The Underestimated Danger of Congenital Hypothyroidism in Adulthood: A Case of Massive Pericardial Effusion in an Adult with Untreated Congenital Hypothyroidism

Ashley Gerard[1], D.O., Walker Elliott[2], D.O., Zachary Buckman[3], D.O., Perry Lin[4], M.D.

OhioHealth Doctors Hospital – Columbus, Ohio

Introduction

- Congenital hypothyroidism is a newborn condition affecting roughly 1 in 2000 newborns, with patients requiring lifelong hormone replacement.
- The incidence of pericardial effusion resulting from hypothyroidism tends to range from 3-37% (4)(5).
- Diagnosing this type of pericardial effusion tends to be a diagnosis of exclusion with a requirement of having an elevated TSH (4).

Case Presentation

- 41-year-old Caucasian female with a past medical history of congenital hypothyroidism, asthma, congestive heart failure, type 2 diabetes mellitus, and hypertension who presented to the emergency department for gradually worsening shortness of breath and exertional dyspnea, non-productive cough, and tightness in her chest.
- TSH was noted to be 123 mclU/ml with a total T4 of 0.2 ng/dl. ANA negative.
- EKG showed normal sinus rhythm with poor R wave progression, old anteroseptal MI, and evidence of electrical alternans in V5.
- CTPA showed cardiomegaly with evidence of heart failure and a massive pericardial effusion with right lung opacities.
- Patient underwent urgent pericardiocentesis with removal of 1250 ml of serous fluid and had Synthroid dosing increased.
- Repeat echocardiogram showed improved pericardial effusion.

