Case Report

Paucicellular variant of anaplastic thyroid carcinoma: A diagnostic pitfall in thyroid pathology

Reetika Sharma, Vidisha Mahajan, Neelam Sharma, Vijay Kaushal

Department of Pathology, Indira Gandhi Medical College, Shimla, Himachal Pradesh, India

ABSTRACT

Paucicellular variant is a rare variant of anaplastic carcinoma. Anaplastic thyroid carcinomas usually creates no problems in histologic diagnosis because of the obvious invasive growth, high cellularity, and marked degree of anaplasia, but paucicellular variant of anaplastic carcinoma is problematic in diagnosis because of its histologic mimicry to benign lesions, e.g. Riedel disease and fibrous variant of Hashimoto thyroiditis, i.e. prominent fibrosis and low cellularity. It is important to distinguish it from these two lesions because both are reactive conditions with favorable prognosis while anaplastic carcinoma is a malignant condition with poor prognosis. We present a case of 45-year-old female presented with a history of thyroid swelling for 10 years. The cytological diagnosis was given as colloid goiter while histopathological examination turned out to be paucicellular variant of anaplastic carcinoma thyroid. To conclude paucicellular variant is the entity to which all pathologists should be familiar and should know differential diagnosis while dealing with any fibrosed lesion of the thyroid.

Key words: Anaplastic carcinoma, paucicellular variant, thyroiditis

INTRODUCTION

Thyroid cancer is fairly common. The worldwide annual incidence ranges from 0.5 to 10 cases per 100,000 people.[1] Anaplastic thyroid carcinoma (ATC) is rare malignancy accounting for < 2% of all thyroid tumors but responsible for about half of all thyroid carcinoma deaths.[2] The tumor is usually seen in the elderly above 50 years of age with a female preponderance. It typically found in 40% of places where goiter is endemic. The mean survival rate is < 6 months.[3] The major cause of death of this high-grade malignancy is either distant metastasis or is due to the involvement of the vital structures of the neck.[1] Paucicellular carcinoma is a very rare variant of anaplastic carcinoma thyroid, which mimics reactive conditions of thyroid like Riedel disease and a fibrous variant of Hashimoto thyroiditis (FVHT).

CASE REPORT

A 45-year-old female presented with a history of thyroid swelling for 10 years. Initially, it was started with 2 cm × 2 cm nodule, which was progressively increasing in size but for last 2 months, there was a history of rapid enlargement of the swelling. There was no history of painful deglutination or respiratory discomfort. On examination, there was diffuse enlargement of the left lobe of the thyroid gland, measuring about 5 cm × 5 cm, firm in consistency and freely mobile. Thyroid function tests were within normal limits. Ultrasonography showed the presence of a hypoechoic lesion. There was no evidence of lymphadenopathy. Fine-needle aspiration revealed

Address for correspondence: Dr. Reetika Sharma, Department of Pathology, Indira Gandhi Medical College, Shimla - 171 001, Himachal Pradesh, India.
E-mail: dr_ritu85@yahoo.com

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colloid material and cytosmears showed abundant colloid with scattered few benign follicular epithelial cells. Hence, the diagnosis of colloid goiter was made [Figure 1a]. The patient underwent partial thyroidectomy. We received single lobe of thyroid measuring 4.8 cm × 3.7 cm × 2.5 cm. The outer surface was unremarkable. Cut surface showed central pearly white focus measuring 2 cm × 2 cm. Rest of thyroid parenchyma was within normal limits [Figure 1b]. Histopathological examination revealed dense sclerosis, the presence of ghost blood vessels, and hypocellular tumor tissue comprised isolated tumor cells with marked nuclear cellular pleomorphism, round, irregular to spindled hyperchromatic nuclei, prominent nucleoli, and a moderate amount of cytoplasm with occasional multinucleate giant cells [Figure 1c and d]. Rest of thyroid parenchyma showed features of nodular colloid goiter with thyroiditis. The patient underwent total thyroidectomy. Other lobe also showed features of nodular colloid goiter with features of thyroiditis. No malignant cells/foci identified.

DISCUSSION

ATC is defined as a highly malignant tumor wholly or partially composed of undifferentiated cells that have features indicative of epithelial origin, on immunohistochemical, or ultrastructural ground. The various modes of presentation are (a) recent rapid enlargement of thyroid in a patient with long-standing goiter (most common) (b) rapid growth of a thyroid mass in a patient without goiter. (c) Recent rapid growth in a patient with recurrent well-differentiated thyroid carcinoma (d) regional or distant metastatic tumor.[3] In this patient, there was a history of rapid enlargement of thyroid swelling, which was present for last 10 years.

