



- The first part of the ascending aorta is posterior to the pulmonary trunk
- The pulmonary trunk ascend up word to the left ,and behind the arch of the aorta it divide to rt. And lt. pulmonary arteries.
- The rt. Pulmonary artery is posterior to the arch of the aorta and the SVC.
- The ascending aorta and the pulmonary trunk both are inside the pericardium, while the arch of the aorta and the descending aorta are in the superior mediastinum .behind the manubrium.
- There are 3 branches of the aorta (brachiocephalic ,lt.common carotid, Lt. subclavian) which are located behind the upper border of manubrium.
- The arch of the aorta is moving backward and slightly to the left. It start interiorly at the sternal angle behind the lower border of manubriam and end as well posteriorly at the sternal angle (T4)
- SVC forms from the union of 2 brachiosephalic veins (the left one is longer and located anteriorly to the aortic branches) used to call them inominnate veins : still used in clinical .

Rt atrium;

-Fossa ovaly has floor(driven from septum blemar?) and margin (driven from septum...?..) I'm not sure what the doctor said exactly..but he mentioned that we'll take it later :/ !!

-Coronary sinus(الحبيب الوريدي) brings most of the blood from the cardiac muscle.

-Venae cordies minimae are also called Thebesian veins

Rt. vintrical :

-Low pressure pump(why ? because it pumps blood against low resistance, has low vascular tone in the arterioles.) in contrast to left ventricle which pumps blood against high resistance.

-Most of the anterior part of the heart is formed by the rt. Ventricle (sternocostal 2/3)

Diaphragmatic part (1/3)

-It has 2 parts 1. Lower rough inflowing part

2. upper smooth out flowing part called infundibulum, on its left is the aortic vestibule.

-AV bundle is the only connection between the arterial and ventricular syncytium, which are separated by fibrous ring that forms the cytoskeleton of the heart.

-AV bundle divide into 2 bands the right one goes into the modulator band (septomargenal trabecule)

Lt. ventricle ;

Is the major pump of the heart

-Its lumen is larger then the right ventricle(where It appears similunar because the intraventricular septum bulge more toward the right), this do not means that the cardiac output is larger in the right than the left.

-The anterior and posterior papillary muscles are attached via chordae tendinae to the anterior and posterior cusps .the anterior papillary muscle attaches mainly to the anterior cusp while the posterior papillary muscle attaches mainly to the posterior.

-Each papillary muscle is formed of several part which we call it collectively anterior or posterior papillary.

-Anterior cusp of bicuspid(called aortic cusp due to its location near the aortic valve) differ from other cusps in :

It has smooth anterior and posterior surface while other cusps have smooth anterior and rough posterior (why? Because it is subjected to 2 streams of blood, one from the atrium to the ventricle and the other from the ventricle to the aorta)

If there is endocarditis on the surface of the cusp it will cause damage to the valve.

-The upper part of the **atrioventricular** septum is thin membranous wall and is divided into 2 parts (anterior : separate ventricles) (posterior : **atrioventricular**: divide the lt. ventricle from the rt. atrium) Its posterior part contain AV bundle

-**Roger** dieses : there is small defect in the septum < usually asymptomatic

If the defect is large(the blood pass from the lt. ventricle to the rt. Ventricle only in systole-not diastole-) , surgery is needed.(but we should be careful not to hit the AV bundle or will lead to **atrioventricular** block .

-It's wall is 3 times thicker due to it's pumping against high resistance.

Lt. atrium :

Most of its surface is smooth except the auricle.

Intra arterial septum contain fossa ovaly(used to be foramen ovaly that closes after birth.)

Valves;

AV valves :

-How do valves work(close and opens)?Close:in the first phase of systole (isometric contraction)the tension of the ventricle wall increase ,that will lead to increase in pressure too .thus the cusp will bulge toward the atrium till its margin gets in a position where further bulging is prevented by the chordae tendinae and papillary muscle.= closed valve

This closer result in the first heart sound.

Open: by relaxation of the ventricle the tension and presser will decrease in the wall of the ventricle till it become lower then the pressure of the atrium .this will create pressure gradient and lead to open of the valve (this will not create a heart sound)

-The papillary muscle function is to keep the valve competent. Any damage in the papillary due to infraction will lead to back flow of blood to the atrium (acute heart failure)

Similunar valves:

in early diastole the ventricle will relax making the blood return toward the ventricle and filling the sinus(cavity between the cusp and the aortic vessel) and closer of the valve.= this closer will lead to the second heart sound

When the BP in the lt. ventricle is higher then the aortas pressure, the valve will open.

Overall: systole has 3 phases 1. Isometric contraction in which the BP of the ventricle will increase thus the AV valve will close first then the semilunar valves will open. 2. Maximum ejection. 3. minimal ejection.

Dystol: 1. relaxation of the ventricle. 2. lower BP in the ventricle than the aorta. 3. return of the blood from the aorta to the ventricle and closure of the semilunar valve.

-Coronary arteries are branches of the ascending aorta, located above the aortic sinus.

-The aortic valve has 3 sinuses 1 anterior and 2 posterior. The left posterior one gives the left coronary artery while the anterior gives the Rt. Coronary artery.

-In systole the blood flow to the aorta and press the cusp to the wall, this will not lead to closure of the coronary arteries (BP in the aorta makes the blood flow into the coronary arteries.)

In systole: isovolumetric contraction will lead to ejection of blood from the ventricle to the aorta this will increase the aortic BP thus pushing of blood into the coronary arteries. The arteries that are on the surface of the heart will be filled with blood easier than the arteries that are in the inside the heart (subendocardial) due to presence of resistance inside the heart that is created by the BP inside the ventricle. This is what makes infarction more dangerous inside the heart than the surface.

Skeleton of the heart:

-Fibrous ring separate the atrial syncytium from ventricle syncytium. (they are only connected through AV bundle)

-Provide attachment for the cusps of the AV valves.

-The posterior part of the intraventricular septum is susceptible to congenital anomalies (VSD)

-SA node is the pace maker where spontaneous depolarization occur and the impulse is carried through the wall of the atrium.

-Nodal artery is branch of the right coronary artery that supply the SA node in 60% of the cases.

-AV node and AV bundle is supplied by inferior intraventricular artery (or called posterior) that is located in the diaphragmatic surfaces.