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Development of Collision Tumor in Thyroid: Papillary Carcinoma and Hurthle Cell Carcinoma in Long Standing Hashimoto's Thyroiditis - A New Rare Entity

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ABSTRACT

Collision tumors of thyroid are very rare that comprise two histopathological and morphological different tumors occurring simultaneously or as secondary metastases from other organs to the thyroid. These tumors are extremely rare and a few cases have been reported in stomach, colon, liver, kidney and ovary. Although thyroid neoplasms are common among endocrine neoplasms, thyroid collision tumors are rare and only a few cases have been reported in the literature. In the literature concurrence of papillary carcinoma and medullary carcinoma of thyroid is most frequently reported.

Keywords: Collision, Papillary carcinoma, Hurthle cell carcinoma, thyroid

INTRODUCTION

Among endocrine malignant neoplasms, thyroid malignancies are most prevalent type (1). Incidence of thyroid carcinoma has increased in recent decades and is associated with increased prevalence of papillary thyroid carcinoma (2). It is reported as seventh most common cancer among women and in men as second fast growing incidence (3). Hurthle cell tumors are rare and their incidence is less than 5% of all thyroid tumors (1). Hurthle cell carcinoma was described initially by Ewing in 1925. The occurrence of oncocytic changes in Hurthle cell carcinoma is similar to that happen in Hurthle cells. It is the cell response to the stressed conditions like autoimmunity (4). The prognosis of patient with thyroid carcinoma in association with Hurthle cell carcinoma is better than that of patient with only thyroid papillary carcinoma. The term collision describes multiple coexistences of different tumors that have distinct origin and border (5). In this case, a concurrence of papillary carcinoma of thyroid with Hurthle cell carcinoma in Indian woman is described in the background of Hashimoto's thyroiditis. The coexistence of these two carcinomas is extremely rare finding (1).

CASE REPORT

A 70 years old male patient was presented to the General surgery Department, Narayana Medical College & Hospital with chief complaints of swelling in front of neck since 5 years. Swelling was progressively

increasing in size. Patient has no history of symptoms related to hypothyroidism, hyperthyroidism and pressure effects since onset. But the patient complaints of hoarseness of voice and rapid increase in size since 3 months. On Clinical examination, an irregular swelling of size 5×6 cm was noted in front of neck and the swelling was moving with deglutition and not moving with protusion of tongue. Clinical diagnosis was given as multinodular goiter. On Ultrasonography of neck revealed as multinodular goiter. FNAC was performed. Smears show High cellularity and revealed benign thyroid follicular epithelial cells arranged in monolayered sheets, clusters and dispersed pattern. Many of the cells are showing Hurthle cell change. Background shows plenty of lymphocytes, few of the lymphocytes are seen impinging on thyroid follicular epithelial cells, background shows colloid and blood elements. Impression was given as Hashimoto's thyroiditis Betheseda category II. Patient underwent total thyroidectomy and the specimen was sent for histopathological examination in 10% buffered formalin. Gross specimen showed measuring 5×4×3.2 cm. Right lobe measuring 5x 4x4 cm. Left lobe measuring 4×1.8×1 cm. Isthmus measuring 1×1×0.5 cm Cut surface of right lobe shows circumscribed lesion of size 4×4× 2.5 cm with prominent solid areas and colloid nodule of size 2×2 cm. Left lobe and isthmus external surface grey brown and congested. Cut surface of left lobe and isthmus shows grey brown areas of colloid. Left lobe cut surface also shows focal grey white area measuring 0.5x0.5 cm. Microscopic examination from right lobe of thyroid reveals proliferating cells in solid sheets, trabecular pattern and singly dispersed pattern. Individual cells are large with well-defined cell outlines with abundant granular eosinophilic cytoplasm. Nuclei are pleomorphic, hyperchromatic central to eccentrical placed and few are showing prominent nucleoli. Foci of capsular invasion noted. At one focus an incidental finding of papillary carcinoma of thyroid showing a single large gland with papillary frond showing fibrovascular core and lined by follicular cells having orphan annie-eye appearance seen. Adjacent foci show Hashimoto's thyroiditis.

Sections studied from left lobe shows features of Hashimoto's thyroiditis.

Final diagnosis was given as Hurtle cell carcinoma with coexistent Papillary microcarcinoma of right lobe and features of Hashimoto's thyroiditis were seen in both lobes.

