

Imaging for Coarctation of the Aorta

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We should not fail to detect the Aortic coarctation, because it can cause shock or cardiac low output, which result in deterioration of the patient's status. There are some tips not to miss the Aortic coarctation in echocardiography. One is so called "the Coarctation type VSD", or posterior malalignment type VSD. This type of VSD is known to be highly associated with Aortic coarctation or interruption. If the distress of the neonate with VSD is strong and the VSD is posterior malalignment type, we should scan the aortic arch more carefully. Second is the dilated LV with decreased systolic function. In most of such situation, the diagnosis may be dilated cardiomyopathy. However the deteriorated LV function can be the result of afterload mismatch caused by the isolated Coarctation of the Aorta.

The Aortic arch usually can be well visualized by echocardiography in neonate or infant. Place the probe in Suprasternal fossa, and we can look down the aortic arch. The measured pressure gradient across the Coarctation may not be high in the setting of low cardiac output, so we should directly measure the diameter of the aortic isthmus.

Although we usually plan the surgery only by echocardiography, CT and angiography are very useful modalities. In grown-up patient CT can better visualize the Aortic arch than echocardiography. Moreover by 3D-CT, we can well understand the precise anatomy of the aortic arch and its branching pattern, which is important in deciding the surgical plan (end-to-end anastomosis or subclavian flap, with or without cardiopulmonary bypass, etc.). Angiography is indicated when the operative indication is in border, and we want to know the precise pressure gradient across the Coarctation. In special situation (e.g. bad patient status), we perform percutaneous angioplasty for the Coarctation of the Aorta.

Fetal diagnosis for Coarctation of the Aorta

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The detection rate for the Coarctation of the Aorta has rapidly increased recently in our hospital. As a result, we could avoid ductal shock in the prenatally-diagnosed patients. It should be the great advantage in the patients' long-term neurological prognosis and medical economy.

However, both screening and definite diagnosis of the Coarctation is difficult. The reason for the difficulty in screening is that visualizing the aortic arch needs some technique. Instead, the screening points are detecting VSD (in the Coarctation Complex), detecting the ascending aorta which is narrower than SVC or pulmonary artery in 3 vessel view, or the aortic arch narrower than the ductal arch in 3 vessel trachea view. In the simple Coarctation of the Aorta, "small LV in fetus" is a very useful sign for fetal screening.

The definite fetal diagnosis of the Coarctation is difficult, because the diameter of the aortic arch changes with the hemodynamic change after birth. Although there is no single criteria for the definite diagnosis, "the shelf" in the aortic isthmus, and diastolic flow in the distal aortic arch may be the useful findings. Anyway fetal diagnosis for the Coarctation is not "definite" but always "possibility", and we should follow up the suspected cases postnatally, sometimes exceeding the neonatal to the infantile period.