

Fetal hyperthyroidism associated with fetal anaemia and severe thrombocytopaenia: a case report

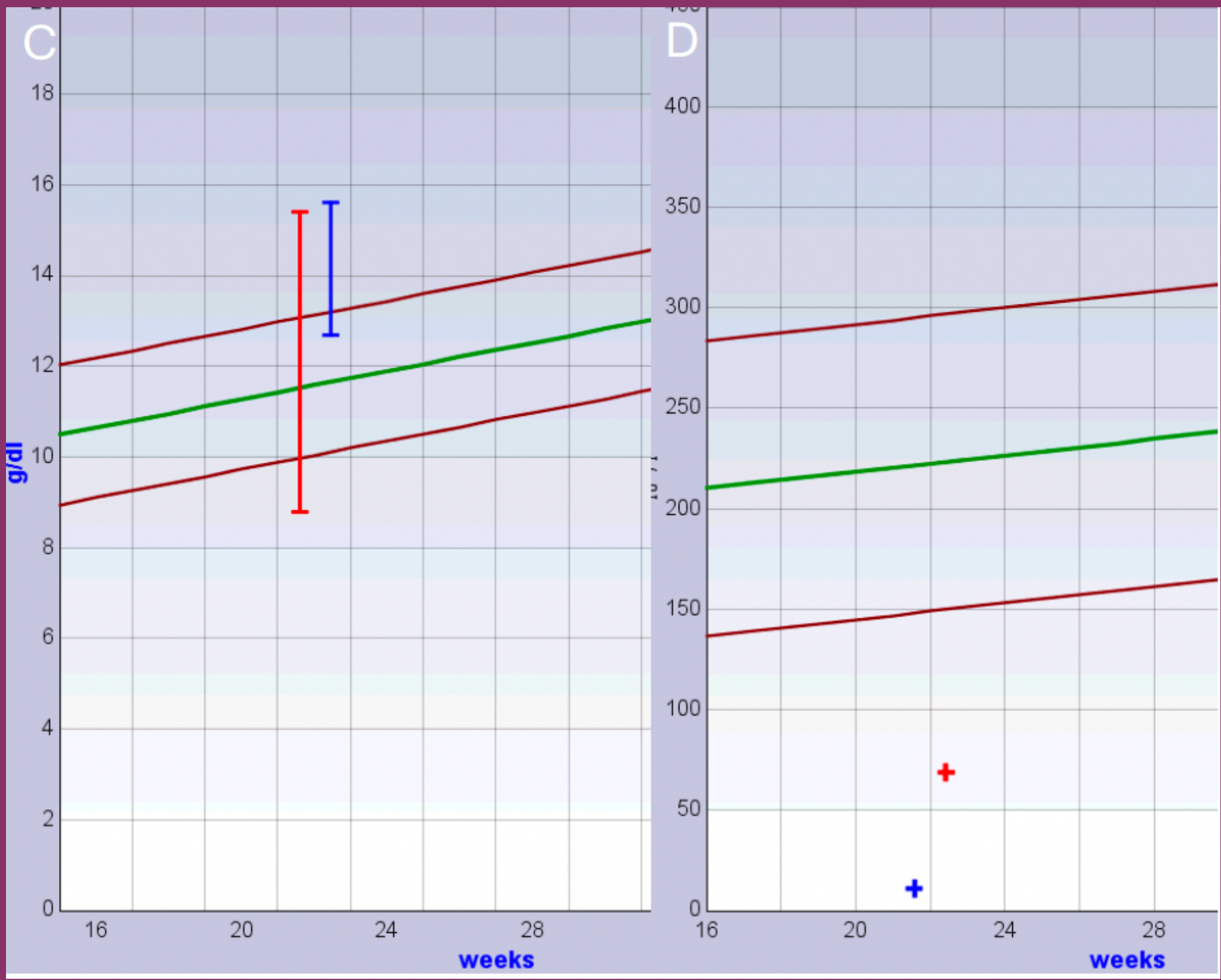