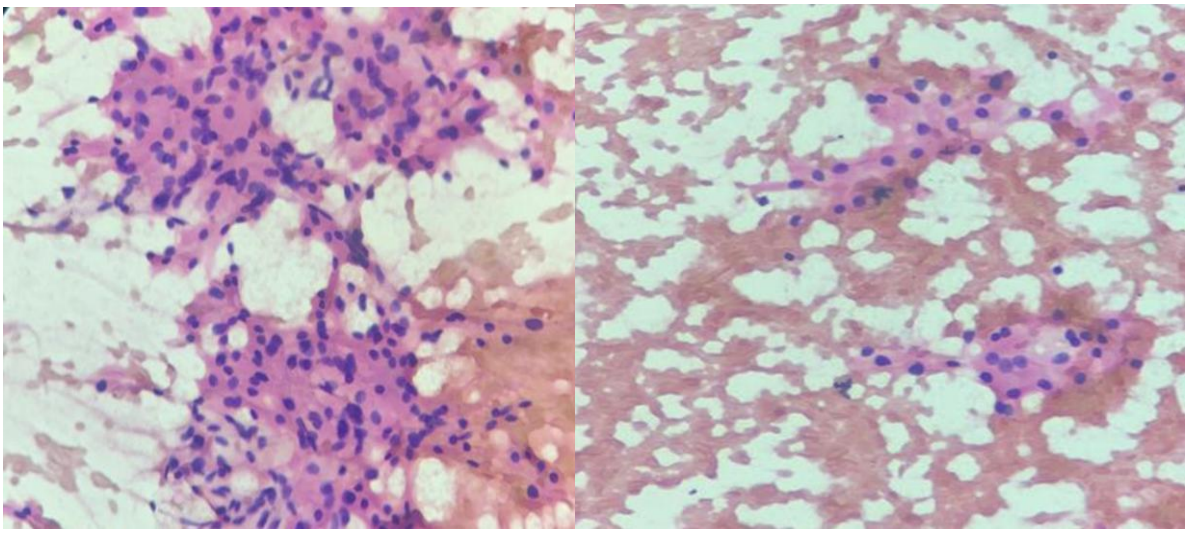

Figure :1 Cytological pictures showing a) Benign thyroid follicular epithelial cells in clusters and impingement of lymphocytes. b) Hurtle cell change. [H&E,40X]

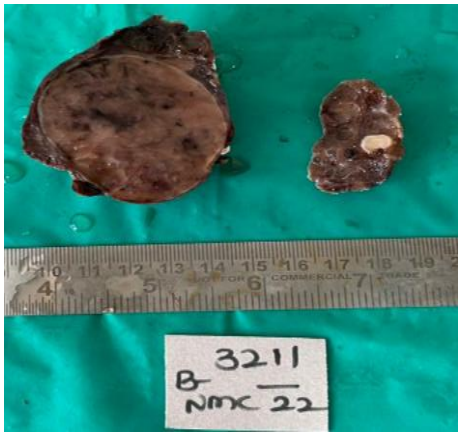

Figure: 2 Gross images showing cut surface of right lobe, left lobe and isthmus.

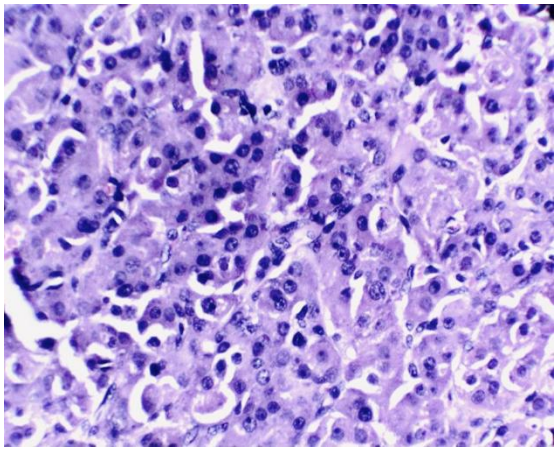

Figure 3: Tumor cells in sheets showing oncocytes with abundant eosinophilic cytoplasm and centrally placed nucleus (H&E,40X)

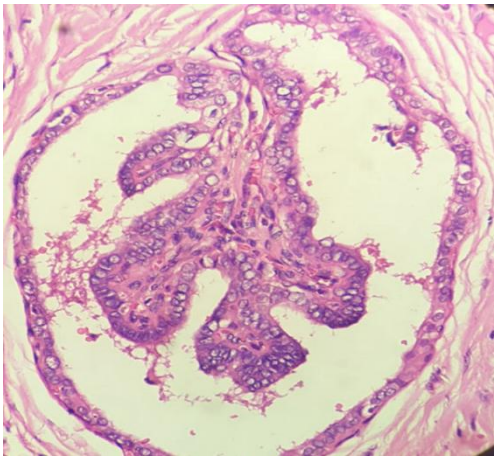

Figure 4: A single focus with papillary frond showing fibrovascular core lined by follicular cells having orphan annie appearance (H&E,40X)

