

# Synchronous Hurthle Cell Carcinoma and Papillary Carcinoma in a Patient with Hashimoto's Thyroiditis: A Rare Case Report

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## Abstract

Hashimoto's thyroiditis, the most common autoimmune thyroid disease, is due to destruction of the thyroid gland by autoantibodies. Various types of thyroid malignancies may arise in Hashimoto's thyroiditis. Follicular carcinomas, papillary carcinomas, lymphomas, medullary carcinomas and hurthle cell neoplasms may develop in Hashimoto's thyroiditis. We present a rare case report of a 35-year-old female who presented with hypothyroidism of a two-year duration. A diagnosis of Hashimoto's thyroiditis was made for which she was under treatment. Due to the recent increase in size of the thyroid, a fine needle aspiration cytology was done. A preoperative diagnosis of Hurthle cell neoplasm was made based on fine needle aspiration cytology findings. The total thyroidectomy specimen revealed Hashimoto's thyroiditis with synchronous papillary carcinoma and Hurthle cell carcinoma, which is a very rare occurrence.

**Keywords:** Papillary carcinoma, Thyroid, Hashimoto's thyroiditis

## Introduction

Cancer of thyroid is the most common endocrine carcinoma. Papillary carcinoma of the thyroid is reported as the seventh most common cancer among women. The association of Hashimoto's thyroiditis with thyroid malignancy is well documented in the literature. Although much less when compared to follicular and papillary carcinomas, Hurthle cell tumors may also arise in a background of Hashimoto's thyroiditis. Papillary and Hurthle cell carcinoma are usually reported to

occur as separate neoplasms, when they occur in Hashimoto's thyroiditis. However the co-existence of both together is a very rare finding. This is a case report of simultaneous existence of Hurthle cell carcinoma and papillary carcinoma in a patient with Hashimoto's thyroiditis.

## Case Report

A 35-year-old female presented with a swelling in the front of her neck which gradually increased in size over the past one year. There was no associated pain, hoarseness or

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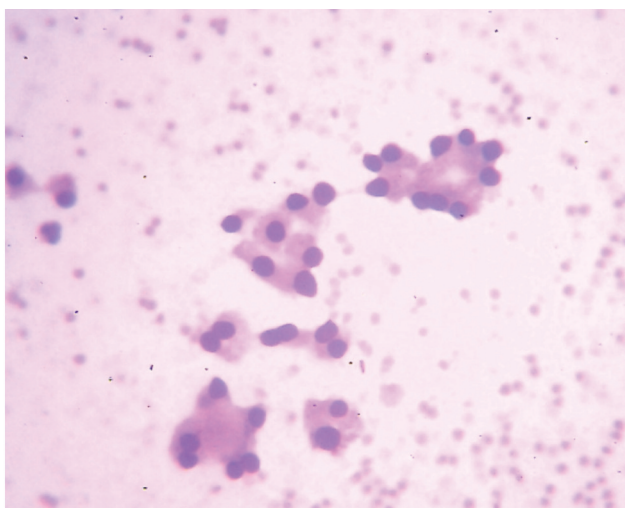
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loss of weight. She was diagnosed with Hashimoto's thyroiditis two years previous and was under treatment for hypothyroidism.

Clinical examination showed a swollen thyroid that measured 8×4cm. The swelling was firm in consistency, moved on deglutition, non-tender and non-pulsatile. Thyroid function tests showed elevated TSH (58.58 mIU/L). An iodine uptake study indicated the possibility of thyroiditis. A fine needle aspiration cytology (FNAC) was performed. The smears showed microfollicular clusters with cells that had abundant eosinophilic cytoplasm and nuclei with mild anisonucleosis (Figure 1). The background showed a few lymphocytes and scant colloid. A diagnosis of Hurthle cell neoplasm was considered. Excision and histopathological examination was advised.

The patient underwent a total thyroidectomy. The gross specimen showed a thyroid that measured 100×50×45 mm and weighed 350g. One lobe was enlarged and measured 60×50×40mm, the cut surface of which revealed an encapsulated grey tan nodular tumor (50×45×40mm) with firm to hard consistency. Adjacent to this was another granular area (8×8 mm) with tiny papillary protrusions (Figure 2). The remainder of the thyroid showed a firm meaty, lobulated appearance with hemorrhagic areas.

The histopathology of the encapsulated neoplasm showed cells with abundant granular,



**Figure 1.** Follicular cells in a microfollicular cluster and singly. The cells have abundant eosinophilic cytoplasm and nuclei with mild anisonucleosis (MGG; 400×).