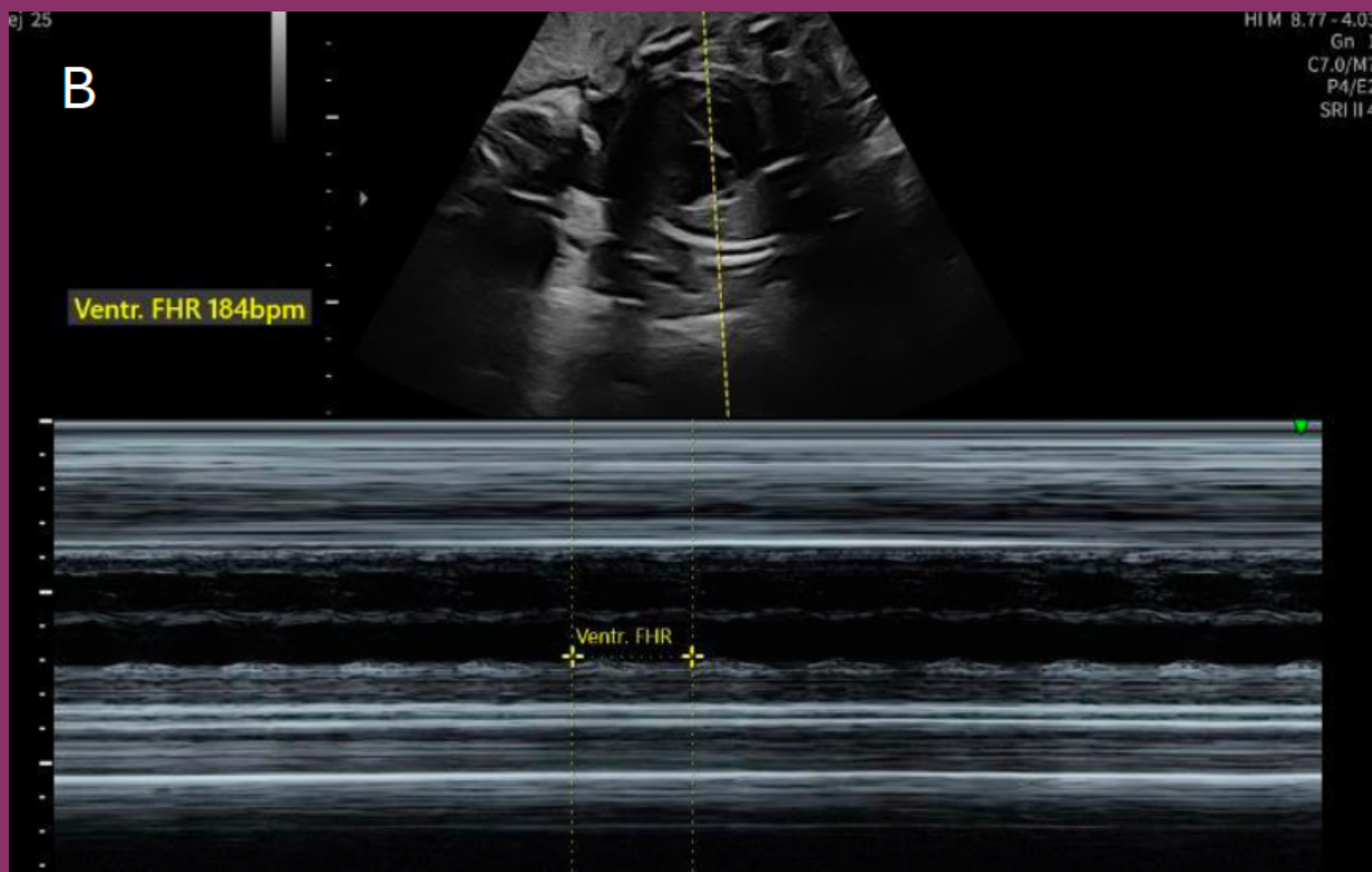
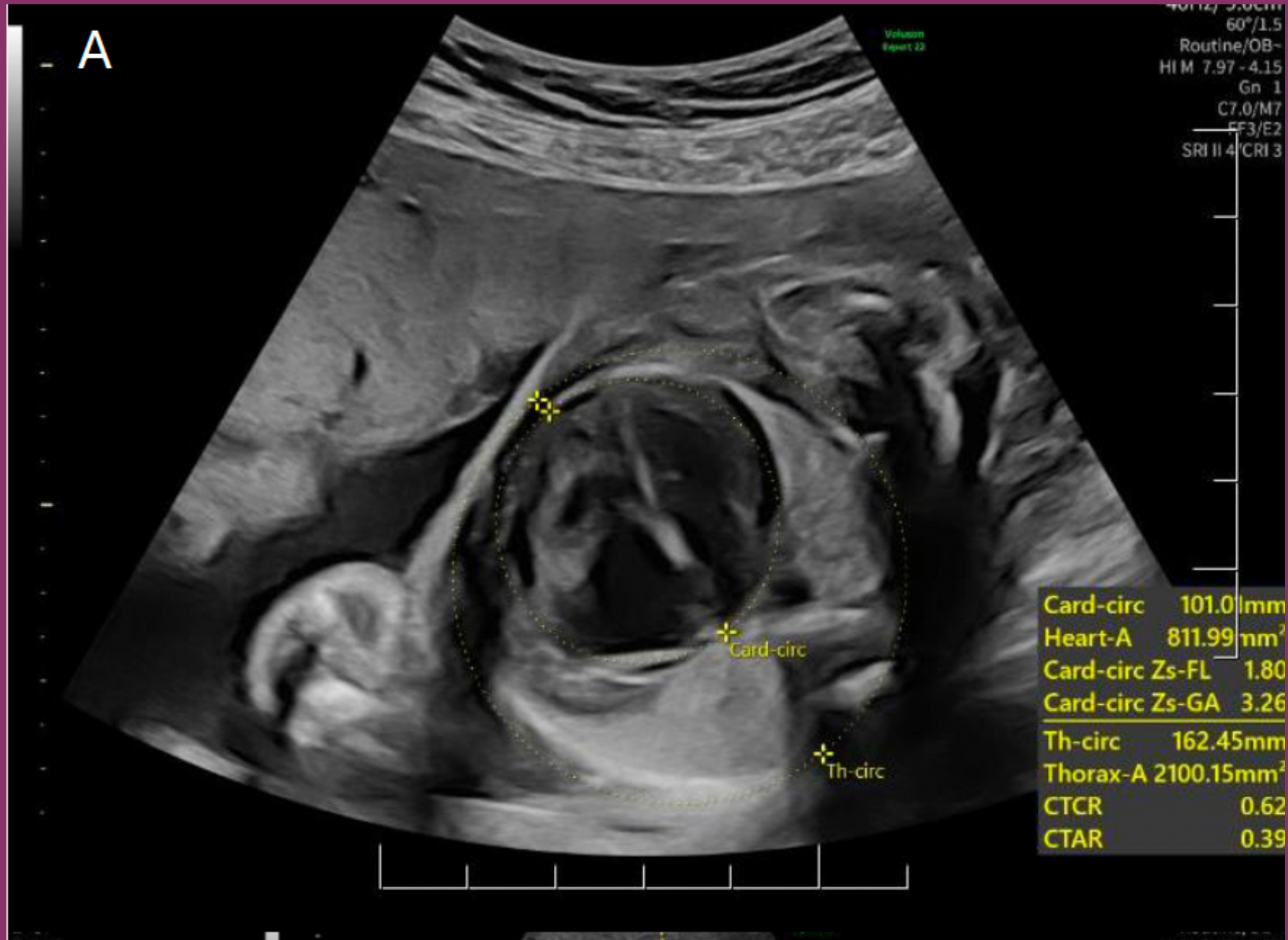
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BACKGROUND

