TRANSPOSITION OF THE GREAT ARTERIES AND ITS DIFFERENTIAL DIAGNOSIS

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Annotation

Transposition of the great arteries (TGA) is a serious, rare heart problem in which the two main arteries leaving the heart are reversed. The condition is present at birth, which means it's a congenital heart defect. Transposition of the great arteries, or TGA, is a heart defect that occurs when the two main blood vessels leaving the heart are in abnormal positions. TGA is a life-threatening congenital condition, meaning it is present at birth. Babies with TGA need surgery.

Key words: blood vessels, transposition, pathophysiology, ventricle, heart, problem.

Transposition, also known as transposition of the great arteries (TGA), is one of the more common types of congenital heart disease. The incidence of TGA is 3.5/10,000 live births and accounts for 5% of all congenital heart disease (CHD) with a male preponderance. It is frequently detected through obstetric ultrasound (OB USS) because of the abnormal outflow tract orientation and abnormal three-vessel view (3VV). This condition can occur in isolation or in combination with other cardiac lesions. When detecting abnormal relationship of the great vessels in utero, it could indicate transposition or congenitally corrected transposition of the great arteries. In both conditions, the aorta arises from the morphologic right ventricle, and the pulmonary artery arises from the morphologic left ventricle. In contrast, the resulting pathophysiology is drastically different. For the purposes of this chapter, we will refer to transposition as TGA and congenitally corrected transposition of the great vessels as TGA. About half of fetuses diagnosed prenatally with this lesion are detected through OB USS. This is likely aided by the frequent ultrasound imaging of mothers with diabetes and the increased incidence of TGA in this population. This may be due to the poor glycemic control with elevated hemoglobin A1C levels (>8.5%) which is associated with an increase in fetal malformations. The high frequency of detection of these lesions through OB USS is interesting as the detection of fetal CHD mostly relies on an abnormal fourchamber view, and there is limited data on the effect of using the outflow tract views. Since the fourchamber view in these lesions is mostly



normal, except for the ventricular septal defects, it is curious to observe this high OB USS detection. In one study there were 52% sensitivity of OB USS when the four-chamber and outflow tract views were considered. When an abnormal three-vessel view is incorporated, sensitivity is further increased as seen later in this chapter. About 80% of cases detected during fetal life are simple transposition, with no associated lesions.

There are two types of transposition of the great arteries:

Complete transposition of the great arteries, also called dextro-transposition of the great arteries (D-TGA). This type reduces the amount of oxygen-rich blood to the body. Symptoms are usually noticed during pregnancy, immediately after birth or within a few weeks of birth. Without treatment, serious complications or death can occur.

Congenitally corrected transposition, also called levo-transposition of the great arteries (L-TGA). This is a less common type. Symptoms may not be noticed right away. Treatment depends on the specific heart problems.

Fetal TGA can mimic other lesions; therefore, it is important to entertain other diagnoses. The main one to consider is double outlet right ventricle as there is also the failure of the great vessels to cross. One must therefore assess carefully for a VSD and for the presence of the posterior great vessel overriding the interventricular septum. CCTGV is another lesion which can be mistaken for TGA.

In conclusion, TGA occurs when the two main blood vessels coming out of the heart — the aorta and the pulmonary artery — are transposed, or switched in position. The aorta is positioned in front of the pulmonary artery instead of behind it. As a result: the aorta is connected to the right ventricle (one of the heart's lower pumping chambers) instead of the left ventricle. The pulmonary artery is connected to the left ventricle instead of the right ventricle.

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