

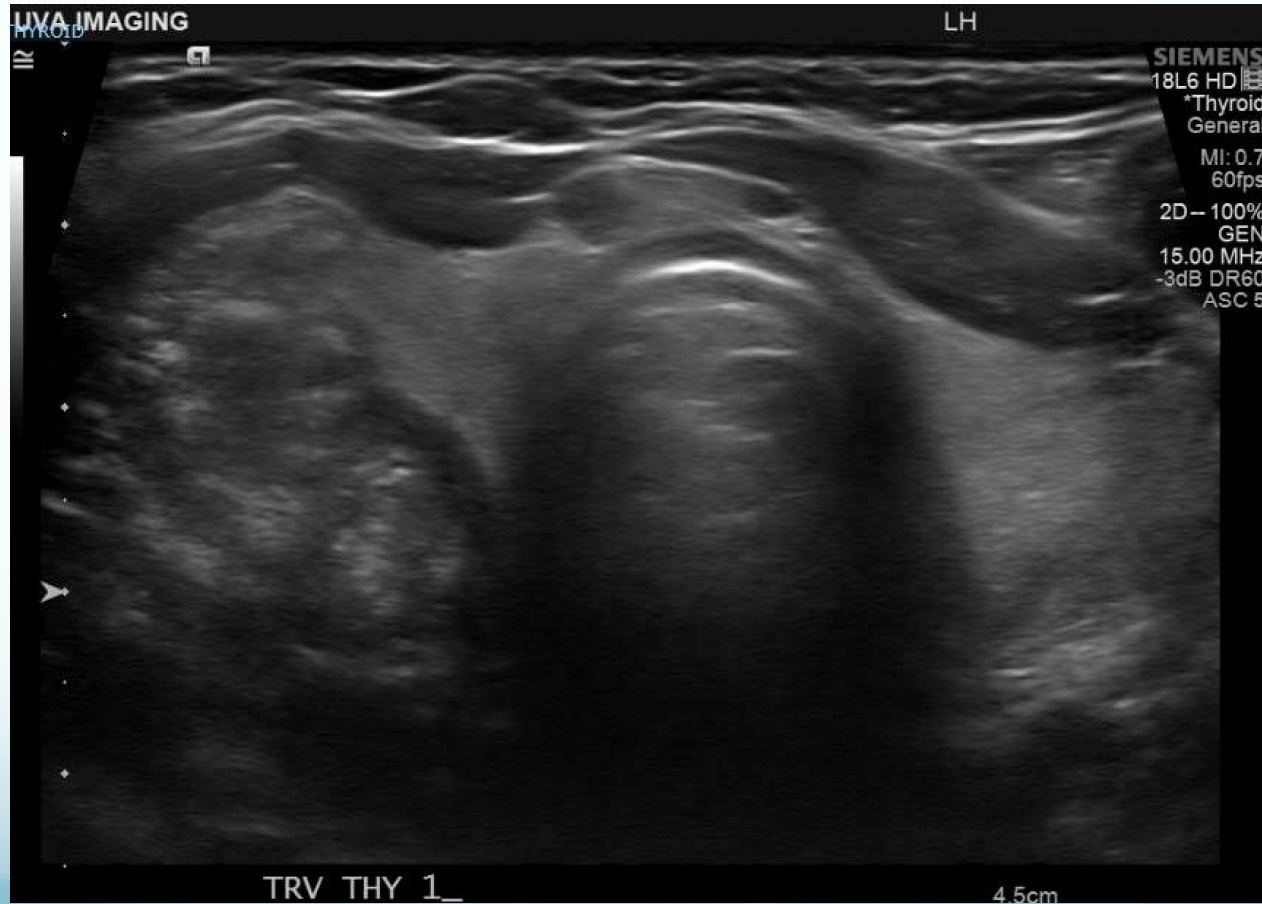
Radiology Pathology Correlation Case Presentation: A Thyroid Nodule with Suspicious Features

Mark Hanak
9/21/18

Case

- Mr. E is a 39 yo M with a PMH of migraines w/o aura, essential HTN and obesity who presented to his PCP for a routine health maintenance exam.
- Prior to the visit the patient had noticed a small right-sided neck mass w/o complaint of compressive symptoms.
- ROS was negative including symptoms of hyperthyroidism and hypothyroidism.
- Pertinent Positive(s): Family history of papillary thyroid CA in father.
- Pertinent Negative(s): No prior head/neck irradiation.
- Patient was referred to UVA for an U/S of the thyroid.

U/S Findings



U/S Report

Nodule #: 1

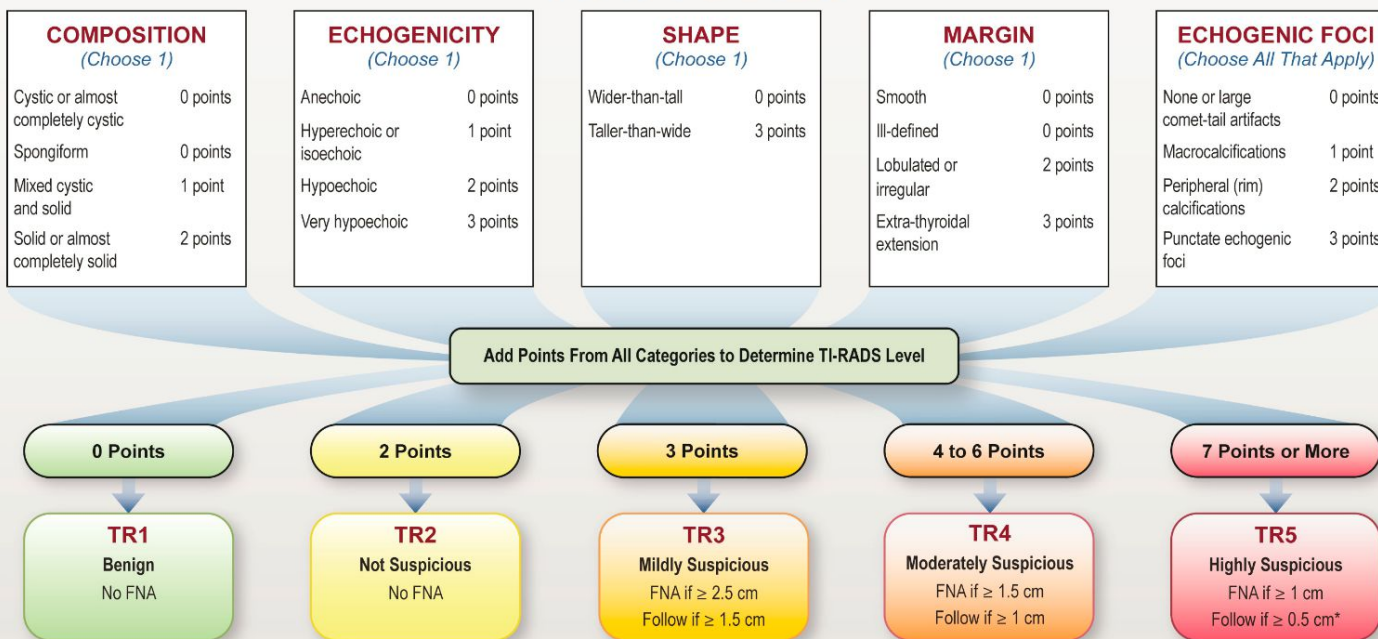
Maximum size: 4.2 cm; Other 2 dimensions 3.6 x 2.2 cm Location: right;mid
Composition: mixed cystic and solid (1)
Echogenicity: isoechoic (1)
Shape: taller-than-wide (3)
Margins: lobulated/irregular (2)
Echogenic foci: punctate echogenic foci (3)

ACR TI-RADS total points: 10
ACR TI-RADS risk category: TR5 (?? points)
ACR TI-RADS recommendation: Ultrasound-guided fine needle aspiration

