

Fever of Unknown Origin: A Grave Diagnosis

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Background

- Fever of unknown origin is an uncommon condition requiring diligent workup. The classic definition involves three weeks of recurrent fevers above 38.3 °C (100.9 °F) despite three outpatient visits or three days of investigation in the hospital.³ While most causes are quickly identifiable and treatable, more sinister causes must also be considered. Imaging is a vital part of the investigation, providing anatomic detail and aiding in the localization of potential abnormalities.

Objective

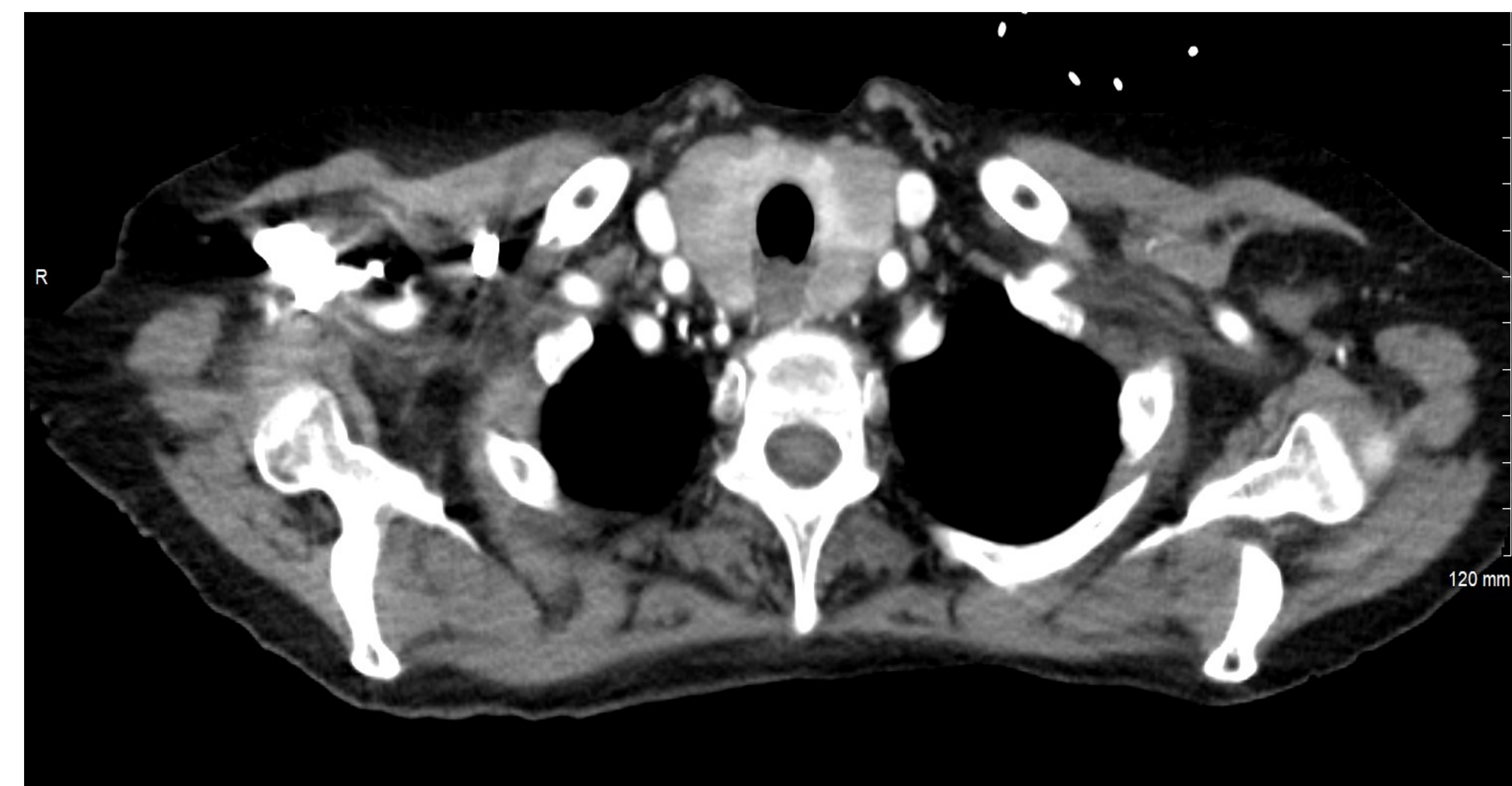
- The objective of this study is to report a case of fever of unknown origin attributed to Grave's Disease, and to underscore the findings and utility of different imaging modalities in aiding the final diagnosis.

