

Case 16070

Papillary thyroid carcinoma(PTC):Local recurrence post thyroidectomy

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Section: Head & Neck Imaging

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Patient: 32 year(s), female

Clinical History

A 33-year-old female presented for an annual follow up neck ultrasound following surgery for PTC. She underwent total thyroidectomy with bilateral modified radical neck dissection(MRND) 5 yrs ago followed by radioactive I₁₃₁ ablation. Histopathology was classical PTC (TNM-staging pT3 pN1b pMx). Current imaging showed a suspicious lesion in the left thyroid bed.

Imaging Findings

On ultrasound neck, both the lobes of thyroid were not seen, consistent with the history of total thyroidectomy. A well-defined very hypoechoic heterogeneous lesion measuring 22x9x8 mm containing tiny punctate foci was located in the left thyroid bed[Fig1]. On colour Doppler it showed heterogeneously increased vascularity[Fig2]. On elastography it showed intermediate to firm stiffness[Fig3].The lesion was bounded medially by the trachea, laterally by CCA and IJV, posteriorly by esophagus and anteriorly by strap muscles. Ultrasound guided FNA of the lesion confirmed recurrence of papillary thyroid carcinoma with lymphoid infiltrates [Fig4]. The patient underwent revision surgery to remove the lesion.

Correlation with available previous imaging from data archive was done for teaching purposes. An ultrasound neck done 2 yrs post-surgery showed a 10x8mm hypoechoic nodule at left level II position. CECT(contrast enhanced computed tomography)neck showed a corresponding 9x7 mm enhancing nodule in the region of the left thyroid bed, anteromedial to left CCA[Fig 5].

Discussion

Papillary thyroid carcinoma is the most common thyroid cancer(80% of cases)[R1], and generally has a good prognosis, if non metastatic. The 10-year survival rate for all papillary thyroid cancers is around 90% [R2]. Cervical metastasis is present in 50-75% of cases at presentation. Local invasion into adjacent structures carries a worse prognosis. Distant metastasis occurs to lung, liver and bone. Total thyroidectomy with radical neck dissection followed by radioactive iodine ablation and thyroid suppression is the optimal treatment for differentiated PTC.

Ultrasound imaging is fundamental in initial evaluation and post-operative surveillance. CECT neck is done in select cases when extensive local invasion is suspected. The iodine used in the contrast CT scans interferes with the radioactive iodine[R3]. It takes about 3-4 months for the iodine to be eliminated from the body. Any radioactive iodine evaluation or treatment then has to be delayed. PET-CT can be used for staging.

Bio-clinical follow up is done with serum thyroglobulin(Tg) (N= 0.2-55.0ng/mL)as this is produced exclusively by thyroid tissue[R4]. Anti-thyroglobulin antibodies ATA (N<4.1 IU/mL) are done simultaneously as, if elevated(as in preceding thyroiditis), they can suppress the Tg levels[R5].

In the index case, with TNM staging of (pT3 pN1b pMx), preoperative ATA levels were elevated to 841 IU/mL. Post-surgery and radioactive iodine ablation, the ATA levels remained elevated up to 32.47 IU/mL (N<4.11 IU/mL)[R5], hence Tg levels (<0.2 ng/mL) were unreliable in this case. Role of ultrasound to detect any local recurrence was even more vital in this case.

From the archives, an ultrasound done 2 yrs post-surgery reported a 10x8mm hypoechoic left level II nodule and corresponding CECT neck showed a 9x7 mm enhancing nodule near the thyroid bed. No FNA was done at that time and patient was kept on follow up. In a post thyroidectomy patient with MRND, even though most of the lymph nodes are removed, care must be taken in interpreting any heterogeneous hypoechoic area, as it may suggest recurrence of PTC.

TAKE HOME MESSAGE

Ultrasound evaluation of the neck remains the mainstay in the initial imaging and follow up of thyroid cancer, both for the thyroid bed and cervical lymph nodes assessment, and this evaluation needs to be very meticulous. The knowledge of the natural history of disease under consideration and the experience of the radiologist is an important factor. Awareness of the abnormal ultrasound features, their recognition and judicious use of an ultrasound guided FNA must be adopted.

Written informed patient consent for publication has been obtained.

