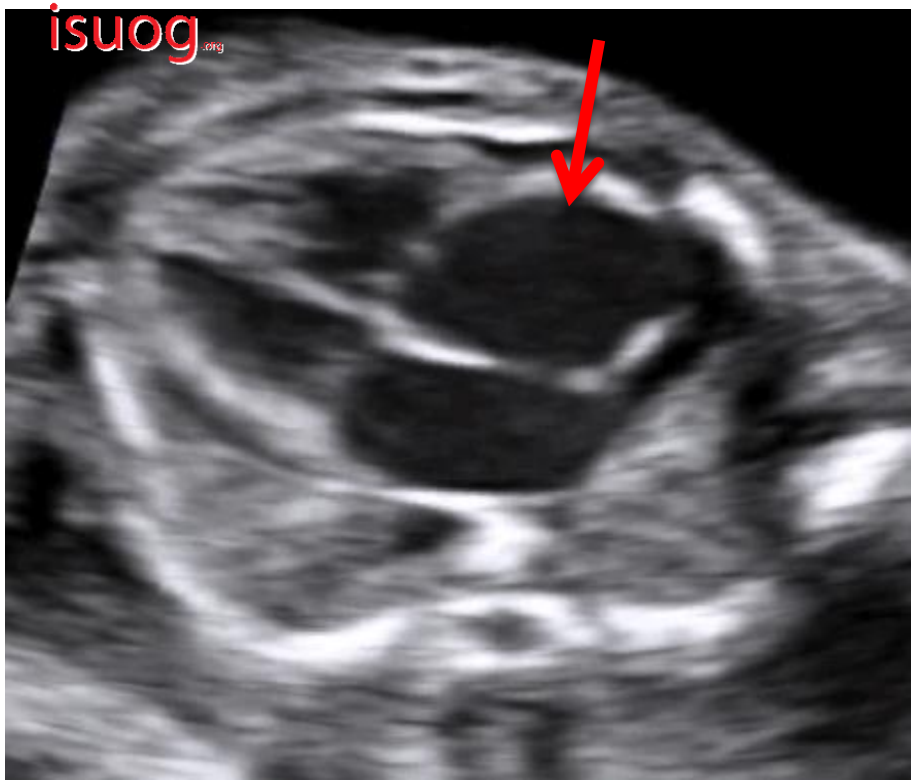
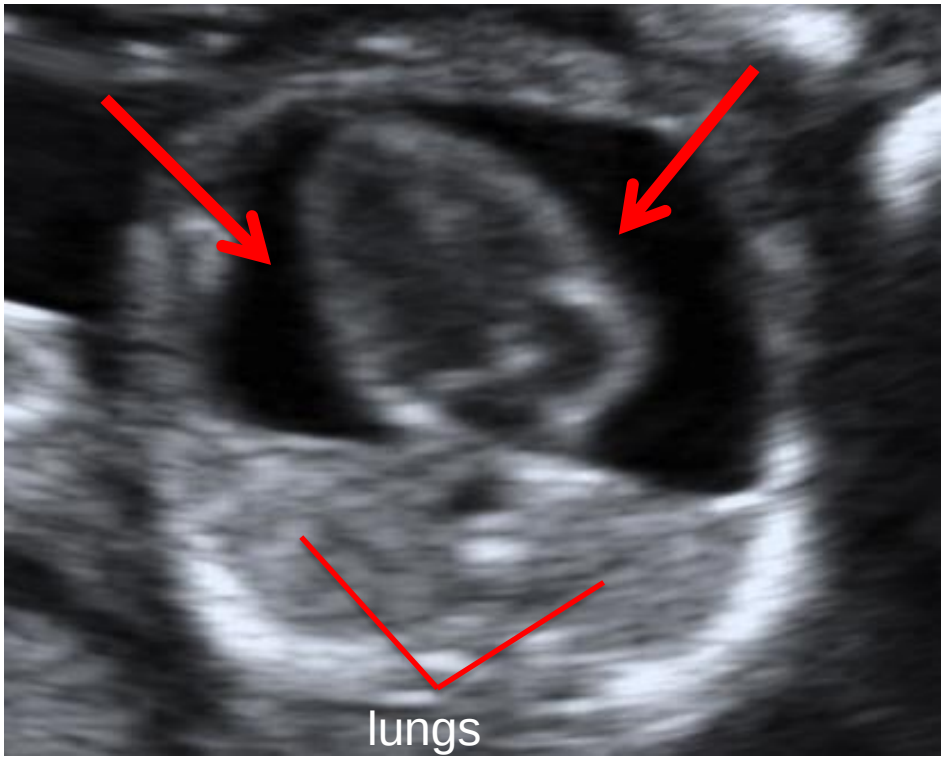
Pericardial effusion: definition





