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Follicular neoplasm of thyroid in a young female: a case report from central India

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Abstract

Thyroid FNAC is very common but its interpretation is difficult. A 16- year- old female patient presented with a single thyroid nodule. A cytologic diagnosis of follicular neoplasm was made on fine needle aspiration cytology (FNAC). Papanicolaou and May–Grunwald–Giemsa staining showed high cellularity, abundant micro-follicles, cell crowding and uniform nuclear morphology. Reporting was done according to Bethesda system. The distinction between Follicular neoplasm and Nodular goiter is the most common differential diagnostic problem in solitary nodules as cytological appearances overlap. Findings were suggestive of follicular neoplasm which is rare in this age group.

Keywords: Thyroid, Follicular neoplasm, Nodular goiter, Bethesda system

Introduction

Thyroid FNA is a safe, cost effective, painless and relatively simple test with the major advantage of being done as an out-patient procedure. It is widely recognized as the critical, primary diagnostic procedure of first choice for the evaluation of patients presenting with thyroid nodules [1–6]. Thyroid FNAC is very common but its interpretation is difficult. There is lack of uniformity in reporting thyroid cytopathology that further complicates the scenario. Thyroid nodules are a common clinical finding and have a reported prevalence of 4–7% in the general population [1, 7, 8]. Most of these nodules are non-neoplastic lesions or benign neoplasms. The main role of fine needle aspiration cytology (FNAC) lies in differentiating between a malignant and benign thyroid nodule. It greatly influences the treatment decision [9]. A 16- year- old female patient presented with a single thyroid nodule. A cytologic diagnosis of follicular neoplasm was made on fine needle aspiration cytology (FNAC). Rarity of this neoplasm at this age prompted us to report the case with review of the literature.

Case Report

A 16- year- old female patient presented with a nodular thyroid swelling of 3-4 cm in size from 3 months with slow progression and was referred by a treating surgeon for FNAC in a private Lab. The swelling was firm, non-tender and moved with deglutition. There was no lymphadenopathy and no organomegaly. Hematological, biochemical and urine examinations were within normal limits. Electrocardiogram and X- ray chest was normal. FNAC was carried out. The slides were made by a conventional method, Papanicolaou and May–Grunwald–Giemsa staining was done, and slides were reviewed. The smears examined showed high cellularity, abundant micro-follicles, cell crowding and uniform nuclear morphology. There was scanty colloid material, absence of nuclear grooves and pseudo-inclusions, no papillae and macrophages. Reporting was done according to Bethesda system. Findings were suggestive of follicular neoplasm which is rare in this age group.

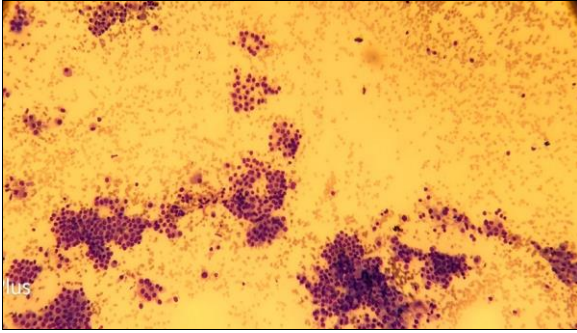
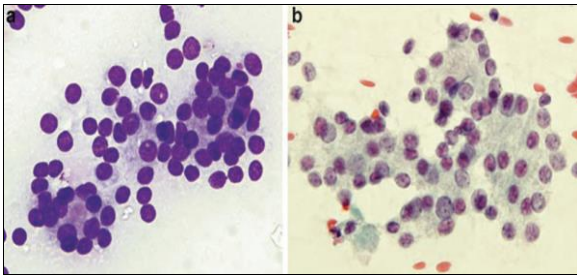


Fig 1: Low power view shows high cellularity composed of microfollicles



- (a) The crowded follicular cells have round nuclei of similar size and faint cytoplasm.
 (b) FN/SFN. Follicular cells are arranged as microfollicles and have round nuclei, evenly dispersed, granular chromatin.

Discussion

Follicular neoplasms (FN) are classified as benign {Follicular adenoma} and malignant {Follicular carcinoma}. FAs and most FCs are encapsulated tumors, occurring in one of the lobes. Follicular adenoma occurs in adults aged 20 to 50 years. It is more common in women. Most patients present with a solitary thyroid nodule noticed for variable periods. They are totally benign and are adequately treated by lobectomy. Follicular carcinoma generally affects patients with a higher mean age compared with follicular adenoma. Mean age at diagnosis for minimally invasive FC is 47-50 yrs and for widely invasive FC is 53-59 yrs. Most patients present with a thyroid mass, but up to 11% of patients present initially with distant metastasis such as bone pain, fracture or a pulsatile mass in soft tissue.

