



Case Report

Diagnosis of anaplastic thyroid carcinoma on fine needle aspiration cytology - A rare case report

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How to cite this article: Mobeen Alwani, Gunvanti B. Rathod. Diagnosis of anaplastic thyroid carcinoma on fine needle aspiration cytology - A rare case report. IAIM, 2015; 2(3): 183-187.

Available online at www.iaimjournal.com

Received on: 17-02-2015

Accepted on: 25-02-2015

Abstract

Anaplastic thyroid carcinoma [ATC] is a rare highly malignant tumor that arises from the follicular cells of the thyroid gland. It accounts for 1% to 2% of all thyroid carcinomas and patients with ATC uniformly have a poor prognosis. Majority of ATCs show spindle cell, giant cell and squamoid cell patterns; these 3 subtypes frequently coexist and they are not predictive of the patient's outcome. Patients often present at an advanced stage, making curative surgical resection not feasible. Recognizing the cytological finding of the ATC and making the prompt and proper cytological diagnosis are helpful to determine the treatment plan for the patients who suffer with this entity.

Key words

Anaplastic thyroid carcinoma, Cytological finding, FNAC.

Introduction

ATC is a rare highly malignant tumor that arises from the follicular cells of the thyroid gland [1, 2, 3]. It accounts for 1% to 2% of all thyroid carcinomas [4]. Most cases of ATC develop in elderly patients and ATC is a rapidly growing tumor [1, 2, 3]. Majority of ATCs show spindle cell, giant cell and squamoid cell patterns; these 3 subtypes frequently coexist and they are not predictive of the patient's outcome [1, 2]. The

diagnosis of ATC is usually based on clinical examination and cytology, histology, imaging study and immunohistochemical study are helpful in establishing the correct diagnosis of ATC [5]. Here we are going to discuss a case of anaplastic carcinoma of the thyroid, presenting as midline neck swelling with presence of thrombus in jugular vein which is quite rare. The aim of this paper is to add more facts about the ATC.

Case report

A 60 years old female patient presented swelling in the midline of neck since last three months which was associated with pain, dysphagia and change of voice. On examination, diffuse and hard swelling along with sensation of heat was noted on the swelling which measures 4.5×4 cm. Ultrasonography (USG) of local part revealed an ill defined large hypoechoic mass in the left lobe of thyroid with calcification along with cervical lymphadenopathy raising possibility of malignant mass lesion involving left lobe of thyroid. Fine needle aspiration cytology (FNAC) was performed by standard procedure [6, 7, 8, 9] from thyroid swelling and cervical lymph node [10, 11]. The smears from the thyroid swelling showed neoplastic cells arranged in loose clusters as well as dispersed singly in the hemorrhagic background. The individual cells showed easily identifiable malignant cytologic features including large, pleomorphic nuclei with irregular nuclear membranes, coarse clumped chromatin and prominent nucleoli. (**Photo - 1, Photo - 2, Photo - 3**) The smears from the lymph node also showed the same features. (**Photo - 4**) Final diagnosis was given as anaplastic thyroid carcinoma. The patient was managed conservatively without surgical intervention.

Photo - 1: Dispersed, single cell pattern with naked nuclei. (H & E Stain, 20X)

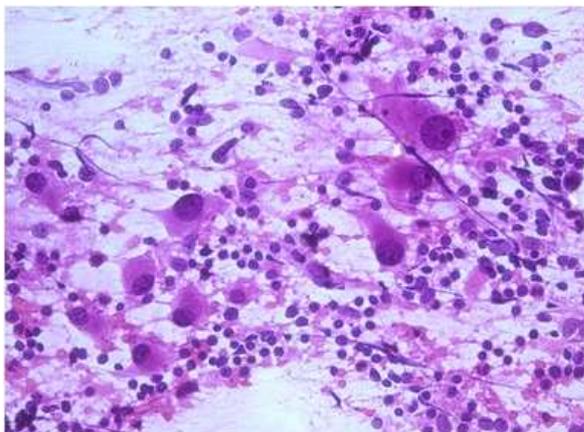


Photo - 2: Anaplastic carcinomas of thyroid with marked pleomorphic malignant cells. (H & E Stain, 20X)

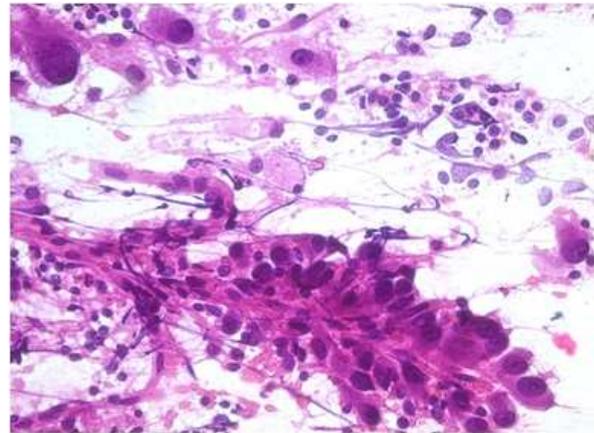


Photo - 3: Anaplastic carcinomas of thyroid with large multinucleated giant cells. (H & E Stain, 40X)

