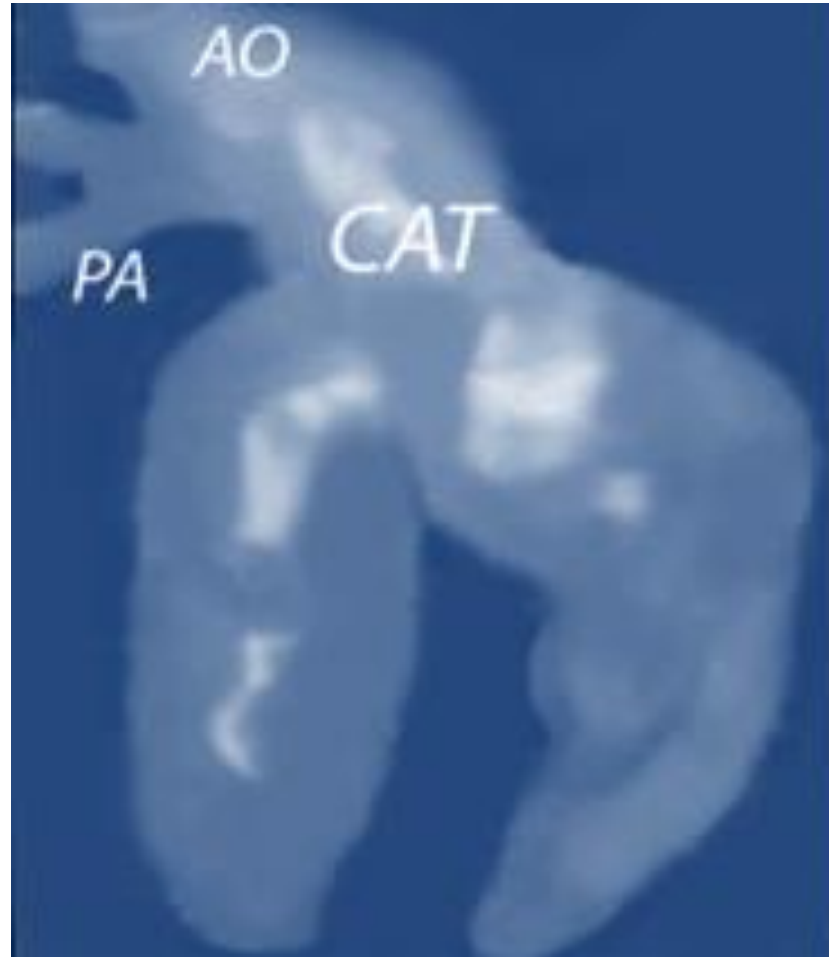
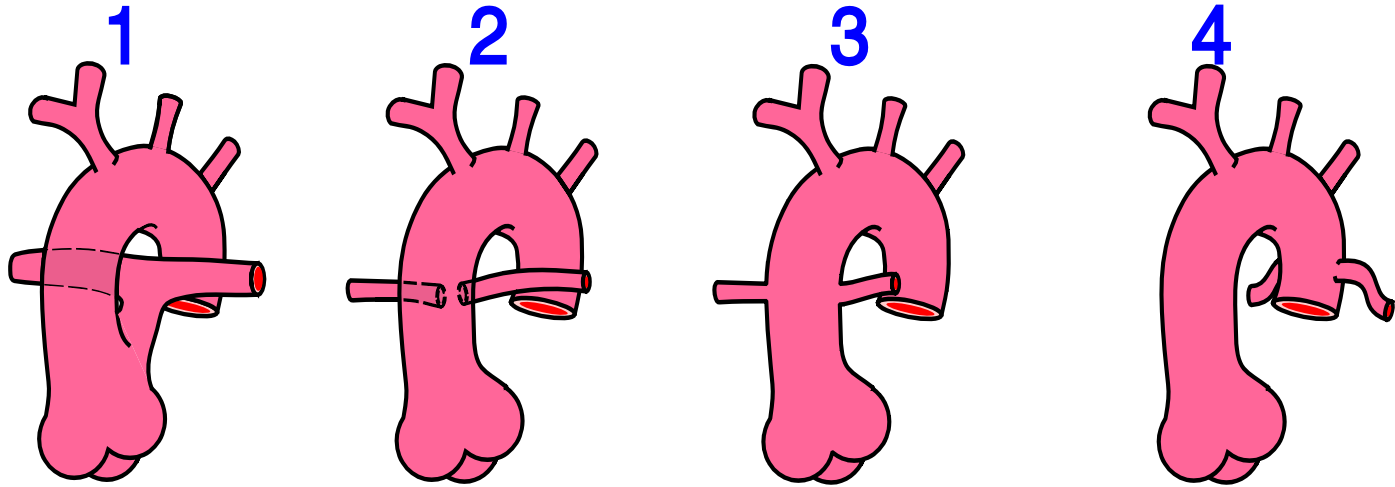


Common Arterial Trunk



Common Arterial Trunk (CAT) is characterized by a single great artery arising from the base of the heart, which supplies the systemic, coronary, and pulmonary blood flow. A ventricular septal defect is almost always associated.

Common Arterial Trunk Anatomy



Collette and Edwards classification of truncus arteriosus.

In the common type (type I), a short pulmonary trunk arises from the truncus arteriosus, giving rise to both pulmonary arteries. In type II, each pulmonary artery arises separately from but close to the other from the posterior aspect of the truncus. In type III, each pulmonary artery arises from the lateral aspect of the truncus. Type IV, characterized by absence of branch pulmonary arteries and presence of aortopulmonary collaterals, is now reclassified as Pulmonary Atresia with VSD.

Common Arterial Trunk: US diagnosis



The four-chamber view usually appears normal in CAT, unless the VSD is large and visible in this plane

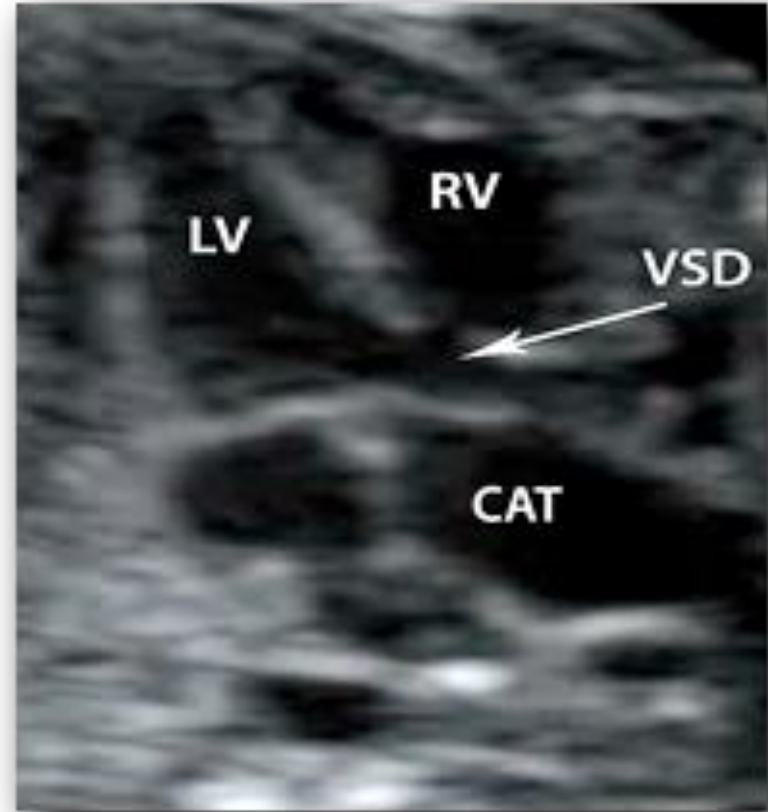
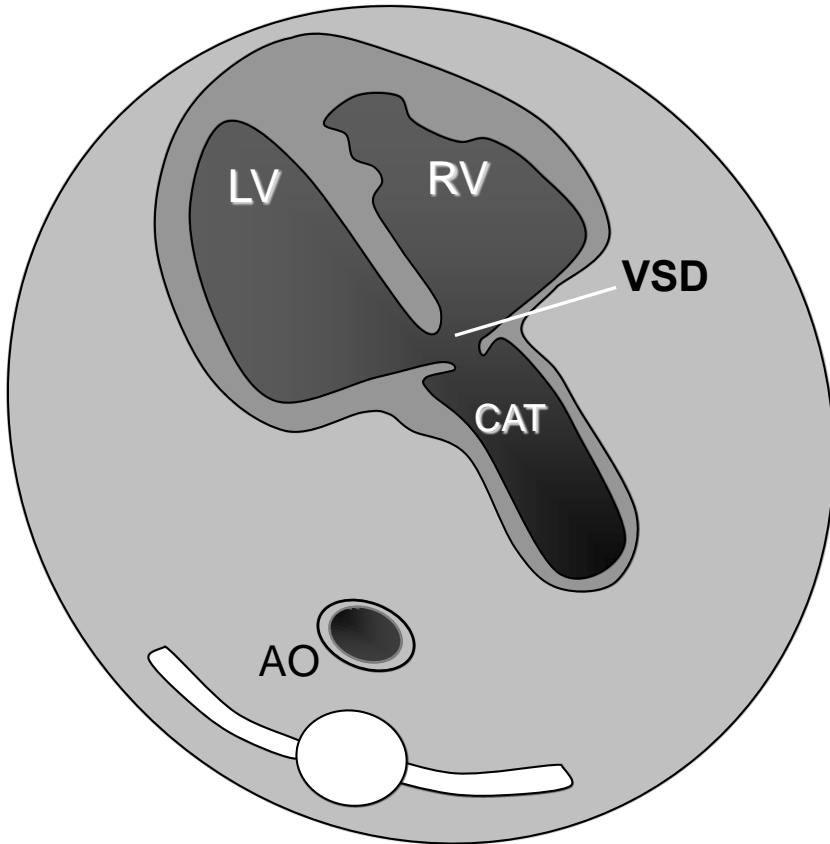
Common Arterial Trunk: US diagnosis



clip 01

Moving from the four-chamber view to the five chamber view allows to detect a malaligned VSD with an overriding large vessel

