Appropriateness of Ultrasound Requests For Evaluation of CT Detected Incidental Thyroid Nodules (ITNs)

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Introduction

- Thyroid cancers are generally indolent. In 340 patient observed over a 10 year period Ito et al. found no cancer deaths and nodal mets in only 3% of patient over 10 years.[1]
- At our hospital we observed a high volume of US requests for evaluation of CT detected ITNs potentially leading to repeat FNA and diagnostic hemithyroidectomy for ultimately benign lesions.
- We therefore sought to review the appropriateness of referrals using the best available guidance, namely the 2015 ACR White Paper for Incidental Thyroid nodules [2] and the 2014 BTA Guidelines for Management of Thyroid Cancer [3] (see overleaf)

Criteria for US follow-up of CT Detected ITNs

ACR[2]
<35 years old, Nodule ≥ 1cm
>35 years old, Nodule ≥ 1.5cm
Suspicious features on CT or MRI • Abnormal LN (Cystic, Ca^{2+}, >1cm or 1.5cm JD) • Local invasion • Lung metastases

BTA[3]
No statistically significant CT indicators of malignancy. ITNs should undergo *clinical evaluation* unless suspicious findings on CT:
• Extracapsular extension • Tracheal invasion • Suspicious lymph node *Consider clinical RFs such as FHx, H&N Radiation, vocal cord palsy etc.*

Methods

A search was performed on the hospital RIS for US referrals generated from CT studies between 01/01/17 and 01/01/20. The referral was deemed appropriate if:

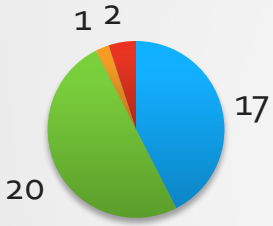
1. CT appearances were suspicious by the ACR criteria.
2. CT appearances were suspicious by the BTA criteria.
3. Patient had systemic cancer symptoms.
4. Other valid indication not otherwise specified as agreed by Consultant Radiologist with Head and Neck subspecialty interest.

Data Points Collected

- •Nodule or goitre?
- •US follow-up suggested by radiologist?
- •Size of nodule
- •Suspicious features as defined by ACR
- •Suspicious features as defined by BTA
- •Systemic cancer symptoms
- •Atypical for other reason not otherwise specified?
- •FNA performed? (surrogate for U3 or greater)
- •Histology?

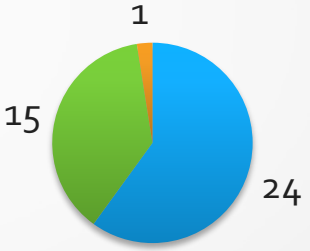
Results

CT Findings



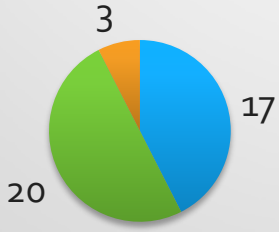
Nodule
Goitre
Low attenuation change
Multiple nodules

US +/- FNA recommended?



