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COLUMNAR CELL TYPE OF THYROID PAPILLARY CARCINOMA: THE DIAGNOSTIC CHALLENGES

[1]*Dr. Swagata Dowerah, M.D., [2]Dr. Mondita Borgohain, M.D., [3]Dr. Ashim Manta, M.D.

[1]Department of Pathology, Silchar Medical College.
[2,3]Department of Pathology, Assam Medical College.

Corresponding Author: Dr. Swagata Dowerah
Department of Pathology, Silchar Medical College.

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ABSTRACT

Introduction: Columnar cell variant of papillary carcinoma thyroid is one of the rarest morphological subtypes of this tumor. Typical nuclear features of papillary carcinoma like ground glass nuclei, nuclear grooves and intranuclear inclusions have not been found to be consistently present in this neoplasm creating difficulties in diagnosis. **Case history**: A 30year old female presented with neck swelling of 7 months duration. There was no history of pain or fever, and on examination, a diffuse swelling was seen which moved on deglutition. USG neck revealed multiple hypoechoic SOL in both lobes of thyroid in a background of sub acute thyroiditis. Initial FNA gave a diagnosis of follicular neoplasm with lymphocytic thyroiditis. On histopathological examination, H & E stained sections revealed papillary structures lined by elongated cells showing nuclear stratification. The typical optically clear nuclei of papillary carcinoma was not seen. Other areas showed normal colloid filled thyroid follicles with evidence of lymphocytic thyroiditis. A diagnosis of papillary carcinoma thyroid, columnar cell type was given. On re examining the FNA slides, focal areas with papilla formation were seen lined by columnar cells with round to oval nuclei showing pseudostratification at places, abundant cytoplasm, inconspicuous nucleoli. Intranuclear inclusions and nuclear grooving was absent as also the powdery chromatin on MGG stained smears. Final diagnosis was columnar cell variant of papillary cancer. **Conclusion:** Columnar cell type of papillary thyroid cancer is a distinct morphological variant which is often missed on FNA smears and may cause diagnostic confusion even in tissue samples. Knowledge of the distinctive morphological features of this tumor is essential for correct diagnosis.

KEYWORDS: papillary carcinoma, thyroid, columnar cell.

INTRODUCTION

Columnar cell variant of papillary carcinoma thyroid is one of the rarest morphological subtypes of this tumor[1] which was first described by Evans in 1986.[2] Biological behavior and histomorphological picture of this neoplasm is different from other variants of papillary carcinoma thyroid and diagnosis on FNA remains a challenge as the typical nuclear features of papillary carcinoma like ground glass nuclei, nuclear grooves and intranuclear inclusions have not been found to be consistently present in this neoplasm. [3] [4] [5] [6] Also, some areas may show follicular and rosette like structures, further adding to the diagnostic confusion.

Case history: A 30year old female presented with swelling in the neck of 7 months duration. There was no history of pain or fever, and on examination, a diffuse swelling was seen which moved on deglutition. Overlying skin was normal. USG neck revealed multiple hypoechoic SOL in both lobes of thyroid in a background of sub acute thyroiditis. The thyroid function tests were normal.FNAC was performed and showed a blood mixed aspirate. FNAC reported a cellular smear with follicular cells in sheets and microfollicles with crowding and overlapping and some areas showing giant cells and epitheliod histiocytes. A diagnosis of follicular neoplasm with thyroiditis was given. Patient underwent thyroidectomy and specimen was sent for HPE. Gross examination revealed a soft tissue specimen measuring 5X3X2cms, greyish white in colour which was solid to cystic on cut section with areas of hemorrhage. H & E stained sections revealed papillary structures lined by elongated cells showing nuclear stratification. The typical optically clear nuclei of papillary carcinoma was not seen. Other areas showed normal colloid filled thyroid follicles with evidence of lymphocytic thyroiditis. A diagnosis of papillary carcinoma thyroid, columnar cell type was given. The slides of FNA were re examined and showed focal areas with papillary fragments, which was initially missed. Apart from this, monolayered sheets and clusters of cells in acinar pattern were seen. The cells were columnar in appearance with

round to oval nuclei, abundant cytoplasm, inconspicuous nucleoli. Focal areas showed pseudostratification of nuclei. Intranuclear inclusions and nuclear grooving was absent as also the powdery chromatin on MGG stained smears. Re evaluation of the cytologic smears in the light of HPE findings led to re diagnosis of the cytological preparations as papillary carcinoma thyroid, columnar cell type. Other areas in the smear showed picture of lymphocytic thyroiditis.

