high diagnostic sensitivity and specificity.<sup>2</sup> Typically cited complications of FNA are pain, hematoma, and rarely infection. The potential for thyroiditis as a complication of FNA is infrequently reported, as it is a rare occurrence of a common procedure. In one prospective study of post-aspiration thyroiditis, the complication was estimated to occur <1% of the time.<sup>3</sup> Patients who develop this type of thyroiditis have either partially cystic or fully cystic nodules. One case report describes thyroiditis occurring in a patient who underwent FNA while receiving hCG injections.<sup>4</sup> Although the mechanism for post aspiration thyroiditis is unclear, it is thought to be related to inflammation of the gland.<sup>3</sup> The inflammation may occur from leakage of proteolytic enzymes found in the cystic material from the thyroid. It may also occur from direct injury causing release of preformed thyroid hormone. We present the case of a patient who developed symptomatic thyrotoxicosis from thyroiditis after FNA of a thyroid nodule.

### Case Presentation

The patient is a 56-year-old woman with a past medical history of multinodular goiter presenting with neck pain accompanied by fever, fatigue, pain with swallowing, and enlargement of bilateral thyroid glands. One-week prior she underwent FNA of a cystic right thyroid nodule with four passes using 25-gauge needles attached to 5 ml syringes. In addition to intermittent fever and fatigue, she also had myalgias and anterior neck pain immediately after the procedure. She took ibuprofen for pain daily since the initial FNA biopsy. There was no known personal or family history of thyroid disease. She denied taking any other medications or supplements at the time. Her vital signs revealed sinus tachycardia at 110 bpm. She was afebrile upon presentation. Her thyroid lobe was very tender to palpation in bilateral lobes, and diffusely enlarged. There was no

thyroid bruit. Thyroid ultrasound performed on that day revealed multinodular goiter with confluent nodules and heterogeneous echotexture. There was no evidence of a suppurative collection or increased vascularity. The cytopathology report from the FNA the week prior was benign. The air-dried and fixed smears contained abundant thyroid follicular epithelial cells arranged in flat sheets. Laboratory studies one month prior to the visit showed a normal TSH of 1.3 mIU/mL (normal range, 0.3-4.7) and free T4 1.1 ng/dL (normal range, 0.8-1.6 ng/dL). Laboratory studies upon presentation showed TSH <0.02 mIU/mL, free T4 1.9 ng/dL, free T3 453 pg/dl (normal range, 222-383 pg/dL), TPO Ab <5.0 (normal range, <20 IU/mL), Thyroglobulin Ab <0.9 (normal range, <4.0 IU/mL), and Thyroid-Stimulating immunoglobulin (TSI) <89 (normal range, <140%). Markers of inflammation such as a sedimentation rate and C reactive protein were not obtained. Radioactive iodine-123 uptake scan showed significantly decreased uptake of 1.9% at 24 hours (normal range, 8-25%). This was suggestive of thyroiditis as the cause of hyperthyroidism.

Approximately six weeks after FNA, the patient was no longer biochemically hyperthyroid and progressed into the hypothyroid phase of thyroiditis. Laboratory studies revealed TSH 17 mIU/mL, free T4 0.5 ng/dL, and free T3 206 pg/dL. Thyroid tests normalized after five weeks. The hyperthyroid, hypothyroid, and restoration of normal thyroid function sequence was consistent with thyroiditis. Repeat ultrasound six months later demonstrated multinodular goiter with a 30% volume reduction in the overall size of the right lobe and a 50% volume reduction of the left lobe. Given the timing of FNA in relation to the onset of thyroiditis, a diagnosis of post-aspiration thyroiditis was made.

### Discussion

Post-aspiration thyroiditis is likely to be an underreported complication, as thyroid function is not routinely assessed after FNA.<sup>3</sup> The mechanism is postulated to be destructive thyroiditis, manifested by transient neck pain and tenderness and transient hyperthyroidism. In these cases, hyperthyroidism is self-limited and can occur due to damage of thyroid follicular cells and release of preformed thyroid hormone. The quick resolution of the hyperthyroid phase and the negative thyroid antibodies, specifically the TSI level, made Graves' disease

unlikely. She did not have a viral prodrome. Her clinical history, physical exam, and improvement in symptoms weighed against a concurrent infectious thyroiditis. Kobayashi et al. described thyrotoxicosis after FNA of thyroid cysts.<sup>3</sup> The incidence of post-aspiration thyrotoxicosis was 0.9%, with elevated serum thyroid hormone levels found 2-20 days after FNA, without significant symptoms of hyperthyroidism.<sup>3</sup> Risks for post aspiration thyroiditis include a relatively large cyst and a larger gauge of needle used for aspiration.<sup>3,4</sup> A review of all reported complications of thyroid FNA reveals reports of pain, hematoma, infection, tracheal puncture, vasovagal reaction, recurrent laryngeal nerve palsy, needle track seeding of malignancy, and acute transient swelling.<sup>5</sup> Of these complications, post- aspiration thyroiditis is rare and presents with a painful neck mass with possible increase in inflammatory markers as well as thyroid enlargement on ultrasound. The potential release of cytokines and pre-formed thyroid hormone can trigger symptoms consistent with thyrotoxicosis.<sup>3</sup> Clinicians performing thyroid FNA biopsies should be aware of the potential complication of post-aspiration thyroiditis.

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