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Slide Seminar
Cases 1-5: Taming the Thyroid

Chair of the Session

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Keynote Speaker

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CASE HISTORIES:

Case 1

Clinical History: A 48-year-old man presents with multiple thyroid nodules. Total thyroidectomy is performed. The gross examination shows multiple solid tan nodules of varying sizes throughout both lobes of the thyroid. The slide is representative of the findings throughout the thyroid.

Discussion: Thyroid nodules are a common clinical finding, and multinodular goiter is a common presentation. Certain presentations of thyroid disease should prompt consideration of genetic syndromes.

Clinical Findings: The submitted slide demonstrates multiple microfollicular nodules of varying sizes. There is lymphocytic thyroiditis with occasional germinal center formation in the background.

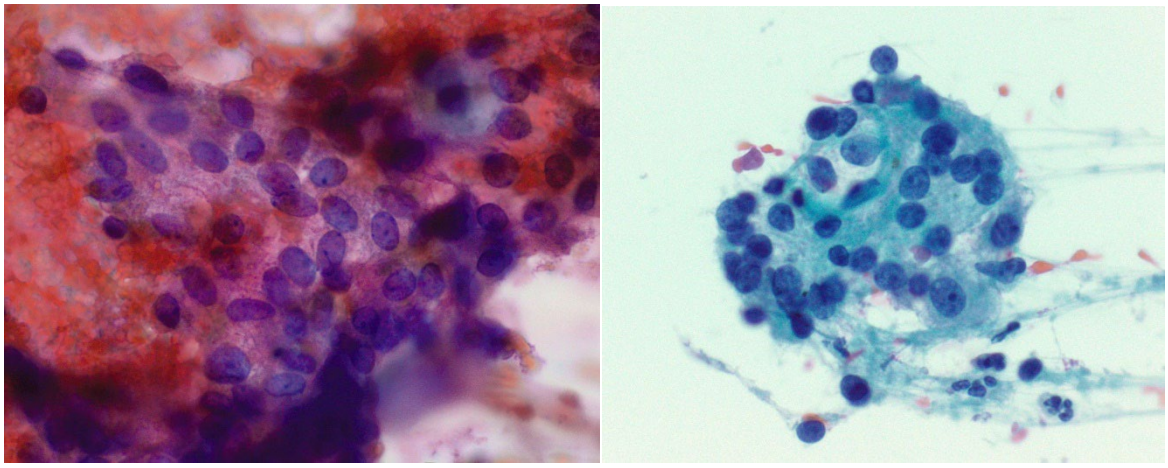
Additional information: Patient has a history of multiple colon polyps, status post subtotal colectomy. Family members with breast, kidney, uterine cancers. The history and pathologic findings are consistent with a PTEN-related syndrome. Thyroid findings in these patients

may consist of adenomatous nodules in a background of thyroiditis, as seen here, papillary carcinoma, follicular carcinoma, c-cell hyperplasia, and follicular adenoma. (Laury et al. Thyroid pathology in PTEN-hamartoma tumor syndrome: characteristic findings of a distinct entity. Thyroid. 2011)

Conclusion: Thyroid findings in a patient with PTEN mutation

Case: 2

Clinical History: A 53-year-old woman presents with incidentally-found thyroid nodule. FNA is performed, showing Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS).



Molecular testing performed on the aspirate sample demonstrated NRAS mutation.
A diagnostic lobectomy is performed. At gross examination, a single, well-circumscribed nodule is found. The nodule is submitted entirely for histologic examination and all sections of the nodule appear similar to the slide presented.

Discussion: Cytologically-indeterminate nodules pose a management challenge in taking care of patients with thyroid nodules. Molecular testing can be a useful adjunct in these cases to aid in risk stratification and patient management.

