Fine-Needle Aspiration of the Thyroid Gland—Its Role in the Investigation of Thyroid Autoimmunity

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The procedure of examining the thyroid by fine-needle aspiration (FNA) cytology is widely adopted. However, its use is mostly restricted to the investigation of an enlarged gland with or without nodular lesions, the objective being to rule out malignancy.

FNA of the thyroid is useful in other clinical settings such as the demonstration of invasion of lymphocytes in autoimmune disease. This application of FNA has old traditions in Stockholm, Sweden. A pioneer in this field was Torsten Löwhagen,[1] who refined the technique and extended it to many other organs.

As a successor cytologist, I work in cooperation with Dr. Bo Wikland. We have elaborated a simple and effective algorithm for the diagnostic workup of the chronically fatigued patient. Our basic objective is to ascertain whether the patient is a victim of symptomatic autoimmune thyroiditis (AT). In this context, a cytomorphologic finding of unequivocal AT is considered to be the gold standard—the most convincing evidence of autoimmune affection of the thyroid gland.

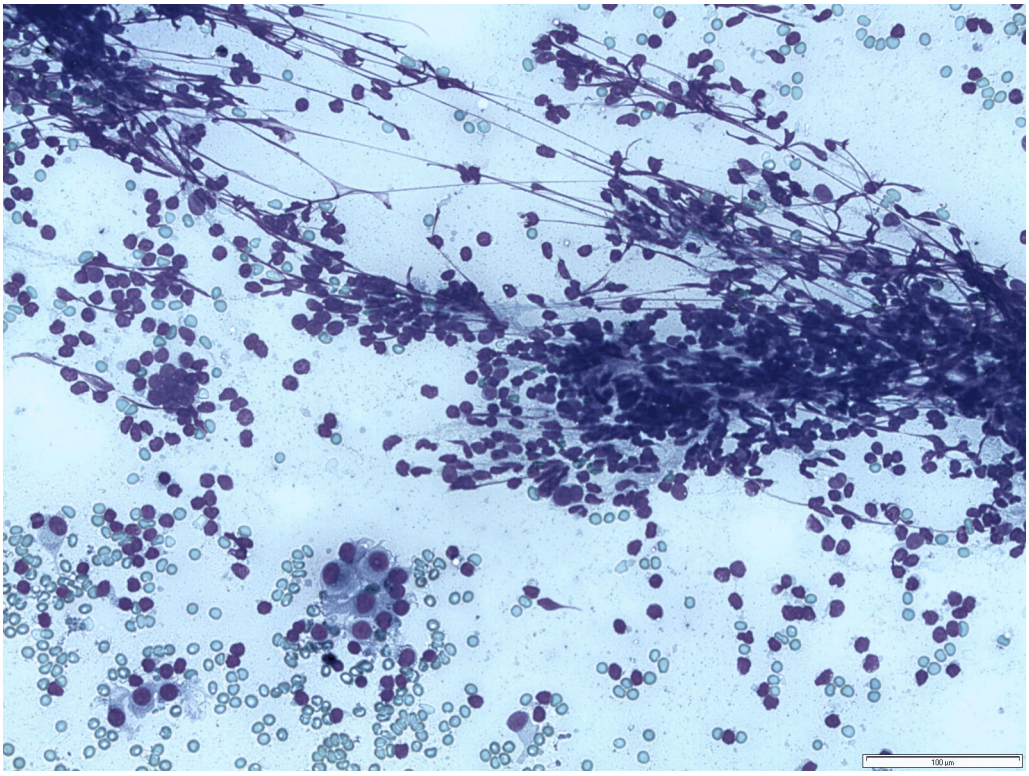

Figure 1. Thyroid epithelium with Hürteloid metaplasia and an increase and infiltration of lymphocytes due to autoimmune response.

Figure 1 shows an FNA specimen. In addition to a background of colloid and a varying amount of follicular epithelium, there is an invasion of lymphocytes. In cases of long-standing autoimmune affection, the follicular epithelium may undergo so-called Hürtheloid metaplasia. In representative specimens, I expect at least 3 follicular complexes infiltrated by lymphocytes, and a background of varying amount of lymphocytes.

In the typical case, there is little doubt of the di-

agnosis of AT. As is so often in biomedical sciences, there are borderline cases with uneven distribution of cytomorphological elements representing autoimmunity. Therefore, in case of uncertainty, repeat examination may be necessary—in particular, in the absence of convincing biochemical/serological evidence of thyroid autoimmunity. Uniform cytomorphological criteria of thyroid autoimmunity would be welcome (e.g., a minimum number of lymphocytes per visual field). Ideally, the importance of documenting thyroid autoimmunity would increase demand for more cytologists; this in turn, would help generate broad consensus documents.

Since 1998, we have performed 8416 thyroid FNA examinations in our laboratory. Of these, the main finding was AT in 1746 (21%).[2]

It is essential to examine the thyroid gland, regardless of its size. Careful palpation may provide useful information. A tender and/or firm gland suggests inflammation/scarring.

Ultrasonography (US) is of value in the examination of a low-volume gland. A small/atrophic thyroid usually represents end-stage AT, a finding mostly encountered in patients over the age of 60.

US can also support a diagnosis of active AT. The experienced examiner will frequently observe an irregular echogenicity. We see small nodules (less than 10 mm in diameter) in about 70% of patients with AT; the nodules rarely call for further investigation. US-directed FNA may be of value in cases where previously aspired material is insufficient for diagnosis.

As we have reported earlier, compared with biochemical and serological assessment alone, and in terms of diagnostic sensitivity, the morphological approach is superior for documenting symptomatic AT.[3][4] In the clinical setting of a patient with strongly suspected symptomatic AT, whose conventional biochemical tests/thyroid antibody assays fail to provide evidence in support of the clinical suspicion, FNA may cytomorphologically document AT. FNA, being an already well-accepted procedure, is a valuable tool (in addition to the evaluation of thyroid nodules) for documenting thyroid autoimmunity, and as such merits wider recognition.

References

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