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CLINICAL CASE REPORT

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The Diffuse Sclerosing Variant of Papillary Thyroid Cancer Presenting as Innumerable Diffuse Microcalcifications in Underlying Adolescent Hashimoto's Thyroiditis

A Case Report

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Abstract: Hashimoto's thyroiditis is the most common diffuse thyroid disease and is characterized by diffuse lymphocytic infiltration. However, the ultrasonographic findings of papillary thyroid carcinomas that arise from Hashimoto's thyroiditis in the pediatric and adolescent population are not well known.

We report a rare ultrasonographic finding in a 22-year-old woman diagnosed with the diffuse sclerosing variant of papillary thyroid carcinoma that arose from underlying Hashimoto's thyroiditis: innumerable diffuse microcalcifications instead of a typical malignant-appearing nodule.

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Abbreviations: Ab = autoantibodies, DSVPTC = diffuse sclerosing variant of papillary thyroid carcinoma, TG = thyroglobulin.

INTRODUCTION

Hashimoto's thyroiditis is the most common diffuse thyroid disease and is characterized by diffuse lymphocytic infiltration. It affects 1.3% of children and adolescents and has a female predominance.[1–3] Hashimoto's thyroiditis is the most important cause of hypothyroidism in children and adolescents. Although still controversial, evidence suggests an increased risk of papillary thyroid carcinoma in patients with Hashimoto's thyroiditis.[4–6] Given its rarity, however, the ultrasonographic findings of papillary thyroid carcinomas that arise from Hashimoto's thyroiditis in the pediatric and adolescent population are not well known. Here, we report the ultrasonographic findings of papillary thyroid cancer with underlying adolescent Hashimoto's thyroiditis.

CASE

Institutional Review Board approval was obtained for this retrospective study, and the requirement for informed consent was waived.

A 22-year-old woman was followed and diagnosed with Hashimoto's thyroiditis at the age of 13 years old. She had no family history of thyroid cancer. At the age of 13, ultrasonography of the neck revealed diffusely enlarged thyroid lobes bilaterally, with diffusely increased vascularity but no focal masses or calcifications (Figure 1A and B). We diagnosed this as compatible with thyroiditis. Three years later, follow-up ultrasonography (Figure 1C) showed diffuse low parenchymal echogenicity compared with the previous examination.

Six years after the last ultrasonography, she visited our institution complaining of a palpable lesion in her anterior neck. Serum thyroglobulin (TG) autoantibodies (Ab) (70.12 U/mL; normal, 0–0.3 U/mL) and microsomal Ab titer (>100 U/mL; normal, 0–0.3 U/mL) were high. The free T4 level was 1.39 ng/dL (normal, 0.89–1.7 ng/dL) and the thyroid-stimulating hormone level was 0.01 (normal, 0.25–4 ng/dL). Diagnostic neck ultrasonography showed innumerable microcalcifications with an ill-defined hypoechoic lesion replacing almost the entire left lobe of the thyroid gland (Figure 1D and E). Metastatic lymph nodes were seen at level VI on the left neck. We suspected that the thyroid lesion was a malignancy and performed ultrasonography-guided fine needle aspiration. The cytological result was a follicular lesion of undetermined significance, not otherwise categorized. Subsequently, we performed an ultrasonography-guided core needle biopsy.

PATHOLOGY

Microscopically, the thyroid core biopsy showed extensive lymphocytic infiltration with lymphoid follicles, diffuse tumor growth with tumor aggregates, and abundant psammoma bodies. There were many tumor foci within lymphatic channels. These findings were compatible with the diffuse sclerosing variant of papillary thyroid carcinoma (Figure 1F and G). No B-type Raf kinase mutation was detected.

She didn't have operation in our institution.

DISCUSSION

Hashimoto's thyroiditis is diagnosed based on TG-Ab or microsomal Ab seropositivity, accompanied by at least one of the following: abnormal thyroid function, enlarged thyroid gland, and morphological changes such as a heterogeneous

