

# Multimodality imaging of ectopic focus in Graves' Disease

Egesta Lopci<sup>1</sup> , Angelo Castello , Emanuela Mazziotti

<sup>1</sup>Humanitas Clinical and Research Center, Rozzano (Milan), Italy

[Received 15 VII 2019; Accepted 27 XI 2019]

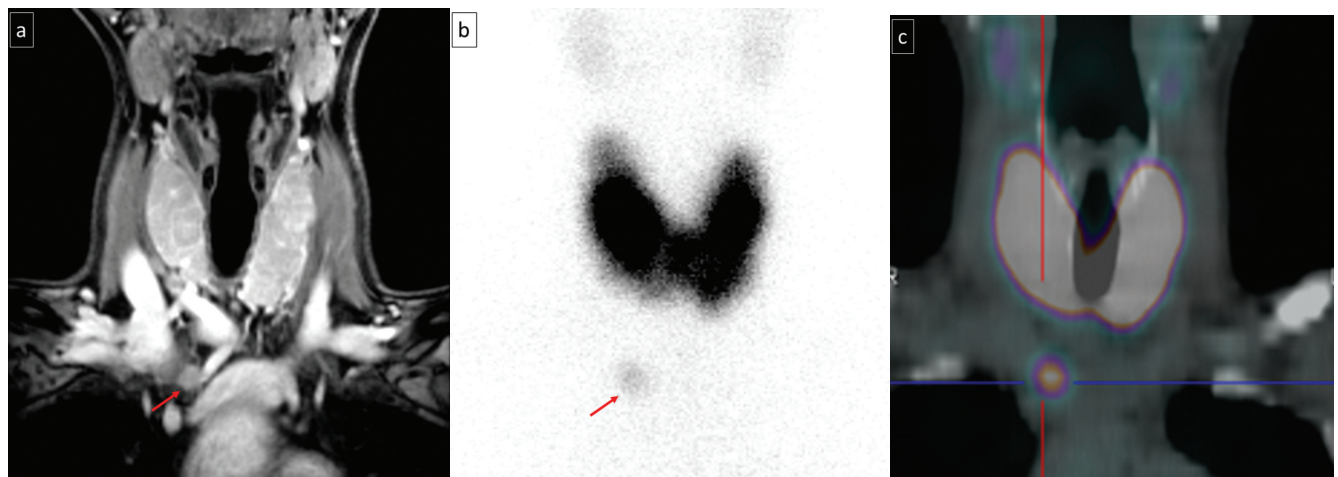
## Introduction

The occurrence of ectopic thyroid tissue affects approximately 7% of adult population. The most frequent site of ectopia is represented by thyroglossal duct, but in 10% of the cases other anatomical structures are interested [1, 2]. Although rarely, ectopic tissue can present as metastasis or develop a primary thyroid carcinoma [1, 3]. Multimodality imaging may be of help in this case to detect ectopia. However, recent publications have questioned the capability of imaging to differentiate benign from malignant ectopic tissue [4–6].

## Findings

Herein we report imaging findings related to an ectopic focus of thyroid tissue in a young female with Graves' disease. The intense uptake of <sup>99m</sup>Tc-Per technetate was depicted accidentally on the thyroid scan performed prior to iodine-131 radionuclide therapy (Fig. 1a–c). On planar views, the abnormal focus of uptake

was found located below the right clavicle (red arrows); therefore, a dedicated SPECT/CT acquisition was required to better define the focus and location. Fused images documented a hot spot in the upper mediastinum (Fig. 1c), in between the supra-aortic vessels. Hence, the patient underwent ultrasonography, which documented a suspicious node behind the sternum that could not be reached due to the location for a fine needle aspiration (FNAB). Briefly, the patient underwent contrast-enhanced MRI of the neck (Fig. 1a). The scan clearly allowed defining the ectopic tissue, located between the brachiocephalic trunk and the right jugular vein. The characteristics of the tissue documented on imaging resulted consistent with thyroid parenchyma (Fig. 1; red arrows), associated to increased signal on diffusion-weighted images. In normal circumstances, the ectopic focus described in the current case report might have not been visible, but due to elevated anti-TSHR antibodies circulating in Graves' disease, it became hyperactive and thus visible at imaging. Since benign and malignant ectopic thyroids resulted similar in shape, margin, and invasion on CT or MRI, in case of these findings a careful monitoring should be suggested.



**Figure 1.** Multipanel illustration of the ectopic thyroid focus incidentally discovered; a) coronal view of processed gadolinium-enhanced MRI; b) <sup>99m</sup>Tc-Per technetate scintigraphy (Thyroid scan); c) fused coronal SPECT/CT images. Red arrows and triangulation define the ectopic focus

Correspondence to: Egesta Lopci, Humanitas Clinical and Research Center, Via Manzoni 56, 20089 Rozzano (Milan), Italy; e-mail: [egesta.lopci@gmail.com](mailto:egesta.lopci@gmail.com)

## References

1. Fumarola A, Trimboli P, Cavaliere R, et al. Thyroid papillary carcinoma arising in ectopic thyroid tissue within a neck branchial cyst. *World J Surg Oncol*. 2006; 4: 24, doi: [10.1186/1477-7819-4-24](https://doi.org/10.1186/1477-7819-4-24), indexed in Pubmed: [16672060](https://pubmed.ncbi.nlm.nih.gov/16672060/).
2. De Felice M, Di Lauro R. Thyroid development and its disorders: genetics and molecular mechanisms. *Endocr Rev*. 2004; 25(5): 722–746, doi: [10.1210/er.2003-0028](https://doi.org/10.1210/er.2003-0028), indexed in Pubmed: [15466939](https://pubmed.ncbi.nlm.nih.gov/15466939/).
3. Cervera-Paz FJ, Roquette Gaona J, Bartual Pastor J. [Ectopic primitive thyroid papillary carcinoma: report of a fatal case and review of literature]. *Acta Otorrinolaringol Esp*. 1994; 45(2): 124–127, indexed in Pubmed: [8086206](https://pubmed.ncbi.nlm.nih.gov/8086206/).
4. Xu F, Shao Z, Yang G, et al. The value of scintigraphy, computed tomography, magnetic resonance imaging, and single-photon emission computed tomography/computed tomography for the diagnosis of ectopic thyroid in the head and neck: A STROBE-compliant retrospective study. *Medicine (Baltimore)*. 2018; 97(13): e0239, doi: [10.1097/MD.00000000000010239](https://doi.org/10.1097/MD.00000000000010239), indexed in Pubmed: [29595677](https://pubmed.ncbi.nlm.nih.gov/29595677/).
5. Siddique M, Bashir H. 99mTc Sodium Pertechnetate Uptake in Ectopic Mediastinal Thyroid Tissue on Hybrid Thyroid Scintigraphy. *Clin Nucl Med*. 2018; 43(11): 820–822, doi: [10.1097/RLU.0000000000002201](https://doi.org/10.1097/RLU.0000000000002201), indexed in Pubmed: [30015662](https://pubmed.ncbi.nlm.nih.gov/30015662/).
6. Noda Y, Kanematsu M, Goshima S, et al. MRI of the thyroid for differential diagnosis of benign thyroid nodules and papillary carcinomas. *AJR Am J Roentgenol*. 2015; 204(3): W332–W335, doi: [10.2214/AJR.14.13344](https://doi.org/10.2214/AJR.14.13344), indexed in Pubmed: [25714319](https://pubmed.ncbi.nlm.nih.gov/25714319/).