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CASE REPORT
Heart failure

Large pericardial effusion in a woman in the second trimester of pregnancy: a case report

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Background Pericardial effusion is common in pregnancy, with causes similar to the general population. Usually, it is found in the third trimester and disappears spontaneously after labour; however, there is a risk of progression to tamponade. Management is based on expert opinion, since few studies have been published.

Case summary A woman with enlargement of a known, chronic, presumably idiopathic pericardial effusion, in the 17th gestation week, presented with mild dyspnoea, without specific echocardiographic signs of cardiac tamponade. She received double antithrombotic treatment with aspirin 100 mg, started before conception, and a prophylactic dose of tinzaparin 4500 IU, started at the beginning of the pregnancy due to obstetrical antiphospholipid syndrome. A multidisciplinary team consisting of the treating obstetrician–gynaecologist, haematologist, cardiothoracic surgeon, and cardiologist discussed the management, taking into account the large size of the effusion and the significant increase during pregnancy, the possibility of further increase during the third trimester, the antiplatelet and antithrombotic treatment, which increased the haemorrhagic risk, and the difficulty and risk to intervene later in pregnancy. A surgical pericardial window was proposed to the patient and family and was performed uneventfully.

Discussion This case demonstrates the importance of a multidisciplinary team approach and shared decision-making in the management of these complex cardio-obstetric patients in order to achieve optimal therapeutic results.

Keywords Pericardial effusion • Pregnancy • Obstetrical antiphospholipid syndrome • Pericardiocentesis • Surgical pericardial window • Case report

ESC curriculum 2.2 Echocardiography • 6.6 Pericardial disease • 9.8 Pregnancy with cardiac symptoms or disease

Learning points

- In large pericardial effusions that develop before the third trimester of pregnancy, an early strategy of surgical pericardial window and drainage might be considered, especially in cases of high risk for cardiac tamponade or haemorrhagic conversion.
- This case demonstrates the importance of a multidisciplinary team approach and shared decision-making in the management of these complex cardio-obstetric patients in order to achieve optimal therapeutic results.

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Introduction

Pericardial effusion is common in pregnancy and can be found in up to 40% of pregnant women in the third trimester as hydropericardium[1]; generally, it develops after the 20th week of gestation and disappears spontaneously shortly after labour.[2] Late pericardial effusions have an unclear mechanism, perhaps due to salt and water retention[3]; although they are usually well tolerated (circulating blood volume is normally increased), there is still a risk of progression to tamponade, indicating that these women must be followed by dedicated multidisciplinary teams.[1–3] Few studies concerning pericardial diseases in pregnancy have been published, mainly case reports or series, while management is based on expert opinion.[3]

The causes of pericardial effusion during pregnancy are similar to those in the general population with viral infections and autoimmune disorders being the most common.[1,4] Antiphospholipid syndrome is a systemic autoimmune disease manifested as venous, arterial, or microvascular thrombotic events in patients with persistent antiphospholipid antibodies and/or a lupus anticoagulant,[5] while family studies *suggest a familial genetic predisposition*.[6] A subtype is obstetrical antiphospholipid syndrome (OAPS), characterized by foetal loss after the 10th week of gestation, recurrent early miscarriages, intrauterine growth restriction, or severe pre-eclampsia.[7]

We present a case of large pericardial effusion occurring prior to the 17th week of gestation, in a woman with OAPS.

Summary figure

Day 1 (at the 17th week of pregnancy)	Patient presentation to the cardiology out-patient clinic: she was referred by her treating cardiologist due to enlargement of a known, chronic, presumably idiopathic, moderate, asymptomatic pericardial effusion (maximal diameter 17 mm at the inferolateral wall at end-diastole), which was diagnosed 5 years previously, at a routine check-up assessment. The patient had a history of OAPS complicated by five miscarriages. She also had a family history of pericardial effusions (her mother and her mother's sister). Upon presentation, vital signs were within normal limits. Echocardiography showed a very large pericardial effusion (maximal diameter 42 mm at the inferolateral wall and 26 mm in the space adjacent to the right ventricle), with no signs of tamponade. The patient was admitted to the hospital for haemodynamic monitoring.
Day 2	In-hospital laboratory investigations: all were normal except for elevated anti-cardiolipin antibodies.
Day 3	Multidisciplinary team discussion: a surgical pericardial window during this hospitalization was recommended, instead of pericardiocentesis or watchful waiting. After a detailed discussion, the patient and her family agreed with the recommendation and gave their consent.
Day 4	Pericardial window was performed; no complications occurred.
Day 5	Discharged from the hospital.
Week 39th of pregnancy	Uneventful labour.

