

A challenging case of thyroid storm

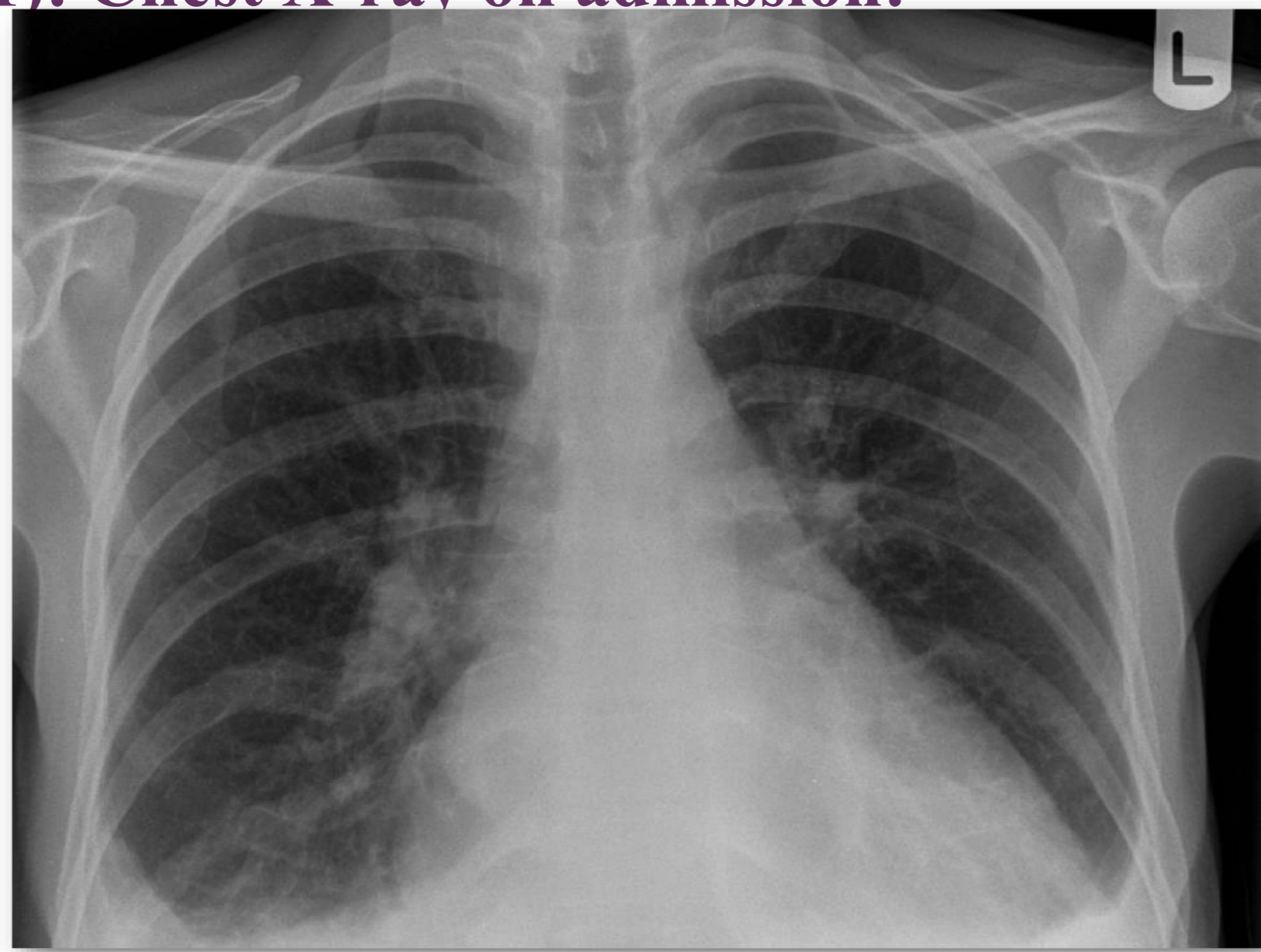
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Introduction:

Thyroid storm is a rare complication of thyrotoxicosis, life-threatening if not managed appropriately ⁽¹⁾.