Leading US sign in CAT: Aortic override



In fact, on the long axis view of the left ventricle, the first hint is the detection of a malaligned VSD with an overriding large vessel

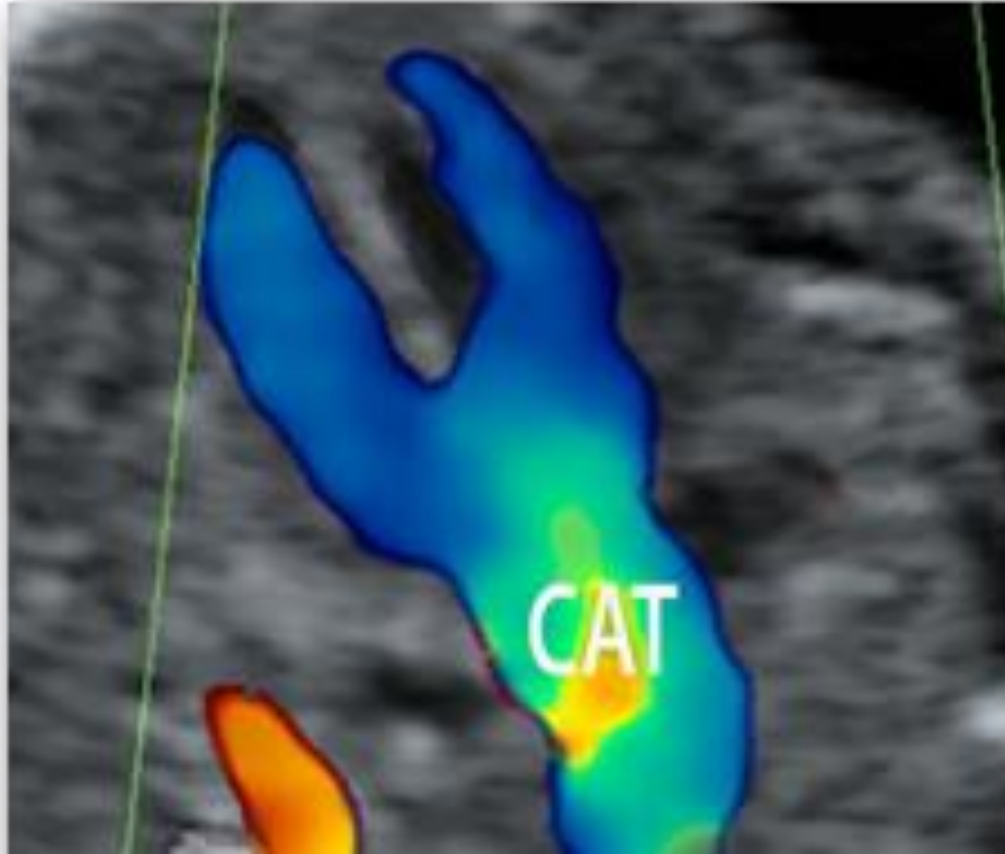
Leading US sign in CAT: Aortic override



clip 02

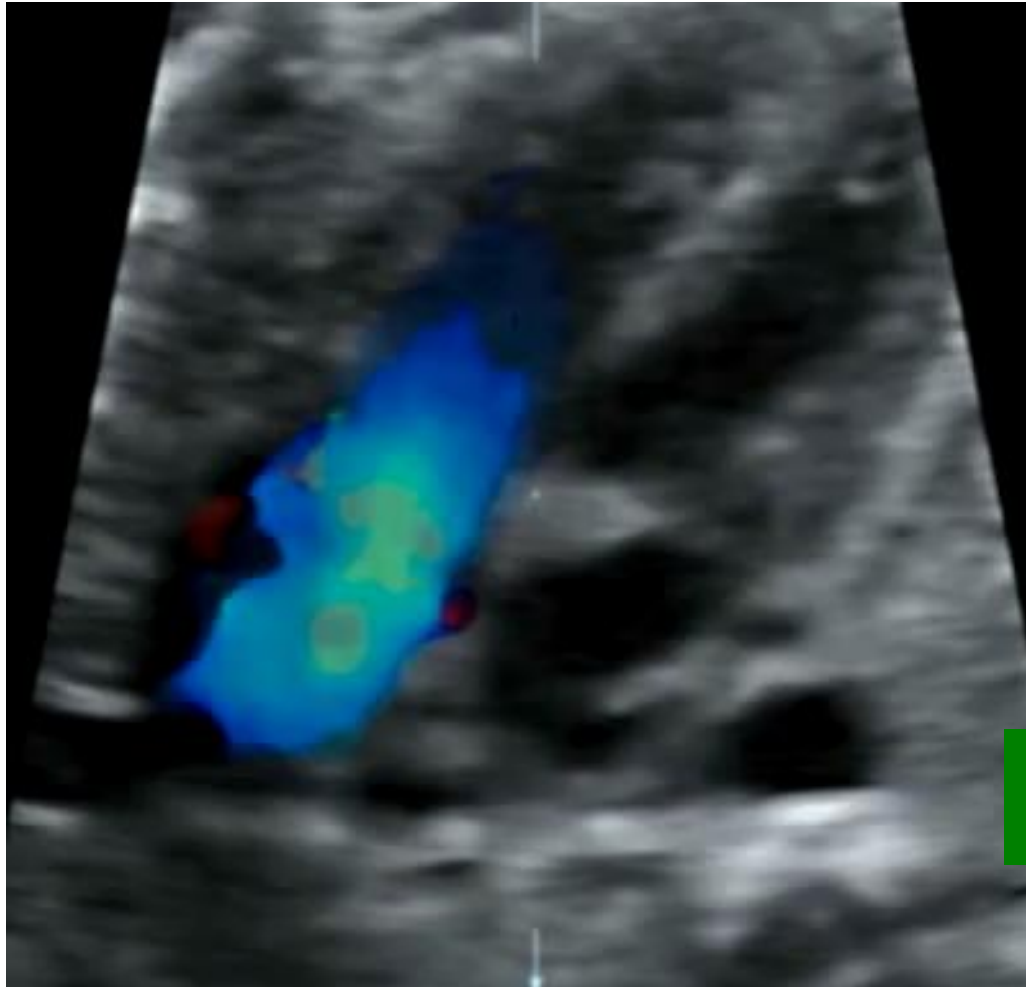
In the long axis view of the left ventricle, the root of the CAT appears large

Leading US sign in CAT: Aortic override



Aortic override can be better visualized with color Doppler. Blood flow drains from both right and left ventricles into the overriding aorta.

Leading US sign in CAT: Aortic override

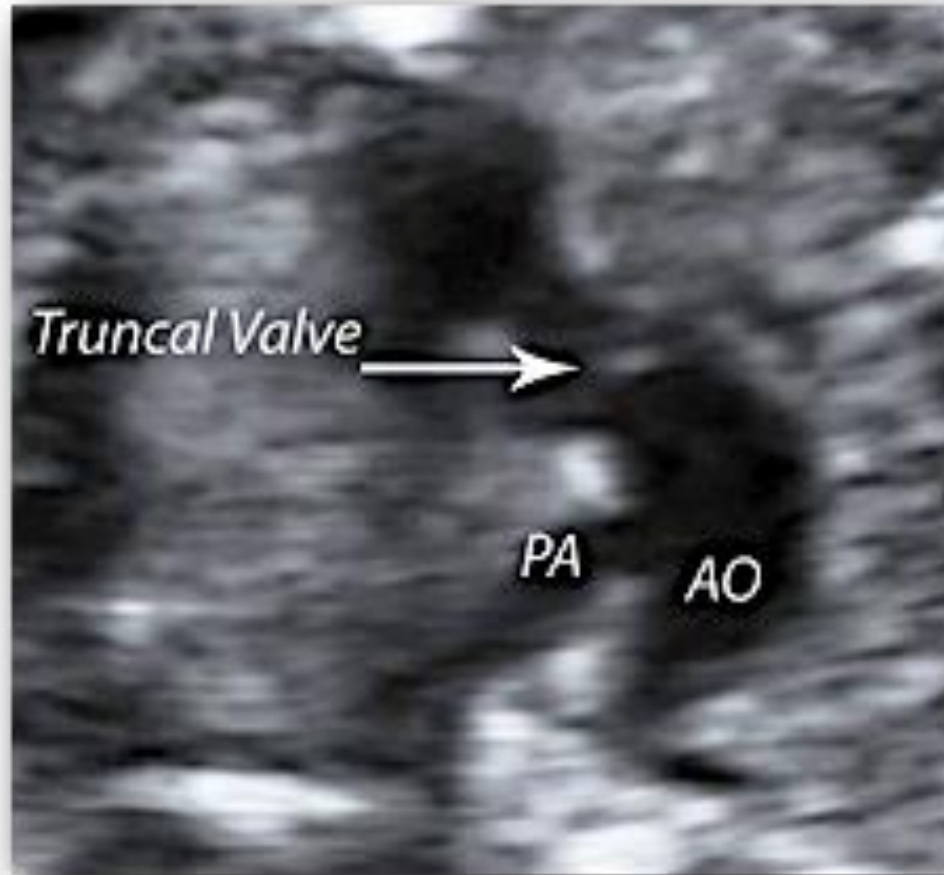


clip 03

Aortic override with a dilated aortic root in color Doppler shows often high velocities and aliasing

CAT

Pulmonary arteries difficult to visualize



Confirming the diagnosis is made by identifying the pulmonary trunk (or arteries) directly arising from the overriding large vessel.