Case presentation

A 35-year-old Caucasian Greek woman, at the 17th week of her sixth pregnancy, was referred by her treating cardiologist to the Cardiology Outpatient Clinic due to enlargement of a known, chronic, presumably idiopathic, moderate, asymptomatic pericardial effusion (maximal diameter 17 mm at the inferolateral wall at end-diastole), diagnosed 5 years previously, at a routine check-up assessment, in February 2022. The patient had a history of OAPS complicated by five miscarriages, androgenetic alopecia, and Hashimoto thyroiditis. She denied any tobacco, alcohol, or illicit drug use. Her family history was not significant for thrombotic or haemorrhagic events, but her mother was diagnosed in her 30s with a chronic, idiopathic, asymptomatic pericardial effusion (maximal diameter 18 mm) that remains stable without treatment, and her mother's sister was diagnosed in her forties with a chronic, idiopathic pericardial effusion that evolved to tamponade and needed an emergent pericardiocentesis, without relapse, pointing probably a familial predisposition. She received folic acid 5 mg, levothyroxine 75 mg, aspirin 100 mg (while trying to conceive), and a prophylactic dose of tinzaparin 4500 IU s.c. once daily (since the beginning of pregnancy), as recommended for OAPS. She had also received vitamin D_3 and small doses of methylprednisolone during the first 8 weeks of gestation by her haematologist for OAPS.

At presentation, she had mild dyspnoea on exertion. Vital signs were as follows: blood pressure 120/70 mmHg, heart rate 65 b.p.m. and regular, respiratory rate 15 breaths per minute, and temperature 36.7°C. Physical examination was normal, except for mild ankle oedema. Her electrocardiogram showed sinus rhythm with low QRS voltages in all leads. The transthoracic echocardiogram revealed a normal left ventricular ejection fraction of 55%, a very large pericardial effusion (maximal diameter 42 mm at the inferolateral wall and 26 mm in the space adjacent to the right ventricle), and a dilated inferior vena cava with reduced inspiratory decrease (*Figure 1A–E*). There were no signs of tamponade, e.g. swinging heart, transmitral early diastolic filling velocity respiratory variation, or diastolic collapse of the right chambers.

The patient was admitted for haemodynamic monitoring. A complete laboratory work-up revealed elevated anti-cardiolipin antibodies, while all other laboratory investigations were normal, including C-reactive protein levels, corrected for pregnancy,[8] excluding therefore additional triggers (like infections or polyserositis) that may have contributed to the increase of the pericardial effusion.

A multidisciplinary team, consisting of the treating obstetrician–gynaecologist, haematologist, cardiothoracic surgeon, and cardiologist, was assembled to discuss the management, focusing on the following parameters: (i) the large size of the pericardial effusion; (ii) the significant increase compared with before pregnancy; (iii) the expected further increase, especially during the third trimester; (iv) the need for continuation of the antiplatelet and antithrombotic treatment, which increased the haemorrhagic risk; and (v) the difficulty and risk to intervene, with pericardiocentesis or surgery, later in pregnancy.