Pericardial effusion is the accumulation of fluid in the pericardial space. Prenatal diagnosis is based on the demonstration of a fluid layer of more than 2 mm surrounding the heart and extending at the level of the atria. Massive effusions cause a typical posterior displacement of the lungs at the level of the 4-chamber view. Pericardial effusion is usually found with fetal hydrops. When isolated it may be a benign transient finding but it can also associated with a wide variety of pathologies, including mostly fetal anomalies, infections and anemia

Images by Josep M Martínez

Sonography of large pericardial effusion

Clip 01

Images by Josep M Martínez

False positive diagnosis of pericardial effusion

Normal apical 4 chamber view. a thin sonolucent layer is frequently seen between the myocardium and the pericardium at the level of the ventricles

Clip 02

Images by Josep M Martínez

False positive diagnosis of pericardial effusion

Normal lateral 4 chamber view a sonolucent layer in the pericardial space is considered a normal finding if the thickness is less than 2 mm, it is not detectable in all positions and does not extend beyond the the atrioventricular groove, reaching the level of the atria

Clip 03

Images by Josep M Martínez

Color Doppler and pericardial space

In these cases, color Doppler will usually reveal in the pericardial space a flow with an opposite direction with respect to al atrioventricular dyastolic filling

Clip 04

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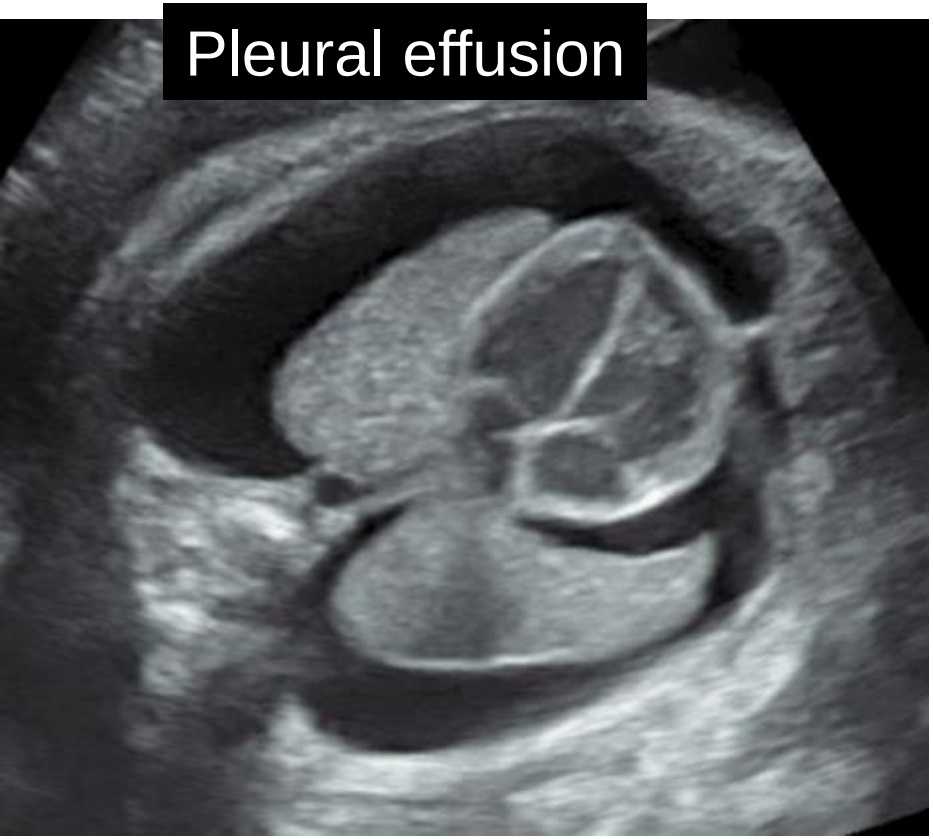
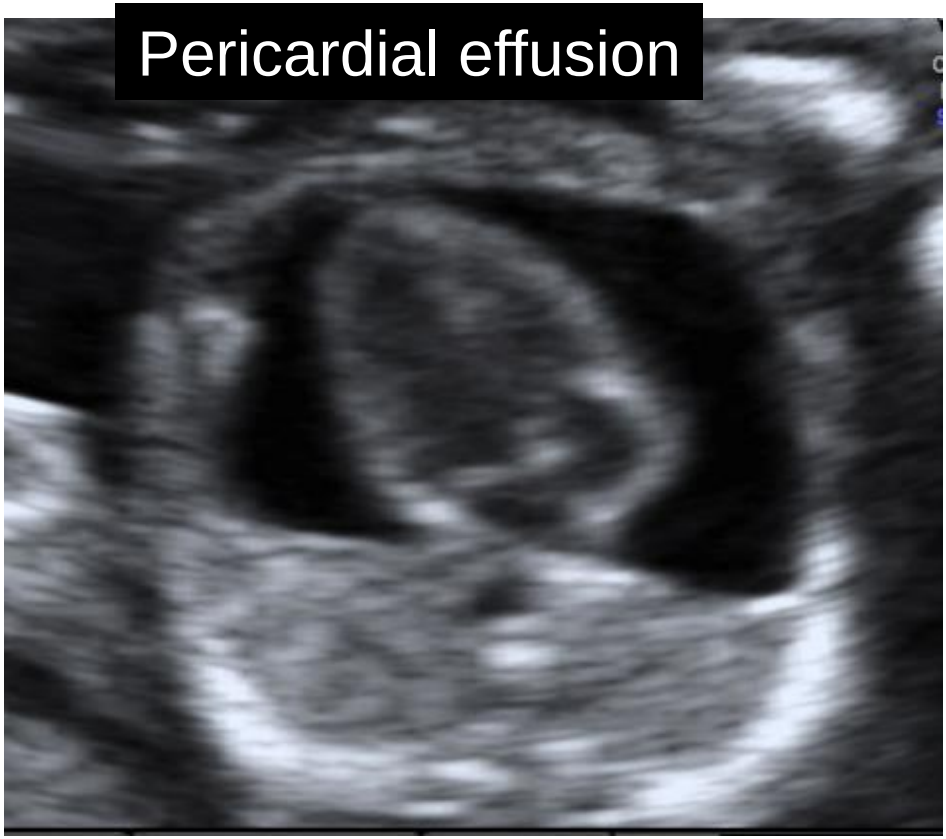
Differential diagnosis of pericardial effusion





