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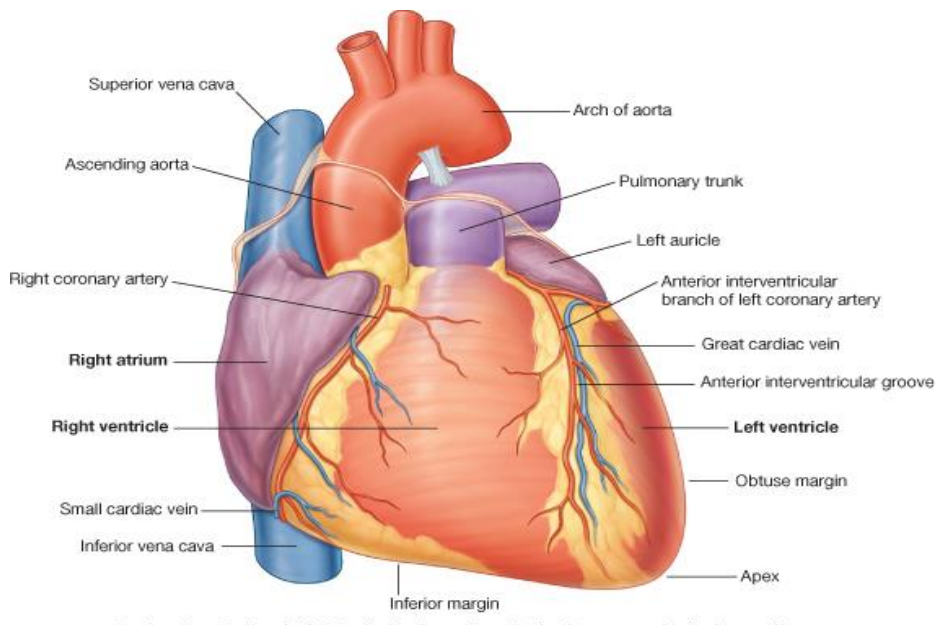
DEPARTMENT: PHYSIOLOGY

ASSIGNMENT

DESCRIPTION OF THE HEART AND ITS FUNCTIONS

- ❖ The heart is a muscle roughly about the size of a human's fist. It lies behind and to the left of the breastbone/sternum.
- ❖ The heart pumps blood through the network of arteries and veins called the cardiovascular system.
- ❖ The inside of the heart is divided into four chambers:
- ❖ The top two chambers are called the atria and are collection chambers for blood.
- ❖ The bottom two chambers are called the ventricles and they receive the blood from the atria and pump it to the lungs and to the body.
- ❖ The chambers are separated by valves that control the direction of blood flow. There are four valves:
 - Aortic valve.
 - Tricuspid valve
 - Pulmonary valve
 - Mitral valve
- ❖ Circulation of blood: This begins at the right side of the heart where blood from the body comes to the right atrium, passes through the right ventricle where it is pumped to the lungs to receive oxygen.
- ❖ Once oxygen is received, it flows to the left atrium and left ventricle respectively where it is pumped to the aorta and the rest of the body.
- ❖ Towards the right side of the heart, the tricuspid valve separates the right atrium and the right ventricle allowing blood to enter the ventricle but not flow backwards to the atrium, blood flows through the pulmonary valve to the lungs.
- ❖ On the left side of the heart, mitral valves separates the left atrium and the left ventricle, blood flows from the left ventricle to the aorta through the aortic valve and to the rest to the body.
 - The coronary, heart arteries, provide oxygen and nutrients to the heart muscle
 - Arteries carry blood with oxygen and other nutrients throughout the body.
 - Veins carry blood back to the heart which pumps it back to the lungs to be oxygenated.

- The right coronary artery supplies blood to the bottom and the back of the heart.
- The left coronary artery splits into two vessels: One branch supplies blood to the front of the heart and the other delivers blood to the left side of the heart.
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- ❖ Throughout the heart there is an electric system that transmits signals. It begins in the SA node: also known as the pacemaker of the heart: sends impulses from the atrium to contract and pump blood into the ventricle. Also, chemical activities take place in the heart such as the secretion of adrenaline which increases the heart rate and the volume of blood pumped by the heart.



- The wall of the heart consists of three layers of tissue:

Epicardium: protective layer mostly made of connective tissue.

Myocardium: the muscles of the heart.

Endocardium: lines the inside of the heart and protects the valves and chambers.

These layers are covered in a thin protective coating called the pericardium.

Each heartbeat can be split into two parts:

Diastole: the atria and ventricles relax and fill with blood.

Systole: the atria contract (atrial systole) and push blood into the ventricles; then, as the atria start to relax, the ventricles contract (ventricular systole) and pump blood out of the heart.

FUNCTIONS

These are some of the major functions of the heart:

The purpose of the heart is to pump blood through blood vessels, arteries and veins to all parts of the body.

The right atrium receives blood from the veins and pumps it to the right ventricle.

The right ventricle receives blood from the right atrium and pumps it to the lungs, where it is loaded with oxygen.

The left atrium receives oxygenated blood from the lungs and pumps it to the left ventricle.

The left ventricle (the strongest chamber) pumps oxygen-rich blood to the rest of the body.

The left ventricle's vigorous contractions create our blood pressure.

CONGENITAL ANOMALIES OF THE HEART

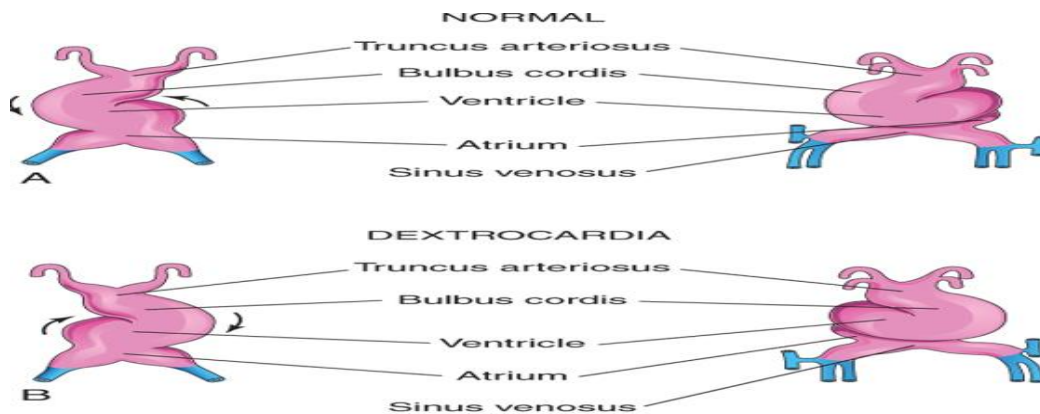
1. DEXTROCARDIA:

This is the bending of the heart tube to the left instead of to the right

Dextrocardia is the most frequent positional abnormality of the heart

In dextrocardia with situs inversus, the position of abdominal viscera is also reverse

the incidence of accompanying cardiac defects is low



If there are no other associated vascular abnormalities, these hearts function normally.

It can also be defined condition in which the heart(four chambered heart) is pointed toward the right side of the chest instead of normally pointing to the left. It is present at birth

In dextrocardia with situs inversus, the position of abdominal viscera is also reverse

2. ECTOPIA CORDIS

This means that the heart is in an abnormal location

In the thoracic form of ectopia cordis, the heart is partly or completely exposed on the surface of the thorax(heart lies on the surface of the chest)

It is usually associated with widely separated halves of the sternum and an open pericardial sac. Death occurs in most cases during the first few days after birth, usually from infection, cardiac failure, or hypoxemia

If there are not severe cardiac defects, surgical therapy usually consists of covering the heart with skin. In some cases of ectopia cordis, the heart protrudes through the diaphragm into the abdomen. The most common thoracic form of ectopia cordis results from faulty development of the sternum and pericardium

Ventricular Septal Defects (VSDs)

VSDs are the most common type of cardiac heart defects, accounting for approximately 25% of defects. VSDs occur more frequently in males than in females, but membranous VSD is the most common type.

VSDs may occur in any part of the IV septum. Most people with a large VSD have massive left-to-right shunting of blood.

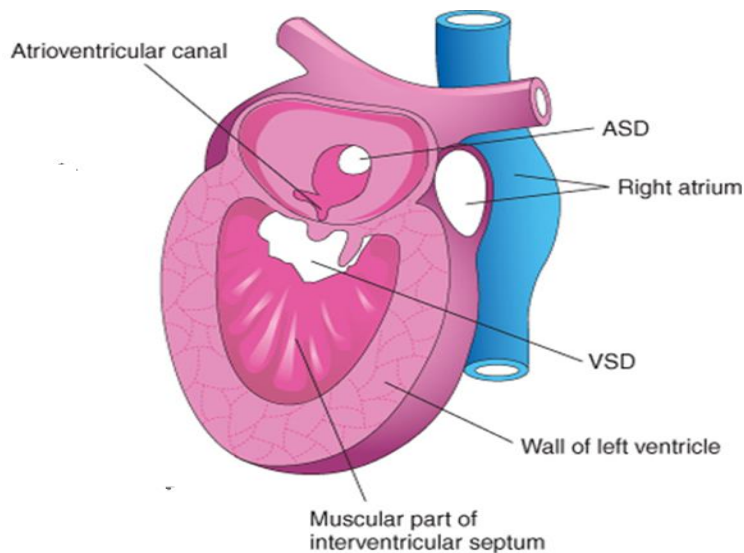
TYPES

3. Incomplete closure of the IV foramen

This results from failure of the membranous part of the IV septum to develop, resulting from failure outgrowth of tissue from the anterior (inferior) endocardial cushion fuses with right and left bulbar ridges.

4. Muscular VSD

This is a less common type of defect may appear anywhere in the muscular part of the interventricular septum. Sometimes there are multiple small defects, producing what is sometimes called the "Swiss cheese" VSD. Muscular VSDs probably occur because of excessive cavitation of myocardial tissue during formation of the ventricular walls and the muscular part of the interventricular septum.



5. TRANSPOSITION OF GREAT ARTERIES

This occurs when the conotruncal septum fails to follow a spiral course and run straight down. As a result of this, the aorta originates from the right ventricle, while the pulmonary trunk originates from the left ventricle.

Because of these anatomic abnormalities, deoxygenated systemic venous blood returning to

the right atrium enters the right ventricle and then passes to the body through the aorta. Oxygenated pulmonary venous blood passes through the left ventricle back into the pulmonary circulation

The condition is sometimes associated with defect in the membranous part of the interventricular septum. It is usually accompanied with a patent ductus arteriosus

Without surgical correction of the transposition of great vessels (TGA), infants with this anomaly usually die within a few months