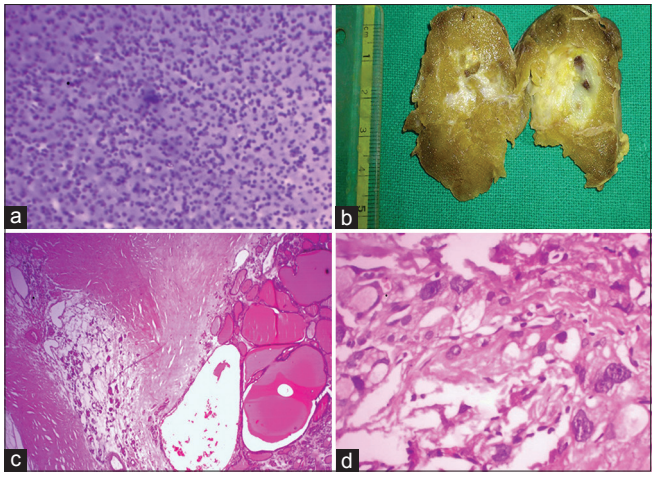

Figure 1: (a) Colloid goiter-showing abundant thin colloid and red blood cells with paucity of epithelial cells (MGG, ×100). (b) Thyroid lobe showing central pearly white focus measuring 2 cm × 2 cm surrounded by normal thyroid parenchyma. (c) Central infracted area represents pearly white zone which was seen on gross and surrounded by colloid filled thyroid follicles (H and E, ×40). (d) Another focus showed highly pleomorphic cells infiltrating the normal parenchyma of thyroid (H and E, ×400)

The morphological spectrum of ATC depends on the admixture of three main histological patterns: spindle cell, giant cell, and squamoid. These patterns often coexist and are not predictive of patient's outcome but are historically used to group ATC in major histological categories and to define their main differential diagnoses.

The morphological variants of anaplastic carcinoma include an angiomatoid variant, osteoclastic variant, rhabdoid variant, lymphoepithelioma such as carcinoma, paucicellular variant, carcinosarcoma, adenosquamous carcinoma, and squamous cell carcinoma.[3]

Paucicellular variant is a distinct variant of anaplastic carcinoma because it mimics a number of benign conditions such as Reidel's thyroiditis,[4] FVHT. Prevalence of this tumor is not known due to the paucity of literature. It is a hypocellular infiltrative tumor with dense sclerosis, infarcted areas, the focal presence of spindle cells with mild nuclear atypia, and a sprinkling of lymphocytes. Infarcted area is often misinterpreted as sclerosis, but the presence of ghost blood vessels favors infracted area.[3,5] Due to the presence of infarcted area in the center, we could not find any atypical cell in cytology and found abundant colloid from surrounding benign follicles. The diagnosis is further supported by the finding of obliteration of blood vessels by the spindle cells, and demonstration of cytokeratin immunoreactivity.[3,5,6]

Cytology smears have a limited role in diagnosing all these lesions because of the paucity of cell material. In FVHT, the fibroinflammatory process involves a part or the whole gland, and it does not include the adjacent tissues. There is an inflammatory population, made up mainly of lymphocytes, with occasional formation of germinal centers, mixed with oncocytes, and sometimes with granulomas with a variable number of giant cells.[7] Riedel's thyroiditis is characterized by invasive fibrosis that partially destroys the thyroid gland and extends into adjacent neck structures. It is very difficult for physicians to distinguish Riedel's thyroiditis from malignant neoplasms of the thyroid clinically because both clinical examination and imaging of Riedel's thyroiditis suggests malignancy. Ultrasonography of Riedel's thyroiditis shows a hypo-echoic and hypo-vascular mass with extension into adjacent soft tissues. However, this appearance is nonspecific and can be seen in other disease processes that present with diffuse fibrotic involvement, such as Hashimoto thyroiditis, lymphoma, and thyroid carcinoma.[8] The other differential diagnosis are diffuse sclerosing variant of papillary carcinoma, sarcomas, and large cell malignant lymphoma.[7] The diffuse sclerosing variant of papillary carcinoma contain abundant psammoma bodies, solid foci of the tumor with characteristic nuclear features of papillary carcinoma and immunohistochemistry will differentiate all these lesions.

CONCLUSION

This case will add to literature of very rare cases of paucicellular variant of anaplastic carcinoma. It is important to recognize this variant so as not to mistaken it for Riedel's thyroiditis and FVHT, which are reactive conditions with a very favorable prognosis. Even if immunohistochemistry is not available, its typical histomorphological features aid in diagnosis.

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Conflicts of interest
There are no conflicts of interest.

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