Surgical repair of a right coronary artery fistula to the right ventricle in a child

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Abstract

Congenital coronary artery fistula is a relatively rare cardiac anomaly accounting for 0.2-0.4% of all congenital heart defects, and when isolated, is commonly asymptomatic. We present a case of an asymptomatic 9-year-old boy who underwent successful surgical repair of a right coronary artery fistula to the right ventricle.

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Abstract:

Congenital coronary artery fistula is a relatively rare cardiac anomaly accounting for 0.2-0.4% of all congenital heart defects, and when isolated, is commonly asymptomatic. We present a case of an asymptomatic 9-year-old boy who underwent successful surgical repair of a right coronary artery fistula to the right ventricle.

Key words:

Coronary artery, coronary artery fistula, congenital heart defect, cardiac murmur.

Key Clinical Message:

Congenital coronary artery fistula usually remains asymptomatic in children, and may be discovered during routine examination. When diagnosed however; it should be repaired to avoid possible serious complications. Surgical repair of coronary artery fistula in children can be performed with excellent outcomes.

Introduction:

Coronary artery fistula (CAF) is an abnormal communication between a coronary artery (CA) and a cardiac chamber or a major vessel. This communication may be of congenital origin, or acquired (postoperatively after repair of congenital heart defects, after myocardial biopsy, or coronary angioplasty). Congenital CAF

is a relatively rare cardiac anomaly accounting for 0.2-0.4% of all congenital cardiac defects (CHD), and may be an isolated lesion or in association with other CHD such as pulmonary atresia with intact ventricular septum, tetralogy of Fallot, hypoplastic left heart syndrome, or others (1, 2, 3). Isolated congenital CAFs are usually asymptomatic in children as only 10-20% of pediatric CAF patients may complain of symptoms such as chest pain, dyspnea, palpitations, or rarely symptoms of congestive heart failure (CHF) (1, 3-5). Complications that may develop include endocarditis, formation of an aneurysm, and rarely rupture (6-10). It is recommended that symptomatic children with CAF should undergo early repair; however, there is still no consensus about the indication and the timing of repair for asymptomatic CAFs (1, 3). Herein, we present a case of a 9-year-old boy who underwent successful surgical repair of a right coronary artery fistula to the right ventricle.

Case presentation:

An asymptomatic nine-year-old boy was presented to our hospital for evaluation of a continuous murmur that was heard during routine examination. Transthoracic echocardiogram (TTE) revealed a large communication between the right coronary artery and the right ventricle near the tricuspid valve. The diagnosis of a right coronary fistula to the right ventricle was confirmed by multislice cardiac computed tomography (MSCT) (Figure 1, 2). The patient was scheduled for elective surgical repair. The operation was performed via median sternotomy with complete cardiopulmonary bypass and cardiac arrest. The dilated right coronary artery was opened longitudinally and a large opening connecting with the right ventricle was seen on the floor of the artery (Figure 3). The right atrium was opened and the orifice of the fistula was seen near the commissure between the posterior and septal leaflet of the tricuspid valve. This orifice was closed by pledgeted 5/0 prolen sutures. The fistula in the right coronary artery was close by fine 7/0 prolen sutures, and the right coronary artery arteriotomy was closed by fine 8/0 suturing to restore its patency. The remainder of the operation was completed uneventfully. Postoperative TTE showed no residual fistula with normal myocardial function. The patient was followed up for one year and was asymptomatic with normal physical activity.

Discussion:

Isolated CAF is a rare congenital cardiac defect accounting for only 0.2-0.4% of all CHD (1, 3). Coronary artery fistulas involving the right heart structures are more common than those involving the left heart structures. Asymptomatic patients with CAF (nearly 80%) are diagnosed after routine examination revealing a cardiac murmur (3, 11, 12) as was the case of our patient. Some authors tend to leave CAF untreated in children considering the low morbidity and mortality in this group of patients and the possibility of spontaneous closure (3, 12, 13). On the other hand however; other authors recommend early closure of CAFs even when asymptomatic to avoid severe complications that may develop such as CHF, infective endocarditis, myocardial infarction, aneurysm formation, rupture, ventricular arrhythmia and sudden death (3, 13).

Conclusion:

Congenital coronary artery fistula usually remain asymptomatic in children, and may be discovered during routine examination. When diagnosed however; it should be repaired to avoid possible serious complications. Surgical repair of coronary artery fistula in children can be performed with excellent outcomes.

Figure legends:

Figure 1: Image of computed tomography angiography showing the dilated right coronary artery. 1: Aorta, 2: Dilated right coronary artery, 3: Right ventricle, 4: Left coronary artery.

Figure 2: Image of computed tomography angiography showing the site of the fistula connecting with the right ventricle.

Figure 3: Intraoperative image showing the large fistula from within the opened right coronary artery.

Figure 4: Intraoperative image showing the site of the opening of the fistula into the right ventricular cavity.

Author Contribution

Alwaleed Al-Dairy : Planned and performed the work leading to the report. Wrote and reviewed successive versions and participated in their revisions.

Ahmad Tarhha : Participated in writing the report and approved the final version

Ahmad Alkayakhi : wrote and reviewed the successive versions and participated in their revisions.

Ola Aldammad : wrote and reviewed the successive versions and participated in their revisions.

Hasan Hasan : wrote and reviewed the successive versions and participated in their revisions

Author's Statement:

Consent: Written informed consent was obtained from the patient's parents to publish this report in accordance with the journal's patient-consent policy**.**

Author's Declaration:

None of the authors listed on the manuscript are employed by a government agency that has a primary function other than research and/or education. Moreover, none of the authors are submitting this manuscript as an official representative or on behalf of the government.

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The authors have no conflict of interest

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