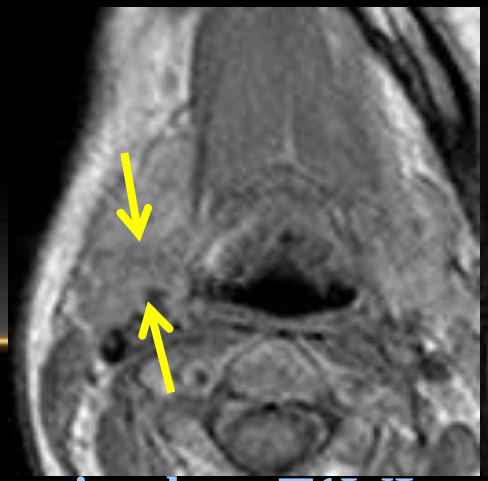
Case 1: Answer

from University of Tsukuba Hospital

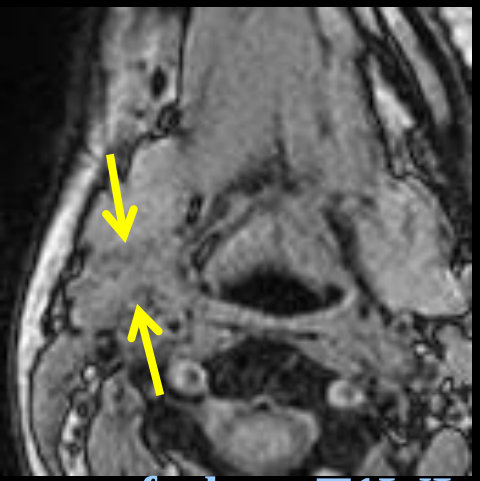
Summary: Clinical & Imaging Findings

- 39F, enlarging soft painless mass in the rt. neck
- recently noticed neck discomfort, no LN swelling

- well-defined flat mass lying between submandibular gl. & carotid a., homogeneous internal structure
- no calc (-), with weak contrast enhancement
- slight signal drop on out-of-phase T1WI
  →contains microscopic fat ? (equivocal finding)
- hyperintense on DWI
  (lymphoid tissue??)
- looks soft?