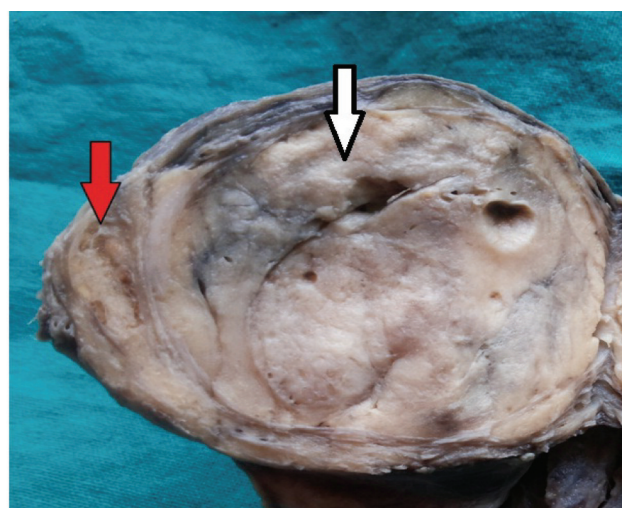
eosinophilic cytoplasm (Hurthle cells). A follicular, trabecular and solid pattern of arrangement was noted (Figure 3). The tumor showed minimal invasion of the capsule and limited vascular invasion. The nuclear features typical of papillary carcinoma and psammoma bodies were not present in the entire tumor.

Sections from the adjacent granular area showed another neoplasm with complex papillae having dense fibro vascular cores covered by single to multiple layers of cuboidal epithelial cells. Cells that lined the papillae showed optically clear ground glass nuclei and intranuclear grooves (Figure 4). A few concentric calcified psammoma bodies were noted.

The rest of thyroid tissue showed dense infiltration of the parenchyma by a lymphoplasmacytic infiltrate with germinal centers. The thyroid follicles were atrophic and lined by Hurthle cells. A histopathological diagnosis of synchronous Hurthle cell carcinoma and papillary carcinoma arising in Hashimoto's thyroiditis was made.

Immunohistochemistry performed in the Hurthle cell carcinoma was positive for thyroglobulin (Figure 5a) and TTF-1 (Figure 5b). The focal trabecular pattern of arrangement raised the suspicion of medullary carcinoma, however immunohistochemistry with calcitonin was negative.

The post-operative period of the patient was



**Figure 2.** Cut surface of a larger lobe with encapsulated grey tan nodular tumor measuring 50×45 mm (white arrow). Note the adjacent granular tumor measuring 8×8 mm with tiny papillary protrusions (red arrow).

uneventful and the patient was referred to an oncology center for further treatment and hence lost for follow up.

## Discussion

Hashimoto's thyroiditis is a well known cause of hypothyroidism. Destruction of the thyroid gland in this disease is due to autoantibodies which include anti-TSH receptor antibody, anti-thyroglobulin and anti-thyroid peroxidase antibody.<sup>1</sup> Hashimoto's thyroiditis commonly affects females during the fifth and sixth decades.<sup>2</sup>

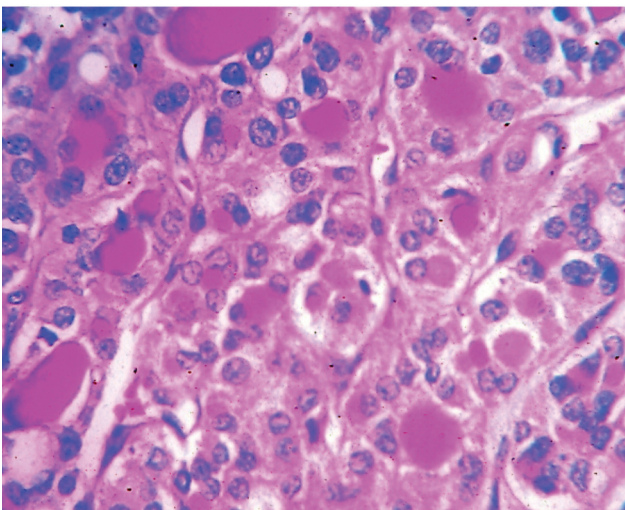
A significant association of Hashimoto's thyroiditis with papillary carcinomas is reported. The papillary carcinomas associated with Hashimoto's thyroiditis have favorable clinicopathologic characteristics compared with those without the disease.<sup>3</sup> The relative risk of patients with Hashimoto's thyroiditis developing a papillary carcinoma in the literature is 1.59.<sup>4</sup> Due to this increased risk, patients may be carefully monitored for the development of papillary carcinoma.

Hurthle cell tumors represent less than 5% of all thyroid tumors.<sup>5</sup> These tumors show more than 75% of Hurthle cells<sup>6</sup> which are mitochondria-rich, thyroglobulin producing follicular epithelial cells. Hurthle cells have a large size, well-defined cell borders, and abundant amount of granular acidophilic cytoplasm, large