CAT

Pulmonary arteries difficult to visualize

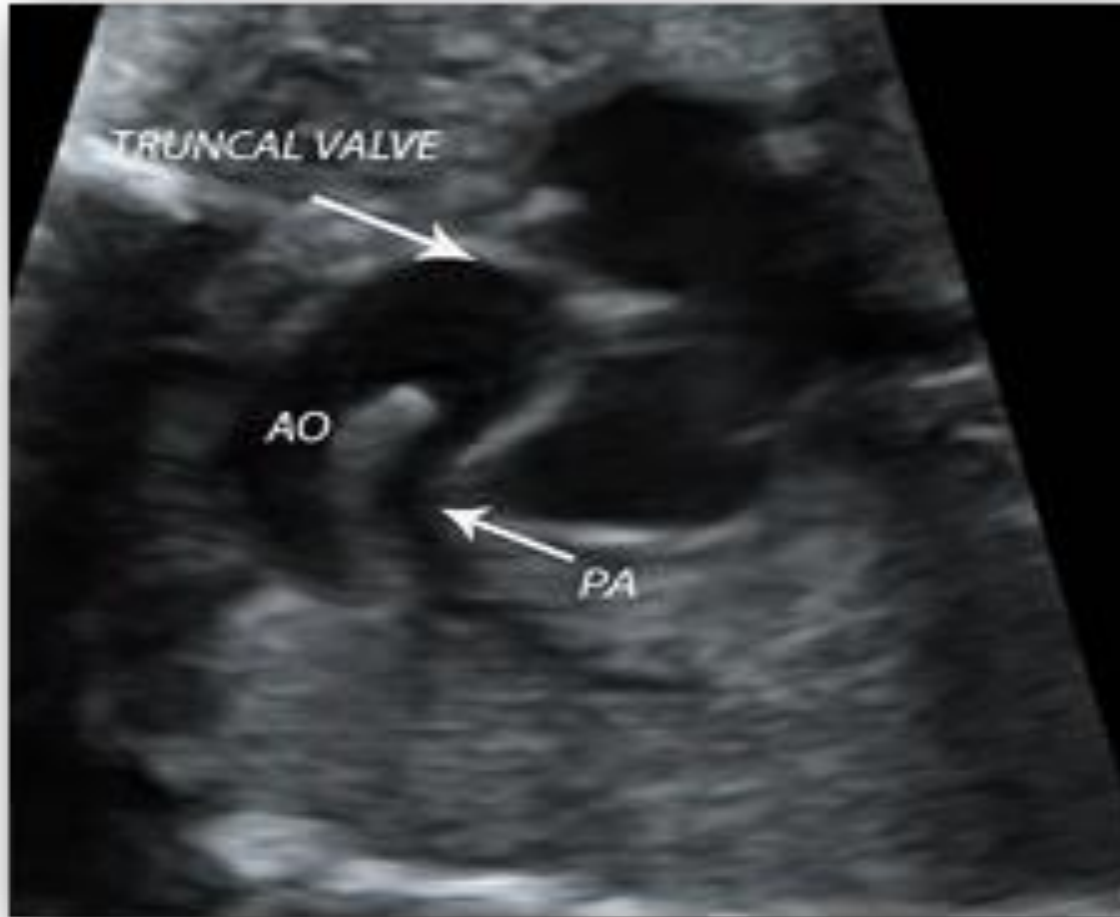


clip 04

Confirming the diagnosis is made by identifying the pulmonary trunk (or arteries) directly arising from the overriding large vessel.

CAT

Pulmonary arteries difficult to visualize



Confirming the diagnosis is made by identifying the pulmonary trunk (or arteries) directly arising from the overriding large vessel.

CAT

Pulmonary arteries difficult to visualize

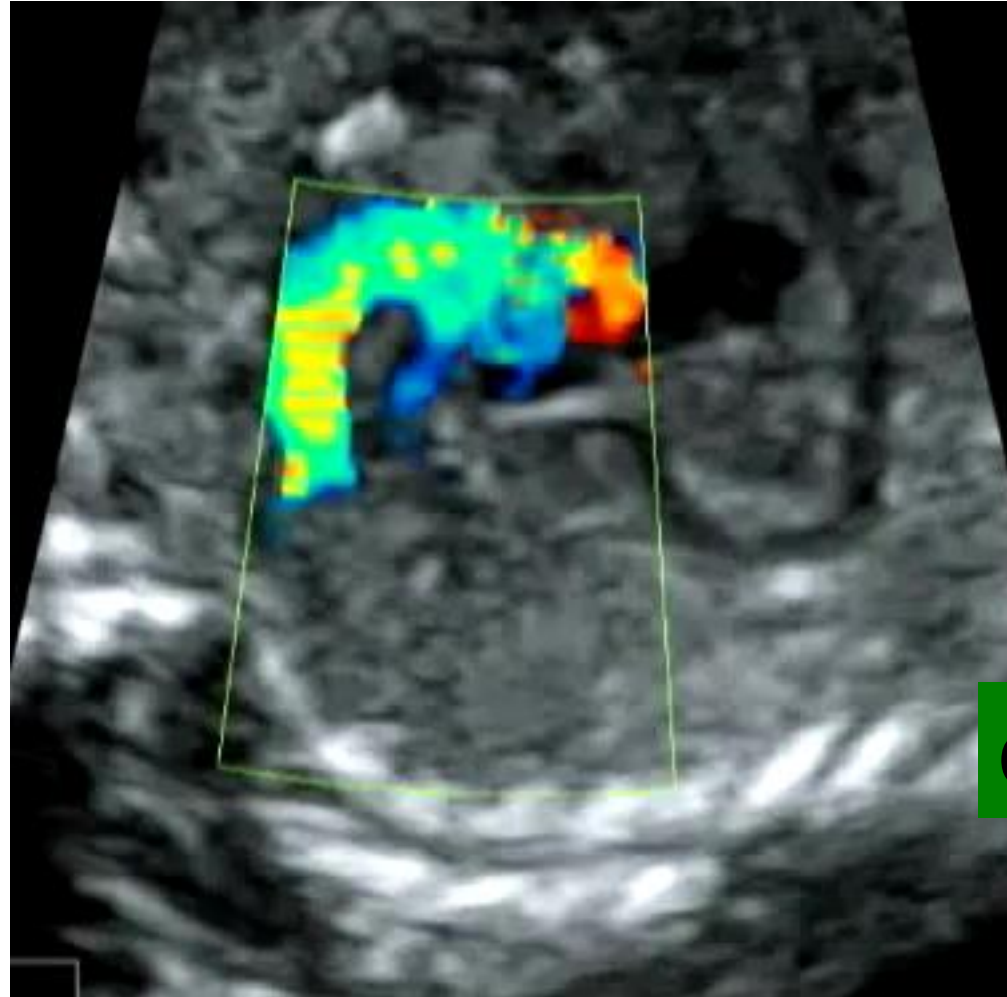


clip 05

Confirming the diagnosis is made by identifying the pulmonary trunk (or arteries) directly arising from the overriding large vessel.