Imaging

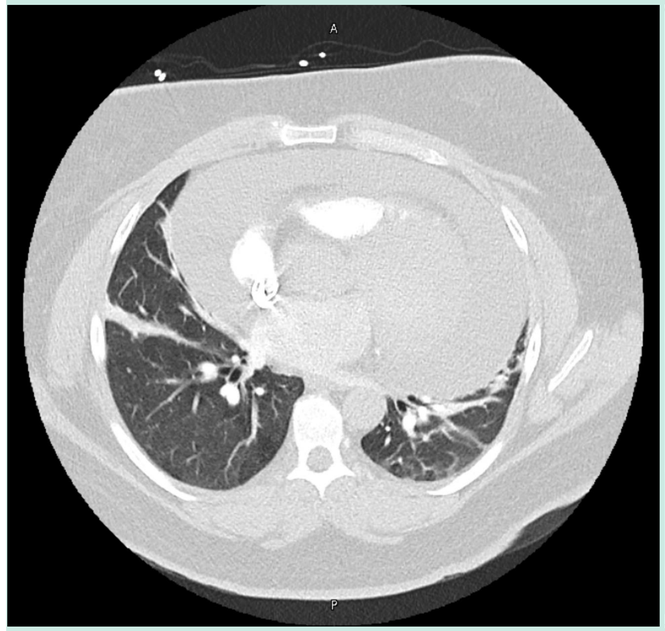

Fig. 1 CT chest showing massive pericardial effusion

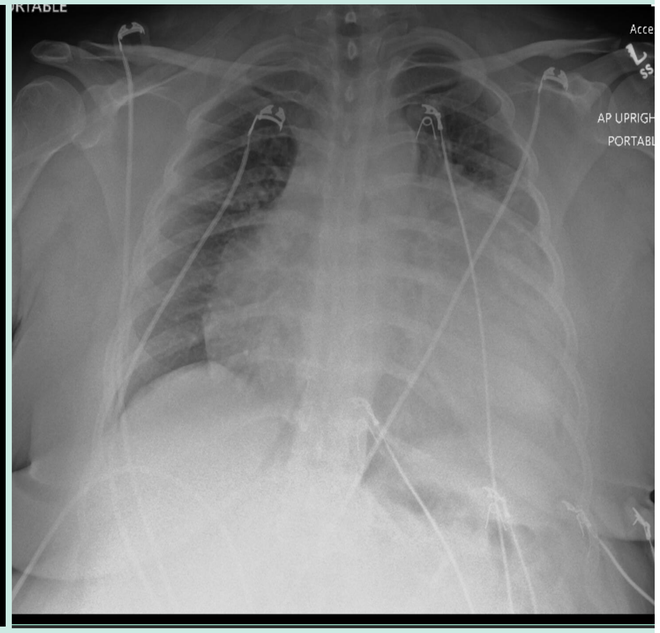

Fig. 2 CXR showing cardiomegaly

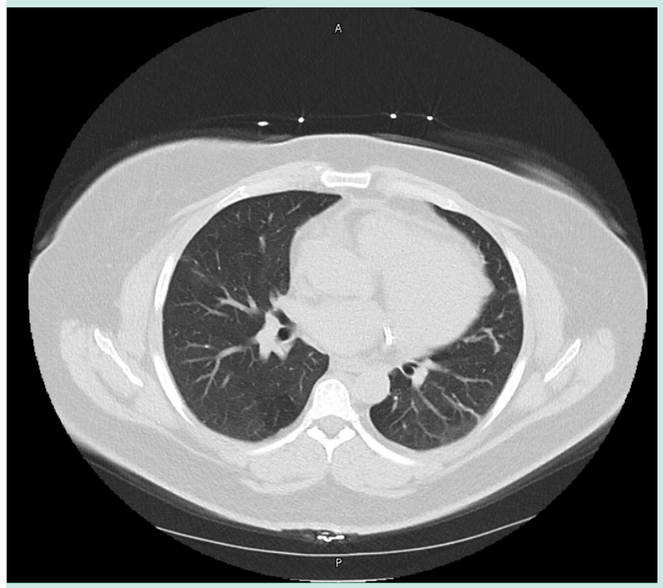

Fig. 3 CT post thoracentesis showing resolved pericardial effusion

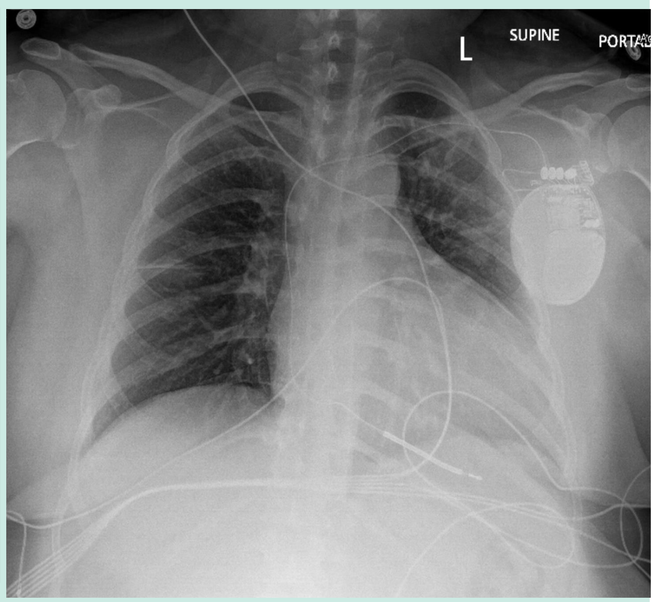

Fig. 4. CXR post thoracentesis

Discussion

- Prior case reports have shown a clear connection between hypothyroidism and pericardial effusion, but only one had suggested a connection with congenital hypothyroidism (5)(6).
- This case demonstrates an adult patient with congenital hypothyroidism with complications leading to pericardial effusion with early signs of cardiac tamponade
- The lack of research into congenital hypothyroidism in adulthood causing pericardial effusion is potentially due to early screening of congenital hypothyroidism. It is standard in the U.S. as well as other countries to screen for this disease due to its high prevalence (1)(3).
- A proposed mechanism is that hypothyroidism can cause pericardial effusion by both increased permeability of epicardial vessels and decreased lymphatic drainage of albumin leading to fluid accumulation in the pericardial space (4).

Conclusion

- While one case of congenital hypothyroidism in adulthood is not enough to declare that it is the same process as we can see with Hashimoto's thyroiditis, it does show similarities between the two.
- Correct dosing and adherence to medication can help prevent secondary complications of hypothyroidism

References

- 1. Cherella, C.E., Wassner, A.J. Congenital hypothyroidism: insights into pathogenesis and treatment. Int J Pediatr Endocrinol 2017, 11 (2017). https://doi.org/10.1186/s13633-017-0051-0
- 2. Alam A, Ashraf H, Khan K, Ahmed A. Uncovering Congenital Hypothyroidism in Adulthood: A Case Study Emphasizing the Urgency of Screening and Clinical Awareness. Cureus. 2023 Sep 20;15(9):e45611. doi: 10.7759/cureus.45611. PMID: 37868446; PMCID: PMC10588732.
- 3. G.F. Rondanini, G. de Panizza, A. Bollati, P. Manzoni, A. Terenghi, M.R. Mutinelli, S. Corallo, G. Chiumello; Congenital Hypothyroidism and Pericardial Effusion. Hormone Research 1 January 1991; 35 (1): 41–44. https://doi.org/10.1159/000181874
- 4. Chahine J, Ala CK, Gentry JL, Pantalone KM, Klein AL. Pericardial diseases in patients with hypothyroidism. Heart. 2019 Jul;105(13):1027-1033. doi: 10.1136/heartjnl-2018-314528. Epub 2019 Apr 4. PMID: 30948517.
- 5. Papakonstantinou PE, Gourniezakis N, Skiadas C, Patrianakos A, Gikas A. Massive pericardial effusion without cardiac tamponade due to subclinical hypothyroidism (Hashimoto's disease). Rural Remote Health. 2018 May;18(2):4384. doi: 10.22605/RRH4384. Epub 2018 May 20. PMID: 29778090.
- 6. Al Janabi T, Gupta V, Naintara F, Seidenberg J, Hoskote A. Cardiac Tamponade: A Late and Rare Finding of Hypothyroidism. Cureus. 2024 Oct 1;16(10):e70617. doi: 10.7759/cureus.70617. PMID: 39483562; PMCID: PMC11526629.