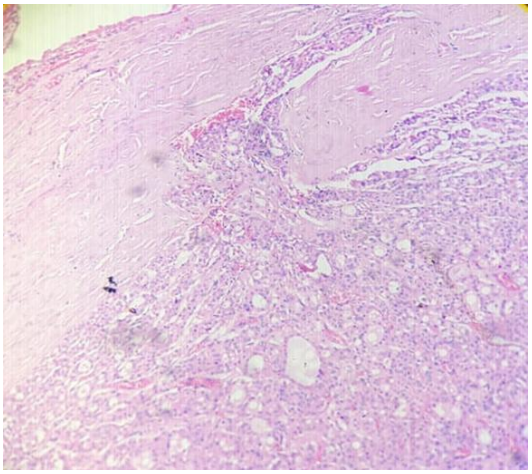

Figure 5: One foci of tumor tissue showing capsular invasion (H&E,10X)

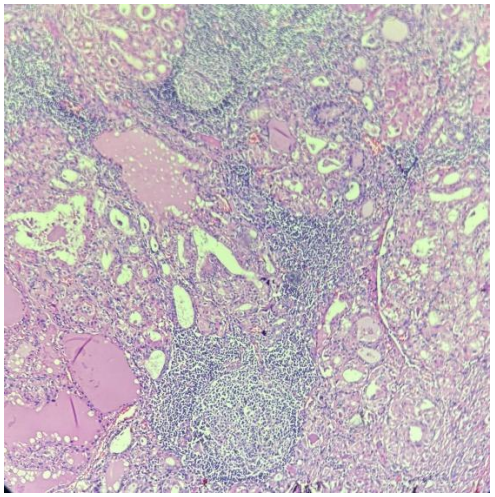

Figure 6: Hurthle cells and lymphoid follicles with prominent germinal centres (H&E,10X)

DISCUSSION

Collision tumors that are complex of some tumors apart have been detected in different organs except thyroid. Although, the collision tumors of the thyroid gland are rare (6), Hashimoto's thyroiditis is most common cause of hypothyroidism in autoimmune conditions. It is mainly due to TSH receptor antibody, anti-thyroglobulin and anti-thyroid peroxidase antibody which triggers T cells to begin the immune reaction (7). Rudolf Virchow in 1863 demonstrated a link between inflammatory process and cancer by leukocytic infiltration in neoplastic tissue (8). There are some common gene rearrangements between PTC, Hurthle cell carcinoma and Hashimoto's thyroiditis (9). Hurthle cell carcinoma has more aggressive behaviour in comparison with other thyroid carcinomas including PTC (1). Hurthle cell carcinomas and papillary carcinomas were noted as separate cancers in Hashimoto's thyroiditis in previous studies (1). However, coexistence of both together in this disease is extremely rare. Hurthle cell carcinoma microscopically show tumor cells which are larger in size, with abundant granular eosinophilic cytoplasm, large nucleus and prominent nucleoli. Tumor cells are arranged in sheets, cords and trabecular pattern. Foci of capsular or vascular invasion noted. Thyroid collision tumor was more common in women with an average of 50-60 years old. In our study, collision tumors are noted in 70 years old male patient.

Compared to other thyroid cancers, including PTC, Hurthle cell carcinoma exhibits more aggressive characteristics (1). Previous studies have identified Hurthle cell carcinomas and papillary carcinomas as distinct malignancies in Hashimoto's thyroiditis (1). The simultaneous occurrence of both cancers in this condition is exceptionally uncommon. Thyroid collision tumors are more prevalent in females, typically between 50-60 years of age. Takano outlined two potential pathways for the development of collision tumors. The first involves a coincidental susceptibility to multiple tumors in the same environment, while the second suggests a shared stem cell origin for these growths (5). In the medical literature, studies by Sinno et al (2), as referenced by Takano et al (5), and Navya et al have documented the uncommon (1) occurrence of PTC and HCC coexisting in patients with Hashimoto's thyroiditis. The management of collision tumors is challenging due to the dual nature of the pathology and the distinct biological behaviors of each tumor type.

CONCLUSION

Collision tumors in the thyroid gland are extremely uncommon. It is crucial for both surgeons and pathologists to be cognizant of this type of lesion and it is necessary to conduct thorough pathological examinations in cases of Hashimoto's thyroiditis patients presenting with multiple nodules.

Declaration by Authors

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