Hyperthyroid-Induced Cardiomyopathy In An Adult: A Case Report

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Citation

F Aziz, P Cheveli. *Hyperthyroid-Induced Cardiomyopathy In An Adult: A Case Report*. The Internet Journal of Cardiology. 2012 Volume 10 Number 2.

Abstract

Although there is ample evidence of hyperthyroidism associated with heart failure at old age, few reports exist in the medical literature regarding adults who experience thyrotoxic cardiomyopathy. In this report we describe an adult patient who presented for urgent care with vague symptoms of palpitations, headaches, lower-extremity swelling, and dyspnea on exertion and was found to have congestive heart failure (CHF) secondary to hyperthyroidism.

INTRODUCTION

Thyroid hormone has profound effects on a number of metabolic processes in virtually all tissues but the cardiovascular manifestations are prominent usually creating a hyperdynamic circulatory state. Thyrotoxicosis is not a common cause of congestive heart failure among black communities.

CASE REPORT

A previously healthy African- American woman, aged 33 years, presented for urgent care with a three-week history of exercise and heat intolerance, dyspnea on exertion, chest pain, and a four-day history of lower-extremity edema and headaches. She also complained of intermittent feelings of racing heartbeat and palpitations during the preceding three weeks that sometimes lasted an entire day. She reported no history of fevers, sore throat, rash, weight loss, or diarrhea. She had no history of syncope and reported being unable to sleep flat on her back without problems. The patient's family history was negative for congenital heart disease, cardiomyopathy, or sudden unexplained death.

Initial vital signs included a heart rate of 130 beats/minute and respiratory rate of 22 breaths/minute. The patient was thin. Her skin was warm and moist. She was not in any distress. She did exhibit mild bilateral hand trembling, but she showed no evidence of hair loss. Her thyroid gland was enlarged, and was soft and without nodules. A cardiac examination revealed a slightly hyperactive precordium, without any gallop or murmur. The patient did not exhibit lid lag, periorbital edema, or pretibial myxedema. An electrocardiogram showed sinus tachycardia, right atrial enlargement, and left ventricular hypertrophy. Chest radiographs revealed mild cardiomegaly with a normal pulmonary vascular pattern. CT Chest with IV contrast showed an enlarged thyroid gland (Fig 1 & 2).

Figure 1

Fig 1: Enlarged Thyroid gland

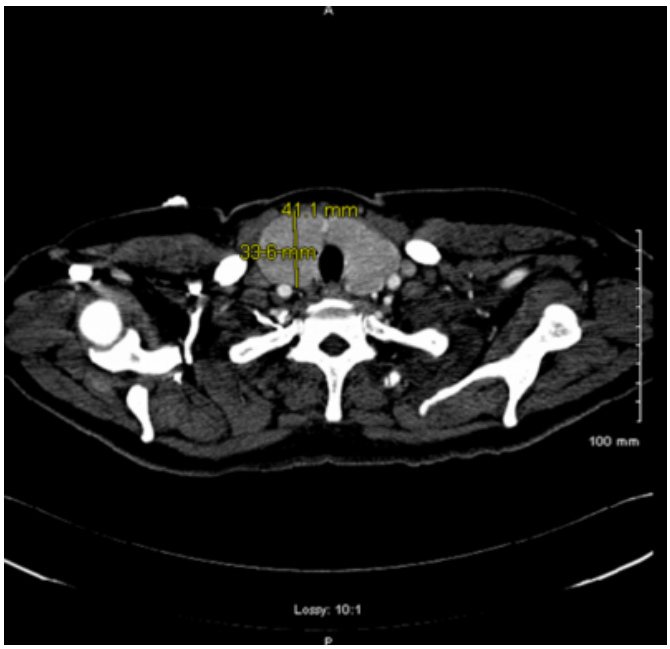
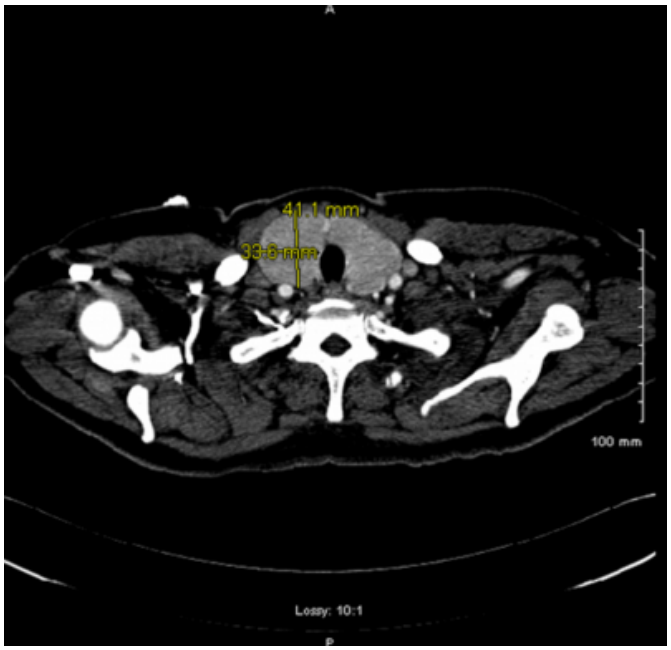


