Atypia in Follicular Neoplasm: Making a Case for Follicular Variant of Papillary Thyroid Carcinoma

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ABSTRACT

BACKGROUND: The Bethesda thyroid classification describes follicular neoplasm (FN) as a cellular lesion showing microfollicular architecture with scant or absent colloid. Fine-needle aspiration (FNA) diagnosis of FN is a screening test that does not differentiate between a benign and malignant tumor. The majority of thyroid nodules diagnosed as FN are benign on histologic examination. This study is designed to determine the positive predictive value of cytologic diagnosis in a subset of FN and offer a practical guide for thyroid physicians by identifying significant risk factors for malignancy based on cytologic atypia.

DESIGN: Based on a retrospective review of cytologic diagnosis between January 2008 and December 2011, all thyroid FNA cases with the diagnosis of FN were reviewed. A subset with cytologic atypia – some features suggestive but not diagnostic for Papillary thyroid carcinoma follicular variant (FVPTC) – was identified. The PPV of the cytologic interpretation of FN with atypia for neoplasia (including adenoma and carcinoma) and that for malignancy were calculated.

RESULTS: A total of 38 cases of thyroid FNA (29 female and 9 male) with the cytologic diagnosis of FN with atypia (and with surgical follow-up) were identified (representing 12% of the total number of cases diagnosed as FN with surgical follow-up over the study period). Many studies concluded that the main diagnostic challenge is to differentiate FVPTC from other follicular lesions. This study was designed to determine the positive predictive value of cytologic diagnosis in a subset of FN and offer a practical guide for thyroid physicians by identifying significant risk factors for malignancy based on cytologic atypia.

Based on a retrospective review of the cytopathology database at Yale-New Haven Hospital between January 2008 and December 2011, all thyroid FNA cases were reviewed. A subset with cytologic atypia – some features suggestive but not diagnostic for Papillary thyroid carcinoma follicular variant (FVPTC) – was identified. The PPV of the cytologic interpretation of FN with atypia for neoplasia (including adenoma and carcinoma) and that for malignancy were calculated.

The majority of thyroid nodules (up to 80%) diagnosed as “follicular neoplasm” (FN) end up being benign after histologic examination. As of now, diagnosis of follicular neoplasm on FNA remains a gray area, because of overlapping cytological features between benign and malignant follicular lesions. The differential diagnoses of follicular neoplasm on FNA include follicular variant of papillary carcinoma (FVPTC), follicular adenoma, follicular carcinoma, and a benign solitary cellular nodule associated with goiter.

Some studies have looked into either cytologic features or biologic markers that could distinguish between benign and malignant follicular patterned lesions in the thyroid; however, none of these cytologic criteria or markers were found to be of reproducible diagnostic value. More than half of the malignant diagnoses were FVPTC on histologic follow-up. Many studies concluded that the main diagnostic challenge is to differentiate FVPTC from other follicular lesions.

This study was designed to determine the positive predictive value of cytologic diagnosis in a subset of FN and offer a practical guide for thyroid physicians by identifying significant risk factors for malignancy based on cytologic atypia.

FNA of the thyroid is one of the most successful screening tests; it has resulted in a tremendous decrease in unnecessary thyroid surgery. Papillary thyroid carcinoma (PTC) is the most common thyroid carcinoma, accounting for 70–90% of all thyroid malignancies. FNA technique is highly sensitive for detecting FVPTC (ranging between 60% to > 90%), especially for conventional PTC. However, FNA of the solitary thyroid nodule is a screening test for the selection of cases that may require excision.

Neoplastic – 30/38 (out of which 26 were malignant), malignancy were 78% and 68%, respectively.

CONCLUSIONS:

Not uncommonly, many cases of FVPTC are misdiagnosed on cytologic samples as benign, or underdiagnosed as follicular neoplasms due to its overlapping features with other follicular-derived lesions. The reported incidence of malignancy in FN is 10–30%.

Here we have presented our experience with cases diagnosed by FNA with atypia. The predominant feature in these cases is the presence of follicular architecture.

On closer look those cases have very focal and subtle nuclear atypia commonly seen in PTC. The positive predictive value for neoplasia and malignancy were 78% and 68%, respectively.

Our institutional data suggests that FN cases should have a comment regarding the presence or absence of nuclear atypia on PTC. The predominant feature in these cases is the presence of follicular architecture.

REFERENCES:

