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Case Report

Rare presentation of thyrotoxicosis due to gestational trophoblastic disease – a case report

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ABSTRACT

Gestational trophoblastic disease (GTD) usually presents early in pregnancy with mild symptoms. Clinical thyrotoxicosis is rare, with thyroid storm only reported in previous case reports. GTD presenting with thyroid storm is potentially life-threatening, and a high index of suspicion is necessary to avoid morbidity and mortality. We report a case of GTD presenting with severe thyrotoxicosis and a negative pregnancy test due to the hook effect. Point-of-care ultrasound (POCUS) was instrumental in making the diagnosis.

INTRODUCTION

GTD ranges from benign, which includes hydatidiform mole, such as complete and partial molar pregnancies, to malignant, which includes placental site trophoblastic tumours, choriocarcinoma, epithelioid trophoblastic tumours, and invasive molar pregnancies. The incidence of benign GTD is estimated to be 1 in 1000 pregnancies. (1) GTD presenting with clinical features of thyrotoxicosis comprises 2% of these presentations. (2) GTD complicated by thyroid storm is exceptionally rare and has only been reported in previous case reports.

The diagnosis of GTD is made by a combination of clinical, radiological, and biochemical features. Clinical features include vaginal bleeding and exaggerated features of pregnancy, such as nausea and vomiting. Biochemically, the patient may have a disproportionately raised serum β-HCG (beta-human chorionic gonadotropin). Radiological features may include the finding of a mass with numerous discrete anechoic spaces, described as a "snowstorm" appearance on ultrasound. The definitive treatment of benign GTD is surgical dilatation and curettage under ultrasound guidance. In contrast, malignant GTD requires a more intensive treatment strategy, which may include repeat curettage, chemotherapy, and, in selected cases, a hysterectomy. (1)

The pathophysiology occurs due to excessive secretion of β-HCG, which is structurally similar to thyroid-stimulating hormone (TSH), binding to TSH receptors, leading to hyperthyroidism. (3)

False negative urine pregnancy tests may rarely occur due to the "hook effect," where exceedingly high levels of β-HCG lead to oversaturation of the test antibodies. (4)

The importance of questioning inconsistent test results and recognising the rare clinical presentation of GTD is highlighted. The liberal use of POCUS should be encouraged to include or exclude important differential diagnoses. This will enable practitioners to reduce morbidity and mortality associated with the complications of GTD.

CASE DESCRIPTION

A multiparous woman in her 30s was transferred to the Emergency Department (ED) of a public hospital in Johannesburg, South Africa, with a concern for heart failure. The patient presented with a one-month history of mild vaginal bleeding. The patient also complained of a 2-week history of bilateral lower limb swelling, progressive dyspnoea, and a 2-day history of lower abdominal pain and had a negative urine pregnancy test on referral.

The patient's previous history included three normal vaginal deliveries, a multi-fibroid uterus, and a previous appendectomy. The patient was unsure of the date of her last normal menstrual period.

The patient arrived in the ED in severe respiratory distress, with a respiratory rate of 43 breaths per minute. The patient was tachycardic with a pulse of 120 beats per minute, apyrexial, a blood pressure of 166/121 mmHg, and an oxygen saturation of 96% on nasal cannula oxygen. On examination, the patient was noted to have mild conjunctival pallor, bilateral oedema of the legs, decreased air entry over the lung bases with no audible crackles, a raised jugular venous pulse, a third heart sound (S3) gallop, and an abdominal mass extending up to the umbilicus. On vaginal examination, the cervix was normal with minimal blood on the glove.

Fechter.indd 141 22-10-2025 11:18:58

A mobile antero-posterior chest X-ray revealed a bat wing appearance in keeping with pulmonary oedema. A pulmonary embolism was initially considered due to the tachycardia and features of right heart strain on the electrocardiogram. A CT pulmonary angiogram was considered, but the patient was initially too unstable to be transported to the radiography department.

A bedside POCUS performed by the emergency physician on call revealed a mild-moderately decreased ejection fraction with no signs of right ventricular strain, bilateral pleural effusions, and diffuse B-lines in keeping with congestive cardiac failure and pulmonary oedema. No features in keeping with a pulmonary embolism were identified. A large cystic abdomino-pelvic mass with a "snowstorm" appearance was noted on transabdominal ultrasound.

A point-of-care urine pregnancy test was negative. A urine pregnancy test repeated after the patient was given a diuretic was faintly positive.

Further laboratory testing, as seen in Table 1, revealed a quantitative β-HCG of > 100,000, a TSH of 0.01 mIU/L (normal: 0.27–4.20 mIU/L), and a Thyroxine (free T4) of 88 pmol/L (normal: 11.9–21.6 pmol/L). Based on these, a diagnosis of thyrotoxicosis secondary to advanced gestational trophoblastic disease was made.

The Burch-Wartofsky Point Scale (BWPS) calculated at the time was 50 points, which was highly suggestive of thyroid storm (BWPS score of >45 is suggestive of thyroid storm). Ideally, this requires rapid and aggressive multimodal management in an intensive care unit.

