

A PICTORIAL REVIEW OF PAEDIATRIC THYROID LESIONS

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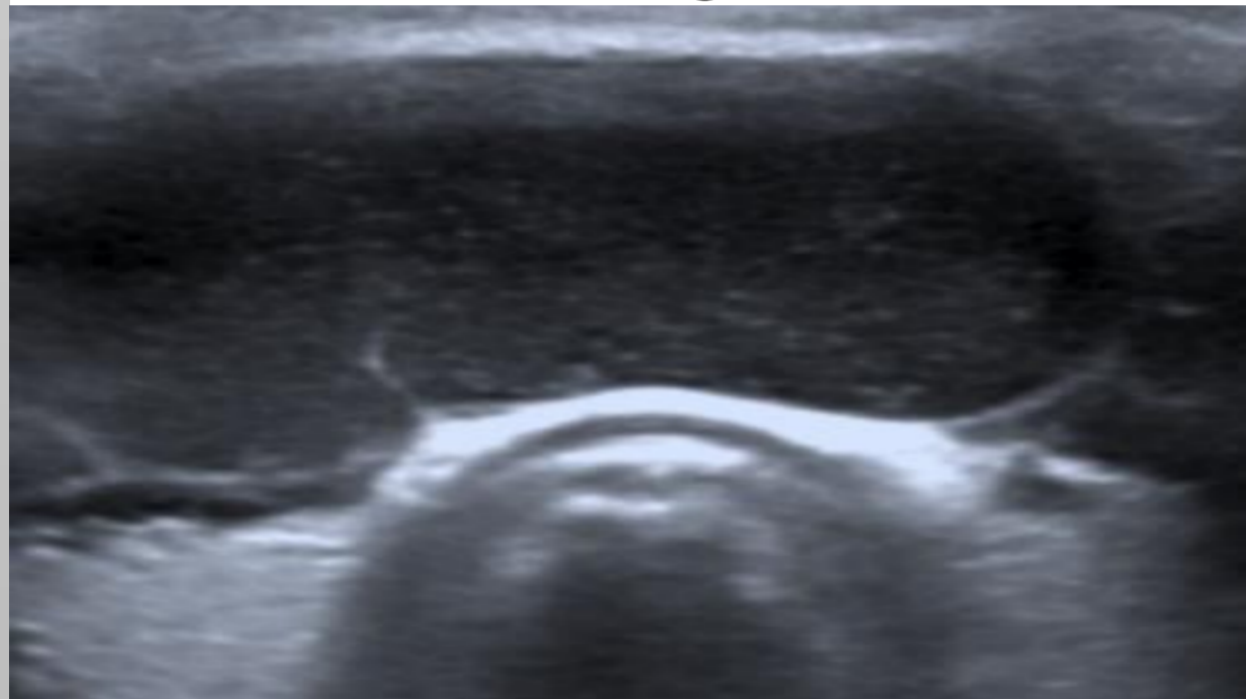
Introduction: Ultrasound is an ideal initial tool for examination of the paediatric thyroid gland, giving real time imaging without radiation dose. Here we demonstrate the characteristic ultrasound appearances of some of the common and clinically relevant paediatric thyroid lesions categorising them into congenital and acquired.

Congenital thyroid lesions: The thyroid gland develops between the 4th-5th week of gestation from the median and paired anlagen at the base of the tongue. It subsequently migrates along the thyroglossal duct to the infrahyoid neck and the duct involutes. Anomalies arise from failure of formation or failure of duct involution.¹

Congenital

Thyroglossal duct cyst

A 7 year old girl presents with a midline swelling. Ultrasound shows a well defined cystic structure which contains echogenic debris.



Hemithyroid

A 2 month old girl presents with congenital hypothyroidism. The the left thyroid lobe is absent. The right lobe and isthmus are normal.



Atrophic thyroid

An 8 year old boy presents with hypothyroidism. Small echogenic triangles either side of the trachea represent atrophic thyroid lobes.