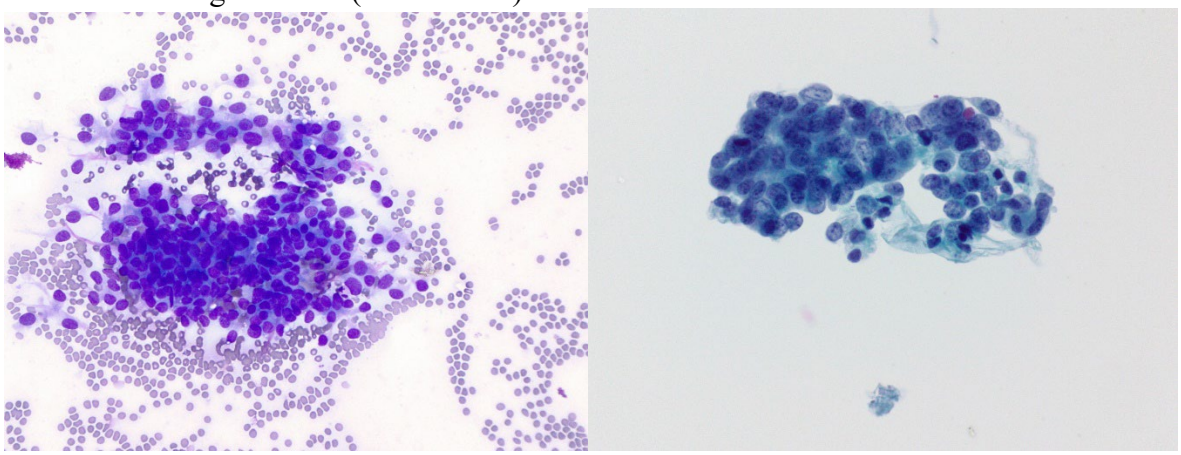
Clinical Findings: The slide shows a well-circumscribed nodule with follicular architecture. Focally, there is a capsule without evidence of invasion. There are nuclear contour irregularities including grooves, but pseudoinclusions are not pronounced. The tumor is submitted entirely and no areas of invasion are seen.

Additional information: The tumor known as Noninvasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features (NIFTP) came about due to a concerted effort to review cases of follicular variant of papillary thyroid carcinoma to reclassify many of these low-risk tumors as “not cancer” to improve patient care and reduce overtreatment. Strict criteria and careful sampling is required to make this diagnosis. (Nikiforov et al. Nomenclature Revision for Encapsulated Follicular Variant of Papillary Thyroid Carcinoma: A Paradigm Shift to Reduce Overtreatment of Indolent Tumors. JAMA Oncol. 2016) On molecular studies, these tumors tend to show RAS-type mutations like those seen in other follicular-patterned thyroid tumors (Jiang et al. Molecular testing in noninvasive follicular thyroid neoplasm with papillary-like nuclear features. Cancer Cytopathol. 2016)

Conclusion: Noninvasive Follicular Thyroid Neoplasm with Papillary-Like Nuclear Features (NIFTP)

Case: 3

Clinical History: A 36-year-old woman presents with incidentally-found thyroid nodule. FNA is performed, showing Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS)



Total thyroidectomy is performed. At gross examination, there were two nodules bilaterally with solid appearance. The presented slide is from the dominant larger nodule.

Discussion: Certain thyroid malignancies can be the first presentation of a genetic syndrome. Pathologists should be aware of these syndromes to optimize patient care.