DISCUSSION

Papillary thyroid carcinoma (PTC) is the most common type of malignant thyroid tumor constituting more than 70% of thyroid malignancies.[7] A subset of thyroid papillary carcinoma is recognized and classified by the World Health Organization as the so-called aggressive variants, including the diffuse sclerosing, tall cell, and columnar cell carcinomas. However, Evans[8] and Ferreiro et al.[9] reported cases of the thyroid papillary carcinoma of columnar cell type that behaved in an indolent manner.

FNAC is a common method of evaluating thyroid lesions and is highly accurate in diagnosing papillary carcinoma. However in the columnar cell variant, the typical nuclear features which clinch the diagnosis of papillary thyroid cancer are absent and reports describing cytomorphological findings of this tumor are few; hence diagnosis solely on the basis of FNA is difficult.

The conventional papillary carcinoma is characterized in FNA by the presence of thick or thin papillary tissue fragments with fibrovascular cores, sheets of tumor cells showing focal nuclear crowding and overlapping, irregular nuclear contours, intranuclear cytoplasmic inclusions (INCI) and nuclear grooves (NG). Psammoma bodies and metaplastic squamous cells may also be present.[10] [11] In case of columnar cell type however, pseudostratification of nuclei is reported to be a prominent feature of this neoplasm, and its presence should alert a cytopathologist regarding this variant of papillary carcinoma. While nuclear grooves have been mentioned is few cases, they were absent in most of the published cases.[3][4][5][12][6] Intranuclear cytoplasmic inclusions were also absent in most of these cases and nucleoli was inconspicuous, as seen also in our case.

The histopathologic features that are used to define the thyroid papillary carcinoma of columnar cell type include the presence of columnar looking cells with nuclear stratification.[8] [9] [13] Some cells may have supranuclear and subnuclear cytoplasmic vacuoles. Some tumors may resemble endometrial or colonic adenocarcinomas.[2] The nuclear features of conventional PTC are not well represented in these tumors. Histologically, the tumors had diverse growth patterns, including papillary, solid, microfollicular, and cribriform. A common pattern was the presence of markedly elongated follicles arranged in parallel cords.[14] In our case, nuclear features of papillary carcinoma were not seen. There was no evidence of vascular or capsular invasion in our case. However, there was evidence of lymphocytic thyroiditis in the sections.

There are several factors which lead to diagnostic difficulty. The lack of typical nuclear features of papillary carcinoma is one of main causes of confusion and careful clinical assessment and awareness is required to identify this entity. It is particularly difficult to diagnose on cytological preparations as papillary structures may be few and many areas may show acinar or follicular structures and may be misdiagnosed as a follicular neoplasm as was seen in our case. Again in case of the encapsulated type of this tumor, and in presence of a second pathology like thyroiditis, the area of interest might be missed unless done under radiological guidance. All these problems were encountered in our case and diagnosis was established only retrospectively after examining the tissue sections. The presence of tall columnar cells may also create diagnostic confusion with tall cell type of papillary cancer and several metastatic malignancies and careful attention to cellular detail and ancillary studies may be necessary.

Legends:

Fig 1 showing gross appearance of the tumor

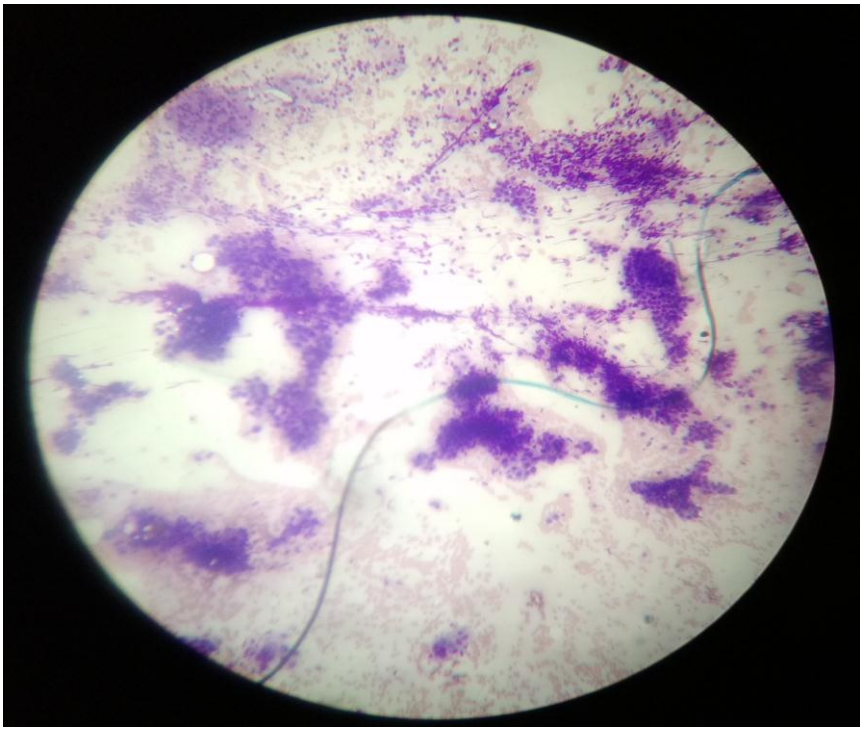

Fig 2 showing aspirate smears from the swelling (MGG, 10X)

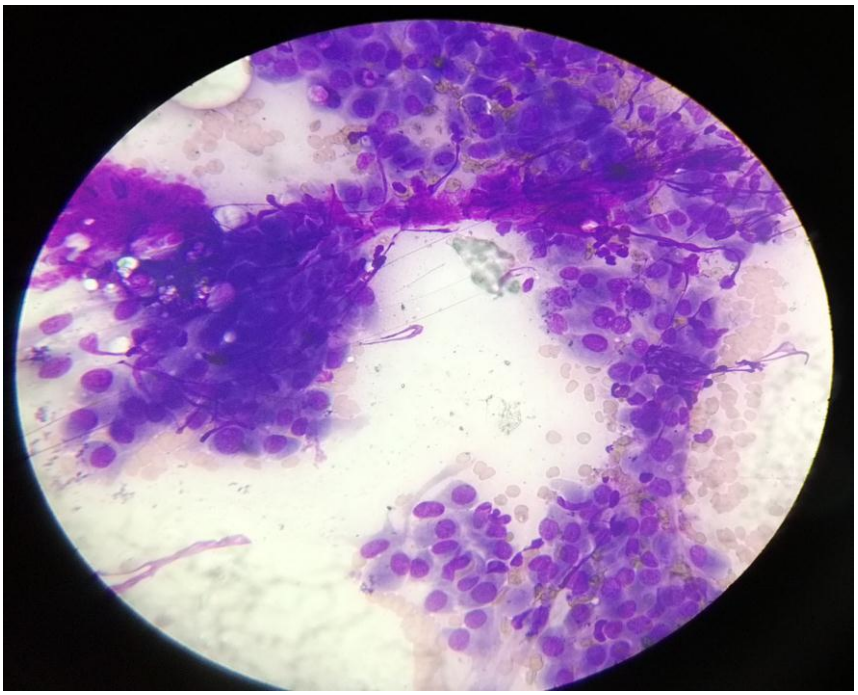

Fig 3 showing papillary structures lined by columnar cells with abundant cytoplasm, round to oval nuclei, inconspicuous nucleoli (MGG, 40X)