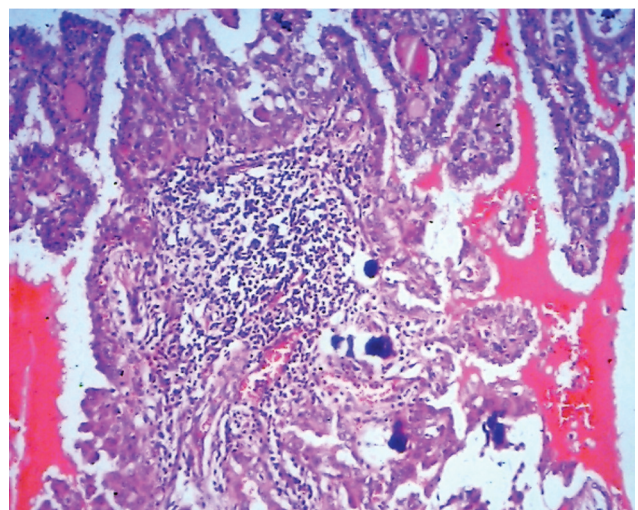
nucleus and prominent nucleolus. Other names for Hurthle cells are Askanazy cells or oxyphil cells.<sup>7</sup> These cells are seen in large numbers of benign conditions such as nodular goiter, long standing hyperthyroidism and in Hashimoto's thyroiditis.<sup>8</sup>

The majority of Hurthle cells tumors are benign and labeled as adenomas, but up to 40% are malignant. Hurthle cell carcinoma is diagnosed when there is the presence of capsular/vascular invasion or lymphatic spread.<sup>8</sup> Since the Hurthle cell tumors share some similarities with follicular tumors in terms of architectural features and the degree of invasiveness, they are now considered to be a variant of follicular carcinoma.<sup>9</sup> Hurthle cell carcinoma behaves in a more aggressive fashion compared to other well differentiated thyroid neoplasms.<sup>10</sup>

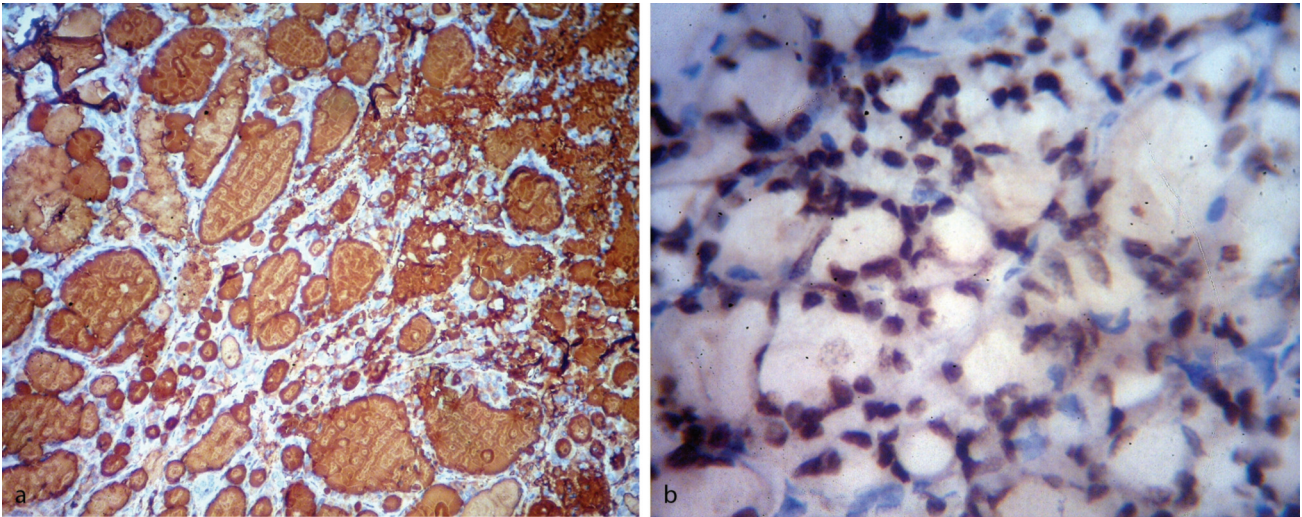
Papillary carcinoma and Hurthle cell carcinoma can arise in Hashimoto's thyroiditis as separate tumors. However the co-existence of both together in this disease is extremely rare. This may be the first case report, to the best of our knowledge, for the synchronous occurrence of both tumors. More studies are required to find out the prognosis and outcome of patients with multiple carcinomas. Though rare, various types of malignancies may co-exist in the thyroid gland. Hence a diligent examination of thyroidectomy specimens may be performed to exclude synchronous occurrence of various neoplasms.



**Figure 3.** Microscopy of the encapsulated neoplasm showing cells with abundant granular, eosinophilic cytoplasm-Hurthle cells (H & E; 400 $\times$ ).



**Figure 4.** Microscopy of adjacent granular tumor with complex papillae covered by single to multiple layers of cuboidal epithelial cells. Psammoma bodies are also noted (H & E;  $\times$ 100).



**Figure 5.** (a) Hurthle cell carcinoma showing positivity with thyroglobulin (IHC; 100 $\times$ ); (b) TTF-1 positivity in Hurthle cell carcinoma (IHC; 400 $\times$ ).

### Conflict of interest

No conflict of interest is declared.

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