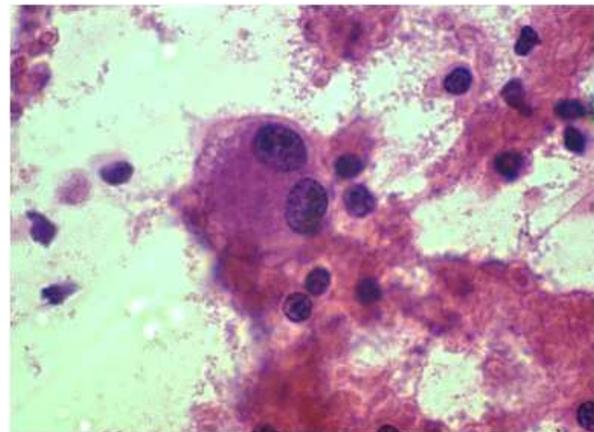
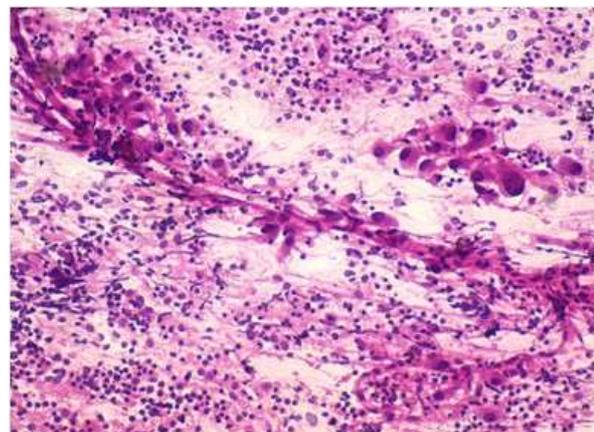


Photo - 4: Malignant cells in lymph node. (H & E Stain, 10X)





Discussion

Malignant tumors of thyroid follicular cell origin have traditionally been classified as either well-differentiated thyroid carcinoma (WDTC), which is composed of papillary and follicular carcinoma, or undifferentiated/anaplastic thyroid carcinoma (ATC). The vast majority of patients with WDTC have an excellent prognosis regardless of the types of treatment used, whereas patients with ATC uniformly have a poor prognosis [12].

The pathogenesis of ATC is not completely understood. Several studies have now shown that some ATCs may be derived from BRAF-mutated papillary thyroid cancer, and targeted expression of BRAF in thyroid cells of transgenic mice results in papillary thyroid cancers that undergo dedifferentiation [13, 14]. This strengthens the theory that WDTC may dedifferentiate to ATC through intermediate forms. Understanding this progression might help identify valuable prognostic factors that can serve as potential therapeutic targets.

Clinically the most common presentation of patients is a rapidly growing, painful, low anterior neck mass which is often firm and fixed to underlying structures [1, 15, 16, 17]. Compressive symptoms including hoarseness, dysphagia, dyspnea and cough are frequent. Regional nodal metastases and vocal cord paralysis are seen in up to 40% and 30%, respectively, of the patients with ATC [18]. Over 70% of patients with ATC have direct invasion of surrounding tissues, such as fat, trachea, muscle, esophagus, and larynx [5]. Systemic metastases occur in up to 75% of patients, with lung being the most common site (80%), followed by bone (6% to 15%) and brain (5% to 13%) [15].

Diagnosis can be made with help of cytology, histology, imaging study and immunohistochemical study. FNAC is an

effective diagnostic modality and cytologically ATC reveals three major patterns such as the spindle cell, giant cell and squamoid cell patterns, and sometimes these patterns are combined in different proportions according to the case [1, 2, 3]. Regardless of type, the nuclei of undifferentiated thyroid carcinoma are highly pleomorphic with dark, irregular chromatin clumping, macronucleoli, and occasional intra nuclear pseudo inclusions. Numerous mitoses and abnormal mitotic figures may be seen. Squamous differentiation, including keratin pearl formation, can also be present, and should be distinguished from a metastatic squamous cell carcinoma by correlation with clinical history. In our case there was presence of squamous differentiation along with keratin in necrotic background.

According to the TNM system (tumor, nodes, metastasis) all anaplastic carcinoma are stage 4. The TNM system further distinguishes stage 4 which includes stage 4A, where tumor is limited to the thyroid and considered surgically resectable; stage 4B where tumor extending beyond the thyroid, is considered surgically unresectable and stage 4C where tumor is present with distant metastases. In our case the patient was in stage 4B with involvement of cervical lymph node.

Patients often present at an advanced stage, making curative surgical resection not feasible. Most studies find that neither the extent of surgery nor the completeness of resection has a significant effect on survival [19]. Because ATCs are rapidly growing, highly aggressive tumors, multimodality treatment can be applied [5].

Conclusion

Although ATC make up a rare group of tumors, they account for a significant portion of the morbidity and mortality associated with thyroid

cancer. Recognizing the cytological finding of the ATC and making the prompt and proper cytological diagnosis are helpful to determine the treatment plan for the patients who suffer with this entity.

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Source of support: Nil

Conflict of interest: None declared.