Final Diagnosis

Differential Diagnosis List

Metastatic lymph node, Reactive lymph node, Scar tissue

Figures

Figure 1 Ultrasound neck



Fig 1 a-f Ultrasound neck showing a heterogenous hypoechoic area measuring 21x9 mm located in the left thyroid fossa region. The lesion shows few tiny punctate foci.

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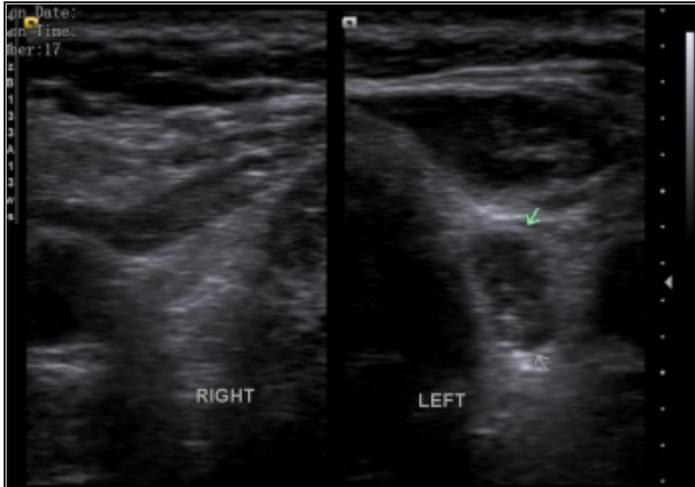
Area of Interest: Head and neck;
Imaging Technique: Ultrasound;
Procedure: Diagnostic procedure;
Special Focus: Endocrine disorders;



Ultrasound neck : Transverse scan showing a heterogenous hypoechoic area measuring 21x9 mm located in the left thyroid fossa region, just lateral to trachea. The lesion shows few tiny punctate foci.

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Area of Interest: Head and neck;
Imaging Technique: Ultrasound;
Procedure: Diagnostic procedure;
Special Focus: Endocrine disorders;



Ultrasound neck showing a heterogenous hypoechoic area measuring 21x9 mm located in the left thyroid fossa region with punctate foci. Right thyroid fossa region showing no abnormality on this scan.

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Area of Interest: Head and neck;
Imaging Technique: Ultrasound;
Procedure: Diagnostic procedure;
Special Focus: Endocrine disorders;

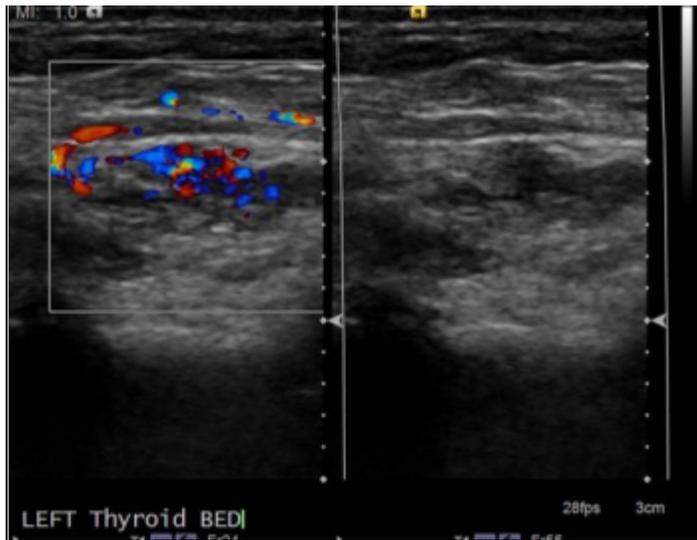
Figure 2 Ultrasound Neck colour Doppler



Ultrasound neck with colour Doppler showing heterogenous and chaotic vascularity in the hypoechoic area located in the left thyroid fossa region.