Figure 2

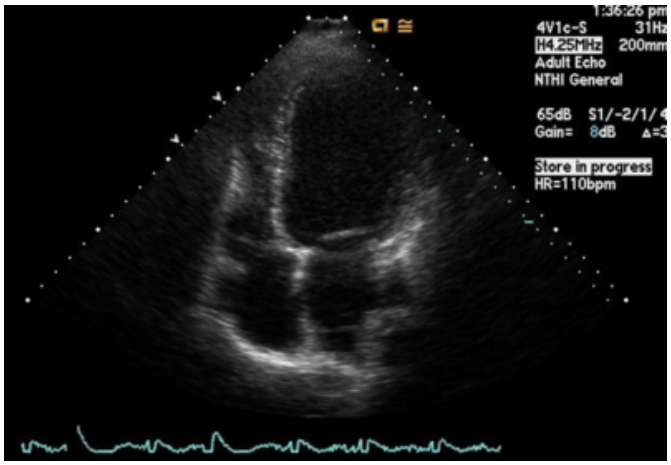
Fig 2: Enlarged Thyroid gland



Transthoracic echocardiogram revealed moderately dilated left ventricle and severely reduced LVSF with EF of 28%. (Fig 3)

Figure 3

Fig 3: Four-Chamber View. Enlarged Left Ventricular with depressed LV function



The patient was admitted to the hospital and given 20 mg of furosemide intravenously twice a day and 2.5 mg of lisinopril every day for CHF.

The patient then had a significant decrease in her lower-extremity edema. An assessment of thyroid- stimulating hormone (TSH) level was ordered at the initial urgent care visit; she had a TSH level of <0.01 U/mL. Her level of free thyroxine (T4) was 3.70 /dL. Because of her hyperthyroidism, the patient was instructed to begin taking 15 mg of methimazole per day and 50 mg of atenolol twice a day. The patient was discharged after three days of hospitalization with close follow-up at clinic. Patient was symptoms free at time of discharge.

DISCUSSION

Cardiovascular manifestations of hyperthyroidism are common and include arrhythmias [1], such as sinus tachycardia, atrial fibrillation, and atrial flutter[2].CHF and cardiomyopathy as a result of hyperthyroidism are not common, especially in young adults. It is not known whether cardiomyopathy in hyperthyroidism is secondary to direct toxic effects of excess thyroid hormone, whether it results from the hyperdynamic or high-output stress caused by the thyroid hormone, or whether it is caused by a combination of both. However, cardiomyopathy caused by hyperthyroidism has been shown to be reversible in adults with antithyroid therapy. Although it is rare for hyperthyroidism to present as CHF or cardiomyopathy, it should be considered in the differential diagnosis, as it is reversible.

The case we describe here illustrates how early diagnosis of underlying hyperthyroidism in an adult can accelerate the healing process in cardiac disease. Thyrotoxic cardiomyopathy in adults has been reported in very few publications, but immediate antithyroid therapy has been shown to provide good long-term outcome in these patients[3-5]. The increasing incidence of adulthood thyrotoxicosis [6], and the possible reversal of cardiomyopathy in these young patients with therapy emphasize the importance of early detection and management of hyperthyroidism.

References

1. Polikar R, Burger AG, Scherrer U, Nicod P. The thyroid and the heart. Circulation 1993 May;87(5):1435–41.
2. Roffi M, Cattaneo F, Topol EJ. Thyrotoxicosis and the cardiovascular sys- tem: subtle but serious effects. Cleve Clin J Med 2003 Jan; 70 (1): 57–63.
3. Khandwala HM. A case of congestive heart failure due to reversible dilated cardiomyopathy caused by hyperthyroidism. South Med J 2004 Oct; 97(10): 1001–3.
4. Markowitz C, Yates WM. Response of explanted cardiac muscle to thyroxine. Am J Physiol 1932; 100:162–6.
5. Forfar JC, Muir AL, Sawers SA, et al. Abnormal left ventricular function in hyperthyroidism: evidence for a possible reversible cardiomyopathy. N Engl J Med 1982 Nov 4; 307(19): 1165–70.
6. Cavallo A, Casta A, Fawcett HD, Nusynowitz ML, Wolf WJ. Is there a thyrotoxic cardiomyopathy in children? J Pediatr 1985 Oct; 107(4): 531–6.

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