Yes
No
CC +/- US FNA

US justified?*



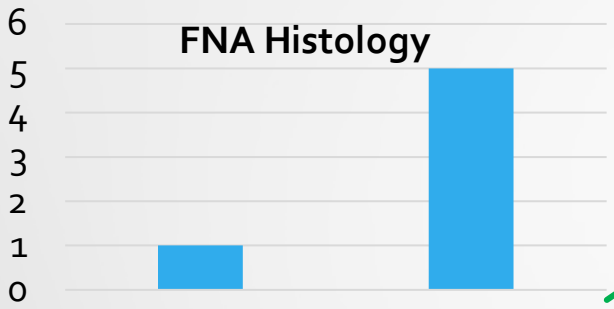
Yes
No
Maybe

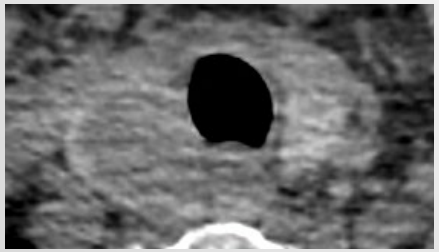
FNA performed

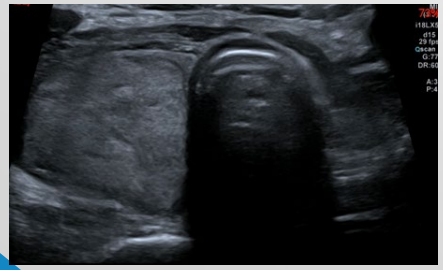
Yes
No

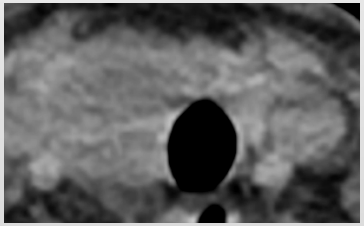
* ACR criteria **or** BTA criteria or Atypical for other reason **or** Indication for CT scan could be thyroid related **or** Systemic cancer symptoms

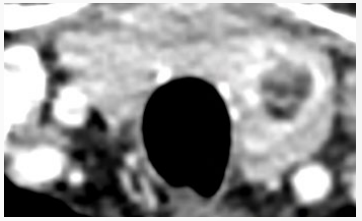
Results

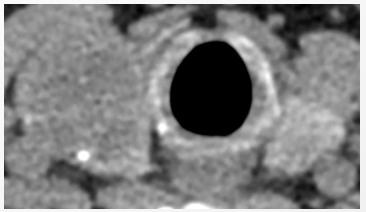


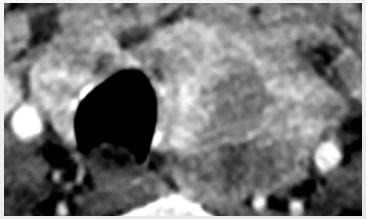


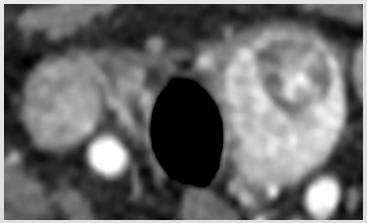












Discussion & Take Homes

- 20/40 cases were goitre's. There is no official guidance on CT assessment of goitre's despite patients with multiple thyroid nodules having the same risk of malignancy as those with solitary nodules.
  - Can still assess for suspicious features on CT i.e. local invasion, LN (Cystic, Ca^{2+})
  - Make sure to compare with previous in order to assess interval change.
- 15/40 US requests generated without direct radiologist recommendation.
  - If you report a nodule that does not need f/up, state this explicitly.
  - Do not mention nodules in conclusion unless US is indicated.

Discussion & Take Homes

- 34/40 referred lesions were U2 on US. Only 6 underwent FNA and of those 5 were Thy2. Only a single lesion was Thy3f in a 79y0 patient who died 3 years later without further investigation.
- No confirmed cancers.
  - Feel empowered to dismiss thyroid nodules – odds are in your favour!
  - Use ACR/BTA recommendations as a guide to help in decision making.
  - There will always be a clinical element radiologists cannot know, therefore it's reasonable to say…***"No need f/up in the absence of clinical RFs"***

Thank you!

- 1. Ito, Y., Miyauchi, A., Inoue, H., Fukushima, M., Kihara, M., Higashiyama, T., Tomoda, C., Takamura, Y., Kobayashi, K. and Miya, A., 2009. An Observational Trial for Papillary Thyroid Microcarcinoma in Japanese Patients. World Journal of Surgery, 34(1), pp.28-35.
- 2. Hoang, J., Langer, J., Middleton, W., Wu, C., Hammers, L., Cronan, J., Tessler, F., Grant, E. and Berland, L., 2015. Managing Incidental Thyroid Nodules Detected on Imaging: White Paper of the ACR Incidental Thyroid Findings Committee. Journal of the American College of Radiology, 12(2), pp.143-150.
- 3. Perros, P et al. (2014) British Thyroid Association Guidelines for the Management of Thyroid Cancer. CLINICAL ENDOCRINOLOGY [online]. 81
- 4. Cooper, D. S., Doherty, G. M., Haugen, B. R., Kloos, R. T., Lee, S. L., Mandel, S. J., … Tuttle, R. M. (2009). Revised American Thyroid Association Management Guidelines for Patients with Thyroid Nodules and Differentiated Thyroid Cancer. Thyroid, 19(11), 1167–1214. doi:10.1089/thy.2009.0110