Nodule #: 2

Maximum size: 1.0 cm; Other 2 dimensions: 1.0 x 0.7 x 0.7 cm Location: left; mid
Composition: solid or almost completely solid (2)
Echogenicity: hypoechoic (2)
Shape: not taller-than-wide (0)
Margins: smooth (0)
Echogenic foci: none (0)
ACR TI-RADS total points: 4
ACR TI-RADS risk category: TR4 (4-6 points)
ACR TI-RADS recommendation: Follow-up ultrasound in 1 year

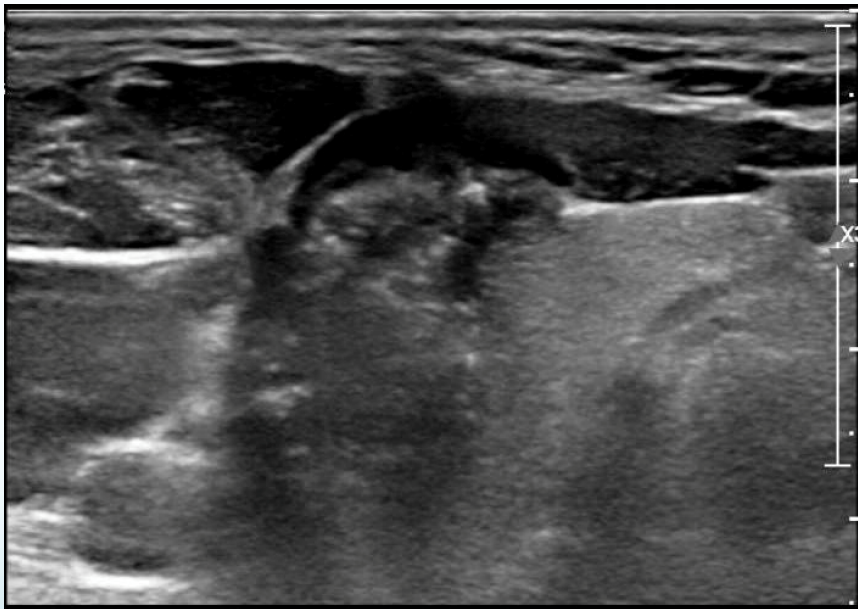
ACR TI-RADS



COMPOSITION	ECHOGENICITY	SHAPE	MARGIN	ECHOGENIC FOCI
<p><i>Spongiform</i>: Composed predominantly (>50%) of small cystic spaces. Do not add further points for other categories.</p> <p><i>Mixed cystic and solid</i>: Assign points for predominant solid component.</p> <p>Assign 2 points if composition cannot be determined because of calcification.</p>	<p><i>Anechoic</i>: Applies to cystic or almost completely cystic nodules.</p> <p><i>Hyperechoic/isoechoic/hypoechoic</i>: Compared to adjacent parenchyma.</p> <p><i>Very hypoechoic</i>: More hypoechoic than strap muscles.</p> <p>Assign 1 point if echogenicity cannot be determined.</p>	<p><i>Taller-than-wide</i>: Should be assessed on a transverse image with measurements parallel to sound beam for height and perpendicular to sound beam for width.</p> <p>This can usually be assessed by visual inspection.</p>	<p><i>Lobulated</i>: Protrusions into adjacent tissue.</p> <p><i>Irregular</i>: Jagged, spiculated, or sharp angles.</p> <p><i>Extrathyroidal extension</i>: Obvious invasion = malignancy.</p> <p>Assign 0 points if margin cannot be determined.</p>	<p><i>Large comet-tail artifacts</i>: V-shaped, >1 mm, in cystic components.</p> <p><i>Macrocalcifications</i>: Cause acoustic shadowing.</p> <p><i>Peripheral</i>: Complete or incomplete along margin.</p> <p><i>Punctate echogenic foci</i>: May have small comet-tail artifacts.</p>

*Refer to discussion of papillary microcarcinomas for 5-9 mm TR5 nodules.