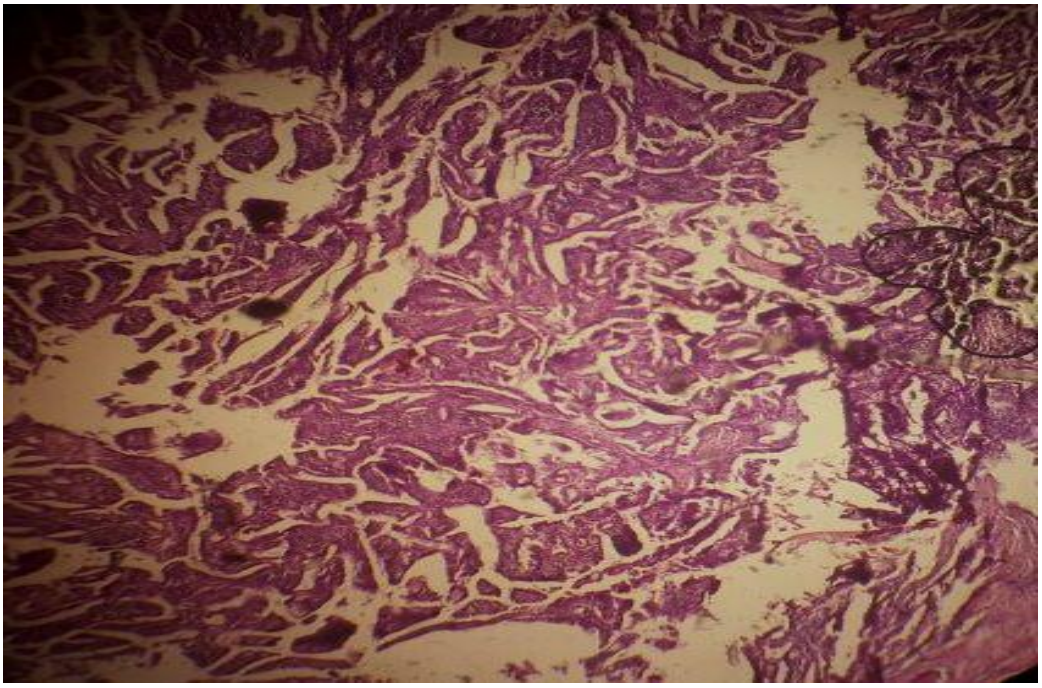

Fig 4 H & E stained sections showing papillae lined by columnar cells with focal areas of nuclear stratification (10X)

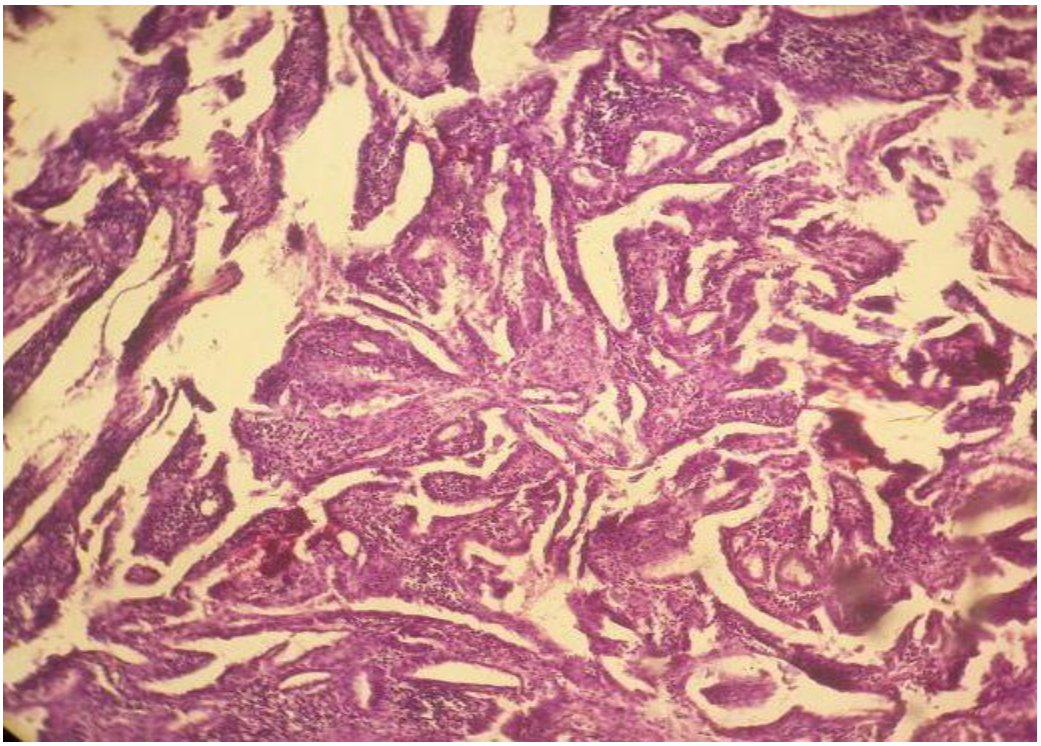

Fig 5 showing sections under higher magnification. Note that typical ground glass nuclei of papillary carcinoma are absent. (H&E,40X)

CONCLUSION

Columnar cell type of papillary thyroid cancer is a distinct morphological variant which is often missed on FNA smears and may cause diagnostic confusion even in tissue samples. Knowledge of the distinctive morphological features of this tumor is essential for correct diagnosis.

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