# Cytomorphology of Columnar Cell Variant of Papillary Thyroid Carcinoma-A Case Report

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***Abstract-*** Columnar cell variant of papillary thyroid carcinoma (CCV-PTC) is a rare and aggressive tumor composed of tumor cells that form papillae, glands and solid structures. Fine needle aspiration on a young female patient who presented with a solitary thyroid nodule. Cytology revealed cellular smears with three dimensional clusters and papillary fragments composed of tall columnar cells. These columnar cells closely resembled respiratory epithelium. Few acini, glandular, solid, syncytial pattern and singly dispersed cells were seen. Nuclei showed pseudostratification. Nuclear grooves were seen occasionally, while intranuclear inclusions and psammoma bodies and colloid were absent. With no obvious clinical history suggesting any visceral malignancies, a diagnosis of CCV-PTC/TCV-PTC was considered. Throidectomy was done. Sections showed well circumscribed tumor with features of CCV-PTC. Here in we wish to document the Cytomorphology of this variant, features to distinguish it from its close mimickers.

***Index Terms***- Columnar cell variant, Tall cell variant, papillary carcinoma thyroid, Fine needle aspiration cytology.

## I. Introduction

Papillary carcinoma is the most common primary malignancy (80%) of the thyroid gland. Known for its disguise in morphology it's still recognized based on its architecture, growth pattern, cellular and stromal features. FNAC is highly accurate in diagnosing papillary carcinoma. [1,6.] Most cases of papillary carcinoma are associated with good prognosis, but few variants are aggressive. Columnar cell variant of papillary thyroid carcinoma (CCV-PC) is known for its aggressive behavior and poses diagnostic problems specially to differentiate it with tall cell variant and rare metastatic malignancies of colon and endometrioid adenocarcinoma.[1-4] Evans first described this entity and suggested that it should be considered as a separate variant of thyroid carcinoma.[1,2,4-6]

## II. Case Report

A twenty year old female presented with solitary thyroid nodule. Her thyroid profile was within normal limits. Ultrasound showed a solid circumscribed nodule measuring 3 cm in diameter. Fine needle aspiration cytology was done. Smears were stained by Papanicolaou, Leishman and MGG stains. Pateint underwent thyroidectomy. Post-operative period was uneventful.

Pathologic findings.

Cytology: Cellular smears. Smears were composed of columnar cells arranged in three dimensional clusters, monolayered sheets, and acinar pattern and in parallel rows. Cells had moderate amount of eosinophilic cytoplasm with oval to elongated nuclei. Nuclear pseudostratification resembling that of respiratory epithelium was seen. Few nuclei showed grooves while inclusions, psammoma bodies and colloid were absent. Normal follicular cells were absent.

Gross Pathology:

Thyroidectomy specimen and pretracheal lymph node received. Right lobe measured 8x4x3.5 cm with a bulge on the outer aspect. C/S showed a circumscribed nodule, solid, fleshy and dark brown measuring 3 cm in diameter. Edge of the nodule was 2 mm away from the right border of the thyroid. One small lymph node and separately sent pretracheal lymph node were unremarkable. The resected surface was painted and sectioned.

Microscopy:

Sections from the nodule showed an encapsulated tumor with tumor cells arranged in papillary, elongated ribbons, cribriform, acinar and solid pattern. Cells showed stratified, hyperchromatic nuclei, with inconspicuous nuclear grooves and single prominent nucleoli. There were focal areas of calcification. Psammoma bodies were absent. Mitotic figures were scanty <2/HPF. Focal capsular and vascular invasion were seen. Small rim of adjacent thyroid showed lymphocytic infiltrate. Both the lymph nodes showed reactive hyperplasia. Based on morphology a diagnosis of CCV-PTC was made.

## III. Discussion

CCV-PTC is one of the variants described by Evans in 1986 and closely mimics TCV-PTC, which was described by Hawk and Hazard. [1] Other close differentials include metastatic colonic adenocarcinoma and endometrioid carcinoma which requires clinical assessment for exclusion. Metastatic nodules are usually multiple and presents with relevant clinical history suggestive of a primary malignancy elsewhere.

TCV-PTC, more seen in elderly (old type) as compared to CCV, shows follicular cells with the height of the epithelium atleast twice its width. Nuclei are basally located and cytoplasm is abundant and paucioncocytic. In the present case, tumor showed mixed pattern of papillary, follicular, acinar, elongated ribbon like, and solid pattern (Fig-1a). Cells were tall to spindle

and resembled respiratory epithelium without cilia (Fig-1b). Cytoplasm was moderate eosinophilic and tapering. Nuclei were stratified and were round to oval, elongated with hyperchromatic to vesicular chromatin. Nuclear grooves and occasional intranuclear inclusions were seen. There was absence of psammoma bodies/multinucleate cells. Scanty malignant colloid was seen. Our case did not show Hurthle cell changes although they can be seen in this variant. There were no areas of necrosis in the present case while some have noticed necrosis in CCV-PTC.

Histopathology showed features of columnar cell variant of papillary thyroid carcinoma. Pseudostratification was clearly seen in both cytology and hisotpathologic preparations. (Fig-2) In addition we found mitosis was rare and less than 2 per 10 HPF although increased mitotic activity is usually seen. It was evident that present tumor showed capsular and vascular invasion. Adjacent thyroid showed lymphocytic infiltration. Both the lymph nodes were free of metastasis .Resected margins were free from infiltration.

Few authors have observed columnar and tall cell variant in the same case with transition within the same follicle [3,] while some have even reported composite tumors.They appear to have similar origin and bad prognosis. While some authors beleive that behaviour depends on the presence of extrathyroidal extension rather than the morphology, while some have categorized both the variants as poorly differentiated carcinoma of the thyroid. [6]

To conclude careful clinical assessment and awareness is required to identify this entity. The lack of typical nuclear features of papillary carcinoma may lead to diagnostic difficulties and may be misstyped as medullary carcinoma or as contamination by respiratory epithelium due to the presence of these columnar cells. [4] Cytokeratin, thyroglobulin and CEA immunostaining may be done if required. Identification of this variant preoperatively may alter the course of surgery in this aggressive variant.

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Figure legend.

[11] Fig-1. Cellular smears composed of tumor cells arranged in monolayered sheets, three dimensional papillaroid fragments and dispersed singly. Cells are columnar to spindle and have vesicular to hyperchromatic nuclei. (PAP, MGG)

[12] Fig-1a. Columnar and elongated to spindle cells with hyperchromatic to vesicular stratified nuclei. Few show prominent nucleoli and nuclear grooves. (PAP)

[13] Fig-2. H P sections showing tumor cells in solid, cribriform, papillary, elongated ribbon-like and acinar pattern. Cells have vesicular to hyperchromatic nuclei. Occasional grooves were seen.(H&E)

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