CAT

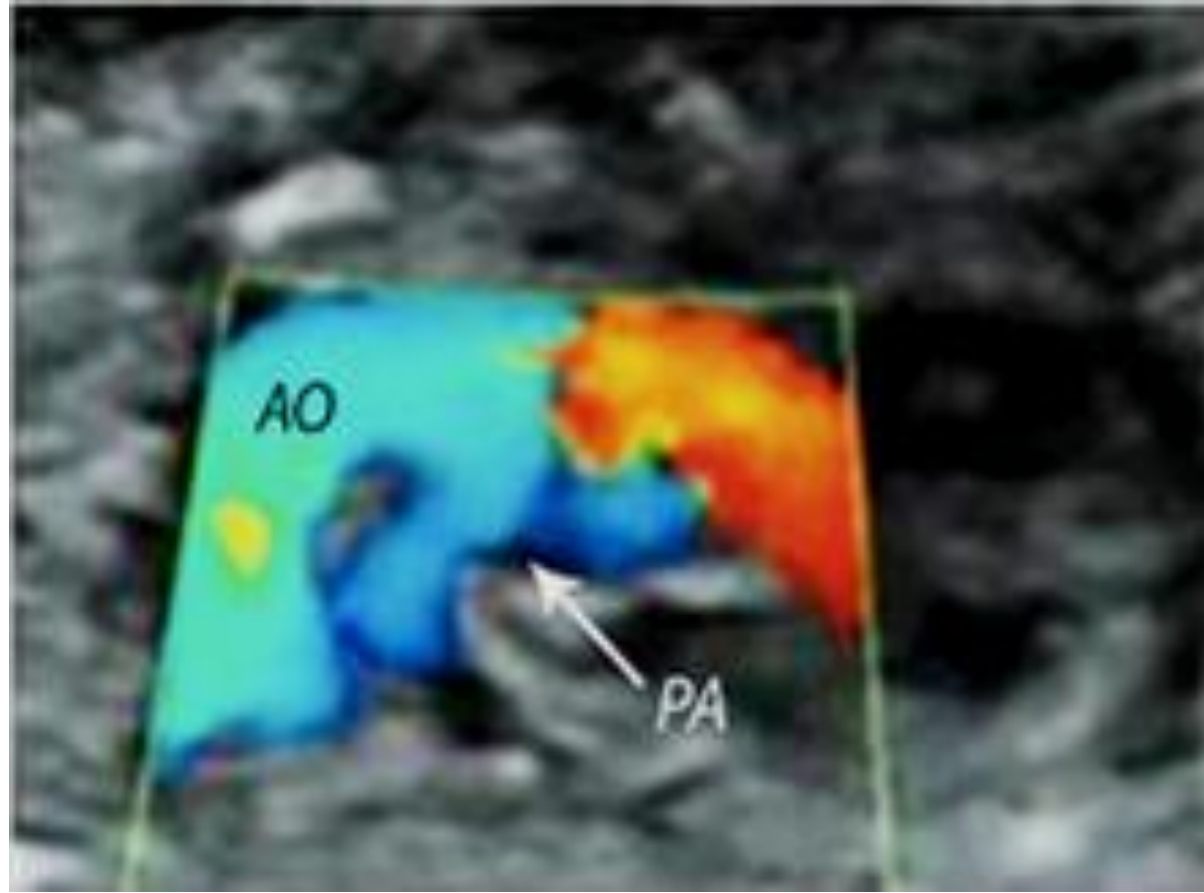
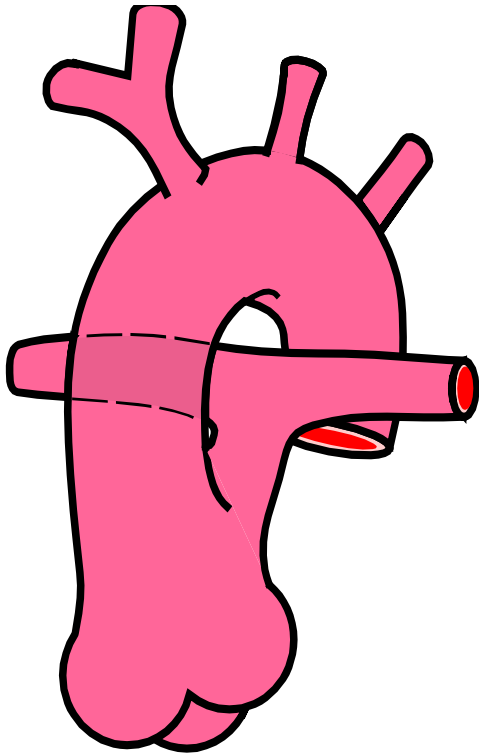
Pulmonary arteries difficult to visualize



clip 06

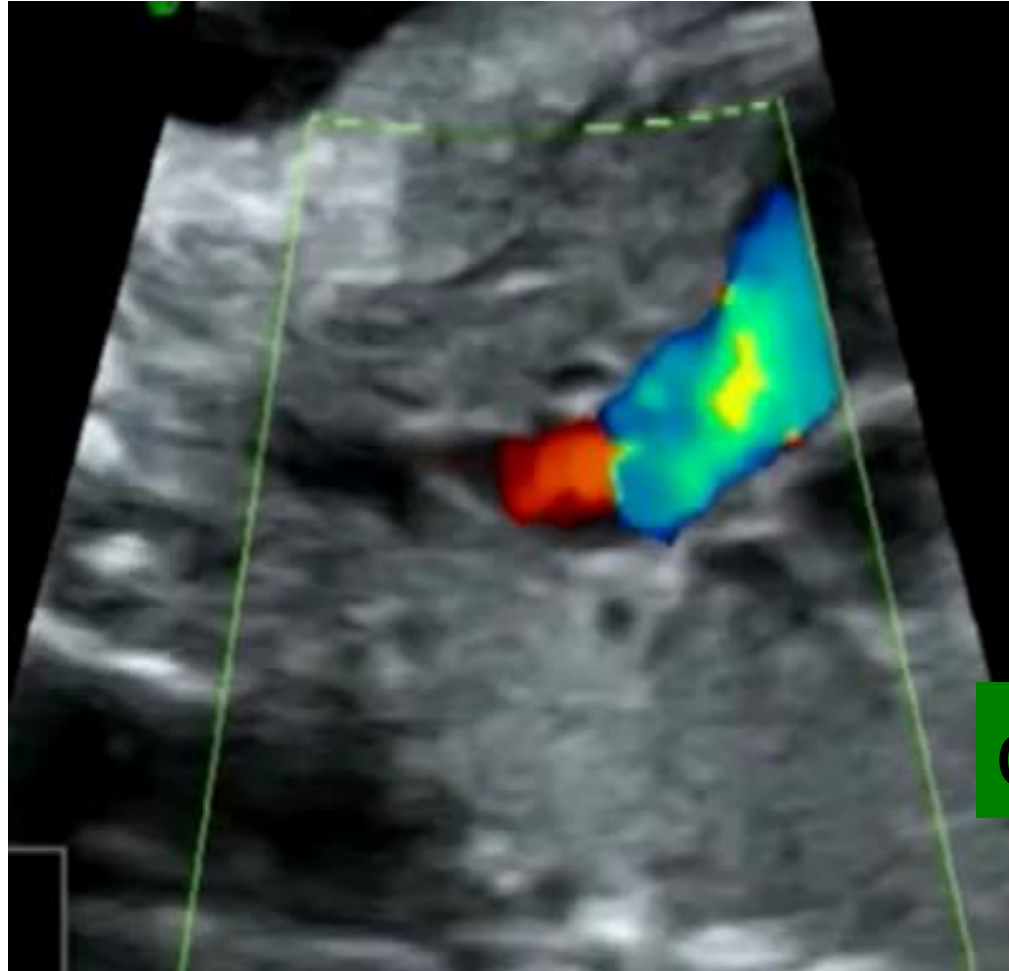
Color Doppler is helpful to detect the origin of pulmonary arteries.

US identification of the origin of PA CAT type 1



In this case the 2 pulmonary arteries arising from the common pulmonary trunk (CAT Type 1) are clearly visible

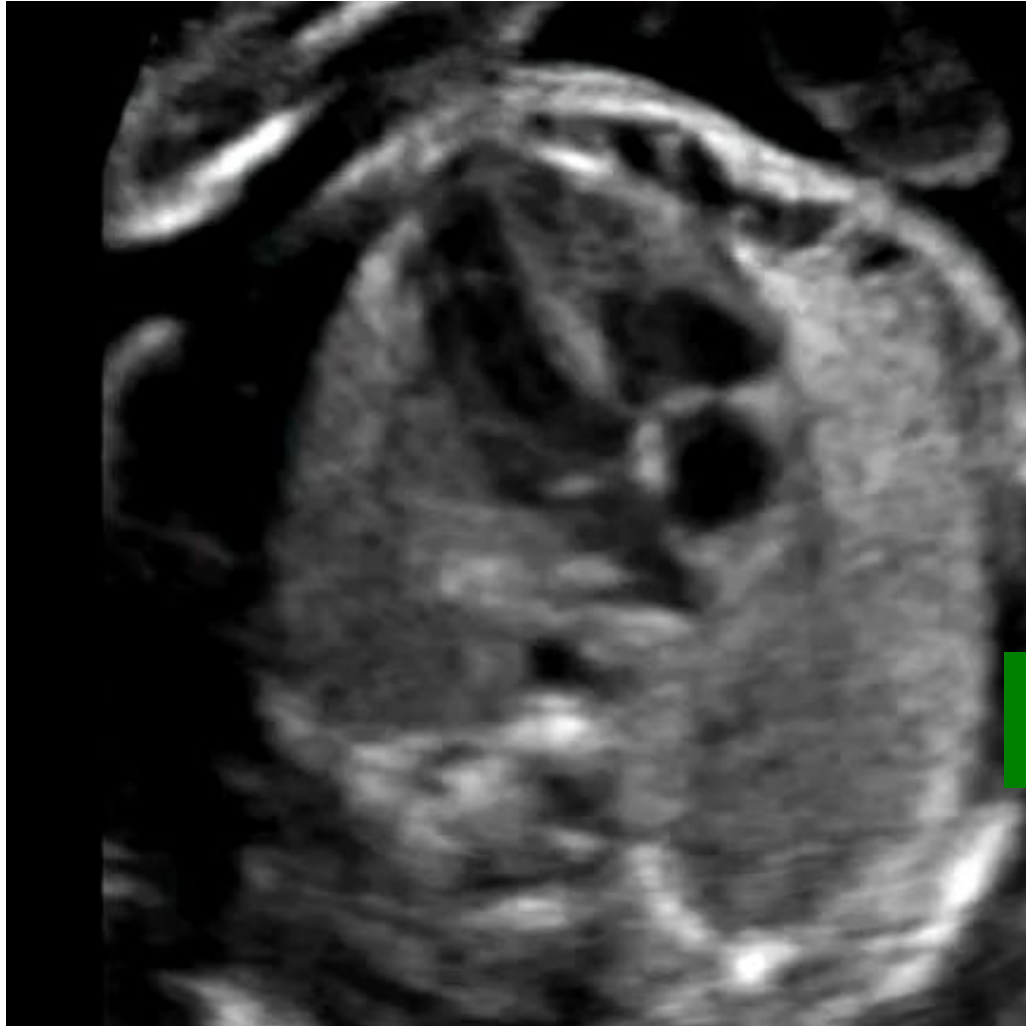
US identification of the origin of PA: CAT type 1



