

## **Q. 20. Describe the Coronary Circulation.**

Heart is the pumping centre of circulation. It circulates blood throughout the body whereby the body gets its nutrition and becomes functional. Being an organ of the body the heart also have some supply of blood for its nutrition. This supply of blood to the heart is known as coronary circulation. The heart muscles are supplied by two coronary arteries originating from the aorta close to its origin. The coronary circulation is one of the shortest circulation of the body. Blood passes through arterioles into a capillary bed and is collected by veins which empty through the coronary sinus into the right auricle.

**Anatomical Considerations :** The heart is supplied by right and left coronary arteries. The *left coronary artery* supplies mainly the left ventricle and the *right coronary artery* supplies mainly the right ventricle but usually also a major part of the left ventricle as well. In about one half of all human beings most blood flows through the right coronary artery then through the left whereas left coronary artery predominates in only 20 percent. Most of the venous blood from the left ventricle i.e. about 75% flows through the

coronary sinus and venous blood from the right ventricle flows through the small *anterior cardiac veins* which empty directly into the right atrium and

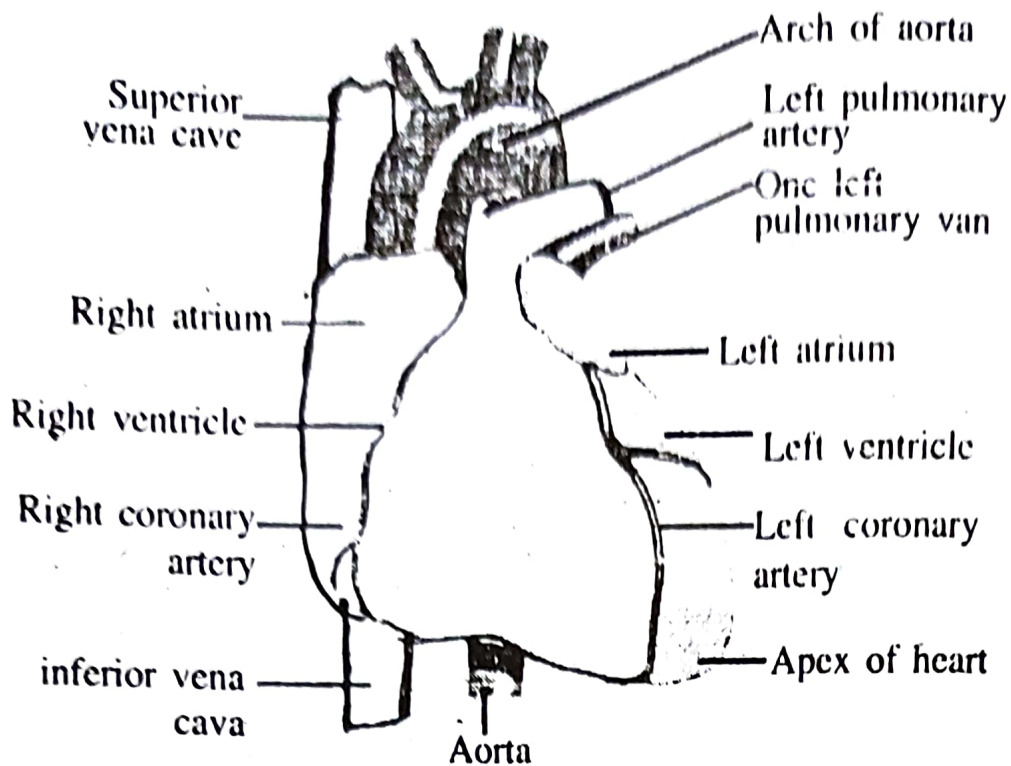


Fig. 75. The heart showing the disposition of the right and left coronary artery and their branches.

are not connected with the coronary sinus. A small amount of coronary blood flows back into the heart through the *thebesiam veins* which empty directly into all the chambers of the heart.

**Coronary Circulation :** The coronary circulation includes arterial supply and venous drainage.

**I. Arterial Supply :** It includes external supply, anastomoses and internal supply.

**(a) External Supply :** The two right and left coronary arteries are the main arterial supply of the heart which arise from the aorta close to its origin. These are the largest vasavasorum as heart was a tube. These are not end arteries but their terminal twigs are called the end arteries. The other negligible supply is done by : (i) Vasavasorum of aorta and pulmonary trunk. (ii) Pericardial arteries. (iii) Blood within the ventricle.

**(b) Anastomoses :** The coronary arteries form three types of anastomoses which are as follows : (i) Anastomoses between the branches of one artery with that of the other. (ii) Communication with the cavities of the heart by some smaller vessels known as Thebesian vessels which open directly into the auricular and ventricular cavity. (iii) Extra-cardiac anastomoses between auricular twigs of the coronary arteries on the one hand and branches of the internal mammary, pericardial, bronchial, phrenic and oesophageal arteries of the other.

**(e) Internal Supply :** The branches of coronary arteries run sub-

pericardial bent at right angle, pierce the myocardium and end on endocardium in a capillary bed which end in a capillary plexus of vein.

**II. Venous Drainage :** The venous blood from the myocardium is chiefly returned through superficial and venous system. The superficial venous system constitutes the coronary sinus, great cardiac veins and anterior cardiac veins. The deep venous system consists of the Thebesian, luminal and sinusoidal vessels.