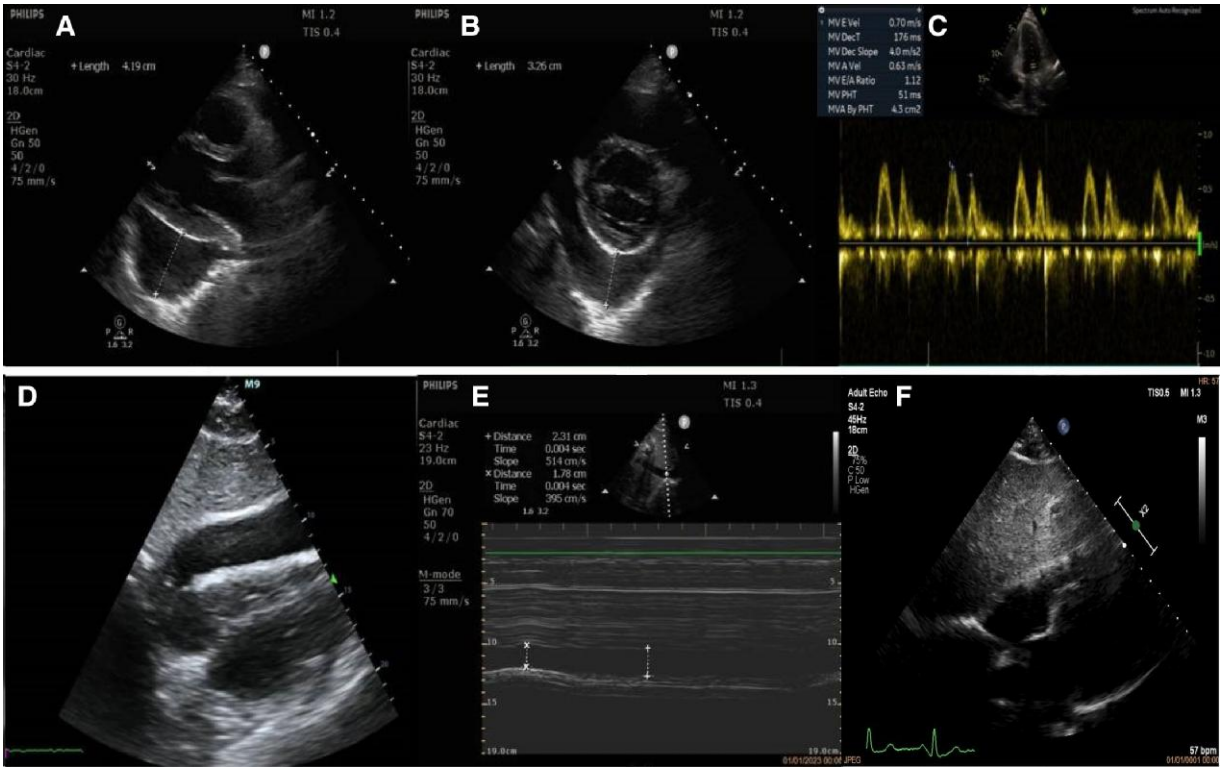

Figure 1 (*A*) Parasternal long axis view. Pericardial effusion diameter is 4.19 cm behind the inferolateral wall of the left ventricle. (*B*) Parasternal short axis. Pericardial effusion diameter is 3.26 cm behind the inferior wall of the left ventricle. (*C*) Transmitral inflow pattern. E/A = 1.12 with normal filling pressures. (*D*) Subxiphoid view. Pericardial effusion diameter is 2.6 cm in the space adjacent to the right ventricle. (*E*) Inferior vena cava dilatation with reduced inspiratory decrease. (*F*) Subxiphoid view after pericardial window, without pericardial fluid at end diastole.

Taken these into account, the team recommended performing a surgical pericardial window during this hospitalization, for reasons exposed in detail in the discussion, instead of pericardiocentesis or watchful waiting. This was explained in detail to the patient and family who agreed with the recommendation. The patient gave her consent, and the intervention was scheduled for the next day, without aspirin discontinuation, under general anaesthesia. A subxiphoid surgical pericardial window and drainage was successively performed; ~800 mL of transudative, sterile, without any malignant cells, pericardial fluid was removed.

Following the operation, the patient was stable and well. The day after there was no leg oedema, a chest X-ray with abdominal shield showed clear lung fields and no overt sign of pericardial effusion (*Figure 1F*). Subsequently, she was discharged from the hospital. She remained stable and had an uneventful delivery on August 2022.

Discussion

Pericardial effusion is found in 15, 19, and 40% of pregnant women in the first, second, and third trimesters, respectively, resolving spontaneously shortly after labour.[9] Tamponade is mainly seen in women with larger effusions, autoimmune diseases,[4,10] haemolysis, elevated liver enzymes, and low platelets (HELLP) syndrome, and preeclampsia, but it has been reported also in women without systematic disorders.[8,11] All cases of tamponade required emergent percutaneous pericardiocentesis, with one case of relapse requiring continuous drainage.[9]

The case presented here had some important points that need to be emphasized: (i) a large pericardial effusion found relatively early in pregnancy (second trimester); (ii) the patient needed double antithrombotic treatment; (iii) there were mild clinical and no echocardiographic signs of tamponade mandating the removal of the effusion; and (iv) although pericardiocentesis could be performed, a surgical pericardial window and drainage was finally recommended.

The decision to perform pericardial window and drainage was mainly based on the high risk of effusion recurrence upon pericardiocentesis, taking into account the early stage of gestation. Moreover, our patient was treated with aspirin and tinzaparin due to OAPS; given that she had already experienced five miscarriages, she would not consider stopping the antithrombotic treatment, which increased the risk of haemorrhagic conversion of the effusion and haemorrhagic complications of percutaneous pericardiocentesis. Finally, according to the guidelines of the European Society of Cardiology, pericardiocentesis should be performed in very large effusions causing signs of tamponade, or if presence of purulent, tuberculous, or neoplastic pericardial effusion is suspected.[1] Although our patient had no haemodynamic impairment, a further increase was probably expected later in pregnancy,[2] while management at a later stage would pose greater risks.

Conclusion

In large pericardial effusions that develop before the third trimester of pregnancy, an early strategy of surgical pericardial window and drainage might be considered in cases of high risk for tamponade or haemorrhagic conversion. This case demonstrates the importance of a multidisciplinary team approach and shared decision-making in the management of these complex cardio-obstetric patients in order to achieve optimal therapeutic results.

Lead author biography

Dr Aidonis Rammos is a cardiologist currently working as a consultant in the Cardiac Intensive Care Unit of the 2nd Department of Cardiology at the University Hospital of Ioannina. His main interests lie within heart failure and acute cardiovascular care.

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Data availability

The data underlying this article will be shared upon reasonable request to the corresponding author.

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