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Oncocytic variant of papillary carcinoma of thyroid -A Diagnostic challenge in Cytology .

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ABSTRACT Oncocytic variant of papillary carcinoma of thyroid is a rare case .Neoplastic and nonneoplastic hurthle cell rich lesions of thyroid has cytological overlapping features and different clinical behavior and management . so despite the ease of recognising hurthle cells on routine cytology smears, they can pose substantial diagnostic challenge to cytopathologists .A 23 year old female presented with thyroid swelling which was diagnosed as Hurthle cell neoplasm -Bethesda Category IV on FNAC.Histopathology showed an encapsulated tumour composed of follicles and papillae lined by large cells with abundant granular cytoplasm and nuclear features of PTC. We diagnosed as an oncocytic variant of papillary carcinoma of thyroid . A possibility of oncocytic variant of papillary thyroid carcinoma should always be considered by pathologist and needs to be differentiated from hurthle cell neoplasm and other hurthle cell rich lesions as its clinical behavior and management is different. Histopathological examination of an entire lesion remains the gold standard for correct diagnosis .

KEYWORDS : aspiration cytology, histopathology, oncocytic variant of Papillary thyroid carcinoma(PTC)

Introduction

Oncocytic cells in the thyroid are often called "Hürthle" cells which are characterised by large , polygonal to square shape, distinct cell borders, voluminous granular eosinophilic cytoplasm, and a large, hyperchromatic nucleus with prominent "cherry pink" macronucl eoli. Presence of hurthle cells on fine needle aspiration of thyroid leads to a wide differential diagnosis including benign and malignant hurthle cell neoplasm and other hurthle cell rich thyroid lesions.[1] It's important to differentiate these which may follow different biological behaviour and clinical management.[2]

Our case report discusses cytopathological features of a rare oncocytic variant of PTC and its differential diagnosis which represent an unusual neoplasm whose clinicopathological and cytological features and behaviour have not been precisely defined. [2] Our case report also discusses diagnostic pitfalls of hurthle cell rich lesions.

Case Report

A 23-year-old female patient presented with thyroid swelling since 2 years. On examination, right lobe of thyroid revealed a mobil e,nontender firm nodule, moving with deglutition. Thyroid profile was normal.Ultrasound revealed an hypoechoic lesions measuring 3.3x2.2cm with features suggestive of colloid Nodule.

FNAC revealed moderately cellular smear showing thyroid follicular cells arranged in mainly microfollicules and few papillae ,composed of large oncocytic cells, with abundent granular eosinophilic cytoplasm.Some are showing pale nuclei, intranuclear groove, intranuclear inclusion and mild anisonucleosis. Backgro und showed blood mixed with colloid and macrophages. We diagnosed as Hurthle cell Neoplasm,Bethesda Category IV.

We received a specimen of right hemithyroidectomy showing a grey white, firm , solid , slightly tan coloured nodule of 3.5x3x1 cm.Capsule was intact .Isthmus was normal.

Microscopy revealed an encapsulated tumor composed of predominantly follicles containing dense colloid, and sparse, small, abortive papillae , lined by large polygonal oncocytes with abundant pink and granular cytoplasm with the classical nuclear features of papillary carcinoma, like optically clear nuclei, overlapping , irregular nuclear membranes, and occasional nucleoli. Prominent nuclear grooves and intranuclear pseudoincl usions were seen in many of the neoplastic cells..

We diagnosed this case as Oncocytic variant of papillary carcinoma of thyroid.

Discussion

The oncocytic variant of papillary carcinoma comprises approximately 10% of cases of PTC. This tumor is characterized histologically by the presence of oncocytic cells with the classic nuclear features of PTC usually in a background of Hashimoto thyroiditis . Thyroid nodules containing Hurthle cells are composed of a wide range of pathologic entities, including Hurthle cell adenomas, Hurthle cell carcinomas, hyperplastic Hurthle cell nodules in Hashimoto thyroiditis (HT), and adenomatous/ multinodular goiters (MNG) with Hurthle cell metaplasia. Distinguishing Hurthle cell neoplasms (HCN) (e.g., adenomas and carcinomas), from benign Hurthle cell lesions (e.g., HT and MNG), is important as HCN requires resection, which pose malignant risk..HCN, both benign and malignant, may show pseudopapillary change HCN may show psammomatous type of dystrophic calcifications,.The main criteria for malignancy is capsular and/or vascular invasion on histology.[4]