We report a 43-year-old woman who presented to emergency services with shortness of breath, palpitations and weight loss. She was pale, cachectic, in atrial fibrillation and had signs of decompensated heart failure. Investigations showed: WBCs: 3.2 x10⁹/L, neutrophils 2.1x10⁹/L, Hb 53g/L, platelet 233, TSH <0.02 mIU/L, FT4 64 (10-25 pmol/L), FT3 19 (2.8-7 pmol/l) and thyroid stimulating antibody > 40 U/L confirming a diagnosis of Grave's disease. Chest X-ray showed bilateral pleural effusions (figure 1), ECG confirmed atrial fibrillation with rate of 130/min. Echocardiogram demonstrated moderate LVSD with mild mitral and tricuspid regurgitations..

Figure (1): Chest X-ray on admission:



Due to initial suspicion of anaemic heart failure and possible wet Beriberi, she was treated with diuretics, blood transfusion, thiamine then commenced on Digoxin & beta-blockers for rate control.

Following review by endocrinology, Carbimazole 30 mg once daily was commenced. On day 3, She became hypotensive, WBC dropped to 2.7 and neutrophils to 1.7. Carbimazole was switched to Propylthiouracil (PTU) due to concerns about agranulocytosis. She was also treated for urinary sepsis. At that point FT4 was 30 pmol/l. Patient declined OGD hence was not anti-coagulated due to undiagnosed iron deficiency anaemia pending outpatient CT angiogram. Her abdominal ultrasound showed a uterine mass suspicious of fibroids. She was discharged after spending 9 days in hospital. Few months after discharge she underwent laparoscopy with hysterectomy and bilateral salpingo-oophorectomy. The histopathology of the mass was consistent with endometriosis.

Discussion: Thyroid storm is a rare but life-threatening complication of thyrotoxicosis. Diagnosis can be challenging especially if it is the first presentation of thyrotoxicosis. The diagnostic criteria are based on the Burch-Wartofsky score ⁽²⁾ which is sensitive but non specific. Mild to moderate anaemia has been reported with Grave's disease ⁽³⁾ however, profound anaemia – as in this case – warrants investigations for concomitant causes. Treatment depends on the severity of the clinical syndrome and often admission to HDU or ITU is indicated. Supportive measures in addition to ATDs like PTU or Carbimazole are the mainstay. Sometimes steroids might be needed to block the peripheral conversion of T₄ to T₃ and in some scenarios rapid blockade with Lugol's Iodine might be needed.

There is solid evidence to suggest that patients with untreated overt thyroid dysfunction are at increased risk of cardiac dysfunction ⁽⁴⁾. Also, persistent sub-clinical thyroid dysfunction is associated with the development of Heart failure ⁽⁴⁾.

Learning points:

1. Thyroid storm diagnosis needs high index of suspicion since symptoms may resemble any high cardiac output state e.g. severe sepsis or anaemia and it might be precipitated by them.
2. Both thyroid storm and sepsis can cause leucopenia, however, vigilance and observation for rare complications of antithyroid drugs including agranulocytosis needs to be considered.
3. Pernicious anaemia has been reported in patients with hyperthyroidism, although there are some reports of microcytic anaemia; however its severity in this case suggests a coexisting aetiology.

References:

1. S Karger, D Fuhrer, Thyroid storm, an update, pubmed, 2008, DOI: [10.1055/s-2008-1046737](https://doi.org/10.1055/s-2008-1046737)
2. Burch, HB, Wartofsky, L, Endocrinol Metab Clin North Am 1993; 22:263
3. M O Hegazi, S Ahmed, Atypical Clinical Manifestations of Graves' Disease: An Analysis in Depth, Journal of Thyroid Research, Volume 2012 (2012)
4. Irwin Klein and Sara Danzi, thyroid disease and the heart, Circulation. 2007;116:1725-1735