clip 07

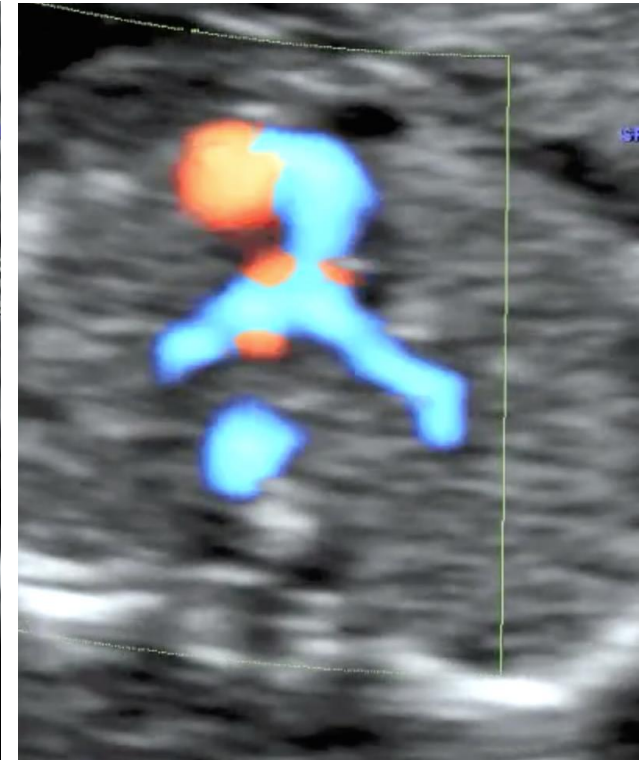
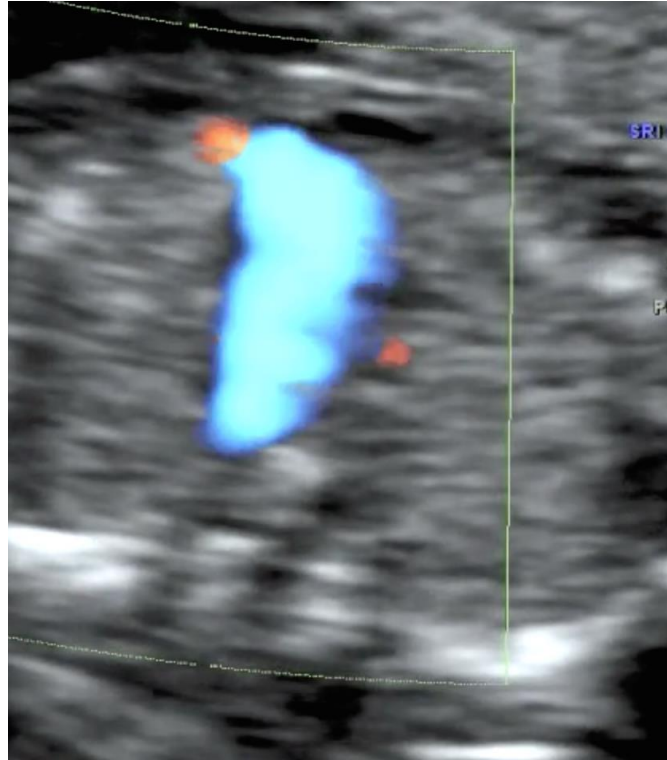
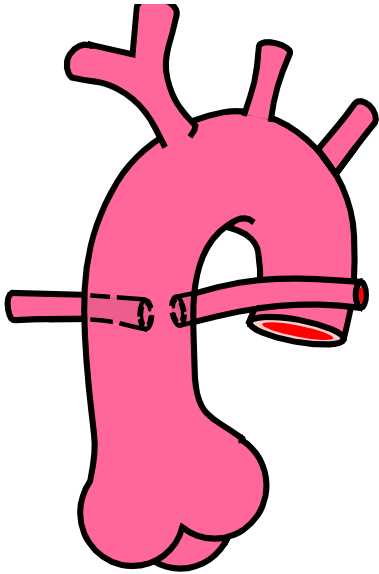
In this case, note both aorta and pulmonary arteries arising from the common trunk, by tilting the probe from one side to another

CAT type 1



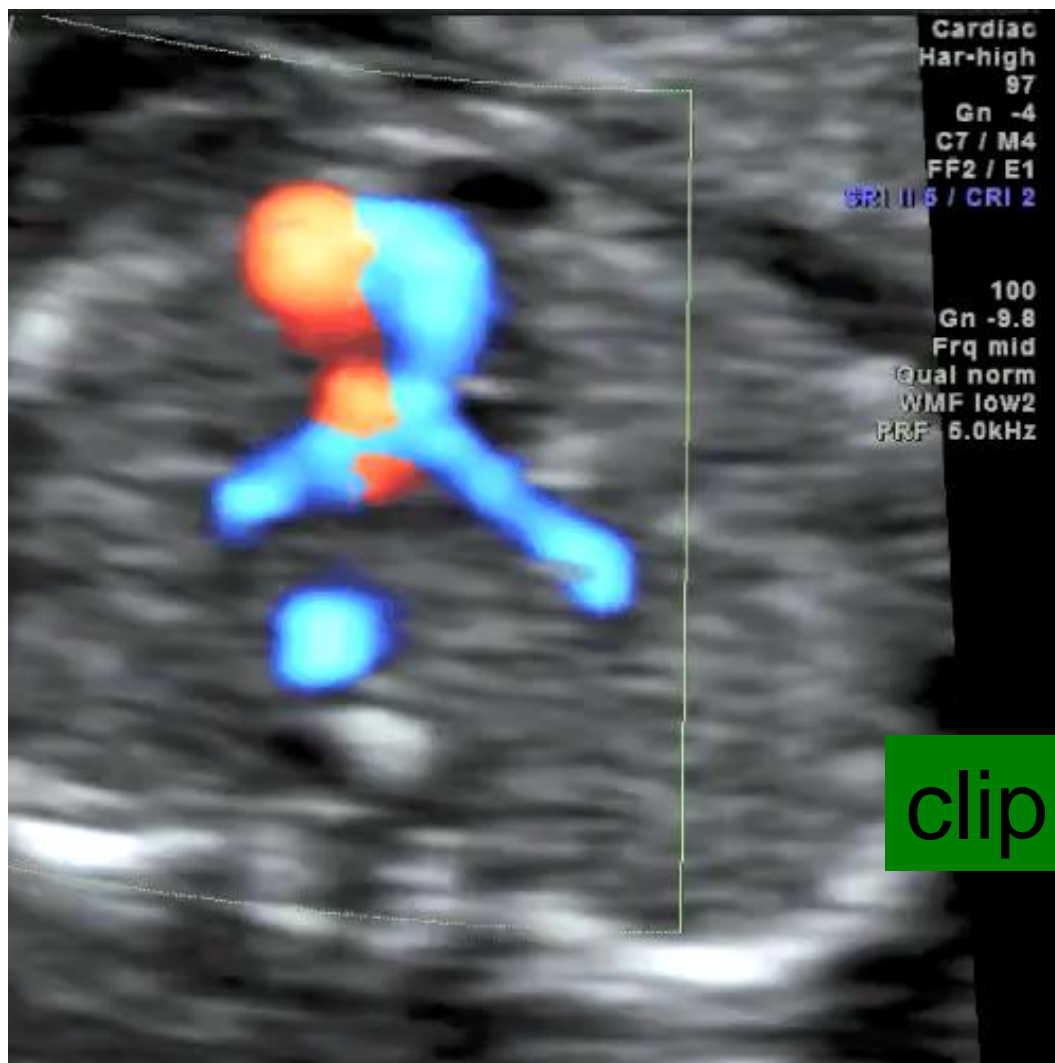
clip 08

CAT type 2



In CAT type II, each pulmonary artery arises separately from but close to the other from the posterior aspect of the truncus

