Case Report

Cytomorphological features of oncocytic variant of papillary thyroid carcinoma with lymphocytic thyroiditis

ABSTRACT

Cytological diagnosis of hurthle cell lesions of thyroid is a diagnostic dilemma. Presence of hurthle cells on fine needle aspiration (FNA) leads to a wide range of differential diagnosis including benign and malignant entities. The oncocytic variant of papillary thyroid carcinoma (PTC) is one entity of the vast list of differentials of which very few cases have been reported to date. We report a case of oncocytic variant of PTC in a 28-year-old female diagnosed on cytomorphology. The findings of FNA smears of the first aspirate were not sufficient for a definitive diagnosis. Repeat FNA was done to rule out the possibility of autoimmune thyroiditis/thyroid neoplasm. The repeat FNA smears showed oncocytic cells present in papillary and loosely cohesive clusters. Many of the cells displayed nuclear features of PTC and the case was finally diagnosed as PTC; oncocytic variant. Thyroidectomy specimen revealed PTC; oncocytic variant with lymphocytic thyroiditis in the surrounding tissue. Thus, in cytology practice, concurrent autoimmune thyroiditis may pose a problem in diagnosis of PTC; oncocytic variant.

Key words: Cytology; oncocytes; papillary thyroid carcinoma

Introduction

Several morphological variants of papillary thyroid carcinoma (PTC) have been recognized based on the architecture, growth pattern, cellular, and stromal features. Oncocytic variant of PTC is a rare malignancy accounting for 1–11% of all PTCs.[1,2] The variation in incidence is due to the fact that diagnostic characteristics of this variant has not been standardized.

Oncocytic cell also known as hurthle cell/Askanazy cell/oxyphilic cell is defined as an enlarged cell with abundant eosinophilic granular cytoplasm due to the accumulation of mitochondria.[3] These cells represent an adaptive mechanism of the follicular cells of the thyroid due to a primary alteration in mitochondrial deoxyribonucleic acid. In the thyroid, oncocytic change occurs mainly in follicular cells, both in nonneoplastic lesions, e.g., Hashimoto's thyroiditis, Graves' disease, and nodular hyperplasia as well as in neoplastic lesions, e.g., adenomas and follicular and papillary carcinomas.[4,5] There is no single criterion to differentiate these entities. In the literature, only a few cases of oncocytic variant of PTC have been reported.[2,6] Oncocytic variant of PTC usually occurs predominantly in females with sex ratio (female:male) of 4:1. We reported a case of oncocytic variant of PTC in a young female diagnosed on cytopathological features and confirmed on histopathology.

Case Report

A 28-year-old female came to our hospital with a midline neck swelling more on the left side, gradually increasing in size, since 1 year. There was no other significant medical

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history. On examination, a firm nontender swelling of size 3.5 cm × 3 cm moving with deglutition was noted. Thyroid profile was within normal limits. Ultrasound of thyroid showed hypo- and hyper-echoic nodules with increased vascularity in the left lobe. Right lobe was unremarkable. Initial fine needle aspiration cytology (FNAC) thyroid revealed sparsely cellular smears composed of clusters of follicular epithelial cells with hurthle cell change, occasional epithelioid cell cluster and giant cell, occasional cells showing nuclear grooving and intranuclear inclusions and few scattered lymphocytes; however, no follicular destruction was identified. A definitive cytological diagnosis was not possible on these findings, so a repeat FNA was done to rule out the possibility of autoimmune thyroiditis versus thyroid neoplasm. Repeat aspirate smears were highly cellular with papillary clusters, loosely cohesive clusters with many cells arranged in microfollicular pattern along with fair number of singly scattered cells. Most of the cells (~95%) had eccentric nucleus and abundant granular cytoplasm. A fair number of nuclei displayed nuclear grooving and intranuclear inclusions [Figure 1]. Cytological diagnosis of PTC; oncocytic variant was given. The patient underwent total thyroidectomy. Thyroidectomy specimen revealed enlarged left lobe measuring 5.2 cm × 4.3 cm × 2.2 cm and cut section revealed a gray, white tumor nodule with irregular margins measuring 2.6 cm × 2.4 cm × 2 cm. The closest resected margin was 0.2 cm from the tumor. Other lobe was grossly unremarkable. Histopathological examination revealed tumor tissue with predominantly follicular pattern with focal areas of papillary architecture. The tumor cells were large, polygonal with abundant pink granular cytoplasm, characteristic of oncocytes. The cells showed nuclear overlapping and the nuclei were optically clear with grooves and intranuclear cytoplasmic inclusions. The thyroid tissue surrounding the tumor showed features of lymphocytic thyroiditis [Figure 2]. Final diagnosis of PTC; oncocytic variant with lymphocytic thyroiditis in the surrounding thyroid tissue was given.

