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Oncocytic Variant of Papillary Thyroid Carcinoma - A Rare Case Report

[1]Dr. Nidhi Naik, Postgraduate Resident, Dept of Pathology, Dr. D Y Patil School of Medicine, Nerul, Navi Mumbai.
[2]Dr. Sudhamani S, Professor and Head of the Dept of Pathology, Dr. D Y Patil School of Medicine, Nerul, Navi Mumbai.
[3]Dr. Surekha Bhalekar, Professor of Dept of Pathology, Dr. D Y Patil School of Medicine, Nerul, Navi Mumbai.
Corresponding Author: Dr. Nidhi Naik, Postgraduate Resident, Dept of Pathology, Dr. D Y Patil School of Medicine, Nerul, Navi Mumbai.

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Abstract

Purpose/Aim: Oncocytic variant of papillary thyroid carcinoma is a rare morphologic variant characterized by the presence of papillary or follicular structures, containing malignant follicular cells with abundant granular eosinophilic cytoplasm with nuclear features of papillary thyroid carcinomas. Few studies have suggested that oncocytic variant of papillary thyroid carcinoma may be more aggressive, with higher rates of recurrent disease. The main aim was to recognize and study this distinctive rare entity in detail as it may be confused with other thyroid neoplasms.

Methods: Histopathology of hemithyroidectomy specimen of a 50-year-old female was studied along with clinical, radiological, and cytological correlation.

Results: Clinically diagnosed as multinodular goiter of left thyroid lobe with thyroid profile showing euthyroid state. Fine needle aspiration cytology was suggestive of Hashimoto's Thyroiditis. Histopathology was suggestive of oncocytic variant of papillary thyroid carcinoma.

Conclusion: Application of strict histological criteria is necessary to distinguish these lesions from other primary thyroid neoplasms that is characterized by similar oncocytic cytoplasmic features.

Keywords: Oncocytic, Papillary, Thyroid Carcinoma, Hashimoto's Thyroiditis, Histopathology.

Introduction

The oncocytic variant of papillary thyroid carcinoma (PTC) is an uncommon form of neoplasm, the clinicopathological features of which have not been precisely defined. In its pure form, this variant is extremely rare (1-11% of papillary thyroid carcinomas). Oncocytic change is defined as cellular enlargement characterized by an abundant eosinophilic granular cytoplasm due to accumulation of mitochondria. Various terminologies such as oncocytes, Hurthle cells, Askanazy cells, oxyphilic or large cells, have been used for these cells. Studies show that it is often associated with local invasion and cervical lymph node metastases and can show resistance to radioactive iodine therapy. The histopathological criteria for diagnosis are the presence of oncocytes with the classic nuclear features of PTC, taking up at least 75% of the entire tumor. We are

reporting this case because of its rarity and unique histological appearance.

Materials and Methods

A 50-year-old female presented with a midline neck swelling for six years gradually progressing in size with decreased tolerance to cold and palpitations for three days. No history of weight gain/ weakness/ change in voice/ dyspnea.

On examination, swelling over the left side of the neck- 10 x 5cms, hard, moves with deglutition. Thyroid function tests showed euthyroid picture. Clinically diagnosed as multinodular goiter of left thyroid lobe. Ultrasonography showed bulky heterogenous left lobe of thyroid measuring 66 x 35 x 47mm with multiple heterogeneously iso echoic nodules within occupying almost entire left lobe largest measuring 19.9 x 16.5mm. Few of them showed egg shell calcification (TIRADS III). FNAC showed benign thyroid follicular cells arranged in clusters and scattered singly with impinging lymphocytes. Few hurthle cells noted. Features suggestive of Hashimoto's Thyroiditis BIRADS II. Left hemithyroidectomy was done and specimen was sent for histopathological examination.