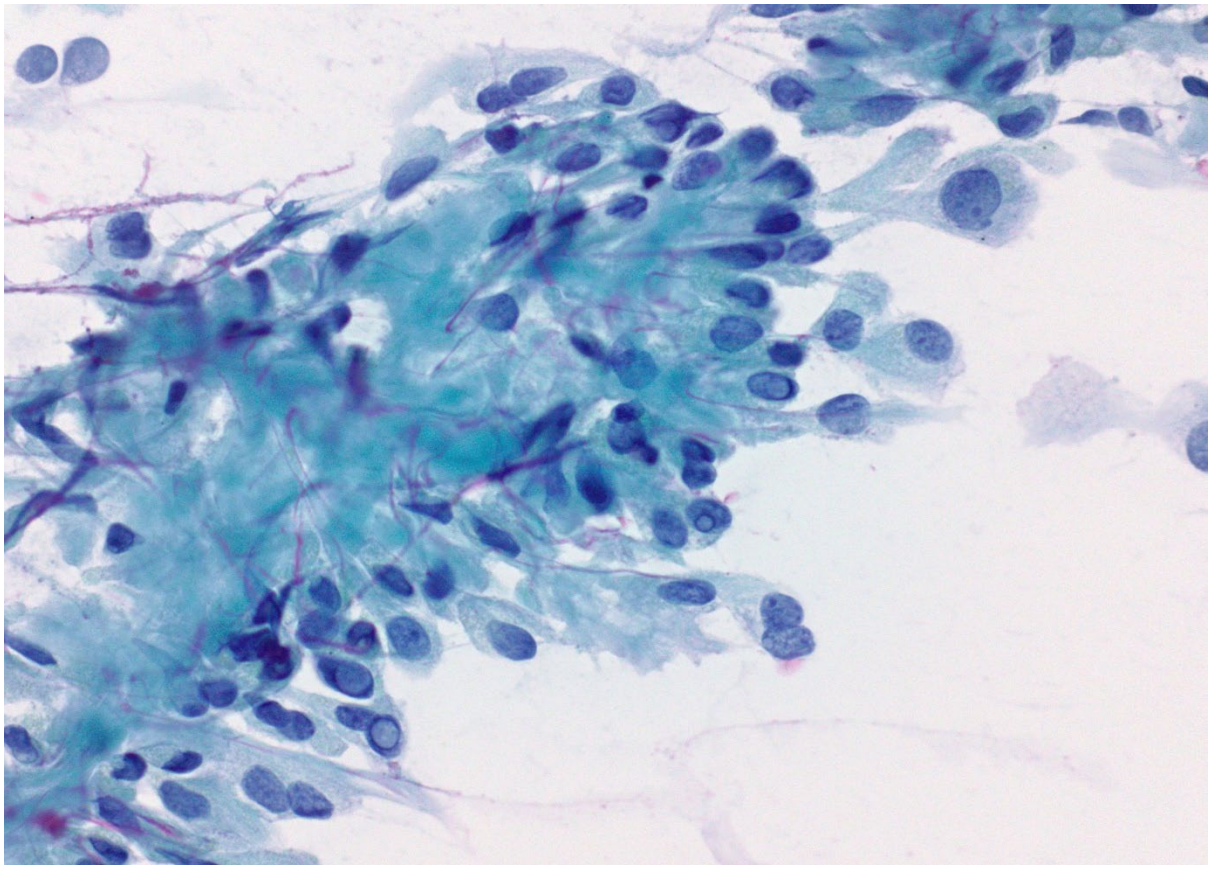
Clinical Findings: The slide shows a tumor with cribriform and papillary architecture. There are focal areas of whorls of cells with abundant eosinophilic cytoplasm and squamous features, consistent with squamous morules. The nuclei are elongated with nuclear contour irregularities including grooves and pseudoinclusions.

Additional information: Cribriform-morular carcinoma of the thyroid was, until recently, classified as a type of papillary thyroid carcinoma. The diagnosis of cribriform-morular carcinoma should prompt evaluation for familial adenomatous polyposis (FAP), as these tumors may be associated with FAP in some cases. Sporadic tumors also occur. (Boyraz et al. Cribriform-Morular Thyroid Carcinoma Is a Distinct Thyroid Malignancy of Uncertain Cytogenesis. Endocr Pathol. 2021)

Conclusion: Cribriform-morular carcinoma of the thyroid

Case: 4

Clinical History: A 50-year-old woman presents with a solitary thyroid nodule.
FNA is performed, showing Atypia of undetermined significance/follicular lesion of undetermined significance (AUS/FLUS)



Diagnostic lobectomy is performed. A single solid nodule is found at the time of gross examination, which is entirely submitted and shows findings throughout similar to the presented slide.

Discussion: Hyalinizing trabecular tumor (HTT) represents a potential pitfall in thyroid cytology.