Case Report Details

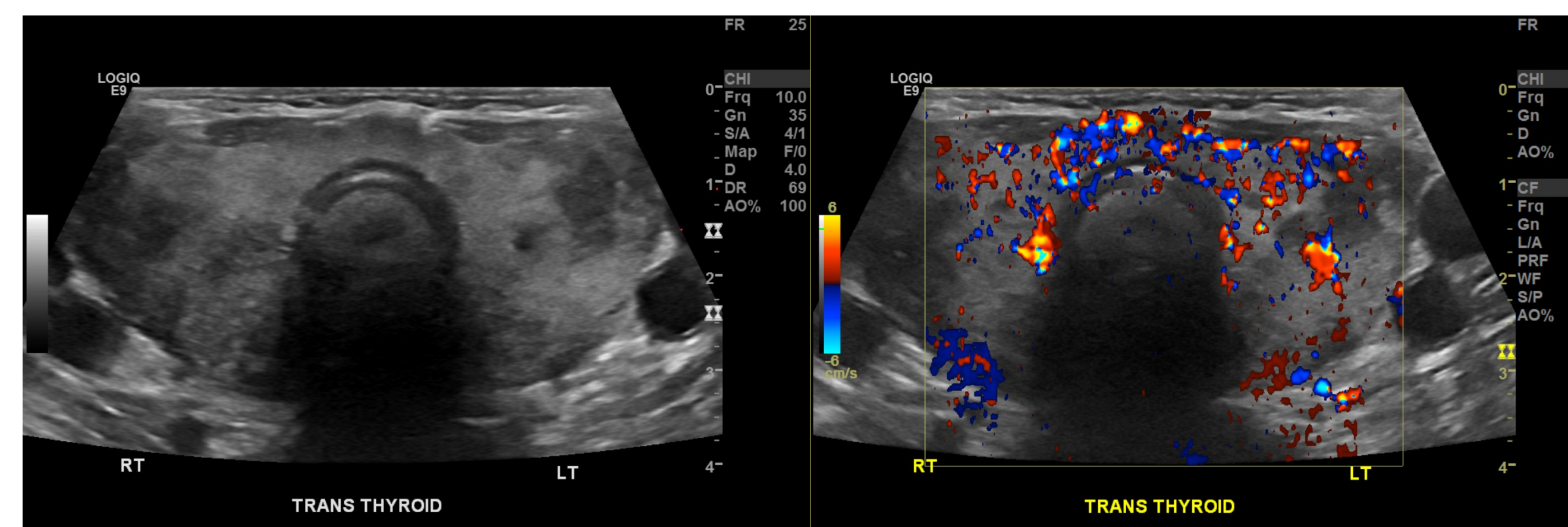
- An 85 year old woman with fever of unknown origin was transferred to MHUMC. She had been complaining of recurrent fevers, weight loss, and chills for 4 weeks with temperatures up to 39.8°C (103.6°F). As an outpatient, she had been treated with multiple rounds of antibiotics for UTI and sinusitis with no relief of symptoms.
- Labs showed low TSH, elevated T4, and elevated CRP.
- Infectious, metabolic, and rheumatic workups were pursued, and multiple imaging modalities were in an attempt to localize the source of her fevers.
- The patient received a full body CT scan shortly after admission, which was negative for intra-abdominal and intrathoracic pathology
- Endocrinology was consulted and the patient was started on methimazole but continued to have fevers, resulting in more imaging for investigation of underlying causes. These are described in **Figures 1-3**.