Results

Gross: Left lobe of thyroid 8 x 6 x 4cm. External surface: Capsule intact, smooth, bosselated. Cut surface: Gritty to cut, fleshy tan white to pink. Entire thyroid parenchyma was replaced by a well-circumscribed, grey-white, fleshy tumor measuring 5 x 3.6 x 3.5 cm. Isthmus measures 0.5 x 0.5cm and was unremarkable. (Figure 1)

Microscopy

Sections showed partially encapsulated malignant tumour arranged in micro follicular and trabecular pattern, composed of large cells with abundant eosinophilic granular cytoplasm and nuclear features of papillary thyroid carcinoma. (Figure 2a &2b) Focal areas of hyalinization, dystrophic calcification noted. Focally, minimal invasive capsular infiltration along with vascular invasion within the capsular blood vessels is noted. Isthmus was unremarkable. Mitotic Rate: 1/10 high power field. Infarct type necrosis was present focally. No evidence of lymphatic invasion/per neural invasion/extra thyroidal extension. No regional lymph nodes received. Based on these features diagnosis of papillary thyroid carcinoma, oncocytic variant was made. Pathologic stage classification (p TNM, AJCC 8th Edition): pT3a N (not assigned). pT3a: Tumor greater than 4 cm limited to the thyroid pN not assigned- no nodes submitted.

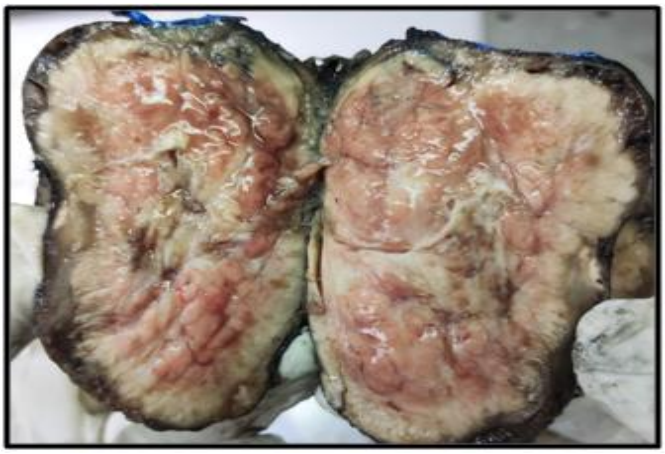

Fig. 1: Cut surface: Gritty to cut, fleshy, tan white to pink

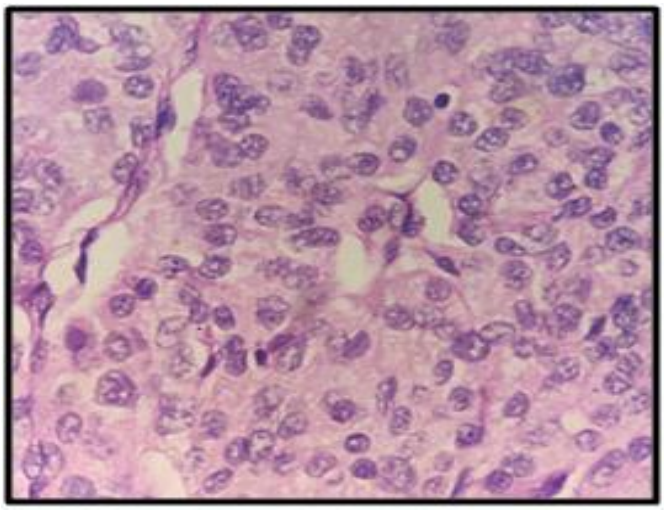

Fig. 2a: Oncocytes with abundant pink granular cytoplasm (H&E:40x)

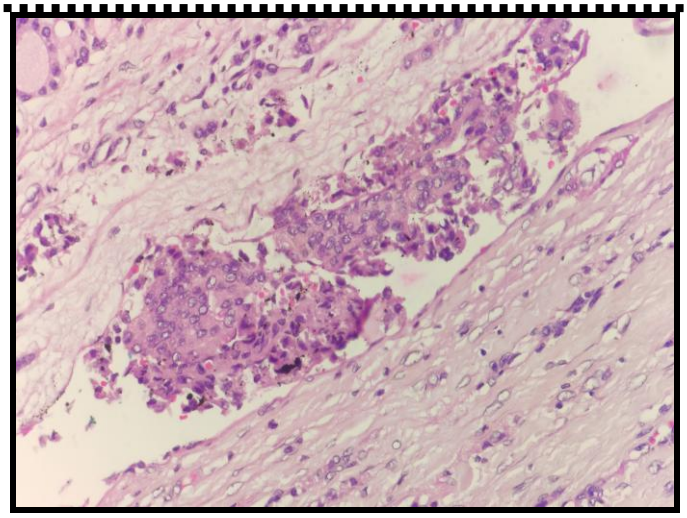

Fig. 2b: Lymph vascular invasion(H&E: 10x)

