Case Report

Multifocal incidental papillary microcarcinoma of thyroid: Diagnostic pitfall in cytology

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ABSTRACT

Papillary microcarcinoma (PMC) of a thyroid tumor measuring 10 mm or less in maximum diameter. PMC of thyroid is an incidental finding, and some of them show multifocality. Here, we present a case of 33-old adult male diagnosed on cytology as benign follicular nodule and subsequently diagnosed as multifocal incidental PMC in the colloid nodule of thyroid on histopathology. PMC of thyroid is a diagnostic pitfall on cytology and ultrasonography-guided aspiration should be done. Optimal therapeutic and management strategy needs to be determined for PMC of thyroid.

Key words: Cytology, papillary microcarcinoma, thyroid

INTRODUCTION

Papillary microcarcinoma (PMC), which is defined as papillary carcinoma of the thyroid that is, <10 mm or less in maximal diameter, whereas other clinic-pathological features like metastasis to regional lymph node and/or distant metastasis are not considered.[1] PMC of thyroid is diagnosed with increasing frequency recently due to the extensive use of ultrasonography (USG) guided fine-needle aspiration cytology (FNAC). Most of the PMC have an excellent prognosis, but some shows distant metastasis and mortality.[2] Due to lack of epidemiological data, there is no clear-cut consensus in the management of the PMC of thyroid. Multifocality has been considered as an important predictor of recurrence and is commonly associated with PMC of thyroid.

CASE REPORT

A 33-year-old male patient presented with a swelling in front of the neck since 1 year. It was insidious in onset and gradually progressive reaching size of 5 cm × 4.5 cm × 4 cm on left lobe of thyroid. There was no history of pain, difficulty in swallowing, change in voice and other symptomology of hyper/hypothyroidism. On clinical examination, revealed a solitary nontender neck swelling moved with deglutition, and no cervical lymph node was palpable. Thyroid function tests were within the normal limit. On USG showed solitary swelling from the left thyroid lobe of measuring 6 cm × 5 cm × 5 cm was reported, with areas of cystic changes.

On FNAC revealed many benign follicular epithelial cells, few cystic macrophages in the background of abundant thin colloid material distributed throughout the smear [Figure 1]. Cytological diagnosis of benign follicular nodule (Category II) according to Bethesda system classification of thyroid cytology was made, advised for periodic clinical and USG follow-up examination.

The patient subsequently underwent left lobectomy of thyroid. Received specimen for Histopathology examination grossly measure 6 cm × 5 cm × 5 cm. Cut surface revealed a grey brown and solid area, few cystic area and two foci of white firm solid nodule measuring <10 mm [Figure 2]. Microscopically showed varying size of follicle lined by cuboidal epithelium filled with colloid and foci of white nodule showed papillary architecture lined by crowded neoplastic cells having cleared chromatin in nuclei, irregular nuclear contour surrounded by sclerotic stroma, along with psammoma bodies and thick colloid material [Figures 3

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and 4]. Hence, diagnosis of multifocal incidental papillary microcarcinoma in colloid nodule of thyroid was considered, advised for total thyroidectomy and long-term follow-up USG and development of recurrence in the neck lymph node.

DISCUSSION

The patients with PMC of thyroid, mean age at diagnosis has been reported to be 41.9–55 years and more common in female with a ratio of 1:4.[3] Etiology of thyroid cancer due to external radiation exposure for treatment of other malignancy in young patients.

Papillary Microcarcinoma of thyroid usually found incidentally (latent tumor) or found after detection of metastasis (occult tumor). The term "incidental" refers to cancers that exhibit no sign related with malignancy prior to the surgical procedure. PMC of thyroid are incidental findings in 25–36% of thyroidectomy samples done for other reasons and in population-based autopsy studies.[4] This finding strongly suggests that most PMCs remain latent and do not become clinically apparent.[5] Multifocality is common in PMC of thyroid and associated with increased risk of recurrence and worse prognosis.

Diagnosis of PMC of thyroid comprise of the three groups: (1) Patients with PMC incidentally found in the thyroid gland after total thyroidectomy for benign disease or at autopsy. (2) Patients with incidentally detected PMC mainly on USG, and evaluated by FNAC. (3) Patients with clinically apparent metastases of thyroid carcinoma, where the primary tumor is not detectable before surgery and microcarcinoma is found in the final histological specimen (occult tumor).[5]

Roti *et al*. attempted to identify clinical characteristics of PMC of thyroid, showed lymph node and distant metastasis is common in >8 mm tumor.[6] Recently, many interesting molecular marker predicting biological behavior of tumor.

