Project Report on Heart / Heart Beat

This project report is entitled "Heart" and all information about Heart, Heart Beat, Internal and External Structure of Heart, Working, Efficiency, Heart Beat, Heart Sound.

Heart :

Heart is soft, spongy, hollow, muscular organ and wall is made up of cardiac muscles. It is about the size of 1st fist (12 x 9 cm) and about 300 grams in weight. It is conical in shape and upper surface of heart is broad and lower surface of the heart is narrow.

It is present in thoracic cavity between the lungs in the cardiac notch. It is radish brown in colour.

Protective Coverings :

Heart is surrounded by two protective coverings called pericardium. Inner pericardium is called visceral pericardium & outer pericardium is called partial pericardium. Between the two pericardium is a space called pericardial cavity. This cavity is filled of fluid called pericardial fluid. This fluid is filled secreted by pericardium itself. This fluid moistened the heart and allows free and frictionless movement of heart.

External Structure of Heart :

Heart is divided into two halves by a septum. Each half have two communicating chamber called Auricles and ventricles. Thus heart is four chambered.

Auricles :

These are the upper part of the heart and Auricles are separated by externally from ventricles by a groove called coronary sulcus.

Ventricles :

Ventricles forms lower part of the heart and separated from each other by inter ventricles septum.

Internal Structure of Heart

Auricles :

Auricles have thin valves because they have to pump the blood to ventricles which are nearest to them. Inner surface of Auricles is smooth or having low elevation. It opens into ventricles and internally two auricles are separated by inter-ventricular septum.

Ventricles :

Ventricle's wall is thick which is more in left ventricles because the right ventricles has to pump the blood to lungs and left ventricles pump the blood to the farthest and of the body with pressure. Therefore they have thick walls. The inner surface of ventricles have low muscular ridges called 'Papillary' columnal carnae and high muscular ridges elevation called papillary muscles. Two ventricles are separated by Inter-ventricular septum.

Great Blood Vessels, Aperture and Valves :

The blood vessels which enter or leave the heart is called great blood vessels. The right auricles receives two main vein called superior and inferior. Vena cava which collects

from head region and lower portion of the body respectively. There opening inside the right auricle is guarded by valve called valve of Vena-Cava. A vein called coronary vein receives blood from the valve of heart itself.

Right auricles opens into right ventricles. Its opening have an aperture called Right A-V aperture. This aperture is guarded by a valve called Tricuspid valve. It has three membranous flaps. Its membrane in auricles is attached and in ventricles is free and attached to the papillary muscles by means of cohordae tendinae.

From the right ventricles a pulmonary arteries arises which takes the blood to the lungs. At the base of the artery, the three pocket shaped valves called semi lunar valves are present. These checks the back return of blood.

Left auricles receives four pulmonary veins which brings pure blood from the lungs. The left auricles opens into left ventricles by an aperture called auricular-ventricular aperture. This aperture is guarded by a value called Bicuspid valve. It is attached to left auricles and in ventricles it is free and attached to the papillary muscles by chordae tendinae.

From the upper left corner of the left ventricles arises the main arteries called Aortic Arch which supplies pure blood to all the parts of body. The base of Aortic arch has three pocket shaped valves called semi lunar valves which checks back return of blood.

Working of Heart :

Heart is a double pump and undergoes regular contraction and relaxation. The contraction of heart is called systole and the relaxation of heart is called Diastole. The heart shows three events. The three events i.e. Auricular systole. Ventricular systole and joint diastole forms a cycle called cardiac cycle.

Joint Diastole :

In this stage both auricles and ventricles are in relaxed stage. The volume of the heart is more and blood is less. The blood flows from great veins in to their respective auricles. Some blood also passes into Ventricles as the A-V aperture remains open.

Auricular Systole :

Now the auricles contracts and contraction of auricles is called auricular systole. Due to this pressure of the blood in the auricles rises and blood moves from auricles to ventricles & does not move back into great blood vessels as their opening get closed. Also the contraction of heart starts from its upper end to the lower end, therefore pushes the blood into ventricles.

Ventricular Systole :

Now ventricles contracts and due to contraction of ventricles area of ventricles decreases. Pressure of blood rises in the ventricles above that of auricles due to of A-V aperture get closed.

This closing of A-V aperture due to contraction of ventricles produces a sound is called lubb-lubb.

The semi lunar valves are still closed and this further increases the pressure. This pushes the semi lunar valves backward and causes their opening. The blood moves into their respective blood vessels & this decreases the pressure of blood in the ventricles.

Now the ventricles undergoes relaxation i.e. diastole condition thus increases their volume. Due to this semi lunar valves get relaxation closed. The closing of semi lunar

valves due to relaxation of ventricles produces a sound called Dupp-Dupp. These sounds ran be heard by placing syhecoscope on the left side of the heart.

Nourishment of Heart :

The heart is supplied by an artery called coronary Artery which supplies pure blood to the wall of heart. As the heart works throughout life (It does more work) it requires more energy and material oxygen. The heart wall gives a vein called coronary veins which removes waste products from the wall of the heart in the right auricles.

Efficiency of Heart :

Heart keeps on beating throughout the life but it does not fatigued. The heart first contracts and then relaxes. After relaxation it undergoes a period of rest before contraction. It rests doubled the time it works. Therefore heart does not fatigues.

Heart Beat :

It is the spontaneous contraction and relaxation of heart to pump out & receive blood to and from the body is called heart beat.

Types of heart beat : - It is of two types

Neurogenic : It under the control of nervous system. It is regulated by an nerve impulse originated from nerve ganglion situated near the heart. It is in Arthropods.

Myogenic : It is under the control of patch of muscles fibers present in the wall of heart itself. If a heart of frog removed and it kept in Saline solution. It keeps on beating for sometime as it is under the control of muscles of heart itself.

Mechanism of Heart Beat :

Heart Beat results from a wave of depolarization called cardiac impulses that originate from the tract called Nodal tissue. It consists of Sinu-auricular Node (S-A) node. Inter auricular node, Bundle of his (AV) bundle branches and purkinje fibers.

S-A Node : It is present in the right upper side of right auricles. A waves of contractions eminates from it. It moves along the wall of auricles & not on the wall of ventricles as the muscles of auricles are not continuous with the muscles of ventricles.

Inter Auricular Node : It is present in the left lower side of Inter auricular septum. The waves of S-A node stimulates the Inter auricular node which produces waves of contraction that passes along the inter ventricular septum through bundle of his bundle branches and purkinje fibres over the wall of ventricles & causes its contraction.

Heart-Beat : The heart beat 72 times per minute. Heart beat is small organism is faster than larger organism. Smaller organism have more metabolic activities & require move energy and oxygen. The heart beat in elephant is 25 times and in cat it 200 per minute.

Heart Output : The heart beats 72 times per minutes & in one minute it pumps 70 ml. of blood and hence the total amount of blood pumped by heart in one minute is 72 x 70 = 5040 ml.

Heart Sound : Due to closing of A-V aperture by the contraction of ventricles a sound called lubb-lubb is produced.

Due to closing of semi lunar valves by the relaxation of ventricles a sound like dupp-dupp is produced. hubb-hubb has low pitch, slow sound and a longer duration. Dupp-Dupp has high pitch, louder sound and of short duration.

If heart does not work properly it will produce sound like mur-mur. This sound is produced due to ineffective working of heart by infection.

Bibliography

- Internet Source : www.google.com www.yahoo.com