Discussion

In the most recent World Health Organization International Histological Classification of Thyroid Tumors, He dinger and colleagues have defined papillary thyroid carcinoma as "a malignant epithelial tumor showing evidence of follicular cell differentiation, with typical papillary and follicular structures as well as characteristic nuclear changes" (WHO)

Jun Hwa Hong et al [5]retrospectively studied 142 patients with PTC who were operated between 2000 to 2005. Their slides were reevaluated to record the proportion of oncocytic change. It was revealed that 45.8% (65/142) of PTC patients showed oncocytic change.

As stated in a study by Jelena Lukovic et all[4], the median age was 55.3 years (range: 19.4 to 85 years) and there was a predominance of female patients. In our case, the age was 30 years in female.

As per study by Türk Onkoloji Dergisi et al [6], oncocytic tumors have variable clinical behaviour. All thyroid tumors with oncocytic features were treated as malignant since 1950. Most studies claim that oncocytic tumors can be classified into adenomas and carcinomas.

In a clinicopathological study of 15 cases done by Berho et al [3],13 cases showed features of Hashimoto's or lymphocytic Thyroiditis. The study stated oncocytic changes may be pathogenetically related to autoimmune Thyroiditis. In our case there was no evidence of lymphocytic Thyroiditis. No features of hypothyroidism was seen. Clinically, she was euthyroid.

As stated in a study by Aradhana Mishra et al[2], it is stated that, on FNAC, they show oncocytes, which are large cells with abundant granular cytoplasm arranged in irregular clusters or papillary in folding with nuclear features of classic papillary carcinoma like fine powdery chromatin, grooves and pseudo inclusions. Our study showed thyroid follicular cells arranged in clusters and scattered singly with impinging lymphocytes and few hurthle cells. It is stated that, grossly, oncocytic variant may show a mahogany brown appearance with papillary excrescences. Few of them may appear gray-white. In our case, it was tan-white to pink. The study also stated that, usually histopathologically they show complex branching papillary pattern or follicular architecture. Micro and macro follicles filled with colloid maybe present. The tumor may be encapsulated with infiltration of the surrounding capsule and lymph vascular invasion. Oncocytic cells cover thin fibro vascular stromal cores. They are round to polygonal or columnar with abundant granular eosinophilic cytoplasm.

It is stressed in a study by Aradhana Mishra et al[2], that, individual tumor cells must show nuclear features of papillary thyroid carcinoma such as nuclear enlargement, oval shape, elongation, and overlap, with clearing, resulting in a ground glass appearance, and irregular nuclear contours with nuclear pseudo inclusions and groove for diagnosis of this variant.

Differential diagnosis includes papillary Hurthle cell carcinoma, tall cell variant of PTC and the oncocytic variant of the medullary carcinoma of the thyroid. Nuclear features of papillary Hurthle cell carcinoma are round shape, vesicular chromatin pattern and prominent

centrally placed nucleolus along with ocalhyperchromasia, binucleation and marked nuclear atypia. Tall cell variant of PTC is characterized by cells that are twice as tall as wide with elongated dark nuclei. The oncocytic variant of medullary carcinoma is characterized by absence of the characteristic nuclear features of PTC with follicular growth pattern and prominent oncocytic cell changes. It shows more areas of medullary carcinoma within the tumor.

Herrera et al[7]defined that oncocytic variant of PC should be more widely recognized as a tumor variant with a truly more aggressive biologic behavior as confirmed in previous studies

On the contrary, Berho and Suster[3]believed that these lesions appeared to have a low-grade clinical behavior akin to conventional PC.

Overall mortality rate of oncocytic tumors have been said to higher in comparison to non-oncocytic tumors.

Berho et al[3] found that oncocytic PTC does not appear to behave more aggressively than conventional PTC. 10year disease-specific survival is 60%.Patients has shown to have good prognosis.

Conclusion

The oncocytic variant of papillary thyroid carcinoma, represents a morphologically distinctive variant of papillary cancer. Diagnosis of oncocytic variant of PTC remains controversial.

Application of strict histological criteria is necessary to distinguish these lesions from other primary thyroid neoplasms that is characterized by similar oncocytic cytoplasmic features.

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