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Area of Interest: Head and neck;
Imaging Technique: Ultrasound-Colour Doppler;
Procedure: Diagnostic procedure;
Special Focus: Endocrine disorders;

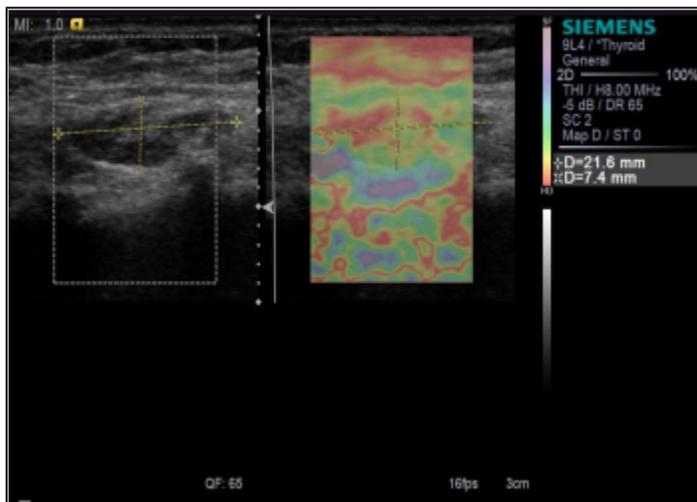


Ultrasound neck with colour Doppler showing heterogenous and chaotic vascularity in the hypoechoic area located in the left thyroid fossa region, with corresponding B mode image.

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Area of Interest: Head and neck;
 Imaging Technique: Ultrasound-Colour Doppler;
 Procedure: Diagnostic procedure;
 Special Focus: Endocrine disorders;

Figure 3 Ultrasound Elastography



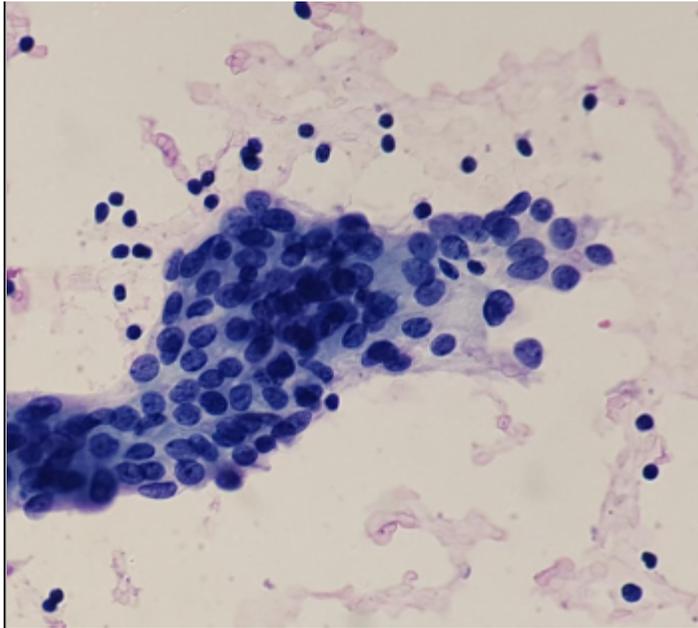
Ultrasound strain elastography image showing the lesion area to be colour coded in orange and yellow, suggesting the stiffness level to be firm to hard, as per the depicted colour map.

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Area of Interest: Head and neck;
 Imaging Technique: Elastography;
 Procedure: Diagnostic procedure;
 Special Focus: Endocrine disorders;

Figure 4 Cytopathology of Ultrasound guided FNA

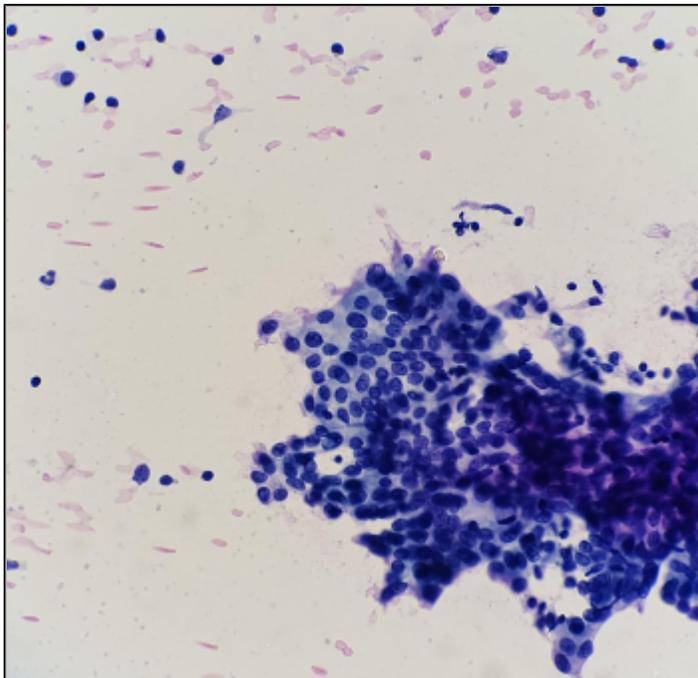




Cytopathology of Ultrasound guided FNA : MGG 60 x : showing epithelial cells with nuclear grooves and an intranuclear cytoplasmic inclusion. Scattered lymphocytes are seen in the background

