

AB006. Atypical morphologies of thymic hyperplasia on CT and MRI

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Background: Thymic hyperplasia (TH) appears as predominantly soft-tissue attenuating thymus with triangular/quadrilateral shape. There are sporadic case reports of TH with multinodular or cystic changes possibly related to Sjogren's syndrome (SjS) and human immunodeficiency virus (HIV). No large systematic study was performed. Therefore, the purpose of this study is: (I) to investigate atypical morphologies of TH, which could be helpful in the appropriate diagnosis of TH; (II) to investigate demographical and clinical conditions relevant to the atypical morphologies.

Methods: Radiological reports of CT and MRI from January 2021 to March 2023 in our medical health network were searched by the term "thymic hyperplasia" (Montage). Two-board certified radiologists reviewed identified cases. First radiologist reviewed all CTs to confirm the presence of TH (>50% of soft-tissue attenuation) and for atypical morphologies. Second radiologist reviewed cases with atypical features to confirm, and discrepancies were resolved in consensus. Atypical features include: (I) multinodular, (II) cystic, (III) lobulated contour, (IV) calcification. MR images were also reviewed if available. Electronic medical records (EMRs) were reviewed for demographics and clinical information relevant to TH.

Results: The search yielded 1,415 reports, belonging to 954 patients. After review by radiologists, 35 cases were found with atypical morphologies. A multinodular morphology was most common (N=19), followed by cystic

(N=12), lobulated (N=7), and calcification (N=5). Of those, eight cases demonstrated overlap features (multinodular/cystic, N=5; multinodular/calcification, N=1; multicystic/calcification, N=1; cystic/calcification, N=1). A total of 51% were male (18/35). Mean age was 52 years. And, 43% (N=11) were former/current smokers (mean 13.4 pack-year); 43% (N=15) of the patients had clinical conditions relevant to TH; most common autoimmune disease was rheumatoid arthritis (N=3), SjS (N=3, including one case with SSA positive), sarcoidosis (N=3), followed by systemic lupus erythematosus (SLE) (N=2), ulcerative colitis (N=1), graves disease (N=1), and steroid therapy (N=3). All three patients with SjS showed overlapping atypical morphologies of multinodular and cystic features. The 29% (10/35) had a history of malignancy, most commonly breast cancer (N=3). One patient with HIV infection demonstrated multinodular feature. However, 34% (12/35) had no clinical conditions relevant to TH. One patient with lobulated TH underwent thymectomy and was pathologically diagnosed with langerhans cell histiocytosis (LCH) involving thymic gland.

Conclusions: Atypical morphologies of TH were investigated. Multinodular and cystic features were relatively common and seen in patients with autoimmune diseases such as RA and SjS, however, also seen in patients with no relevant clinical conditions.

Keywords: Thymic hyperplasia (TH); atypical; multinodular; cystic

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Footnote

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Ethical Statement: The authors are accountable for all

aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was approved by the institutional ethics board of the University of Pennsylvania (No. 853435) and individual consent for this retrospective analysis was waived.

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