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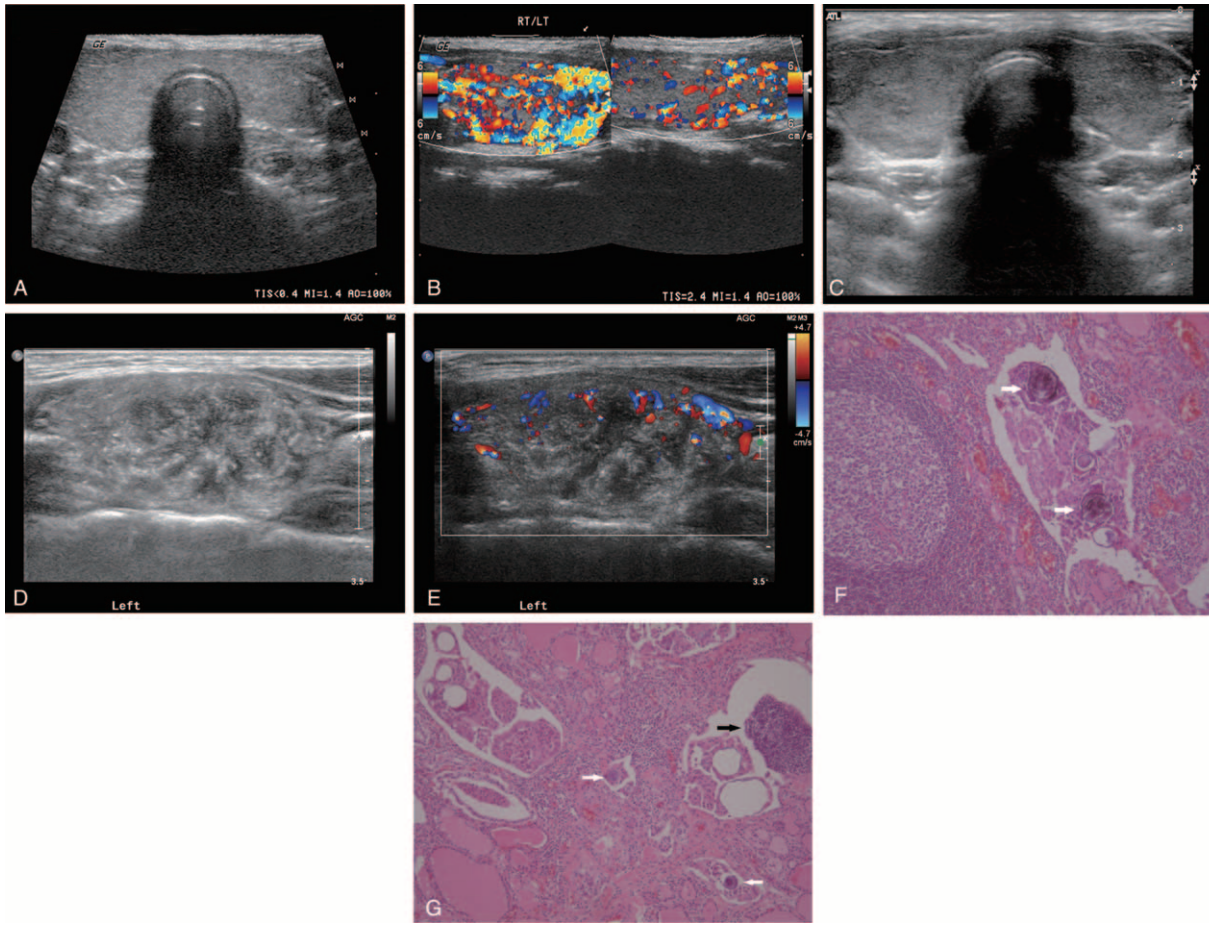

FIGURE 1. Serial ultrasonography of a 22-year-old woman who had been diagnosed with Hashimoto's thyroiditis. At the age of 13 years old, initial ultrasonography of the neck revealed diffusely heterogeneous and enlarged thyroid lobes bilaterally, with diffusely increased vascularity without any focal mass or calcifications. This was compatible with thyroiditis (A, B). Three years later, follow-up ultrasonography revealed more heterogeneous parenchymal echogenicity compared with the previous examination (C). At the age of 22, innumerable microcalcifications were detected, with an ill-defined hypoechoic lesion replacing almost the entire left lobe of the thyroid gland and increased vascularity (D, E). Histopathological sections showed lymphocytic follicles with activated germinal centers and aggregates of tumor cells and several psammoma bodies (white arrows) (hematoxylin-eosin [H&E] stain, × 100) (F). Tumor cell aggregates (black arrow) were present in the lymphatic spaces, and a few concentric calcified psammoma bodies (white arrows) were noted (H&E stain, × 100) (G).

echotexture, diffuse hypoechogenicity, and hypoechoic micronodules with a surrounding echogenic rim on thyroid ultrasonography.

The ultrasonographic appearance of thyroid cancer in patients with Hashimoto's thyroiditis is not well reported. Durfee et al[7] reported that the sonographic characteristics of cancerous nodules were similar in patients with and without Hashimoto's thyroiditis. However, they focused on nodules and diffuse lesions such as diffuse microcalcifications, and non-mass-like hypoechoic lesions were not included. Another study reported the ultrasonographic findings of 3 pediatric papillary thyroid carcinomas associated with Hashimoto's thyroiditis. In all 3 cases, irregularly shaped hypoechoic nodules with microcalcifications were noted on ultrasonography of the thyroid gland.[8] In this study, however, the variant type of the papillary thyroid carcinoma was not mentioned.

There have been case reports of 15- and 18-year-old girls with the diffuse sclerosing variant of papillary thyroid carcinoma presenting as Hashimoto's thyroiditis.[9,10] In these cases, the ultrasonographic findings of the thyroid glands included a diffusely altered thyroid parenchyma, with a snow-storm appearance, and generally enlarged thyroid lobes with diffusely prominent microcalcifications. However, the researchers overlooked possibility of causal relationship and did not make clear the order of the incident between Hashimoto's thyroiditis and papillary thyroid carcinoma.

To our knowledge, the relationship between Hashimoto's thyroiditis and the diffuse sclerosing variant of papillary thyroid carcinoma is not well established. Our patient was an extremely rare case of the diffuse sclerosing variant of papillary thyroid carcinoma arising from adolescent Hashimoto's thyroiditis. We performed ultrasonography twice before making the diagnosis of papillary carcinoma, and there were no suspicious features on these examinations. Therefore, it took <6 years for thyroiditis to develop into overt extensive papillary carcinoma in Hashimoto's thyroiditis.

Pediatric and adolescent thyroid carcinoma has a relatively favorable prognosis in terms of mortality, but a high risk of

recurrence. Younger patients tend to present with more advanced disease, including node metastasis. The American Thyroid Association Guidelines include management guidelines for children. For patients with autoimmune thyroiditis, evaluation by an experienced thyroid ultrasonographer should be performed in any patient with a suspicious thyroid examination (suspected nodule or significant gland asymmetry), especially if associated with palpable cervical lymphadenopathy.[11] However, they did not mention diffuse microcalcifications in autoimmune thyroiditis as a suspicious feature. Here, we report sclerosing variant of papillary thyroid cancer arising from adolescent Hashimoto's thyroiditis which ultrasonographic findings were innumerable diffuse microcalcifications replaced almost the entire left lobe. We wish our case would be helpful when deciding the management of thyroid lesions presenting with these features.

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