The main differential diagnosis is pleural effusion, which appears on sonography as a fluid layer surrounding the lungs. With large pericardial effusion the heart is found within a fluid collection that displaces the lungs posteriorly.

Images by Gianluigi Pilu

Differential diagnosis of pericardial effusion

Another important clue to the specific diagnosis of pericardial effusion is the demonstration of the atrial appendages freely floating within the fluid collection

Images by Gianluigi Pilu

Pericardial effusion and chromosomal anomaly

Pericardial effusion with nuchal and skin edema at 14+6 weeks. Pericardial effusion can be associated with a chromosomal anomaly in up to 20-30% of the cases. It can be a transitional finding in trisomy 21 fetuses, thus its disappearance should not be reassuring in this regard. The thickness, however, is not related to the risk of abnormal chromosomes.

Though there is not widespread consensus, fetal karyotyping should be discussed with parents, even in isolated pericardial effusion.

Clip 05

Images by Josep M Martínez

Pericardial effusion and cardiac anomalies (1)

Pericardial effusion requires a comprehensive echocardiographic study due to its possible association to:
1.structural cardiac disease
2.arrhythmias
3.tumors

In this case an apical diverticulum of the right ventricle was seen at 14 weeks' gestation. Color Doppler imaging shows bidirectional flow to and from the diverticulum

Images by Josep M Martínez

Pericardial effusion and cardiac anomalies (2)

Pericardial effusion in a case of left isomerism. The video demonstrates situs ambiguus, unbalanced atrioventricular canal and complete atrioventricular block

Clip 07

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Pericardial effusion and cardiac anomalies (3)

Pericardial effusion in a case of a large pericardial teratoma. The video shows the posterior compression of both lungs by the severe pericardial effusion. The heart is structurally normal but there is a huge tumor in the upper mediastinum. The mass has a solid and a cystic component and is very richly vascularized by vessels fed from the aortic and pulmonary roots

Clip 08

Images by Josep M Martínez

Pericardial effusion and fetal anemia

There is a well established association between pericardial effusion, heart failure and fetal anemia. Once cardiac structural anomalies have been excluded, a detailed echocardiographic evaluation of cardiac function and circulation is mandatory.
In this case of Rh alloimmunization, mild pericardial effusion and cardiomegaly are associated with a PSV in the middle cerebral artery of 58 cm/s, which is > 1.5 MoMs for 20 weeks' gestation. This finding is consistent with fetal anemia

