Cytology of Hashimoto’s Thyroiditis Coexistent with Papillary Thyroid Carcinoma: A Case Report

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The co-existence of cytological evidence for Hashimoto’s thyroiditis (HT) and papillary thyroid carcinoma (PTC) is uncommon in routine practice. We present the case of a 56 year-old female who presented with bilateral thyroid nodules and PTC was suspected based on the fine needle aspiration cytology. Smears showed high cellularity, neoplastic cells with squamoid cytoplasm and enlarged nuclei with pseudoinclusions. Hurthle cells and lymphocytes were also noted. Colloid was scant. Histopathological examination revealed HT with PTC. There was no evidence of metastasis. Cytotechnicians and pathologists should be vigilant for the presence of neoplastic cells in smears during routine screening that show Hurthle cells and lymphocytes.

Key words: Hashimoto’s thyroiditis, papillary thyroid carcinoma, fine needle aspiration cytology, Hurthle cells, lymphocytes

Introduction

The majority of primary thyroid cancers are papillary thyroid carcinomas (PTC) and there is a higher incidence in females than males. However, evidence of papillary thyroid carcinoma and Hashimoto’s thyroiditis do not commonly co-exist on cytological examination. The incidence of neoplasia in Hashimoto’s thyroiditis diagnosed by fine needle aspiration cytology is 4% [1]. Thyroidectomy is the treatment of choice and thyroxine (T4) replacement is usually needed thereafter. We report the case of a 56 year-old female patient with cytological findings suggestive of papillary thyroid carcinoma but later diagnosed with both Hashimoto’s thyroiditis and papillary thyroid carcinoma following pathological examination.

Case Report

A 56 year-old female patient presented to our outpatient department complaining of hot flushes and was found to have bilateral thyroid nodules on physical examination. She had no significant past medical history. Laboratory tests were consistent with hypothyroidism (thyroxine: 3.4 µg/dl; thyroid stimulating hormone: 107.3 µU/ml). Antithyroglobulin antibody (ATA) and antimicrosomal antibody (AMA) were not tested. Papillary thyroid carcinoma was initially suspected based on ultrasonography-guided fine needle aspiration cytology. Cytological smears showed high cellularity (Fig. 1a), multiple neoplastic cell nests with enlarged nuclei (Fig. 1b) and malignant cells with squamoid cytoplasms (Fig. 1c). Hurthle cell nests and lymphoid cells were also noted (Fig. 1d). Pseudoinclusions of malignant cells and papillary fibrovascular cords were not seen. Right total thyroidectomy and left near total thyroidectomy were performed and further histological examination revealed the co-existence of Hashimoto’s thyroiditis (Fig. 2a) with papillary thyroid carcinoma (Fig. 2b). A postoperative radioiodine (I-131) whole body scan showed no evidence of metastasis. On recent follow-up, the patient remains well after surgery no palpable neck masses and continues on thyroxine (T4) and thyroglobulin supplementation.
Fig. 1. (a) Fine needle aspiration cytology examination showing an admixture of epithelial cells and lymphoid cells. (Liu stain, x 100) (b) Crowded abnormal cell nests with enlarged nuclei. (Liu stain, x 400) (c) Smears showing neoplastic cells with squamoid cytoplasm. (Liu stain, x 400) (d) Hurthle cell changes and lymphoid cells are noted. (Liu stain, x 400)

Fig. 2. (a) Subsequent histological examination reveals oncocytic follicular epithelial cells with lymphocytic infiltration. (H&E, x 100) (b) Tumor cells with papillary structure are also found. (H&E, x 100) (c) Immunohistochemical (IHC) staining of oncocyes is negative for cytokeratin 19. (IHC, x 400) (d) Neoplastic cells stain positively for cytokeratin 19. Note the cytoplasmic staining of malignant cells. (IHC, x 400)
Discussion

It is estimated that approximately 70 to 75 percent of thyroid carcinomas will be PTC [2]. Fine needle aspiration cytology of the thyroid is the most cost-effective diagnostic tool. The initial gold standard management of papillary thyroid carcinoma larger than 1.0 cm in diameter is total thyroidectomy followed by radioiodine ablation. Following surgery, the majority of patients should receive exogenous thyroid hormone sufficient to suppress plasma levels of thyroid stimulating hormone. Recurrences can occur many years after initial therapy and therefore clinical follow-up should be life-long.

Hashimoto’s thyroiditis was originally named struma lymphomatosa and was described by Hakaru Hashimoto in a German surgical publication in 1912 [3, 4] where he described four women with goiters that appeared to have become lymphoid organs. The main histological characteristics of Hashimoto’s thyroiditis include lymphoid follicular centers, diffuse lymphocytic infiltration, degenerated thyroid epithelial cells and prominent fibrosis. The association between Hashimoto’s thyroiditis and papillary thyroid carcinoma has been noted before and common pathophysiological pathways have been explored. Akhtar and colleagues have suggested that Hashimoto’s thyroiditis and papillary thyroid carcinoma may originate from the same pluripotent stem cells called solid cell nests (SCNs). This is based on shared immunohistochemical positivity for p63 in both Hashimoto’s thyroiditis and papillary thyroid carcinoma [5].