Histological diagnosis of a well differentiated FC requires demonstration of capsular and/or vascular permeation. Most FNs especially adenomas have a uniform internal structure that is reflected in the cytological smears. FAs are more common in women and microscopically show a variety of histological patterns such as micro follicular, normo follicular, macro follicular, trabecular and solid [10].

Cytologically follicular lesions include FA, FC, cellular nodular goiter and follicular variant of papillary carcinoma [11]. Smears in FN are cellular in a bloody background that is usually devoid of colloid. Many uniform sized follicular cell clusters, microfollicles and rosette formations are present. Syncytial aggregates, nuclear crowding and overlapping are also often seen. The repetitive smear pattern with uniform cell population contrasts with the variable pattern of different cell types seen in colloid and hyperplastic nodules. Microacinar clusters with a central lumen {that may contain a drop of colloid} represent microfollicles. These are characteristic of Follicular neoplasm but may be found focally in nodular goiter. Rosette like groupings without a

lumen suggest a more solid growth pattern. Small blood vessels with adherent epithelial cells can be found in any type of follicular neoplasm.

In our case we reviewed the cytology slides based on representative cytologic FN findings such as abundance of follicular epithelial cells, presence of microfollicular structures, abundant cell crowding, abundant dispersed isolated cells, homogenous nuclear morphology, lack of nuclear grooves, lack of colloid material and lack of macrophages with reference to previous reports and the Bethesda system for reporting thyroid cytology.

The distinction between FN and NG is the most common differential diagnostic problem in solitary nodules as cytological appearances overlap. A microfollicular focus in a colloid nodule cytologically resembles a microfollicular neoplasm, while smears from a macrofollicular adenoma resemble a dominant nodule in multi nodular goiter. The presence of hemosiderin within macrophages and follicular cells excludes FN [12]. The false negative rate of cytology in FN may be 30% or more because of the inability to recognize normo follicular neoplasms [13]. However these distinctions are of little clinical importance if the nodule is recognized as benign and spared from unnecessary surgery. Most FCs are micro follicular, trabecular or solid, contain little colloid and will be reported as FN by cytology. Although the failure to recognize FC as neoplastic has been surprisingly high in some series, other studies show high diagnostic sensitivity with false negative rates as low as 0-2%. [14, 15, 16, 17].

Cytological features in FA and FC are similar with cellular smears composed of syncytial clusters of crowded cells. There is a tendency for uniform nuclear enlargement in FC whereas FA may show small or large nuclei. These differences are often subtle with much overlapping [18, 19, 20]. Cells from a well differentiated but clinically aggressive FC may not appear obviously atypical or enlarged in smears. Anisokaryosis is more a feature of non-neoplastic lesions as NG and thyroiditis [10].

The Bethesda System for Reporting Thyroid Cytopathology (TBSRTC) established a standardized, category-based reporting system for thyroid fine-needle aspiration (FNA) specimens. The 2017 revision reaffirms that every thyroid FNA report should begin with one of six diagnostic categories, the names of which remain unchanged since they were first introduced:

- Nondiagnostic or unsatisfactory
- Benign
- Atypia of undetermined significance (AUS) or follicular lesion of undetermined significance (FLUS)
- Follicular neoplasm or suspicious for a follicular neoplasm
- Suspicious for malignancy
- Malignant.

There is a choice of two different names for some of the categories. A laboratory should choose the one it prefers and use it exclusively for that category. Synonymous terms (e.g., AUS and FLUS) should not be used to denote two distinct interpretations. Each category has an implied cancer risk that ranges from 0% to 3% for the "benign" category to virtually 100% for the "malignant" category, and, in the 2017 revision, the malignancy risks have been updated based on new (post 2010) data. As a function of their risk associations, each category is linked to updated, evidence-

based clinical management recommendations. For unsatisfactory cases, a repeat examination with follow-up or consideration of surgery is recommended. For benign cases, additional examination or treatments are not necessary. In the atypia category, because the malignancy rate is approximately 5-15%, a repeat FNAC with consideration of surgery is necessary. The category of suspicious malignancy or malignancy is indication for lobectomy or total thyroidectomy. For the FN, when the autonomic nodules are not found in the thyroid scan, lobectomy or total thyroidectomy is recommended. For the HCN, lobectomy or total thyroidectomy is recommended without a thyroid scan. In the FN or HCN cases, although a few cytologic findings can be helpful for the suspicion of FN/HCN, the prediction value of malignancy is relatively low. FNAC cannot provide definitive criteria for the distinction between benign and malignancy when FN/HCN is suspected^[21].

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