Images by Josep M Martínez

Pericardial effusion and fetal anemia

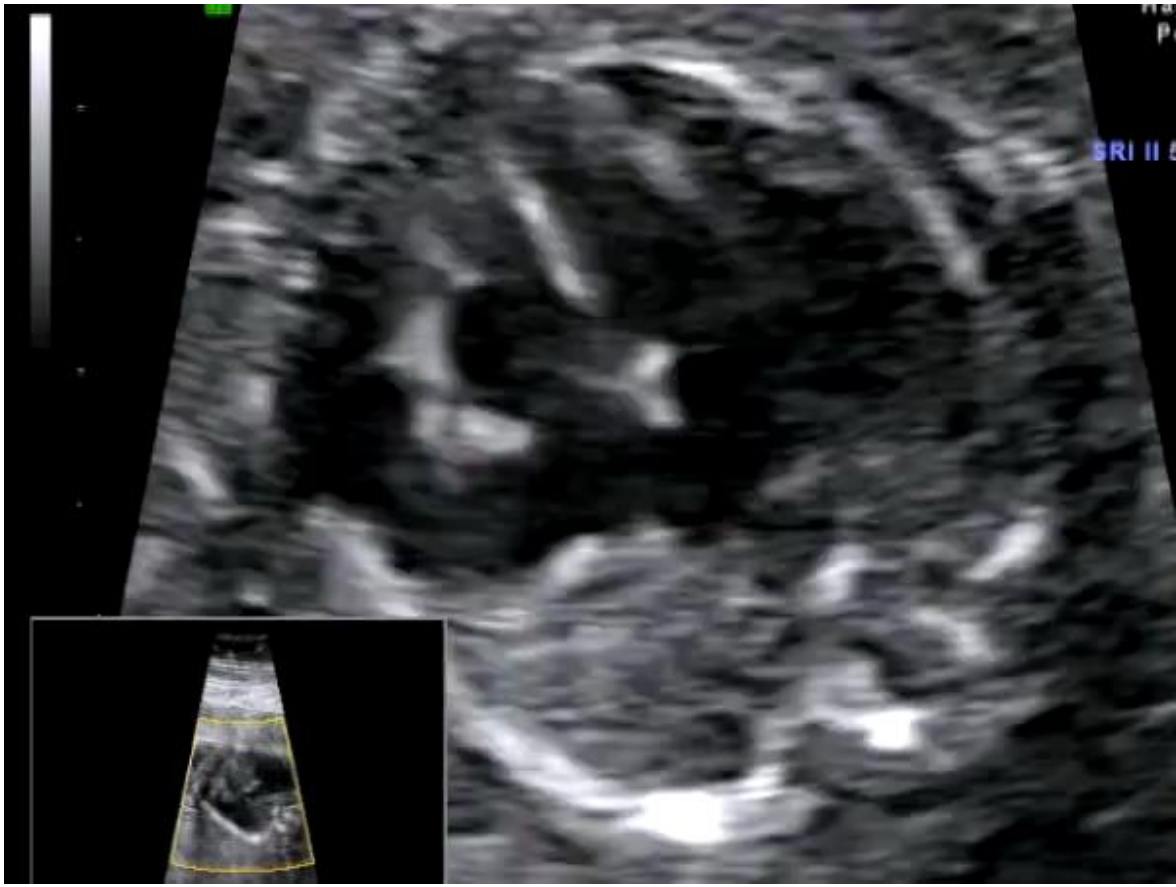
Same case of the previous slide. The video shows an initial pericardial effusion with severe cardiomegaly and tricuspid insufficiency. There is also a small muscular ventricular septal defect, as seen by color Doppler

Clip 09

Images by Josep M Martínez

Pericardial effusion and fetal infection

Fetal infections such as CMV and parvovirus B19 may cause pericardial effusion. There are probably multiple mechanisms including primary myocarditis, pericarditis and heart failure. The video shows slight pericardial effusion, with cardiomegaly, ascites, oligoanhydramnios and ventriculomegaly. Amniocentesis confirmed infection by CMV



Clip 10

Images by Josep M Martínez

Isolated pericardial effusion

If structural and functional heart disease are ruled out as well as chromosomal anomalies, fetal anemia or fetal infection, then the pericardial effusion is claimed to be isolated

Spontaneous resolution is a common finding in isolated cases. However, strict follow-up is needed every 1-2 weeks, in order to detect evolution to hydrops.

The video shows an isolated pericardial effusion, which was transitory and reggressed spontaneously in 4 weeks despite the severity

Clip 11

Images by Josep M Martínez

Prognosis and management

In premature fetuses with primary massive pericardial effusion prenatal therapy with pericardiocentesis may be an option to prevent cardiac tamponade

The video shows a large pericardial effusion secondary to a huge pericardial teratoma with heart failure, hydrops and severe bradycardia. Pericardiocentesis was performed, with immediate normalization of the fetal heart rate. This allowed the pregnancy to continue for a period of 5 weeks

Clip 12

Images by Josep M Martínez