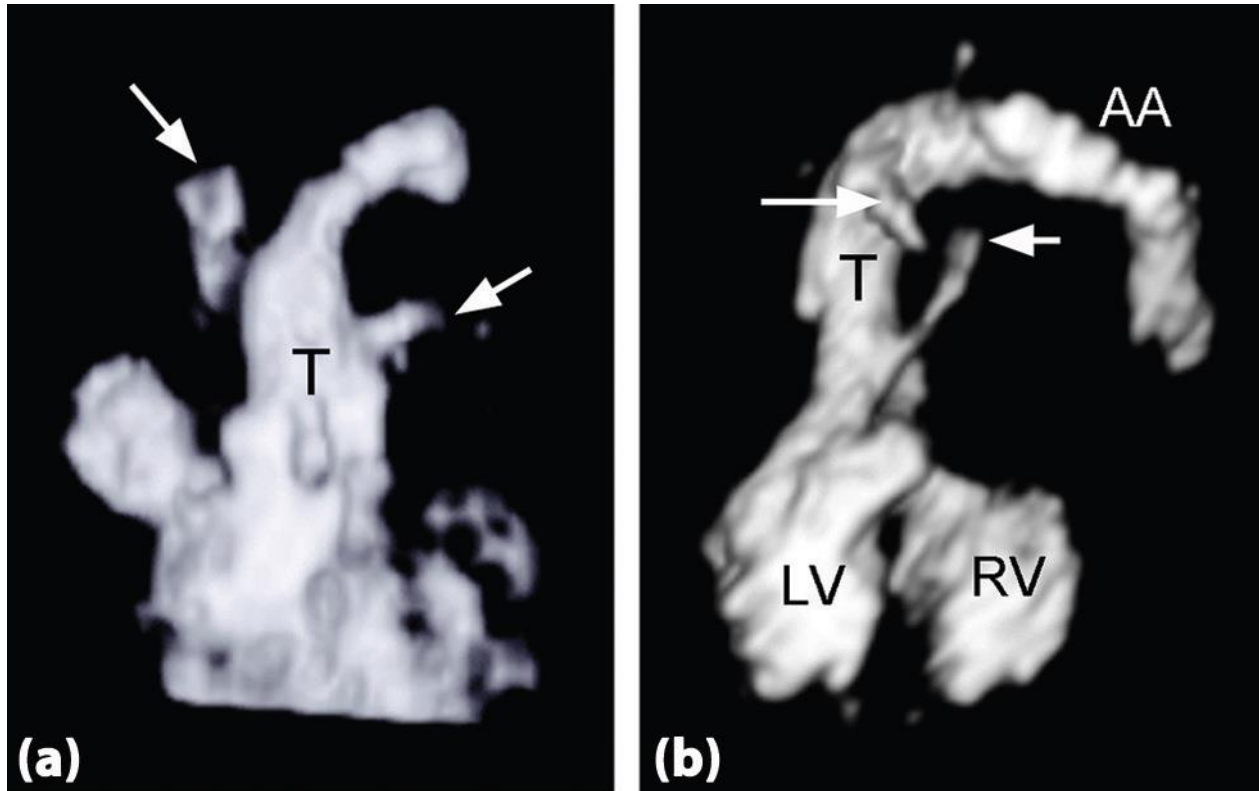
CAT type 2



CAT type 3



CAT type 2 and type 3



Three-dimensional B-flow imaging is of help in the differential diagnosis of truncal type. (a) In type II, the two pulmonary branches arise directly and separately from the truncus, without a main pulmonary artery, at the same distance from the truncal valve; and (b) in type III, in this image with a posterior approach, the two pulmonary branches depart at different distances from the truncal valve. The overriding position of the truncus is also evident. AA: aortic arch; LV: left ventricle; RV: right ventricle; T: truncus arteriosus.

CAT

Truncal Valve

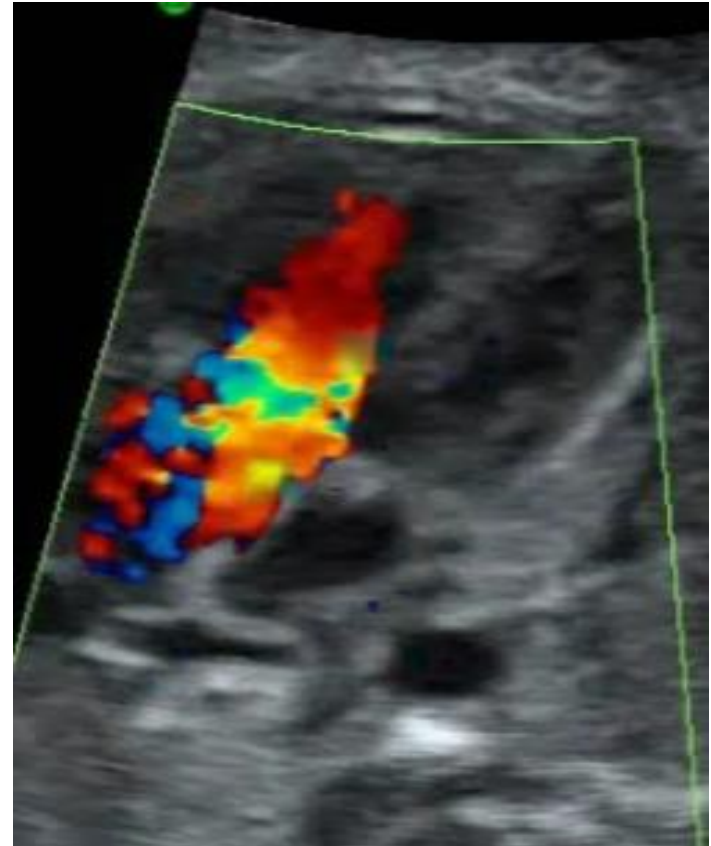
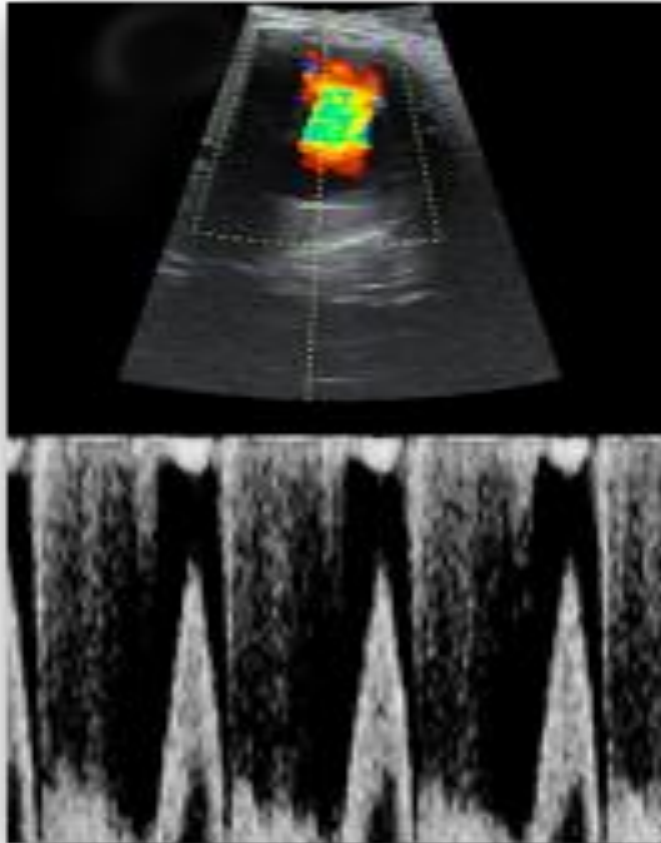