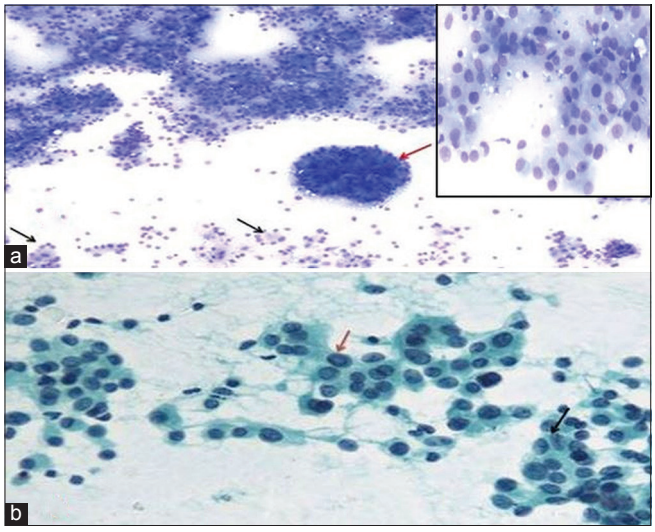

Figure 1: (a) Repeat fine needle aspiration: Shows cells in papillary clusters (red arrow) and microfollicular pattern (black arrows) (MGG, ×100). Inset: Showing high power picture of cytology with MGG (×400). (b) Repeat fine needle aspiration: Cells with abundant granular cytoplasm, nuclear overlapping, intranuclear inclusions (red arrow) and nuclear grooving (black arrow) (Pap, ×400)

Discussion

Oncocytic or hurthle cell tumors are rare thyroid neoplasms of follicular cell origin. Oncocytic variant of PTC has also been described. The oncocytic variant of PTC represents a relatively unusual neoplasm.

Cytopathological diagnosis of an oncocytic variant of PTC is difficult in view of large number of differential diagnosis of lesions with oncocytic cells. The features of oncocytic PTC on aspiration cytology have also not been well described.

Inspite of recommendations suggested by various studies to distinguish benign from malignant hurthle cell neoplasm, the diagnostic precision reaches only 60%.[7] Hürthle cells in Hashimoto's thyroiditis and goiters are more cohesive, show more anisokaryosis and are without nucleoli compared to those in malignant neoplasm. For differentiating hurthle cell adenoma from hurthle cell carcinoma, some of the significant features are hypercellularity, presence of syncytia, predominance of isolated smaller cells, increased nucleocytoplasmic ratio, nuclear pleomorphism, nuclear membrane irregularities, intranuclear-cytoplasmic inclusions, and multiple nucleoli. Findings of papillary configuration or nuclear features like presence of nuclear grooves and

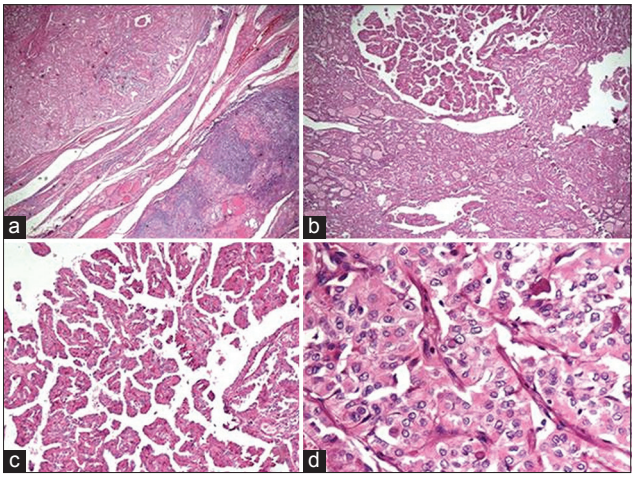

Figure 2: H and E stained section showing (a) tumor nodule with lymphocytic thyroiditis in adjacent surrounding thyroid parenchyma (×40). (b) Papillary and follicular pattern of growth (×100). (c) Papillary pattern with optically clear nuclei (×200). (d) Oncocytic cells with intranuclear inclusions and grooves (×400)

inclusions in isolation do not confirm the diagnosis of PTC because these features have also been described in a variety of other lesions of the thyroid gland. All the required characteristics for the diagnosis of oncocytic variant of PTC, i.e., highly cellular smears with presence of tumor cells with abundant granular cytoplasm, true papillae with fibrovascular cores with characteristic nuclear features of PTC[8] were present in our case.

There are only a few case reports[2,6] and series[1] on the concurrent presence of autoimmune thyroiditis with an oncocytic variant of PTC, and this poses a difficult diagnostic challenge for cytopathologists. Lymphocytic thyroiditis may show predominant hurthle cells with few lymphocytes or hurthle cells with mild nuclear atypia and occasional nuclear grooving, hence leading to a false positive diagnosis of PTC.[4] On the contrary, oncocytic variant of PTC may be missed when co-existing with autoimmune thyroiditis in view of the predominance of hurthle cells along with a fair number of lymphoid cells. Hence, cytopathologists should always advise a repeat FNA in doubtful cases. In our case, the repeat aspirate was fruitful in making the cytopathological diagnosis of oncocytic variant of PTC.

Conclusion

Cytopathological diagnosis of PTC oncocytic variant is a diagnostic challenge for cytopathologists. The diagnosis is further complicated by concurrent presence of autoimmune thyroiditis.

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Conflicts of interest

There are no conflicts of interest.

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