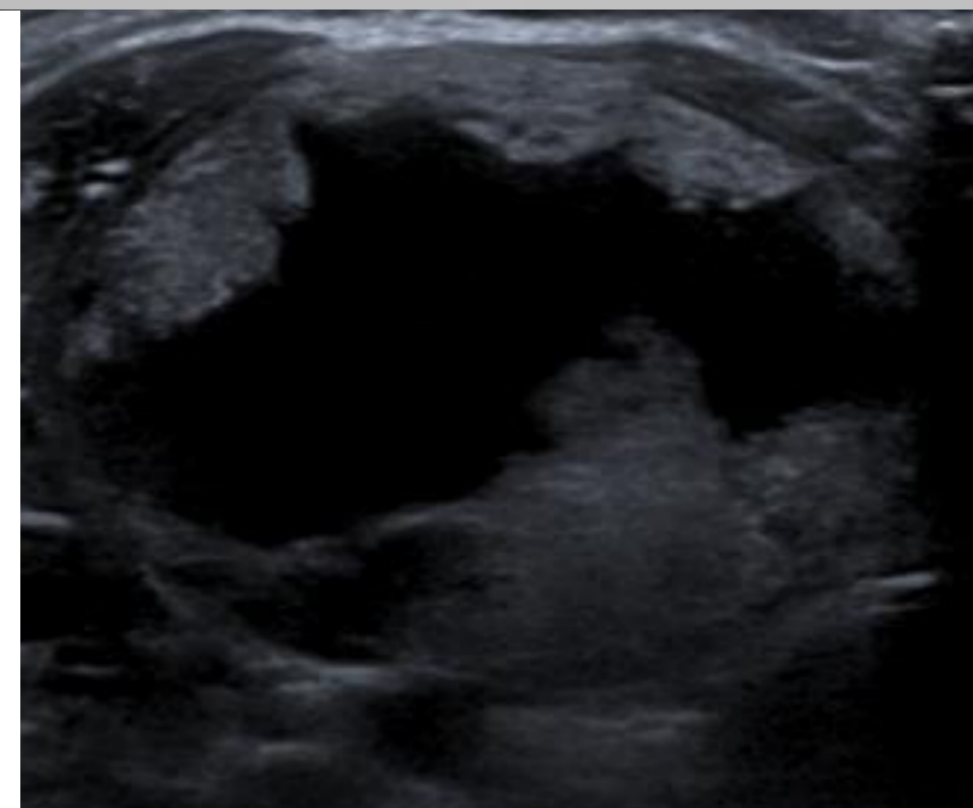


Acquired - Nodules: Thyroid nodules are uncommon in the paediatric population but the risk of malignancy is high (25%). Features which are suggestive of malignancy include irregular margins, lymph nodes, micro-calcification and internal disordered vascularity. These appearances are not well ratified in the paediatric population and a low threshold for fine needle aspiration biopsy should be exercised given the overall high risk of malignancy.²