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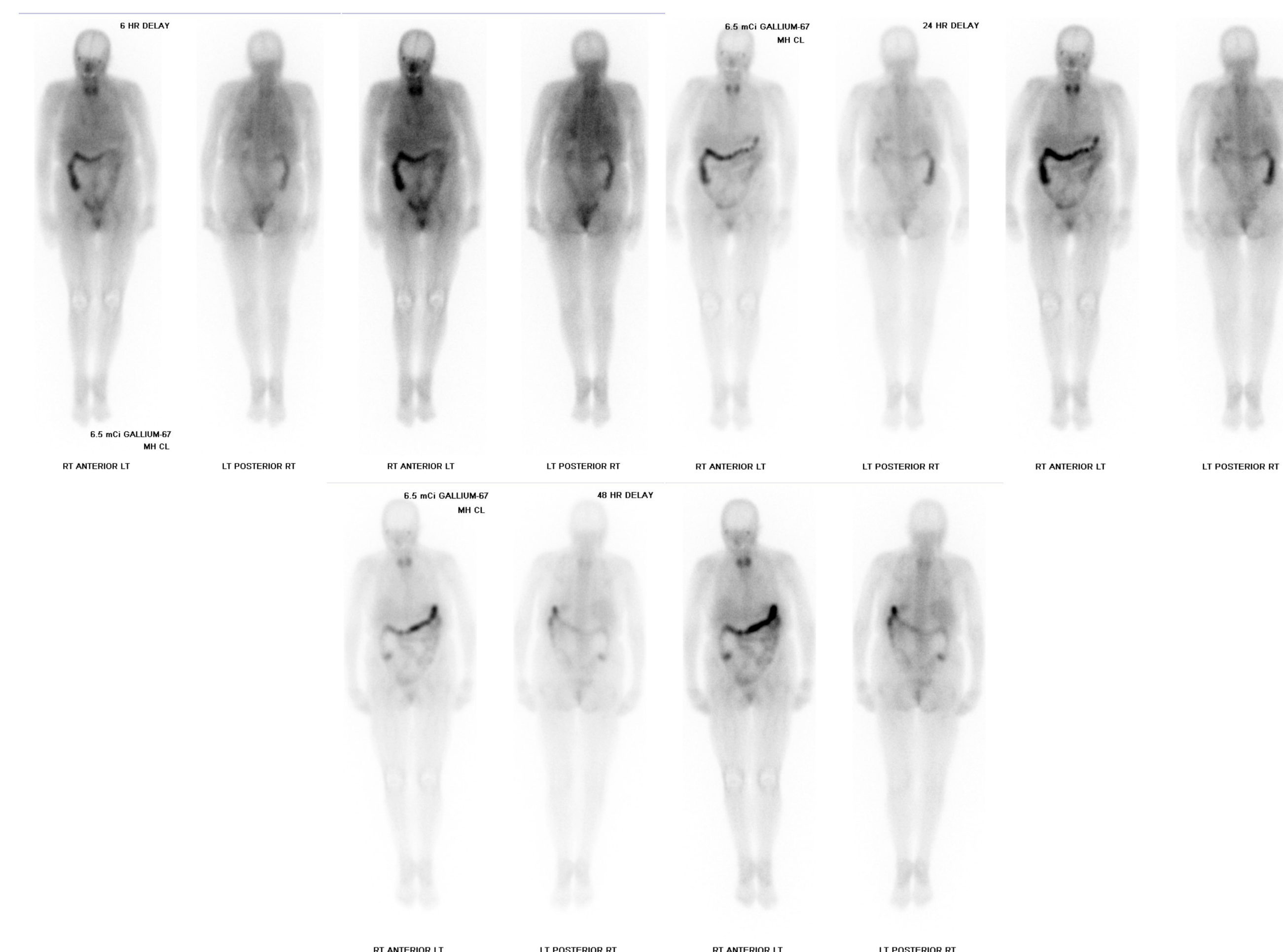
Imaging



• **Figure 1:** CT of the chest with contrast demonstrates an enlarged and heterogenous thyroid gland.



• **Figure 2:** Thyroid Ultrasound demonstrates a diffusely enlarged and heterogenous thyroid gland with associated hyperemia, which can be seen in thyroiditis or Grave's disease.²



• **Figure 3:** Gallium-67 scintigraphy at 4, 24, and 48 hour intervals show increased and persistent radiotracer uptake within the thyroid gland. Physiologic uptake of radiotracer by the bowel is also noted.

Discussion

- Computed tomography is preferred for bony and intra-abdominal/intra-thoracic pathology and served as an initial screen. This study showed a heterogenous gland, which is nonspecific but can be associated with thyroid malignancy, multinodular goiter, or diffuse parenchymal disease.
- Ultrasound is the preferred modality for evaluation of the thyroid gland.² This exam is better able to delineate the glandular parenchyma and has the added utility of Doppler settings for the evaluation of blood flow. Doppler ultrasound in this patient showed hyperemia, which is a common finding in inflammatory disorders of the thyroid.
- Gallium scintigraphy further served to aid in the diagnosis. Although the mechanism of action is not fully understood, gallium-67 has a predilection for areas of infectious/inflammatory response. In this case, the thyroid gland demonstrated increased radiotracer uptake. In the setting of this patient's diagnosis, this finding has only one prior report in the literature.¹
- Given the findings on three different imaging modalities in conjunction with laboratory abnormalities, this patient was received presumptive diagnosis of Grave's disease and discharged from the hospital. She was given increasing doses of propylthiouracil with resolution of her symptoms by one month post-discharge.

Conclusion

- The thyroid remains an important organ to consider in the cause of fever of unknown origin. While imaging alone cannot diagnose thyroid disease, it can provide important guidance in management and decision-making in conjunction with clinical and laboratory findings.

References

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