- Maternal thyroid disease associated with fetal thyroid dysfunction as a result of placental transmission of thyroid antibodies is a well described pregnancy complication.
- Uncontrolled maternal thyrotoxicosis significantly increases the risks of both maternal complications, such as hypertension and congestive heart failure, as well as fetal complications including stillbirth, fetal growth restriction and neurobehavioral disorders in offspring in later life.
- Graves’ disease affects approximately 0.1% to 0.4% of pregnancies, however fetal sequelae are rare with only 1% of patients giving birth to a baby with hyperthyroidism. A pathognomonic finding in Graves’ disease are IgG TSH-receptor autoantibodies to thyroid antigens (TRAbs antibodies), and transplacental passage of these antibodies can result in either fetal hyperthyroidism or hypothyroidism.
- TRAb antibodies compete with Thyroid Stimulating Hormone (TSH) for binding to the TSH-receptor, which results in either a stimulatory (TSAb) or blocking (TSBAb) effect. These antibodies can remain elevated even after a patient has undergone thyroidectomy.
- Transplacental transfer of TRAb increase as gestation advances, and in the absence of maternal treatment, will result in fetal hyperthyroidism usually from 26 weeks’ gestation, although disease may present as early as 21 weeks. Fetal hyperthyroidism can be suspected based on ultrasound findings such as fetal tachycardia and goitre, although confirmation of the fetal thyroid status requires fetal blood sampling and measurement of fetal TSH and free thyroxine.
- In adults, various hematological associations of thyroid disease have been described, including anemia, thrombocytopenia and pancytopenia.
- However, to our knowledge, these hematological sequelae have not been previously reported.