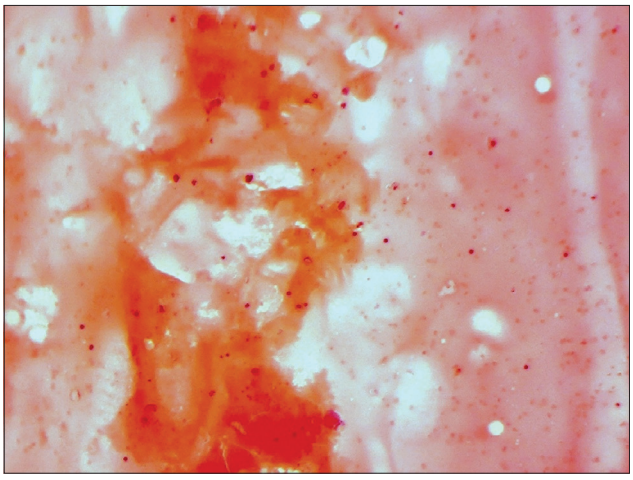

Figure 1: Fine-needle aspiration cytology shows cystic macrophage, follicular epithelial cells and colloid (H and E, ×100)

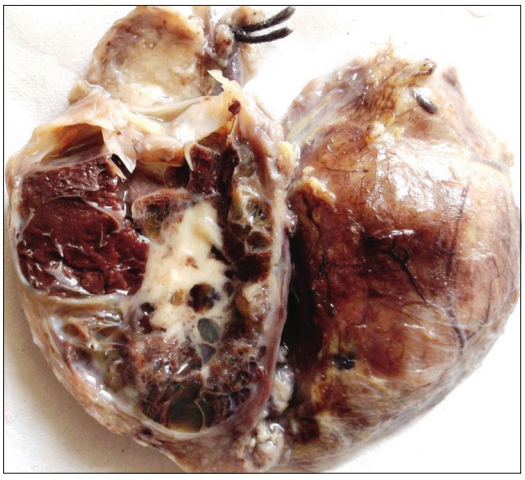

Figure 2: Gross microphotograph of left lobectomy shows solid and cystic brownish area and multifocal solid white area of papillary microcarcinoma

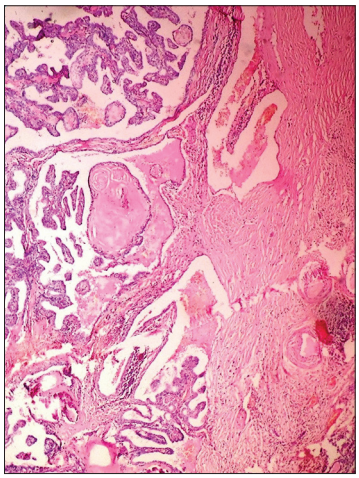

Figure 3: Junction of goiter area and papillary microcarcinoma area shows characteristic papillary projection, psammoma body and sclerosis (H and E, ×40)

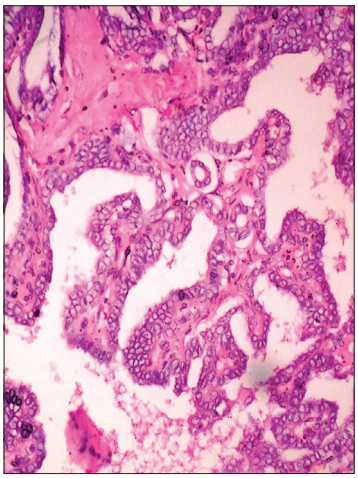

Figure 4: Hallmark nuclear characteristic of papillary carcinoma and fibrovascular core (H and E, ×400)

About 70% of papillary thyroid carcinoma shows BRAF mutation associated with expression of vascular endothelial growth factor indicates progression, invasiveness and recurrence of PMC. Overexpression of cyclinD1 immunohistochemistry predict the aggressive growth, tumor size and metastatic potential of PMC of thyroid.[7] Positivity of protein S100A4 immunohistochemistry has been significantly associated with macrometastasis and lateral node metastasis.[8]

The majorities of these patients do extremely well with appropriate limited surgery and close follow-up. Ito and Miyauchi proposed a new therapeutic strategy for PMC of thyroid with ultrasonographically detectable nodal metastasis; they recommend total thyroidectomy and therapeutic neck dissection. PMC of thyroid without nodal metastasis, they recommend careful observation without further surgery.[9] Recent study showed patient's age more than 45 years need aggressive treatment than <45 years.[10] Lin and Bhattacharyya studied the impact of medical and surgical intervention on the survival of patients showed overall actual survival rates, at 10 and 15 years, were 96.6% and 96.3%, respectively.[11] Recently, Piana *et al*., found 3 cases of PMC of thyroid treated, recurred, metastasize to lymph node and lead to death, were positive for cyclinD1 on primary and metastatic site.[12]

Ono *et al*. studied cytomorphological features of focal papillary thyroid carcinoma arising within follicular adenoma in 17 cases, on FNAC they are often interpreted as atypia of undetermined significance due to overlapping features.[13] Immunohistochemistry of cytokeratin -19, HBME-1 and Galactin-3 positivity is helpful to differentiate between papillary thyroid carcinoma and benign follicular nodule in difficult cases.

In our case of PMC of thyroid age was <45 years, multifocality, incidental detection, male sex, negative cervical nodes should be considered for total thyroidectomy and long-term follow-up USG for lymph node is required to detect any late recurrence due to multifocality.

CONCLUSION

Incidental multifocal PMC of thyroid is capable of metastasizing but majority of pursue benign course, excellent prognosis and overall survival. In our case, USG guided FNAC should be done in both nodules in order to detect multifocal PMC that should be treated more aggressive with a total thyroidectomy rather than lobectomy. Future research work is directed on molecular marker to define small group of PMC of thyroid with an aggressive biological behavior.

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