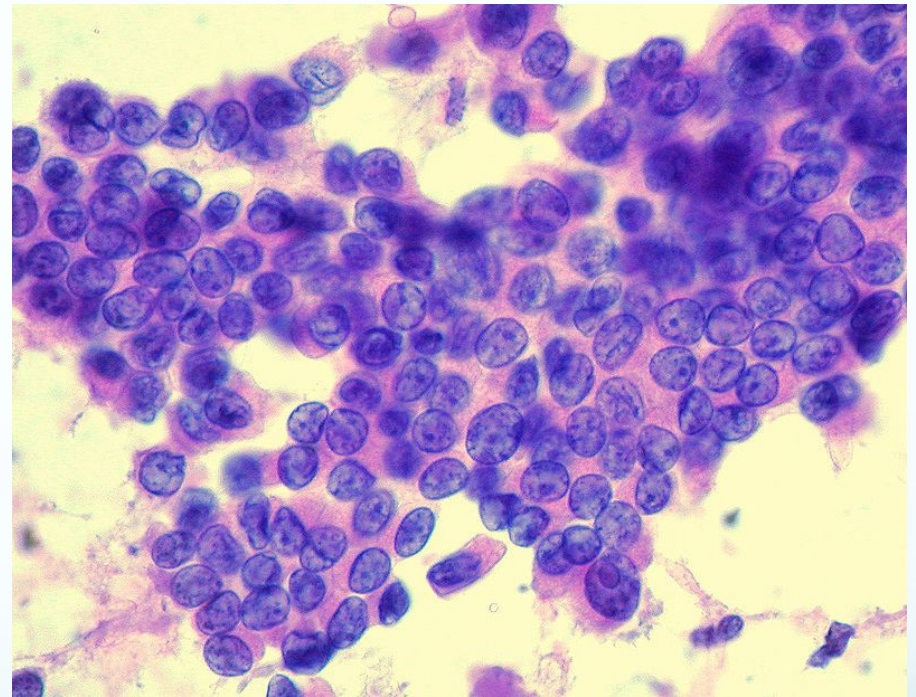
FNA of Thyroid Nodule



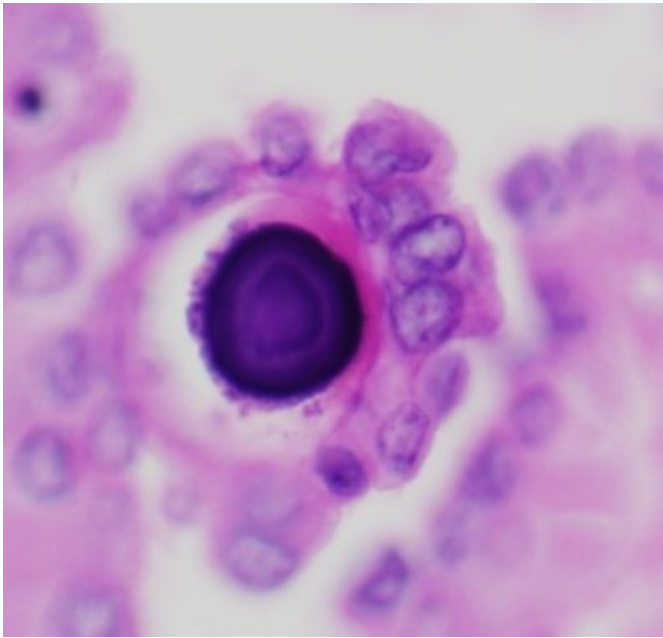
- Patient was consented and brought back to the procedure suite.
- Pre-procedure U/S confirmed previous findings and was used to determine appropriate location for biopsy.
- Patient was then prepped and draped in normal sterile fashion.
- Adequate analgesia was attained with subcutaneous infiltration of 1% lidocaine (w/o epi).
- Under U/S guidance, two separate passes using 25 gauge needles were made. An additional pass with a 22 gauge needle was also made.
- Specimens were then deemed adequate by the cytopathologist after alcohol fixation.

