

Case report

Hurthle cell carcinoma: a rare variant of thyroid malignancy

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Abstract

Hurthle cell carcinoma is a rare entity of differentiated thyroid carcinoma. Modality of treatment is controversial due to the nature and rarity of the disease. However, total thyroidectomy followed by adjuvant treatment is prudent in this variant of thyroid malignancy in view of its aggressive nature. We report a case of Hurthle cell carcinoma of thyroid in an elderly male in which the pre operative diagnosis was follicular carcinoma. The outline of management is discussed.

Keywords: Hurthle cell carcinoma, thyroid malignancy, management.

Introduction

Various types of malignant tumours can be derived from thyroid gland according to its cellular constituents: follicular cells, parafollicular cells, lymphoid cells and stromal cells. Most of the differentiated thyroid carcinomas are usually arising from follicular cells. Hurthle cell carcinoma which arises from follicular epithelium is an extremely uncommon tumor but the presentation could be in more destructive behavior.

Case Summary

A 68 years old male presented with history of anterior neck swelling for two months duration. It was rapidly increase in size. It was associated with symptoms of palpitation, lost of appetite and lost of weight. However he denied of any difficulty in breathing, no breathlessness on exertion and no voice change. There was no odynophagia and dysphagia or other symptom of hypothyroidism or hyperthyroidism. Premorbidly he was diagnosed to have hypertension and currently was on oral anti-hypertensive medications. He has no past history of malignancy or receiving any radiation

therapy before. However one of his daughters was a diagnosed case of thyroid carcinoma.

Clinical examination revealed a diffuse, firm anterior neck swelling with size 6 x 18cm which moved with swallowing. There was no other neck node palpable. He has no tremors, proptosis with normal vital signs. The thyroid function test was normal. Fine needle aspiration for cytology revealed a follicular lesion. Neck ultrasonography was reported as multinodular goiter with heterogenous nodules.

In view of the patient's age, nature of the presentation and positive family history, thyroid malignancy was highly suspected. Total thyroidectomy was commenced. Intraoperatively the procedure was uneventful and bilateral recurrent laryngeal nerves and superior laryngeal nerves were identified and preserved. However, he developed left vocal cord palsy at day three post surgery. As it was a delayed onset, conservative management was undertaken and patient was discharged home. The

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histopathological examination of the thyroidectomy specimen was reported as oncocytic variant (Hurthle cell) carcinoma of left thyroid lobe.



Figure 1: Gross feature of the left thyroid gland shows a solid tan coloured circumscribed lesion occupying almost the entire lobe. Thin rim of fibrosis and foci of hemorrhage are noted

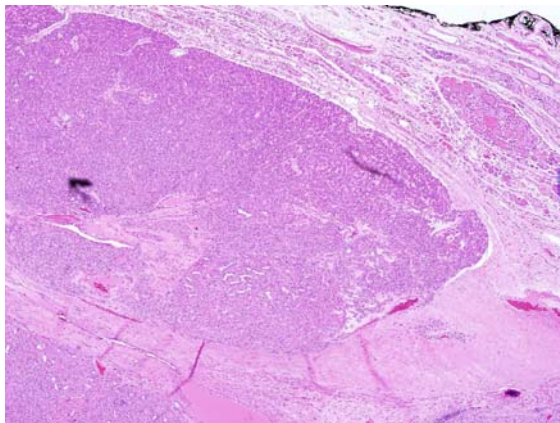


Figure 2: Feature of focal capsular invasion is identified (Magnification x4)

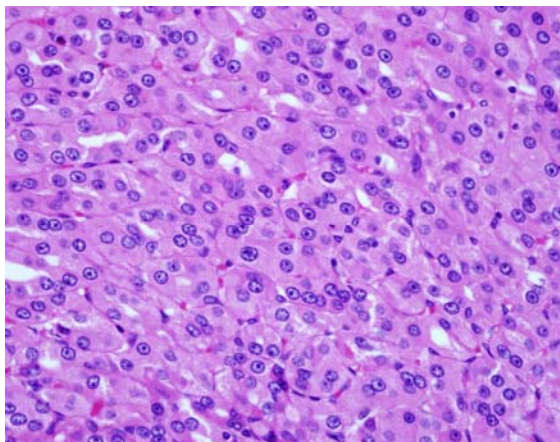


Figure 3: Oncocytic cells (75%) in solid sheet displaying round nuclei with prominent and abundant eosinophilic granular cytoplasm (H&E stain x 40)

The patient underwent whole body scan which disclosed a residual thyroid tissue at thyroid bed and lymph nodes metastasis. He was referred to oncology unit for radioiodine ablation.

