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MEDULLARY CARCINOMA THYROID- A RARE PRESENTATION

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ABSTRACT
Medullary carcinoma of thyroid (MTC) is an uncommon thyroid tumor which derives from the parafollicular or C cells of the glands and is associated with specific supportive diagnostic markers. MTC often presents as a thyroid nodule. Like all thyroid cancer, MTC is easier to treat and control if found before it spreads to other parts of the body. However, it frequently spreads before the thyroid nodule is discovered. The cytological diagnosis is often difficult owning to variable patterns of growth and cytological features, the diagnosis was established on fine needle aspiration cytology (FNAC) followed by surgical resection and confirmed on histopathology. Preoperative Calcitonin levels were also done in our case.

INTRODUCTION

Medullary tumors are the third most common of all thyroid cancers. They make up about 3-10 % of all thyroid cancer cases [1]. It is a neuroendocrine tumor derived from specialized thyroid cells called Parafollicular cells - C-cells (from ultimobronchial body of neural crest); that secrete calcitonin. MTC is the first human malignancy known to be associated with a tumor marker, the hormone calcitonin, measurement of which enables diagnosis as well as prognostication, following surgical resection of the primary thyroid tumor [2].

The sporadic form accounts for 70% of cases and familial form 10- 20%. Hereditary MTC is transmitted as an autosomal dominant trait either alone as familial Medullary thyroid carcinoma (FMTC) or as part of multiple endocrine neoplasia (MEN) type 2A or 2B1 [1].

This tumor merits special attention because detection of the precursor lesion (C-cell hyperplasia) and the hallmark genetic mutation with (gremline gain-of-function mutations) in the RET gen in specific cases can actually enable the prevention of this tumor [3].

This cancer has a much lower cure rate than does the well-differentiated thyroid cancers (papillary and follicular), but cure rates are higher than they are for anaplastic thyroid cancer [4].

CASE REPORT

55 year old male patient presented with complaints of hoarseness of voice for past one year. He had no other significant complaints.

On physical examination no obvious anterior neck swelling noted. Clinical suspicion of vocal cord palsy was made.

CT scan then done reveled a heterogeneously enhancing lesion in the lower pole of the left thyroid gland extending into the trache-oesophageal groove with suspicious compression of the recurrent laryngeal nerve causing vocal cord palsy.

USG guided FNA from the neck mass along with the enlarged lymph node were obtained. The smears were stained with PAP, H& E and Geimsa.

Microscopic examination revealed tumor cells arranged singly and in clusters. Cells were pleomorphic with moderate anisonucleosis. Plenty of plasmacytoid cells, binucleate, multinucleate cells are also seen. These

cells had uniform stipple/salt and pepper chromatin with moderate amount of cytoplasm. Few scattered cells showed cytoplasmic granulation. With the background showing variable number of lymphocytes along with homogenous, eosinophillic, amorphous, acellular material.

FNA of lymph node showed similar cytological picture.

A diagnosis of Medullary carcinoma of thyroid was made on the basis of these cytological features.

PAS stain was done to confirm homogenous, pink, amorphous, acellular material as amyloid and it showed positivity.

Also patient was investigated for thyroid profile and Se.calcitonin, it revealed elevated Se.calcitonin levels of 1561.00 pg/ml and T3 & T4 were normal and TSH was raised 25.5 Iu/ml

Based on the clinical, hematological and cytopathological findings diagnosis of Medullary carcinoma thyroid was confirmed.

Patient was operated and total thyroidectomy along with neck dissection was received for histopathological examination.

Thyroid altogether measured 8x3x1 cm. Left lobe of thyroid measured 4.5x3.5 cm.

E/S- tan brown, a mass on the left lobe of thyroid is noted.

C/S-the entire left lobe is replaced by a well circumscribed, yellow tan, firm, nodular tumor mass measuring 4x1.8x1.2 cm.

No papillae, necrosis, calcification or hemorrhage noted.

Right lobe and isthmus were unremarkable.