FNA Results

- Bethesda Class VI (Malignant)
 - Papillary thyroid carcinoma
- Features of PTC:
 - Major Features → Nuclear
 - “Orphan Annie eye” cytoplasmic nuclear inclusions
 - Cell elongation
 - Peripheral nucleoli
 - Nuclear membrane irregularities
 - Nuclear clefts/grooves
 - +/- Psammoma bodies
 - Sheets of cells
 - Papillary architecture (less common)

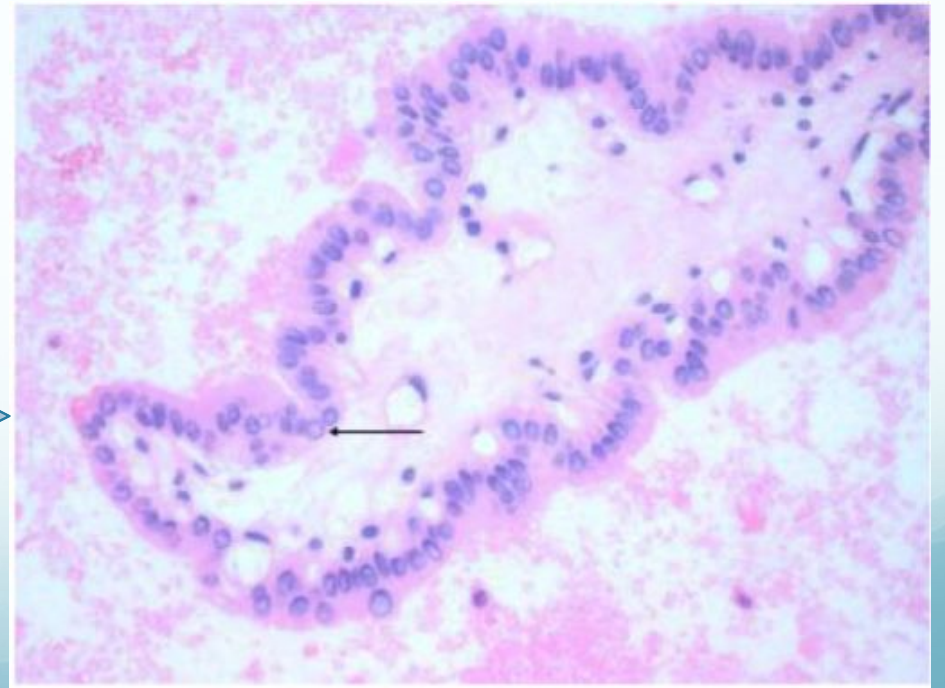


Representative Cytopathology



Psammoma Body

- Papillary Architecture
- Arrow pointing to "Orphan Annie eye"



Bethesda Class	Diagnostic Category	Cancer Risk	Usual Management
I	Non-diagnostic or unsatisfactory	5 – 10%	Repeat FNA
II	Benign	0 – 3%	Clinical and sonographic F/U
III	AUS or FLUS	10 – 30%	Repeat FNA, molecular testing or lobectomy
IV	Follicular neoplasm	25 – 40%	Molecular testing, lobectomy
V	Suspicious for malignancy	50 – 75%	Near total thyroidectomy or lobectomy
VI	Malignant	97 – 99%	Near total thyroidectomy or lobectomy

Back to Mr. E...

- He has been notified of the results of his FNA and is scheduled for an appointment with Dr. Shonka in otolaryngology today (9/21/18) to discuss surgical interventions.

References

- Tessler FN, Middleton WD, Grant EG, Hoang JK, Berland LL, Teefey SA, et al. . ACR Thyroid Imaging, Reporting and Data System (TI-RADS): white paper of the ACR TI-RADS committee. J Am Coll Radiol. (2017) 14:587–95.
- Ross DS. Topic: Diagnostic approach to and treatment of thyroid nodules. UpToDate. (2018)
- Cibas ES, Ali SZ. The 2017 Bethesda System for Reporting Thyroid Cytopathology. Thyroid: official journal of the American Thyroid Association. 2017;27:1341–1346.
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- Haugen, B.R., Alexander, E.K., Bible, K.C. et al. 2015 American Thyroid Association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer: the American Thyroid Association Guidelines Task Force on Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid. 2016; 26: 1–133