Discussion

The Hurthle Cell, the other name for oncocytes, is derived from follicular epithelium. It produces thyroglobulin, large in size and polygonal in shape, and has indistinct cell borders, voluminous granular cytoplasm because of excessive mitochondria, a large nucleus, a prominent nucleolus and an intensely pink cytoplasm as shown by hematoxylin–eosin staining¹. It can be found in both neoplastic and non-neoplastic conditions of thyroid gland, particularly Hashimoto's thyroiditis, nodular and toxic goiter. They have also been described as occurring in salivary gland, esophagus, pharynx, trachea, kidney, pituitary, larynx and liver¹.

The tumour arising from these cells is known as Hurthle cell tumour, also known as oncocytic or oxyphilic tumours. It was first described by Ewing in year 1938². They are defined as encapsulated tumours containing 75% Hurthle cells and histologically proven to be follicular cell origin². Based on the presence of vascular and capsular invasion, the tumours are categorized into benign Hurthle cell adenoma and malignant Hurthle cell carcinoma².

Hurthle cell carcinoma (HCC) makes up of 3% of differentiated thyroid carcinomas and is more common in areas of iodine excess³. It is considered by some to be a variant of follicular cancer (FC) but many think that it should be considered as a different entity as it has a significant difference oncogene expression from FC⁴, and carries more sinister manifestation and prognosis. Other differences are illustrated in Table 1^{3,5,6}.

In general, the behaviour of HCC depends on the patient's age, gender, tumor size, local invasion, lymph node and distant metastasis, tumor stage, and treatment modalities HCC occurs at the older age than FC and papillary carcinoma, frequently between fifth to seventh decades of life. Female has higher preponderance but male has poorer prognosis.

Table 1: Differences between Hurthle cell carcinoma and Follicular cell carcinoma

	<i>Hurthle cell carcinoma</i>	<i>Follicular carcinoma</i>
Age	More elderly	Fifth to seventh decades
Iodine diet	Iodine excess	Iodine deficiency
Radiation exposure	More likely previous exposure	-
Extension of local disease	Multifocal, bilateral	Focal
Regional nodes	10-25%	< 5%
Distant metastasis	34%	19%
Mortality rates (with metastasis)	80%	65%
Genetics	Familial thyroid hcc: germline mutation on chromosome 19p13.2	Rare
Radioiodine uptake	<10%	75%

In some studies, the likelihood of malignancy is directly proportional to the size of tumour. Stojadinovic et al in 2002 reported 75% of widely invasive HCC were tumor size of more than 4cm⁷. Sippel et al in 2008 concluded malignancy is greater than 50% with a tumour size larger than 4 cm⁸. However, there was a report which revealed tumours with size less than 2cm that were locally invasive, or patient presented with distant metastasis⁵.

Local invasion or extrathyroid involvement heralds poor outcome. Kushchayeva Y et al in 2004 reported 62.5% of patients with local invasion succumbed due to metastasis⁵. Survival rate of 33% with local invasion was also reported by Stojadinovic et al⁷.

Frequency of nodal metastases is noted increasing during years of follow up in HCC patients with the rate of 10- 25%⁵. It denotes the recurrence of tumor with a diminish survival rate. Distant metastasis to lung, bone, liver and central nervous system is common and it delineates poor prognosis.

Taking the nature of HCC into account which is : (i) multifocal within thyroid gland, (ii) less sensitive to radioiodine ablation (5-10 % takes up Iodine 131) , (iii) Thyroglobulin levels becomes an accurate predictor of persistent and recurrence, total thyroidectomy is proposed and supported by most of the surgeons⁹. Some of the surgeons even recommend prophylactic or therapeutic central neck dissection on the ipsilateral of the primary tumour in view of common nodal involvement subsequently⁵.

The application of radioactive Iodine 131 is controversy as HCC is poorly radioactive –avid. However, it carries some credits in conferring a survival benefit as reported in a series¹⁰. As most of HCC produce thyroglobulin(Tg), thus measurement of serum Tg levels can be used as a marker for detection of recurrence. Routine radioactive Iodine 131 ablation following total thyroidectomy is prudent to be performed to identify persistent or recurrent disease and to ablate any remaining normal thyroid tissue so the Tg level is a more accurate predictor⁵.

HCC have an intact thyroid- stimulating hormones receptor –adeylate cyclase system.

Therefore, following radioiodine ablation, thyroid-stimulating hormone suppression with thyroxine should be started to reduce the potential risk of recurrence.

As HCC is less iodine-avid, external irradiation could be considered as an adjuvant for patient with large tumours extrathyroidal extension or extensive lymph nodes involvement². Palliative radiotherapy should be reserved for

inoperable cases, unresectable local invasion, and isolated distant metastases.

In the present case, patient underwent total thyroidectomy followed by palliative radioiodine ablation. He was also started on thyroid stimulating hormone (TSH) suppression after the ablation. Subsequent follow up with serum Tg monitoring was carried out to monitor the disease progression.

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