Although cytological evidence of Hashimoto’s thyroiditis co-existing with papillary thyroid carcinoma has been described before [6], it has been rarely seen in our native academic literature. The frequency of carcinoma in Hashimoto’s thyroiditis varies between 0.5 to 23.7% [6] and the sensitivity of cytology in the diagnosis of papillary thyroid carcinoma is 92% in Hashimoto’s thyroiditis [7]. As observed in our study, salient cytological findings in such a patient include a high cellularity, multiple Hurthle cell nests, multiple neoplastic cells with enlarged nuclei and squamoid cells (neoplastic cells with squamoid cytoplasm) [8-11]. Pseudoinclusions of malignant cells are also found, as are lymphocytes and scant colloid. The differential diagnosis based on these cytological features includes Hashimoto’s thyroiditis, Hurthle cell tumor, papillary thyroid carcinoma and malignant lymphoma. A Hurthle cell tumor can be excluded due to lack of tight clusters of Hurthle cells with uniform size and shape. The nuclei of Hurthle cell tumors are usually large, vary in size and may contain prominent nucleoli. Moreover, oncocyes, normal follicular cells and lymphoid cells can also be identified in the current subject, and this picture is not consistent with one of malignant lymphoma. A monomorphic population of large atypical lymphoid cells and lymphoglandular bodies is usually also seen in the image of malignant lymphoma. Papillary thyroid carcinoma was initially suspected due to the presence of neoplastic cells with pleomorphic and enlarged nuclei, pseudoinclusions (Fig. 3) and some squamoid cells. This diagnosis was later confirmed. Further histological sections of both thyroid glands revealed obvious lymphocytic infiltration and lymphoid follicle hyperplasia. Most follicular cells demonstrated oncocyte change and a small encapsulated, cystic tumor measuring 0.5 cm in diameter was found in the left thyroid tissue. Sections of the left lobe of the thyroid also show the papillary structure lined by enlarged neoplastic cells with pseudoinclusions (Fig. 4). There is a small amount of lymphocyte infiltration in the papillary cords. There is essentially no indication of malignancy in sections of the right lobe of the thyroid. Hashimoto’s thyroiditis with concurrent papillary thyroid carcinoma is thought to be the diagnosis.
Szporn and colleagues state that cellular swirls can be found in 17% of cytological specimens deemed to show papillary thyroid carcinoma. Cellular swirls are tumor cell aggregates that are concentrically organized [12] but none were identified in our study. Lymphocytic infiltration, which is taken to be indicative of Hashimoto’s thyroiditis, can occur in 58% of patients with papillary carcinoma [13]. Nasser and colleagues state that immunocytochemical staining for cytokeratin 19 will be positive in most cases of papillary thyroid carcinoma, with a sensitivity of 92% and specificity of 97%. Hashimoto’s thyroiditis is negative for cytokeratin 19 [14]. In our patient, immunohistochemical staining for cytokeratin 19 was clearly negative in regions of Hashimoto’s thyroiditis (Fig. 2c) and positive in areas of papillary thyroid carcinoma (Fig. 2d). The possibility of associated neoplasm can not be definitely ruled out even though background changes are suggestive of Hashimoto’s thyroiditis. Cytotechnicians and pathologists must be vigilant for the presence of neoplastic cells in routine smears exhibiting Hurthle cells and lymphocytic infiltration.

References

案例報告

橋本氏甲狀腺炎合併甲狀腺乳突癌之細胞學檢查：一案例報告

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橋本氏甲狀腺炎合併甲狀腺乳突癌在臨床細胞形態學檢查中並不常見。本案例為一位五十六歲女性病患，臨床症狀為兩側甲狀腺結節。細針抽吸細胞學檢查初步懷疑甲狀腺乳突癌。顯微鏡下顯示細胞量多，及具類鱗狀樣細胞質(squamoid cytoplasm)、細胞核增大伴隨偽含類(pseudoinclusion)之惡性細胞。也可發現何氏細胞(Hurthle cell)及淋巴球，但膠質(colloid)很少。病理組織檢查證實為橋本氏甲狀腺炎合併甲狀腺乳突癌。並無發現癌症轉移之證據。細胞醫檢師或病理醫師例行篩檢時，應更留意富含何氏細胞及淋巴球之抹片中出現惡性細胞之可能性。

關鍵詞：橋本氏甲狀腺炎、甲狀腺乳突癌、細針抽吸細胞學檢查、何氏細胞、淋巴球

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