clip 11

Truncal valve is often thickened and dysplastic

CAT

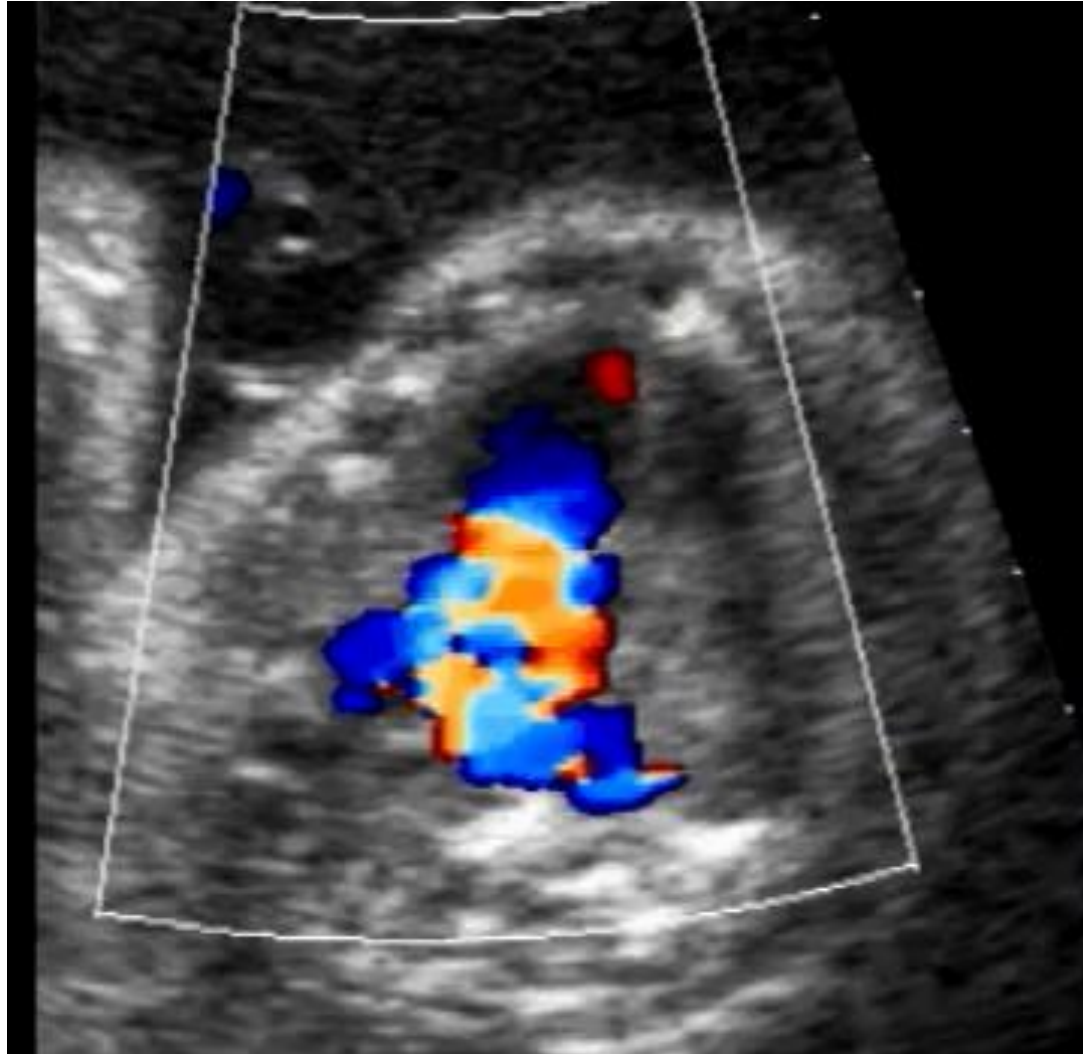
Truncal Valve



Color Doppler may be used to evaluate the steno-insufficiency of the truncal valve and spectral Doppler may help to quantify the degree of truncal valve stenosis and insufficiency.

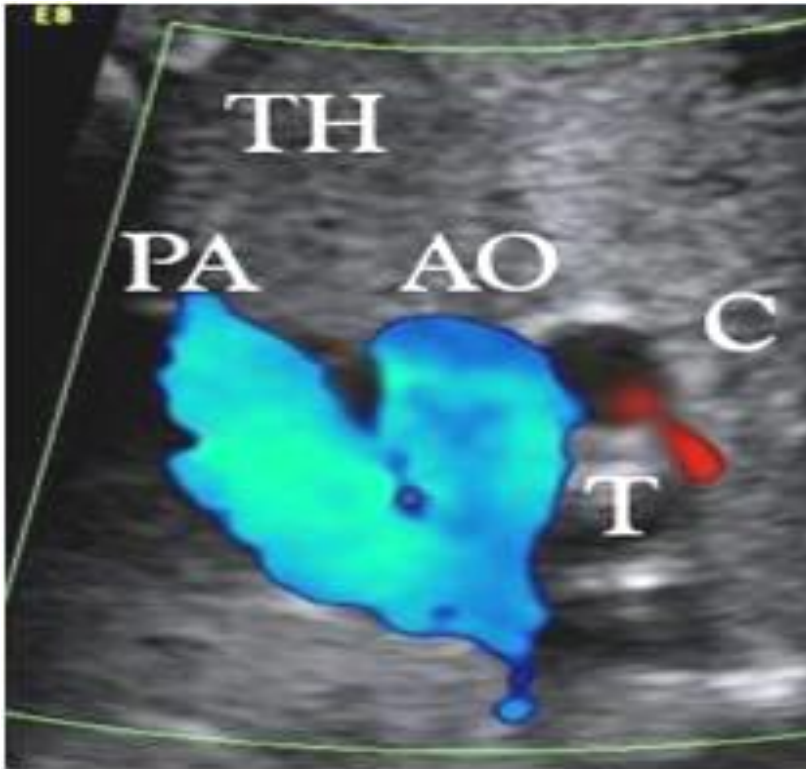
CAT

dysplastic truncal Valve

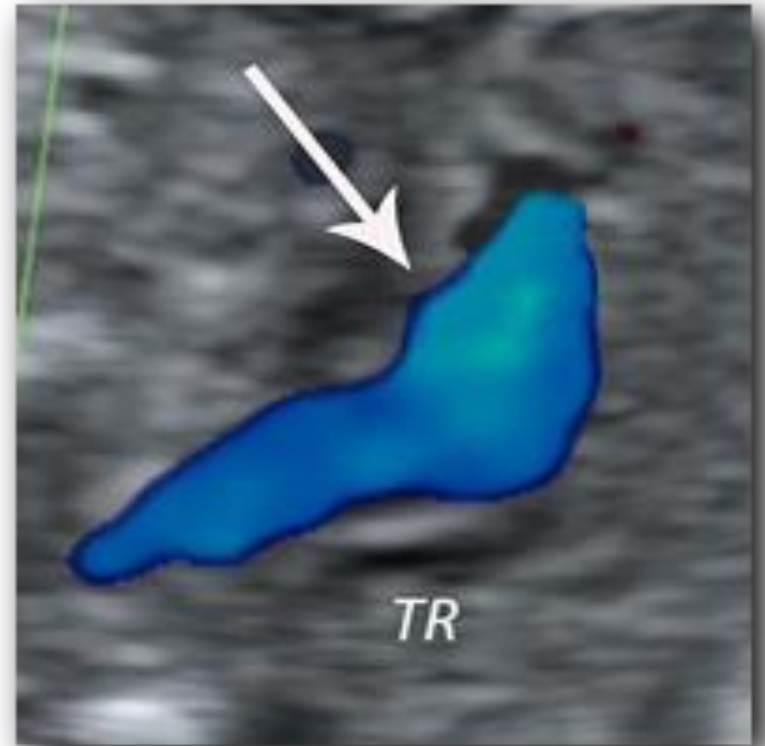


CAT

three-vessel-trachea view



Normal

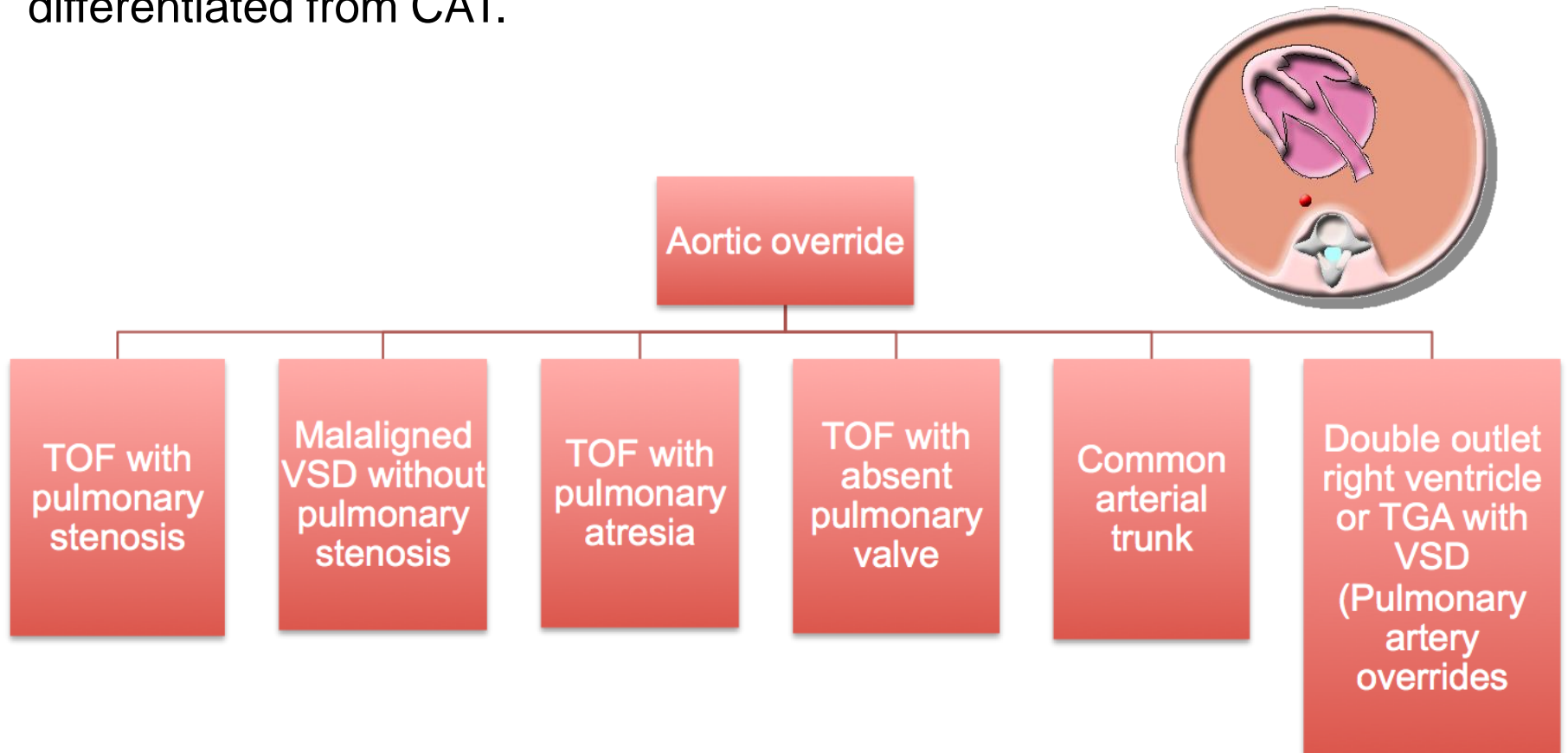


CAT

The three-vessel-trachea view shows a single large vessel, representing the aortic arch

