Clinical Correlation with Coronary Circulation

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Heart is supplied mostly by two coronary arteries-right and left. Only inner 75-100mm of endothelial surface gets nutrition directly from the blood in the cardiac chamber. Anatomically coronary arteries are not end-arteries because they anastomose with each other by their trunk branches and sub-branches- mostly at the pre-capillary level. So they are functional end arteries. Right coronary artery supplies whole of the right atrium, most of the right ventricle except a strip along the anterior interventricular groove, post-inferior one third of ventricular septum and S-A node and A.V. node in the majority of subjects, left coronary artery supplies most of the left atrium and left ventricle except a strip along the posterior and inferior surface of the heart and also supplies anterior–superior two third of the ventricular septum.

The most common cause of death in affluent society across the world is ischemic heart disease which results from occlusion of coronary artery or its major branches; clinically the occlusion of coronary arteries and their major branches may be within the fast 2-5 cm of left anterior descending and circumflex branches and proximal and distal third of right coronary artery. Average frequencies of critical narrowing of the three major arterial trunk are anterior interventricular (LAD)-40-50%, right coronary artery (RCA), 30-40% and circumflex branch of left coronary artery (LCX),15-20%.

Description

The coronary arteries, the first branches of aorta, supply the myocardium and epicardium. The right and left coronary arteries arise from the corresponding aortic sinuses at the proximal part of the ascending aorta just superior to the aortic valve, and pass around opposite side of the pulmonary trunk. The coronary arteries supply both the atri and the ventricles, however the atrial branches are usually small and not radiating apparent in the cadaveric heart. The ventricular distribution of each coronary artery is not sharply demarcated. The right coronary artery arises from the right aortic sinuses of the ascending aorta and passes to the right side of the pulmonary trunk, running in the coronary groove. Near its origin the RCA usually gives off an ascending S.A. nodal branch, which supplies the S.A. node. The RCA then descends in the coronary groove and gives off of the right marginal branch which supplies the right border of the heart as it turns toward the apex of the heart. After giving off this branch, the RCA turns to the left and continues in the coronary groove to the posterior aspect of the heart. At the crus of the heart the function of the septa and walls of the four heart chambers. The RCA gives rise to the AV nodal branch, which supplies the AV node. The SA node and AV node are part of the conducting system of the heart (Fig. A & B).

Dominance of the coronary arterial system defined by which artery gives rise to posterior interventricular branch of posterior descending artery. Dominance of the right coronary artery is typical approximately 67%. The right coronary artery give rise to the large posterior interventricular branch which descend in the posterior interventricular groove towards the apex of the heart. This branch supplies adjacent areas of the both ventricles and sends perforating septal branch into the IV-septum. The terminal branch of right coronary artery then continues for a short distance in the coronary groove. The right coronary artery supplies the diaphragmatic surface of the heart. The right coronary artery supplies. (Fig.-D)

1. the right atrium
2. most of the right ventricle, part of the IV septum
3. part of the left ventricle(diaphragmatic surface)
4. the S.A node 60% of people
5. the A.V node 80% of people.

The left coronary artery (LCA) arises from the left aortic sinus of the ascending aorta passes between the left auricle and the left side of the pulmonary trunk and runs in the coronary groove. In approximately 40% of the people the S.A nodal branch arise from the circumflex branch of the LCA and ascends on the posterior surface of the left atrium to the S.A. node. As it enters the coronary groove, at the superior end of the anterior IV groove, the LCA divides into