



Origin of right coronary artery from the left sinus of Valsalva

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ABSTRACT

Knowledge of normal coronary anatomy and its variations or anomalies is essential in heart surgeries. Failure in detection of these anomalies leads to complications. We are reporting a rare case of anomalous origin of right coronary artery from the left posterior aortic sinus (Left sinus of Valsalva) near the left coronary ostium. In the present case, both the coronary arteries rose from the left posterior aortic sinus. The presence of this type of variation is of clinically important in sudden cardiac death cases. Anomalous aortic origin of coronary arteries can lead to myocardial infarction and angina pectoris. © IJAV. 2008; 1: 12–13.

Key words [anomalous right coronary origin] [right coronary ostium] [left sinus of Valsalva] [myocardial ischemia]

Introduction

Coronary arteries are the vasa vasorum of the ascending aorta, because the heart is developed from the fusion of two primitive endothelial tubes, which represent the ventral aorta. The right coronary artery arises from the right coronary sinus (anterior aortic sinus) of the ascending aorta and the left coronary artery arises from the left posterior aortic sinus of the ascending aorta [1]. Ostia of the coronary arteries are located in the center of the corresponding aortic sinuses. Malformations of the position of the ostia and origin of coronary arteries lead to high risk of sudden death [2]. In some cases the coronary ostia are slit-like; during exertion, the coronary arteries get compressed between the aorta and pulmonary artery, this lead to lack of oxygenation and myocardial ischemia and may result in sudden death [1,3]. Pathological examination of coronary arteries in autopsies is essential for the explanation of the sudden death and for the improvement of the therapeutic procedures.

Case Report

The present anomaly was observed in a 34-year-old woman underwent autopsy. The cause of death was severe burns. The heart weighed 255 g. The origin of right coronary artery from the ascending aorta was abnormal. The right coronary artery, which is supposed to take origin from the anterior aortic sinus, originated from the left posterior aortic sinus. The distance between the right and left coronary artery ostia was 2 mm and the ostia laid at the same level in the left posterior aortic sinus.

Both the ostia laid at the upper part of the aortic sinus. The size of the right coronary ostium was smaller than the left. In the present case the right and left coronary arteries originated from the left posterior aortic sinus as a rare variation. When observed the course, the right coronary passed between the aorta and pulmonary trunk and the left coronary artery was dominant. There was no right coronary ostium in the right aortic sinus of the ascending aorta (Figure 1).

Discussion

In angiographic studies, the incidence of right coronary artery origin from the left aortic sinus is 0.17–0.38% [4,5]. In some studies, this anomaly is considered as a variety of single coronary artery, even if both the coronary arteries originating from one orifice in the left sinus of Valsalva [6]. This anomaly was considered relatively benign in the absence of arteriosclerosis [4].

A right coronary artery originating from the left sinus of Valsalva is a rare variation [2,3,7]. The anomalous origin of right coronary artery is often associated with bicuspid aortic valve, mitral valve prolapsus, ventricular septal defects and congenital heart diseases [3,5]. The position of the coronary ostia in respective aortic sinuses varies; in 87% of the cases the left coronary artery may originate from the mid portion of the sinus, in 10% of the cases from the posterior third and in 3% of the cases from the anterior third of the aortic sinus. The right coronary artery may originate from mid third of the sinus in 40%, in the posterior third in 59% and in the anterior third

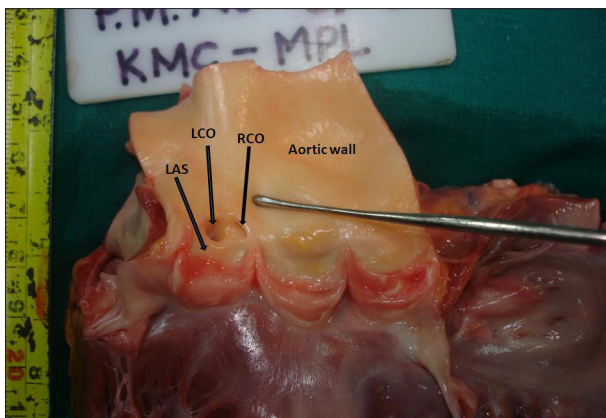


Figure 1. Dissection of the heart showing the anomalous origin of right coronary artery from the left sinus of Valsalva. (**LCO**: left coronary ostium, **RCO**: right coronary ostium, **LAS**: left aortic sinus)

in 1% [8]. Normally the coronary ostia are situated in the lowest part of the aortic sinus, commonly referred as “low take-off” [9]. However, in the present case the ostia were at the upper part of the sinus, which may be referred

as “high take-off”. High and low coronary ostia create problems in coronary angiography [10]. Vlodaver et al. reported the common positions of the coronary ostia at the level of sinotubular junction in 56% of cases, a high left ostium and a low right ostium or at the junction in 30% of cases, high right ostium and low left ostium or at the junction in 8% of the cases and the rarest combination is when both coronary ostia are high in 6% of the cases [9]. The association between the anomalous origin of coronary arteries from aorta and conditions like angina pectoris, syncope and myocardial infarction has been established [4].

In the present case the risk of compression of right coronary artery between the aorta and pulmonary trunk is high, and thus may induce myocardial ischemia. The origin of the right coronary artery from left sinus of Valsalva is a risk factor for sudden death during exercise. In cases with coronary artery anomalies, the risk of death is higher in patients younger than 30 years and the risk lowers at aged people [3]. These coronary anomalies can be detected in early stages of life, by developing the markers for identification and simultaneous surgery for the anomaly may be the best way to prevent sudden death [11].

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