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Area of Interest: Head and neck;
Imaging Technique: Image manipulation / Reconstruction;
Procedure: Biopsy;
Special Focus: Endocrine disorders;



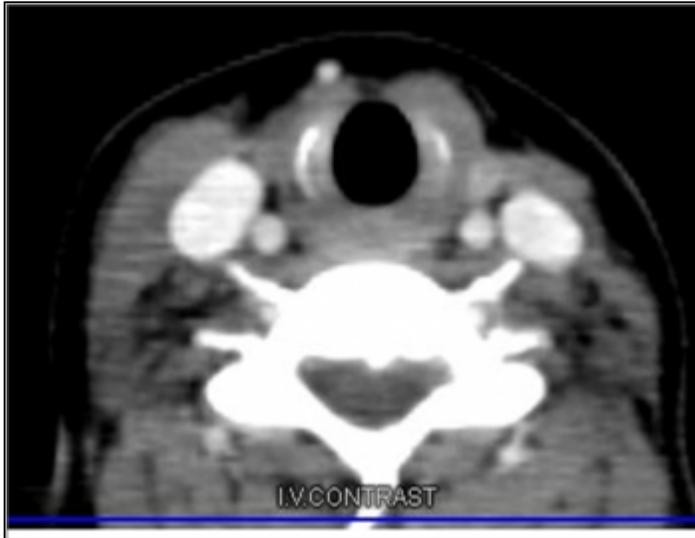
Cytopathology of Ultrasound guided FNA : MGG 60 x : showing epithelial cells with nuclear grooves and an intranuclear cytoplasmic inclusion. Scattered lymphocytes are seen in the background

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Area of Interest: Head and neck;
Imaging Technique: PACS;

Procedure: Biopsy;
Special Focus: Endocrine disorders;

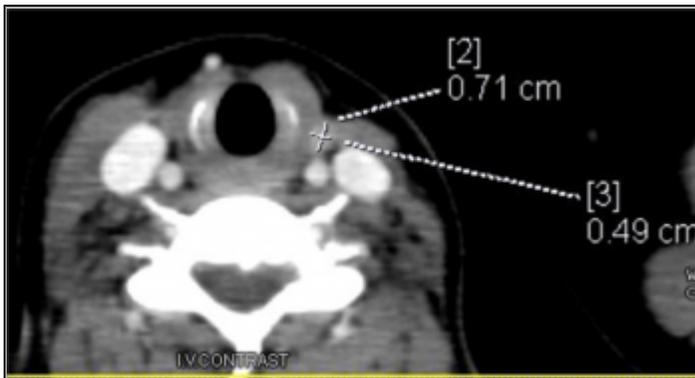
Figure 5 Figure 5 CECT Neck



CECT Neck : 2 yrs post surgery Axial post contrast images showing a small 7x5mm enhancing nodule in the left upper neck anteromedial to the carotid vessels

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Area of Interest: Head and neck;
Imaging Technique: CT;
Procedure: Contrast agent-intravenous;
Special Focus: Endocrine disorders;



CECT Neck : 2 yrs post surgery Axial post contrast images showing a small 7x5mm enhancing nodule in the left upper neck anteromedial to the carotid vessels

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Area of Interest: Head and neck;
Imaging Technique: CT;
Procedure: Contrast agent-intravenous;
Special Focus: Endocrine disorders;



CECT Neck : 2 yrs post surgery Axial post contrast images showing a small 7x5mm enhancing nodule in the left upper neck anteromedial to the carotid vessels

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Area of Interest: Head and neck;
 Imaging Technique: CT;
 Procedure: Contrast agent-intravenous;
 Special Focus: Endocrine disorders;



CECT Neck : 2 yrs post surgery sagittal post contrast images showing a small 7x5mm enhancing nodule in the left upper neck anteromedial to the carotid vessels

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Area of Interest: Head and neck;
 Imaging Technique: CT;
 Procedure: Contrast agent-intravenous;
 Special Focus: Endocrine disorders;

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Citation

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