in-phase T1WI

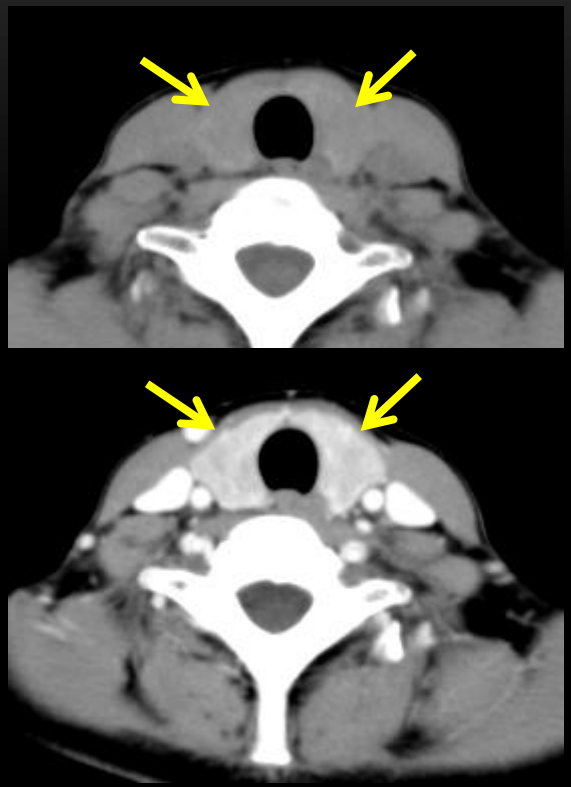


out-of-phase T1WI

DDx: Enlarging SOFT neck mass

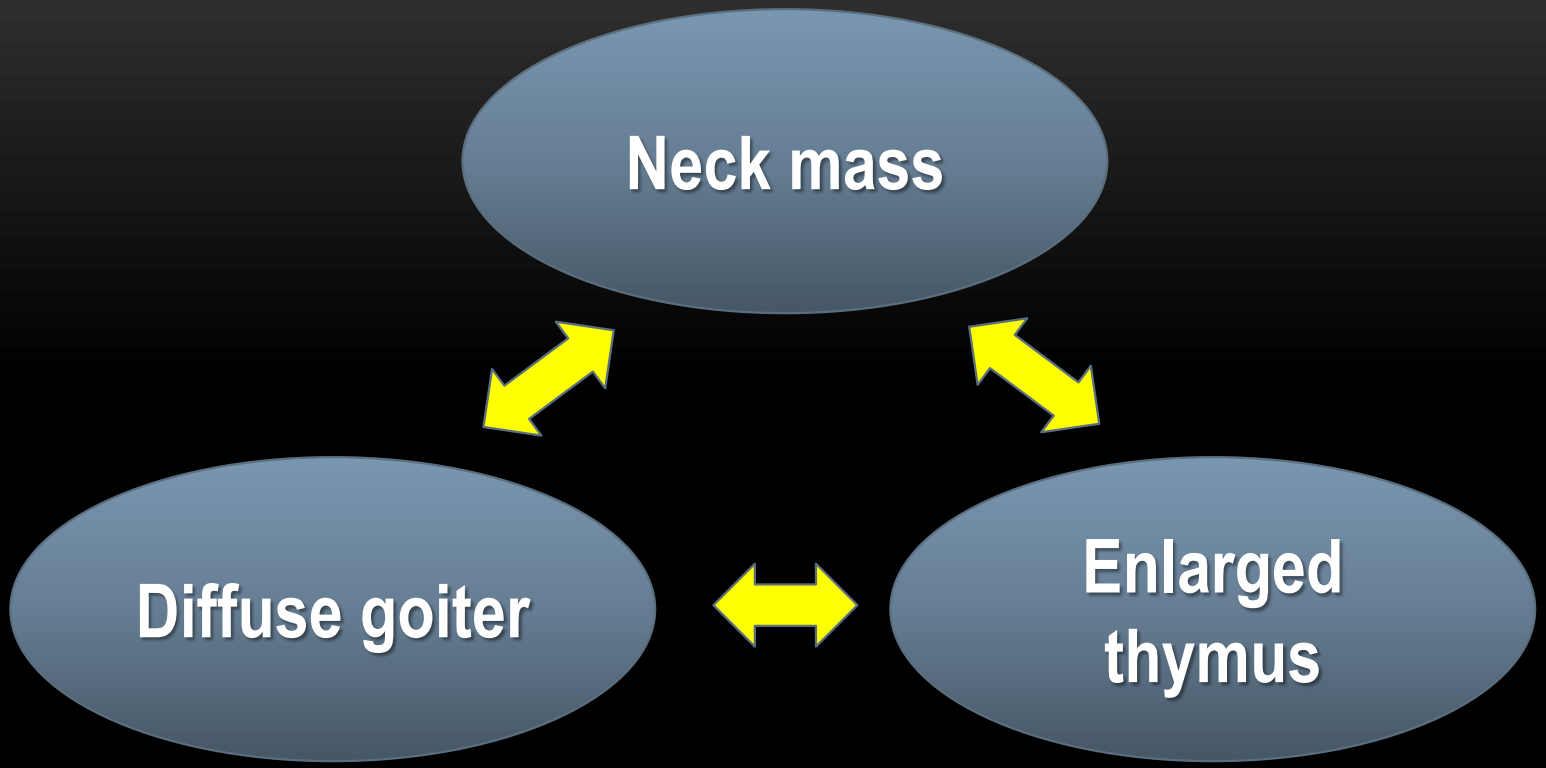
- Tumor
  - Metastasis
  - Lymphoma
  - Neurogenic tumor
- Inflammation
  - Infectious / noninfectious lymphadenopathy
- Congenital mass
  - Cysts (branchial cleft cyst, thyroglossal cyst…)
  - Vascular malformation
  - Ectopic thymus

Additional Imaging Findings



Diffuse goiter, hypodense & Irregular CE

Enlarged thymus



- Is there any relationship among these findings?

