3RD CORONARY ARTERY: INDEPENDENT CONUS: A CASE REPORT

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ABSTRACT

Coronary arteries are large vasovasora which supply blood to the heart in the form of ring and sling. They encircle the atrioventricular junction of the heart like a crown and perfuse the heart. Usually there are two coronary arteries arising from the ascending aorta namely right and left coronary artery arising from the right and left sinus of Valsalva. The first branch of the right coronary artery is the conus artery. It is a fairly small vessel which curves away from the main right coronary artery and proceeds ventrally, encircling the outflow tract of the right ventricle at about the level of the pulmonary valve. The distal twigs of the branch may join a branch of left coronary artery to form the anastomotic circle of Vieussens. In the present case the conus artery was found to arise independently from the right sinus of Valsalva during routine dissection carried out in the department of Anatomy. It was not found to be a branch from right coronary artery. The anatomy & clinical relevance of the independent conus has been discussed in this case report.

KEYWORDS

Coronary, Conus, Independent, Infundibulum, Third Coronary.

INTRODUCTION

Coronary arteries are large vasovasora which supply blood to the heart in the form of ring and sling. They encircle the atrioventricular junction of the heart like a crown and perfuse the heart. Usually there are two coronary arteries arising from the ascending aorta namely right and left coronary artery arising from the right and left sinus of Valsalva. The first branch of the right coronary artery is the conus artery. Immediately after its origin as a branch from right coronary artery it ramifies anteriorly on the lowest part of the pulmonary conus and upper right ventricle.

CASE REPORT

During routine dissection of coronary arteries in the department of Anatomy the conus artery was found to arise independently from the anterior aortic sinus (Right sinus of Valsalva). This artery had a very short course. It was found to supply the infundibular area of the right ventricle. The anterior aortic sinus showed presence of two ostia. The right conus artery had a separate ostium in the anterior aortic sinus (Fig. 1 & 2). Ostium was located in the anterior aortic sinus close to that of the ostium located for the right coronary artery.

DISCUSSION

The incidence of supernumerary coronary arteries has been stated to be 4% by Grants and incidence of third coronary artery has been reported to be 33% by Banchi (1904). The reported frequency of independent conus ranges from 33% to 50% in various studies on gross dissection while it is 1 to 4% on angio graphic films. Collateral conus arising directly from aorta plays a significant role in preserving myocardial function by filling up the occluded left anterior descending artery.

Conus artery is normally a branch of right coronary artery. It anastomoses with a branch from left anterior interventricular artery and forms an anastomotic circle of Vieussens. In the angiographic anatomy in the right anterior oblique view it appears to be directed towards the right. When it arises independently from the anterior aortic sinus it is called as third coronary artery. The other terms used in the literature to denote this artery are conal artery, preinfundibular, artery, adipose artery and supernumerary coronary artery. Whenever it has independent origin it is either not opacified or only poorly opacified on selective injection of the right coronary artery. Since the ostium of the independent conus is quite small, its catheterisation is quite difficult. Early anatomists have observed supernumerary coronary arteries. Anatomists Richard Quain2 has mentioned about a large supplementary vessel arising near the right coronary artery in his atlas. Gross2 commented on the frequency and potential function of such vessels when occlusion of main coronary arteries develop.

Embryological Basis

Earlier embryologists stated that coronary arteries developed by angiogenesis i.e. sprouting from aortic root. However, the recent studies have shown that the coronary arteries develop by vasculogenesis i.e. the mesenchymal cells in the subepicardial space give rise to a network of vessels on the myocardial surface. Endothelial sprouts from this network approach the outflow tract & connect with the aortic root sinuses. Vessels which develop tunica media and adventitia persist, while those which do not develop media and adventitia regress. This observation differs from the theory proposed by Ogden. According to his theory there is dual origin of the coronary arteries-proximal and distal. The distal vascular network appears first in the interventricular and atrioventricular grooves and then communicates with the extra cardiac great vessels. With further persistence of some vessels and regression of other vessels the final coronary arterial pattern develops. Brooks Edwards et al (1981) has stated that independent origin of conus artery is uncommon in
neonates and quite frequent in adults. This observation suggests that postnatal changes occur in the branching pattern of coronary arterial system.

Fig. 1: a) Right coronary artery, b) Independent conus artery

Fig. 2: Red arrow pointing towards the ostium for right coronary artery and white arrow pointing towards the ostium for third conus artery

REFERENCES