

Arterial switch to 12 o'clock associated with reduced coronary reserve in adolescence

May 13 2016

Arterial switch to the 12 o'clock position is associated with abnormal coronary perfusion in adolescence, reveals research presented today at EuroCMR 2016. Babies born with transposition of the great arteries (TGA) undergo the arterial switch operation in the first days of life.

TGA is a [congenital heart defect](#) in which the two [major arteries](#) leaving the heart, the pulmonary artery and the aorta, are connected to the wrong ventricles. The result is that oxygenated blood in the lungs is pumped back to the lungs instead of around the body. Blood in the body continues circulating instead of going to the lungs to pick up oxygen.

Babies born with TGA undergo a surgical procedure, called the arterial switch operation, in the first days of life to switch the arteries to the correct position. As part of the operation the coronary arteries, which supply blood to the heart, are removed from the "old" aorta and reimplanted into the "new" aorta. The new position of the coronary arteries is described as hours on a clock, for example 12 or 1 o'clock.

"This act of reimplanting the coronary arteries leads to the most complications associated with the arterial switch operation," said last author Dr Francesca Raimondi, a paediatric cardiologist at Hôpital Necker Enfants Malades, APHP, Paris, France. "Our previous research has shown that at 5 to 7 years of age, some patients who had the arterial switch operation have stenosis in their coronary arteries."

The hospital now has a policy to check the coronary arteries of arterial

switch patients when they are 5 to 7 years of age using a computed tomography (CT) scan.

The current study investigated whether coronary perfusion abnormalities were present in adolescents who had the arterial switch operation as newborns for the TGA abnormality. It included 66 patients aged 14 years on average. The investigators used cardiac magnetic resonance (CMR) imaging to study the perfusion and anatomy of the coronary arteries. A qualitative study was performed to assess the presence or absence of perfusion defects. Semi-quantitative analysis was done to calculate the amount of perfusion.

The investigators found that patients whose arteries had been reimplanted in the 12 o'clock position more frequently had perfusion defects than other patients.

"This is the first time it has been shown that TGA patients whose coronary arteries are reimplanted in the 12 o'clock position may be more prone to myocardial ischaemia when entering adulthood," said Dr Raimondi. "It suggests that patients with this specific coronary anatomy need more intense follow up to see if they develop symptoms of ischaemia."

She concluded: "The best position for the coronary arteries is after 1 o'clock but in some patients it was not possible because of their anatomy and surgeons had to reimplant in the 12 o'clock position. We have shown that these [patients](#) may be at risk for complications but our study needs further confirmation in a larger cohort."

More information: The abstract 'First Pass Perfusion Reserve Index in Paediatric Patients with Arterial Switch for Transposition of Great Arteries' will be presented during the session BEST Oral Abstracts which takes place on 13 May from 9:45 to 10:45 in the Main

Auditorium.

Provided by European Society of Cardiology

Citation: Arterial switch to 12 o'clock associated with reduced coronary reserve in adolescence (2016, May 13) retrieved 23 April 2024 from <https://medicalxpress.com/news/2016-05-arterial-oclock-coronary-reserve-adolescence.html>

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