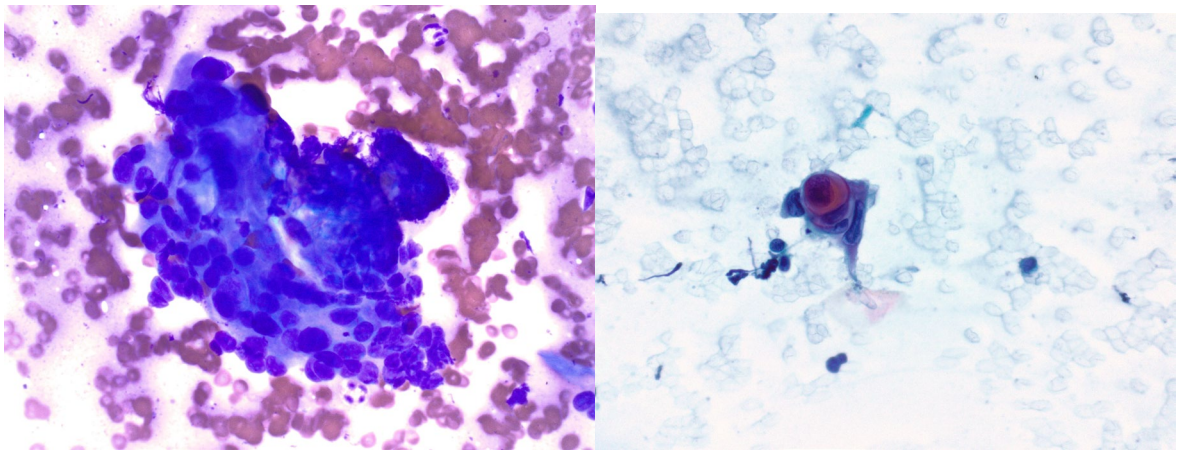
Clinical Findings: The slide shows sections of a well-circumscribed nodule which is strikingly eosinophilic. On closer inspection the tumor is comprised of a nested and trabecular proliferation of cells with abundant eosinophilic cytoplasm surrounded by pink hyaline material. The nuclei show grooves and abundant pseudoinclusions. The cytoplasm shows amorphous yellow material in many areas.

Additional information: Molecular testing performed on the aspirate sample demonstrated a PAX8-GLIS3 fusion. HTT is an uncommon thyroid tumor which poses a pitfall on cytology, as the abundant nuclear pseudoinclusions can lead to a diagnosis of papillary thyroid carcinoma, or the hyaline material may lead to a misdiagnosis of medullary thyroid carcinoma. Cytologic clues to the diagnosis of HTT include abundant eosinophilic cytoplasm with yellow bodies, the lack of true papillae, and cells radiating from a hyaline core. (Rossi et al. The Diagnosis of Hyalinizing Trabecular Tumor: A Difficult and Controversial Thyroid Entity. Head Neck Pathol. 2020) I always consider HTT whenever a thyroid FNA has “too good” of PTC features-i.e. pseudoinclusions are too abundant. A characteristic PAX8-GLIS3 fusion has been found in HTT, which is helpful as many of these tumors may fall into an indeterminate cytologic category and receive molecular testing.

Conclusion: Hyalinizing Trabecular Tumor

Case: 5

Clinical History: A 60-year-old man presents with a tumor of the left thyroid lobe. Fine needle aspiration of the mass is performed, showing “carcinoma with squamous features”.



Total thyroidectomy is performed. At gross examination, a firm, infiltrative tumor is found to replace the inferior lobe of the thyroid, with extrathyroidal extension. The presented slide is representative of the tumor.

Discussion: A squamous lesion in the thyroid may represent a reactive/metaplastic or a component of a malignancy. Pure squamous carcinomas of the thyroid are rare, and are considered a form of anaplastic carcinoma given similar biology.

Clinical Findings: The slide shows an infiltrative tumor completely replacing the thyroid parenchyma, with growth into and around adjacent soft tissues, muscle, and vessels. Irregular cords and nests of epithelioid cells are intermixed with a lymphoplasmacytic background in a desmoplastic stroma. Occasional areas of better-developed squamous features are seen in the epithelial component.

Additional information: Intrathyroidal thymic carcinoma (ITC) (previously referred to as CASTLE or lymphoepithelioma-like carcinoma) is a malignancy with thymic epithelial differentiation, as evidenced by positivity for CD5, p63, CD117 in the epithelial component. These tumors may pose a challenge on cytology or biopsy due to having squamous features.

Conclusion: Intrathyroidal thymic carcinoma (ITC)