Microscopic examination revealed tumor cells arranged in nests and cords. Individual cells are polygonal to spindle shaped and were separated by amyloid like material confirmed on PAS stain. Areas of calcification were also noted.

Congo red staining for confirmation of amyloid was done and it showed apple green bifrigence on polarized microscope.

2/13 lymph nodes from the neck dissection mass showed evidence of metastasis by the tumor.

DISCUSSION:

It accounts for 6.8% of the primary thyroid carcinomas. It is slightly more common in females than in males (ratio of 1.3:1) and the average age of presentation is 36 years (30-50 years) [5].

Typically, patients present with a thyroid nodule that on further evaluation is found to be cancer. As with all thyroid disease, a thorough history is important, such as a family history of thyroid cancer, personal history of radiation exposure, or enlarged lymph nodes

If the nodule is large, it may cause symptoms such as difficulty swallowing, choking sensations, or a large mass in the neck. Rarely, the cancer can grow into the recurrent laryngeal nerves cause hoarseness.

MTC invades locally and gives rise to metastasis in cervical and mediastinal lymph nodes and distant organs, particularly lung, liver, and skeletal system [6].

In 50-67% of cases, the tumor has metastasized to regional lymph nodes at the time of surgery and hence radical node dissection is justifiable in most cases. It usually pursues a low grade course and ultimately metastasizes [7].

Our patient presented in 5^{th} decade with complaints of hoarseness of voice with no visual or palpable mass. The diagnosis of Medullary thyroid cancer is most frequently made by a combination of fine needle aspiration biopsy of the thyroid nodules and specific blood tests and radiological tests.

Calcitonin (CT) is the most reliable tumor marker because it is highly specific and sensitive. A variety of diseases, other than MTC, including nodular thyroid disease, autoimmune thyroiditis and neuroendocrine tumors, may also cause elevation of CT but levels of CT above 100 pg/ml are reported to be invariably associated with MTC [8, 9].

Fine needle aspiration although not a substitute for conventional surgical histopathology is considered as a first line diagnostic test for evaluation of thyroid lesions. Early diagnosis and treatment would markedly lead to improved cure rates [10].

This tumor has a range of different cytological patterns plasmacytoid, spindle cell, small cell, follicular, tubular and giant cell variants. The commonest is plasmacytoid cell type. FNAC smears from the plasmacytoid MTC are usually cellular, yielding tumor cells that are dispersed and are characterized by eccentric nuclei, “neuroendocrine type” chromatin moderately abundant dense cytoplasm, binucleated and multinucleated cells and a relatively clean background [11].

In our case ultrasound guided FNAC along with Se.Calcitonin levels and special stains supported our diagnosis. Although finally diagnosis was made on surgical pathology.

Amyloid may be observed as acellular material in the form of strings or as round to oval shaped fragments; it can be seen surrounded by tumor cells or separate from them which stain variable shades of magenta with MGG and grayish-orange with Pap. Congo red staining helps to differentiate amyloid from colloid or hyaline fragments and is diagnostic for MTC [11].

The best treatment for medullary thyroid cancer is surgery. The goal of surgery is to completely remove all disease at the first operation. A complete resection can be difficult since a high percentage of patients with a palpable nodule will already have lymph node metastases. The minimum recommended operation for MTC is a with central lymph node dissection.

PROGNOSIS

Beahr's *et al* have reported an 85% 10 year survival rate if the tumor is restricted to the thyroid gland and 42% 10 years survival rate if lymph node metastases are present. For those whose cancer has spread outside of the neck to other parts of the body including the liver, lungs, and bones (i.e. metastatic disease), the 10-year survival rate is 20-40% [12].

FOLLOW UP

The patient is under regular follow up. No remission noted. Thyroid profile, Se.calcium and calcitonin levels are under normal range.The patient is doing well without any co morbidities.

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CONFLICT OF INTEREST:

The authors declare that they have no conflict of interest.

STATEMENT OF HUMAN AND ANIMAL RIGHTS

All procedures performed in human participants were in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This article does not contain any studies with animals performed by any of the authors.

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