Rare case of fetal thrombocytopaenia/anaemia associated with maternal hyperthyroidism



A: fetal cardiomegaly at 21 weeks gestation. **B:** moderate fetal tachycardia noted, with regular sinus rhythm. **C:** Fetal haemoglobin levels pre and post fetal blood transfusions at 21 and 23 weeks gestation. **D:** Fetal platelet results pre and post transfusion and 21 and 23 weeks gestation.

CASE REPORT

- A 30-year-old woman presented to hospital with fever, night sweats, dyspnea, and a rash beginning four weeks after starting minocycline for rosacea. On examination, her temperature was 40.1C and she was tachycardic. Computed tomography of the chest showed multiple areas of parenchymal consolidation with extensive lymphadenopathy.
- Six months later, she presented to hospital with palpitations, diaphoresis, and weight loss. On exam, she was tachycardic and had ocular findings suggestive of Graves’ disease. Her labs were notable for undetectable TSH, free T4 >100 pmol/L, free T3 of 45 pmol/L, and elevated thyrotropin receptor antibody (TRAB) of 29.7 IU/L, consistent with Graves’ disease.
- More than six years following her initial presentation, she became pregnant.
- At 21 weeks of gestational age, a routine prenatal ultrasound showed fetal tachycardia, cardiomegaly and a pericardial effusion. She was admitted to a tertiary care obstetric centre for investigation. Although the patient’s TSH and free T4 were well controlled at 0.42mIU/L and 18pmol/L, respectively, she was found to have a persistently elevated TRAB titre exceeding the upper limit of detection of over 100 IU/L.
- Serial ultrasound and MRI revealed numerous fetal abnormalities, including ventriculomegaly with intraventricular hemorrhage, cardiomegaly, hydrops fetalis, and a markedly enlarged fetal thyroid. The Middle Cerebral Artery (MCA) Peak Systolic Velocity (PSV) was significantly elevated at ~ 60 cm/s (well above 1.5 MoM), suggesting fetal anemia.
- Cordocentesis revealed undetectable fetal TSH, free T4 greater than 100pmol/L, anemia (hemoglobin 88 g/L) and thrombocytopenia (platelets 10 x10⁹/L). Despite intrauterine transfusion of red blood cells and platelets, the fetus remained mildly anemic and severely thrombocytopenic one week later.
- Despite a trial of methimazole, IVIg, and prednisone to achieve a fetal euthyroid state, it was decided that termination was the best course of action given the progression of fetal hydrops, evolving maternal mirror syndrome and the overall poor prognosis.
- Autopsy of the fetus revealed fetal hemochromatosis.