The initial management of the patient in the ED was aimed at improving cardiac failure and pulmonary oedema. It included non-invasive ventilation (NIV), urinary catheterisation, and diuresis with 80mg furosemide intravenously (IVI). Propranolol 10mg orally and hydrocortisone 200mg IVI were given as part of thyroid storm management. The Endocrine unit advised against the use of Lugol's iodine and carbimazole, as the cause of the hyperthyroidism was not due to the thyroid itself.

The patient stabilised on the above treatment, was weaned off NIV, and transferred to the obstetrics and gynaecology high care unit early the following morning, where the patient underwent ultrasound-guided suction and curettage.

The patient had an uncomplicated recovery.

Histology showed morphological and immunophenotypical features in keeping with a complete molar pregnancy.

DISCUSSION

β-HCG is a heterodimer consisting of two subunits, namely an alpha and a beta subunit, joined noncovalently.

TABLE 1: Relevant laboratory results

	Initial presentation	Day 07 Post suction & curettage
White Cell Count 3.90 - 12.60 x 10^9/L	14,7	
Haemoglobin 11.6 - 16.4 g/dL	10,7	
Platelet Count 186 - 454 x10^9/L	247	
Creatinine 49-90 umol/L	101	
eGFR: MDRD formula mL/min/1.73m^2	53	
Sodium 136-145 mmol/L	138	
Potassium 3.5-5.1 mmol/L	4,2	
Chloride 98-107 mmol/L	104	
Bicarbonate 23-29 mmol/L	14	
Anion gap 9-16 mmol/L	24	
β-HCG IU/L	>100 000	30732
Thyroid stimulating hormone 0.27-4.20mIU/L	0,01	0,01
Thyroxine (freeT4) 11.9-21.6 pmol/L	83,7	14
Tri-iodo thyronine (free T3) 3.1 - 6.8 pmol/L	42,9	
D-Dimer Quantitative 0.00 - 0.25mg/L	4,81	
Troponin I < 23ng/L	32	
NT-proBNP < 300 ng/L	> 35 000	

The beta subunit of β-HCG resembles that of the TSH beta subunit. It therefore enables β-HCG to bind to the TSH receptor and exert thyrotropic effects, possibly causing an excessive release of thyroid hormones in the case of GTD. The alpha subunit is completely identical in both TSH and β-HCG. (3)

Severe complications associated with hyperthyroidism in GTD have been reported, including thyroid storm, acute respiratory distress syndrome, and pulmonary hypertension. (5) An early, effective multidisciplinary management team guided the treatment of our patient.

In our case, bedside ultrasound was instrumental both in excluding alternative diagnoses, such as pulmonary embolism, and in rapidly identifying the abnormal intrauterine contents, leading to urgent formal quantitative serum β-HCG and thyroid function testing to confirm the diagnosis.

The initial negative urine pregnancy test that was later faintly positive can be explained by the "hook effect". The "hook effect" occurs due to excess human chorionic gonadotropin antigens overwhelming the finite antibodies present in the urine pregnancy test. With the antigens being excessive, the formation of the complex is hindered and is reflected as falsely negative. Tests may be repeated with diluted urine to balance out the excess antigens. The urine was incidentally diluted by diuretic therapy. (4)

This case report highlights the rare presentation of thyrotoxicosis induced by advanced gestational trophoblastic disease. It also highlights the "hook effect" and the limitations of point-of-care pregnancy tests. This may be mitigated by the liberal use of POCUS in the critically ill patient as an adjunct to form a holistic assessment in the emergency department. The use of the Rapid Ultrasound for Shock and Hypotension (RUSH) protocol in this case provided invaluable information. (6)

CONCLUSION

Advanced GTD has become a rare disease entity due to advances in obstetric care, but it may present with features of thyroid storm. Early recognition and management are necessary to prevent morbidity and mortality. The "hook effect" may cause false negative urine pregnancy tests, and this case report highlights that point of care testing is fallible. Emergency practitioners making use of them should be aware of their limitations and question their significance if they do not support the clinical picture. POCUS is a valuable adjunct in rapidly differentiating causes of heart failure and shock.

INFORMED CONSENT & ETHICS:

Informed consent was provided by the patient. Ethical clearance was obtained. No funding was provided for the case report.

REFERENCES

1. Botha MH, Matsatseng T, Kruger TF. Clinical gynaecology. 5th ed. Cape Town: Juta and Company (Pty) Ltd; 2016.
2. Sun SY, Melamed A, Joseph NT, et al. Clinical presentation of complete hydatidiform mole and partial hydatidiform mole at a regional trophoblastic disease center in the United States over the past 2 decades. Int J Gynecol Cancer. 2016; 26(2):367–370.
3. Hershman JM. Human chorionic gonadotropin and the thyroid: hyperemesis gravidarum and trophoblastic tumors. Thyroid. 1999; 9(7):653–657.
4. Priyadarshini S, Manas F, Prabhu S. False negative urine pregnancy test: hook effect revealed. Cureus. 2022; 14(3):e22779.
5. Pereira JVB, Lim T. Hyperthyroidism in gestational trophoblastic disease – a literature review. Thyroid Res. 2021; 14(1):1–7.
6. Bagheri-Hariri S, Yekesadat M, Farahmand S. The impact of using RUSH protocol for diagnosing the type of unknown shock in the emergency department. Emerg Radiol. 2015; 22(5):517–520.

Fechter.indd 144 22-10-2025 11:18:59