A prominent nucleolus with oncocytic cytoplasm is an important feature of a true Hürthle cell.[5] In our case, we had not seen prominent nucleoli in most of the oncocytes on FNA . Moreira et al.[5] reported that prominent nucleoli were also present in 57% of follicular neoplasms and absent from all PTCs. The absence of nucleoli in the oncocytes associated with a background containing colloid, multinucleated giant cells and macrophages were the reliable criterio for the diagnosis of PTC which we have seen in our case however nuclear grooves and inclusions which were also seen

in our case are not helpful in distinguishing the type of oncocytic neoplasm as small percentage of oncocytic follicular neoplasms may show nuclear grooves and inclusions [6] . Andrew A. Renshaw,[7] studied 18 cases in their study in which cytological differential diagnosis included both papillary carcinoma and Hurthle cell lesions . They observed 11 cases with overlapping features of papillary carcinoma and Hurthle cells including pale to granular chromatin, small to medium nucleoli, oval to round nuclei, occasional grooves and rare intranuclear inclusions, occasional nuclear overlapping . Cells arranged in sheets, follicles, or singly. Hurthle cells with mild nuclear pallor and occasional grooves as one of features of Hashimotos thyroiditis . MNG with prominent hurthle cell change, hurthle cell neoplasm and papillary carcinoma are described as differential diagnosis of Hashimotos thyroiditis .Hyperplastic hurthle cell nodules occur in Hashimotos thyroiditis and mimic hurthle cell tumour on histological examination. Similarly, in a multinodular goitre with Hurthle cell metaplasia, hurthle cells usually present as a minor constituent along with presence of macrofollicules with abundant thick and thin colloid, foamy and haemosiderin-laden macrophages in the background which characteristically are seen in colloid nodule.[8] Gayatri et al [9] reported false positive case of HT mistakenly diagnosed as hurthle cell neoplasm in a Hurthle cell-rich smear with scanty lymphocytes in the background.

Yin Ping Wong et al. [10] reported a case whose aspirates showed predomonently of hurthle cells with nuclear features suspicious of papillary carcinoma which were similar to our case but it turned out to be Hurthle cell carcinoma where as in our case it was oncocytic variant of PC. Thus hurthle cell rich lesions show cytological overlapping features making diagnosis difficult.

Other differential diagnosis of oncocytic PTC includes papillary Hurthle cell carcinoma,tall cell variant of PTC and oncocytic variant of the medullary carcinoma of thyroid and metastasis of Renal cell carcinoma to thyroid.[11]

Herrera et al. defined that oncocytic variant of PC has more aggressive biologic behavior as confirmed in previous studies. On the contrary, Berho and Suster believed that these lesions have a low-grade clinical behavior akin to conventional PC.According to study of Cheung et al, which depends on molecular basis of Hurthle cell PC, this tumor may behave in a similar fashion to PTC.Thus clinical behavior of oncocytic variant of PTC not precisely defined.[11]

Conclusion –

Neoplastic and nonneoplastic hurthle cell rich lesions has cytological overlapping features and different clinical behavior and management so despite the ease of recognising hurthle cells on routine cytology, they can pose substantial diagnostic challenge to cytopathologists . A possibility of oncocytic variant of papillary thyroid carcinoma should always be considered and needs to be differentiated from hurthle cell neoplasm and other hurthle cell rich lesions as its clinical behavior and management is different. Histopathological examination of an entire lesion remains the gold standard for correct diagnosis .

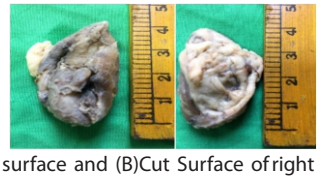


Fig.1 A) External surface and (B)Cut Surface of right hemithyroidectomy reveal white, firm , slightly tan colored nodule

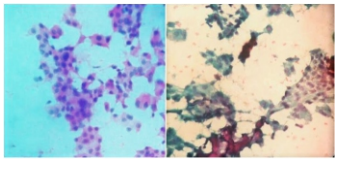
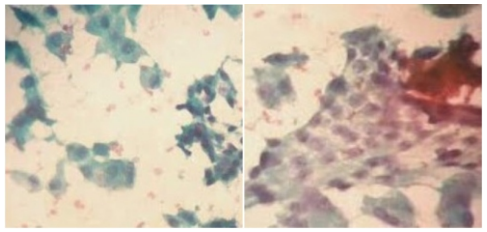


Fig.2 A) B)



C) D)

FNAC smears revealed showing thyroid follicular cells in mainly microfollicular pattern(A) and few papillae(B) composed of large oncocytic cells (C,D).

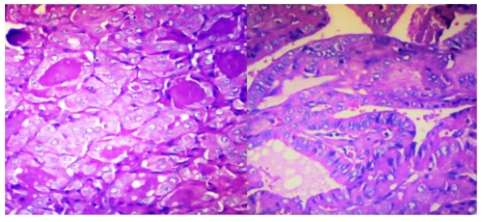


Fig.3 A) B)

Histopathology - revealed an encapsulated tumor composed of mainly follicular growth pattern (A) containing dense colloid, and sparse, small, abortive papillae(B) lined by large polygonal oncocytes with the classical nuclear features of papillary carcinoma.

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