Acquired - Nodules

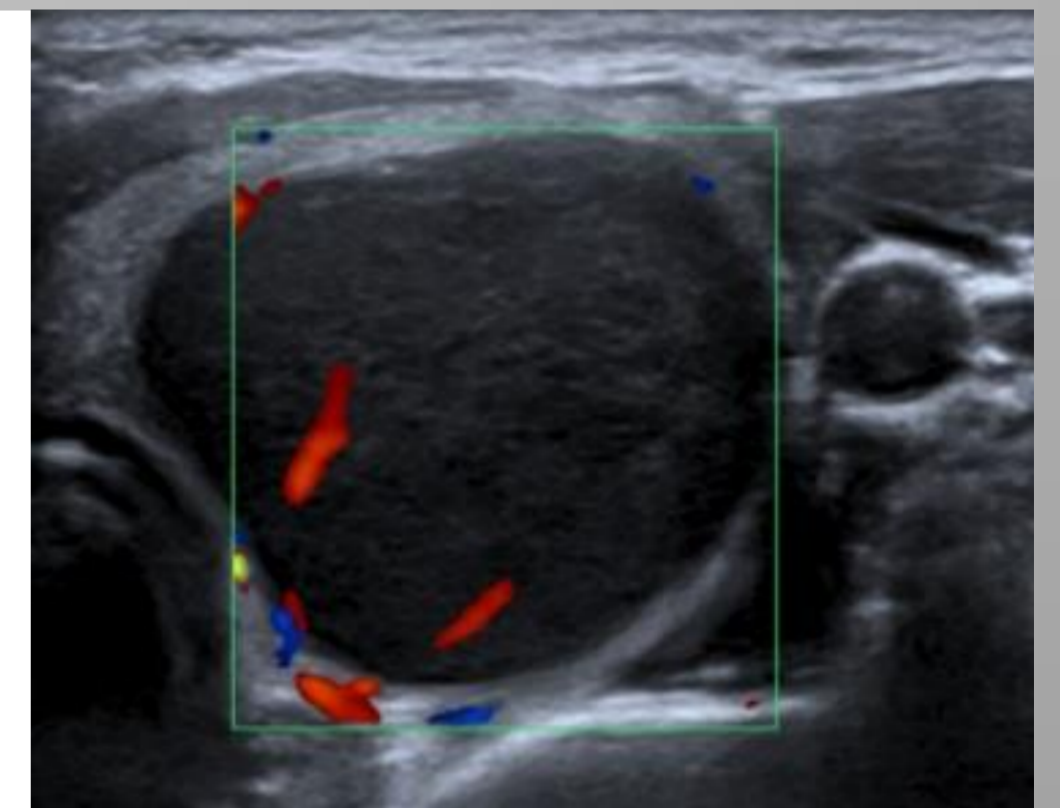
Benign nodule

A 14 year old girl presents with an acute neck swelling. There is a hyperechoic, well defined benign nodule. This has been complicated by haemorrhage demonstrated by the anechoic centre, a rare complication.



Papillary carcinoma

A 15 year old girl presents with painless neck swelling. Here we see a suspicious hypoechoic lesion with irregular central vascularity.

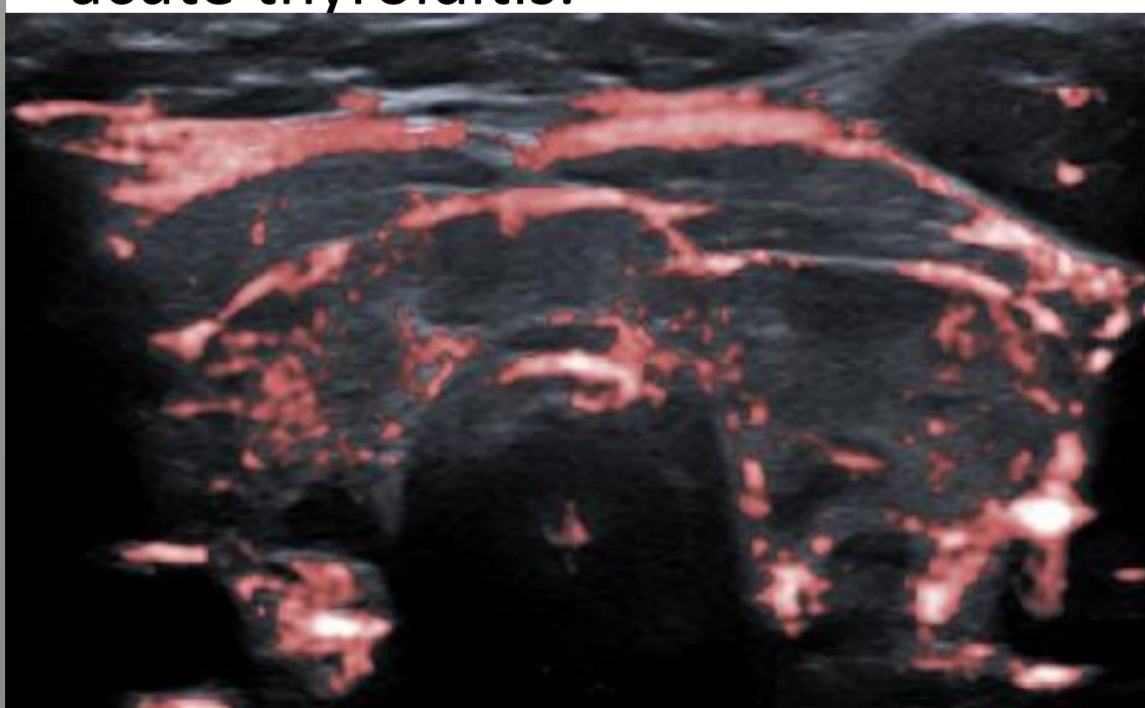


Acquired – Diffuse: Diffuse thyroid disease includes autoimmune and infective aetiology and is characterised by a diffusely enlarged thyroid gland with increased heterogeneous echotexture and increased vascularity.¹

Acquired – Diffuse disease

Graves' disease

A 12 year old girl presents with thyrotoxicosis. The thyroid gland is enlarged and hypervascular consistent with a diagnosis of acute thyroiditis.