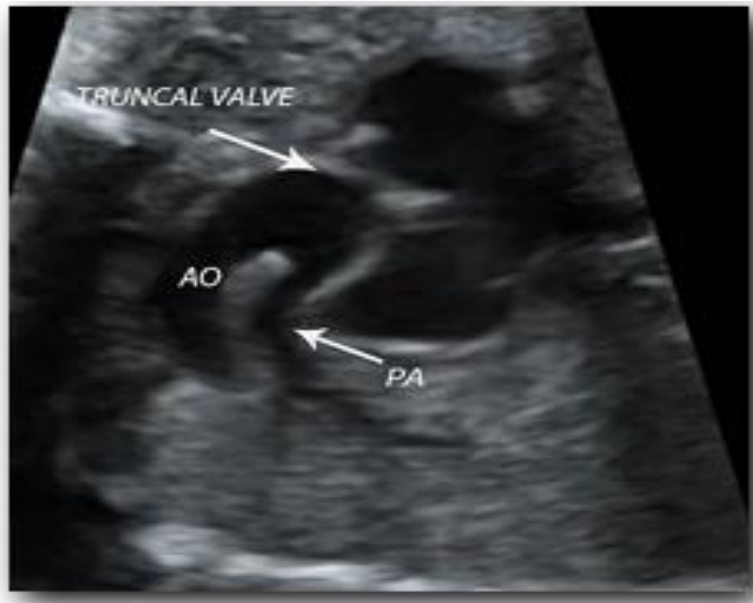
Differential diagnosis of CAT

Differential diagnosis includes mainly CHD presenting with aortic override. The assessment of the pulmonary arterial circulation is of big help. In cases when only a large vessel is found, PA-VSD is the major CHD to be differentiated from CAT.

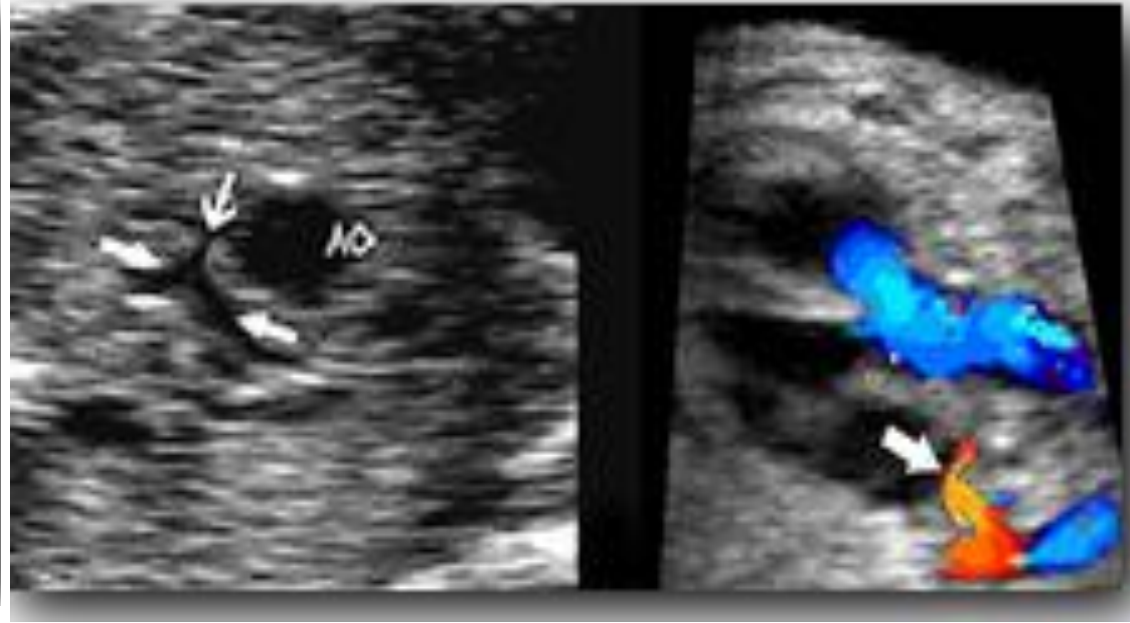


Differential diagnosis of CAT

CAT



PA - VSD



The demonstration of a common origin of both the aorta and the pulmonary artery from a large overriding trunk is crucial for the correct diagnosis of CAT. The semilunar valve is almost always dysplastic in CAT, which is unfrequent in PA-VSD. In addition in PA-VSD, a retrograde flow in the ductus arteriosus can be demonstrated and MAPCAs (arrow) are often present.

CAT

Associated Anomalies

Associated cardiac anomalies

can be present,

- Absence of ductus arteriosus may be found in 50% of cases
- Aortic arch anomalies and tricuspid atresia are associated in a certain number of cases

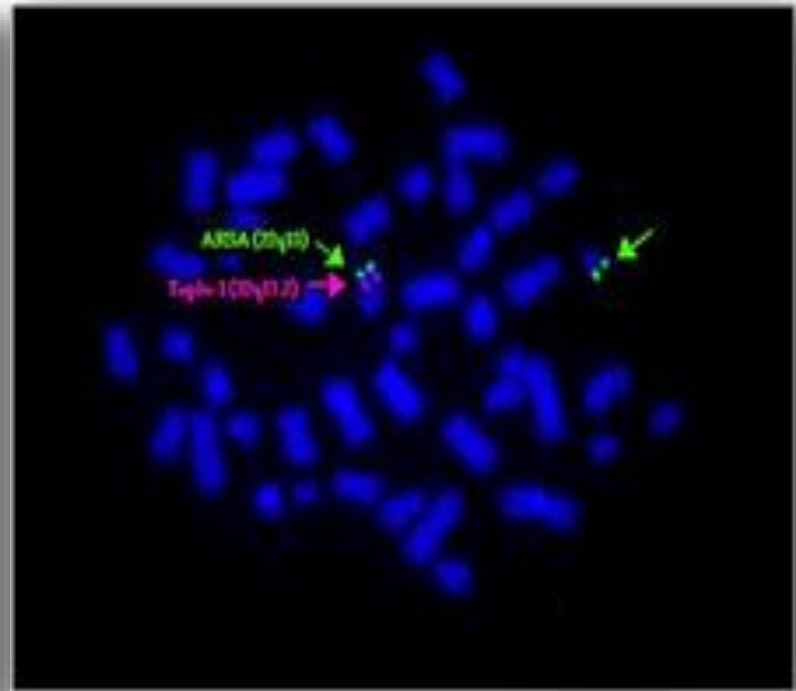
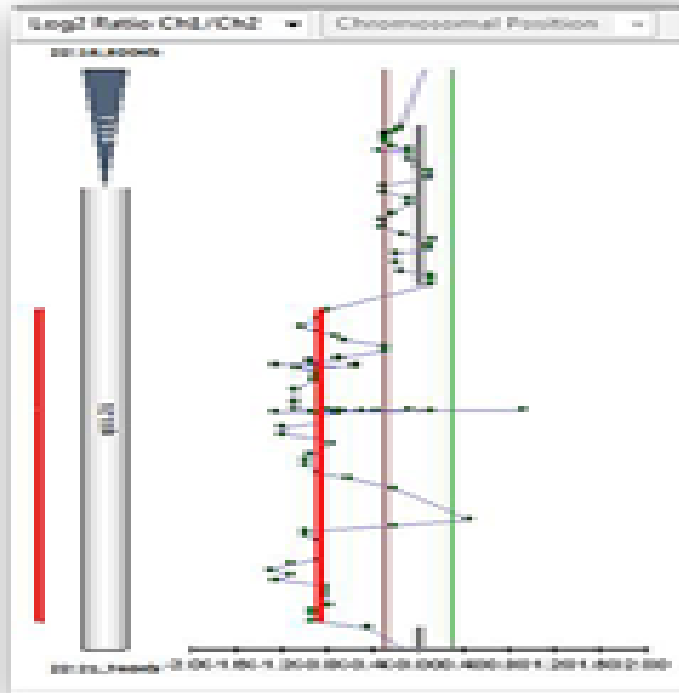
Associated extracardiac anomalies

are common in fetal series

- **Del. 22q11** occurs in about 30% of CAT cases
- Extracardiac structural malformations are present in up to 40% of cases

CAT

Associated Anomalies



Chromosomal 22q11 microdeletion is present in about one third of cases

Common Arterial Trunk Prognosis



Prognosis is related to the presence of associated anomalies and of unfavorable cardiac anatomy.