Relationship Between Diffuse Goiter & Enlarged Thymus

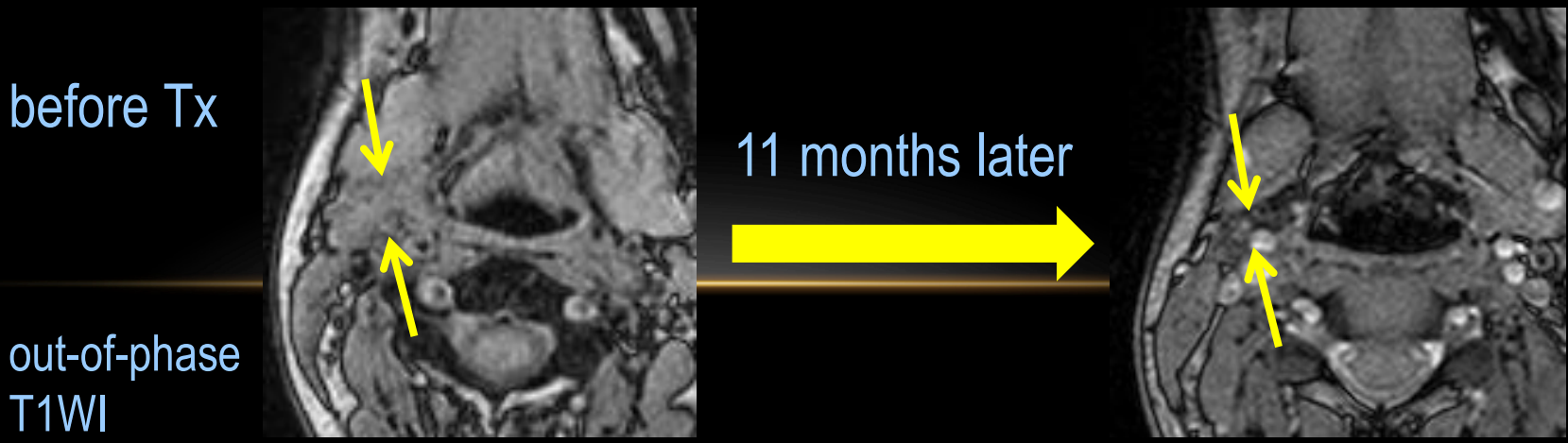
- Thymic enlargement has been reported in patients with Graves' dis..
  - Antibodies directed to the thyrotropin receptor have a causative role in Graves' disease.
  - Thyrotropin receptors are also present in the thymus.
  - These antibodies stimulate the thymus gland leading to thymic hyperplasia.
  - Lymphoid hyperplasia > true thymic hyperplasia
- Microscopic fat can be detected in thymic hyperplasia by chemical shift MRI.

Relationship Between Neck Mass & Thymus

- During the 7th gestational week, the thymic primordia migrates caudally and medially to their final destination in the anterior mediastinum.
- Complete or partial migration failure of the unilateral thymic gland causes ectopic cervical thymus.
- Ectopic thymus may manifest as a neck mass, which can be mistaken for a pathologic process.

Additional Clinical Information

- One month before, she noticed the neck mass and had been diagnosed as having Graves' disease by symptoms of weight loss & palpitations.
- However, antithyroid medications had been cancelled due to drug allergy.
- After CT & MR exams, aspiration cytology of the neck mass was performed. → The result was class II (lymphocytes only).
- Because the neck mass was considered to be related to Graves' disease, antithyroid treatment was restarted.
- The neck mass shrank and showed lower intensity on out-phase T1WI, which indicated fatty degeneration.



Final Diagnosis

- Ectopic thymic hyperplasia associated with Graves' disease

Take Home Points

- The presence of fatty tissue is detected by MR chemical shift imaging sensitively.
- When you see a neck mass containing fatty tissue, consider the possibility of ectopic thymus.
- Patients with ectopic thymus usually manifests some symptoms in childhood. However, ectopic thymus can enlarge even in adulthood if the patients has thymoma or hyperthyroidism-related thymic hyperplasia.

REFERENCES

1. Murakami M, Hosoi Y, Negishi T, et al: Thymic hyperplasia in patients with Graves' disease. Identification of thyrotropin receptors in human thymus. J Clin Invest 1996;98(10):2228-34.
2. Takami K, Omiya H, Higashiyama M, et al: A case report of large thymic hyperplasia associated with hyperthyroidism. Ann Thorac Cardiovasc Surg 2009;15(6):404-7.
3. Ahsan F, Allison R, White J: Ectopic cervical thymus: case report and review of pathogenesis and management. J Laryngol Otol 2010;124(6): 694-7.
4. Nasseri F, Eftekhari F: Clinical and radiologic review of the normal and abnormal thymus: pearls and pitfalls. Radiographics 2010;30(2):413-28.