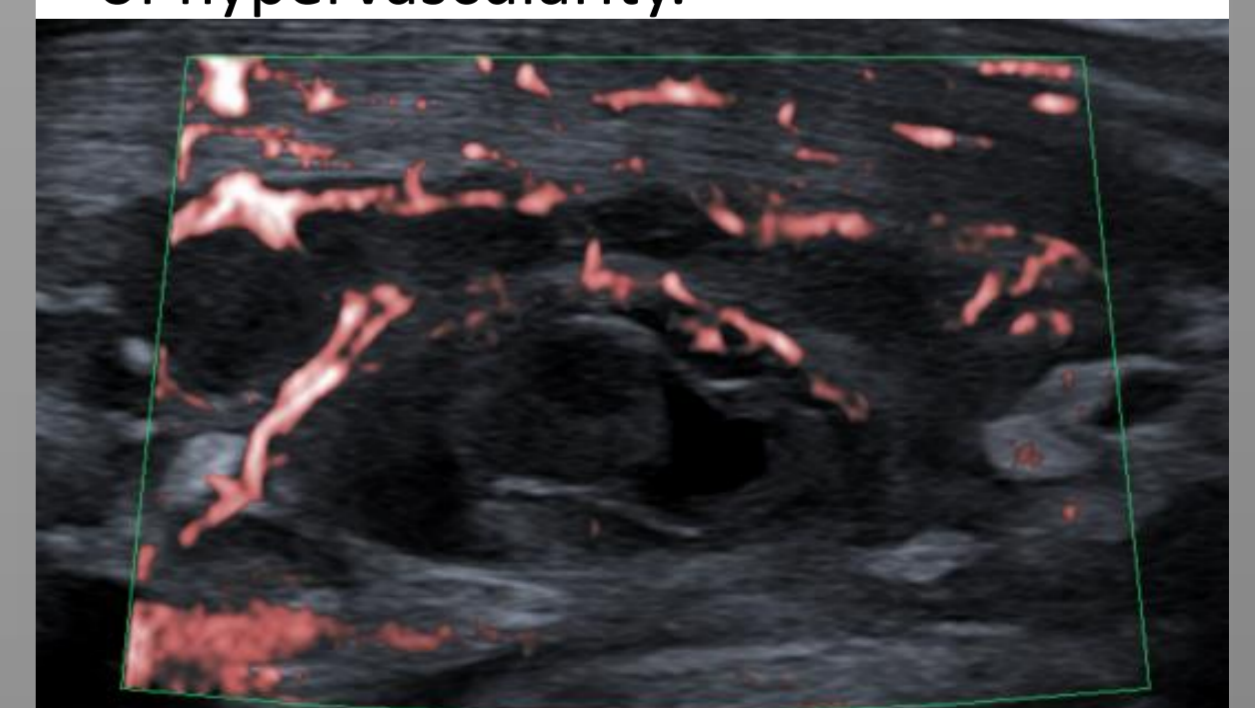
Hashimoto's thyroiditis

A 14 year old girl presents with hypothyroidism. The thyroid gland is enlarged. There is diffuse parenchymal heterogeneity and multiple hypoechoic nodules.



Bacterial abscess

A 14 year old girl presents with a tender lump and fever. There is a centrally necrotic avascular soft tissue mass with a peripheral rim of hypervascularity.



Conclusion: Ultrasound plays a pivotal role in the evaluation of all paediatric thyroid lesions. Ultrasound is the most sensitive modality for determining malignant lesions and facilitates aspiration/ biopsy and follow-up.

References:

1. Hong H.S., Lee E.H., Jeong S.H., Park J., Lee H. 2015. Ultrasonography of Various Thyroid Diseases in Children and Adolescents: A Pictorial Essay. *Korean Journal of Radiology*. **16**: 419–429.
2. Essenmacher A.C., Joyce P.H., Kao S.C., Epelman M., Pesce L.M., D'Alessandro M.P., Sato Y., Johnson, C.M., Podberesky D.J. 2017. Sonographic Evaluation of Pediatric Thyroid Nodules. *RadioGraphics*. **37**: 1731–1752.