Surgical management of a failing Left ventricle

Essay
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صدق الله العظيم

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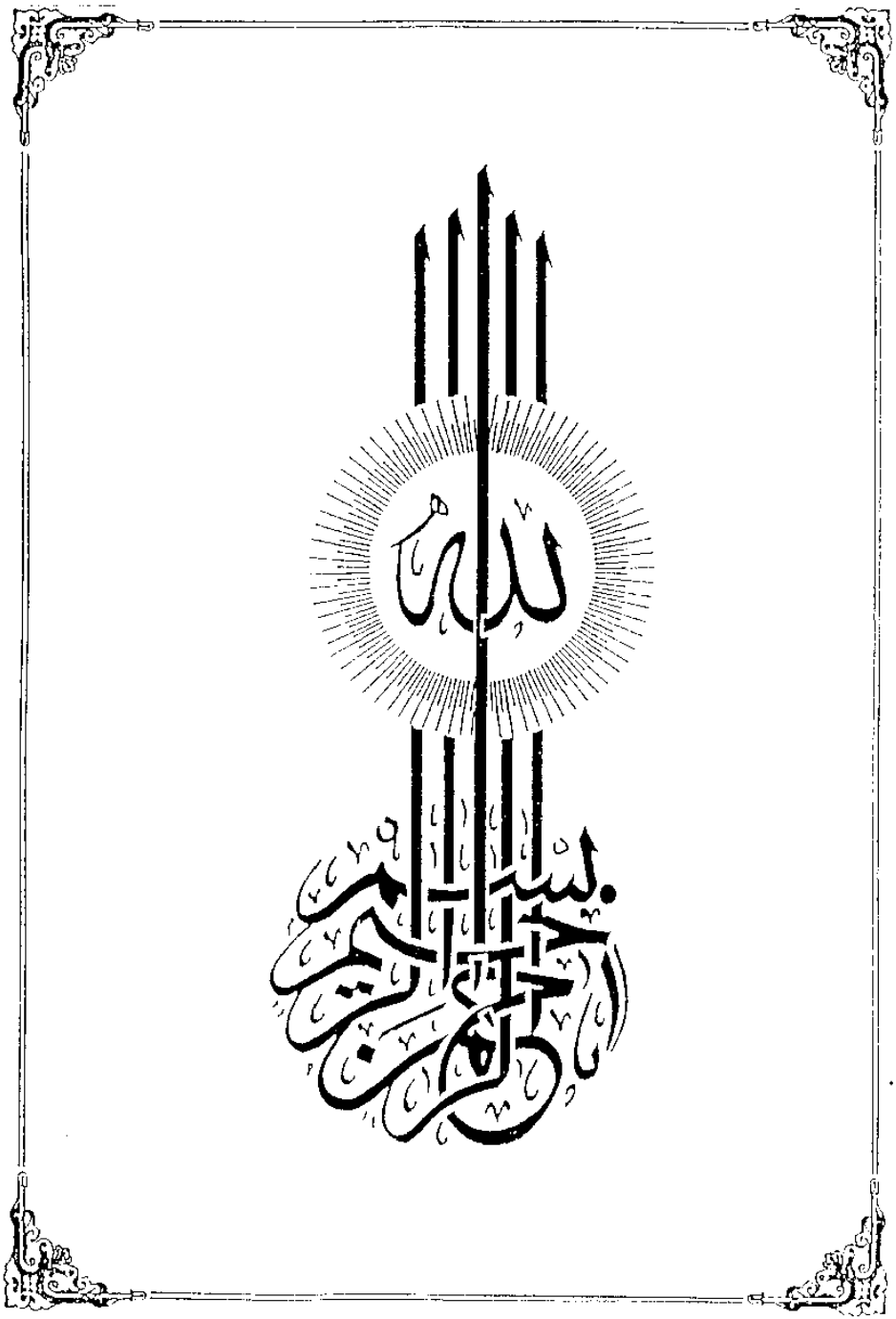

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Introduction

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Heart failure is a clinical condition with a high mortality. Medical therapy has improve the clinical course of this condition considerably in recent years . Numerous surgical intervention such as high risk coronary by pass surgery, resection of left ventricular aneurysms , heart valve replacement and cardiac transplantation became accepted therapeutical options. More recently . Transmyocardial laser, revas,cularization, implantation of Mechanical assist devices implantable cardioverters defibrillators and dynamic cardiomyoplasty introduced into clinical practice and still under evaluation. (15)

Cardiac transplantation is aproven effective therapy for selected patients with end stage congestive heart failure . A multidisciplinary team consisting transplant physicians and surgeons performs selection. Clinicians responsible for patient assessment must establish the severity of cardiacdysfunction, formulate a prognosis, and stratify patients according to risk for mortality.The scarcity of organ donners makes careful screening of potential recipients necessary to identify those individuals most likely to obtain a long term benefit .(37)

As the number of donors is unlikely to increase dramatically in the near future , there is an urgent need to

develop mechanical alternatives to transplantation. Also left ventricular assist devices (LVAD) recipients face important issues relating to device durability, cost and potential need for concomitant heart support . this lack of data on long term durability contrasts units a yearly mortality rate of about 5% After the first year of transplant. .(90 & 57)

From the above, the issue of finding a new alternative is raised Surgical alternatives to transplantation include partial left ventricular resection, dynamic cordiomyoplasty, (LVAD) partial left ventricular resection is innovative procedure in which the heart is surgically reduced in size and cardiac function is dramatically improved immediately after surgery.

(90 & 11)

So it's reasoned that reducing left ventricular diameter in patients with dilated ceardiomyopath or in other selective end stage cardiac patients well improve ventricular function. So partial left ventriculectomy can be used treat selected group of cardiac patient .

So surgical reduction has been proposed to reduce left ventricular wall stress and improve geometry in patients with left ventricular failure although left ventricular dysrhythmia negated the result . (49 & 8)

Further studies and longer follow- Up periods are needed to fully assess the effects of this procedure .

Anatomy and development of the heart

Development of the Heart

The human heart, as in all vertebrates, is formed by the fusion of two symmetrically developing tubes, but the fusion is gradual, commencing at the bulbar, or arterial end and extending to the venous end. The pericardial cavity can be identified before the head fold is formed or while it is in process of formation. (83)

Heart is then represented by groups of angioblasts which lie between the pericardium and the endoderm of the yolk sac. At this stage the ventral (or yolk sac) wall of the pericardium, which will form both the epicardium and the myocardium, is thicker than the dorsal wall and is termed the myo-epicardium. When the head fold is formed, the mantle becomes the dorsal wall of the peri-cardium and lies ventral to the foreget.

While this reversal of the pericardium is taking place, the cardio-genic mesoderm gives rise to two paramedian endothelial tubes which rapidly fuse to form a tubular heart. Except at its venous end the

tubular endothelial heart is separated from the myo-epicardial mantle by an interval occupied by a formless cardiac jelly.(83)

A transverse groove appears on the surface of the heart tube about its middle and indicates the junction of the bulbus cordis with the ventricle. The bulbus is situated cranial to the groove and is continuous with the first pair of aortic arches. The ventricle shows a second groove at its caudal end where it opens into a commen atrium, which lies at first in the floor of the pericardium (the future septum transversum) and is disposed transversely.

On each side the common atrium is joined caudally by a short venous trunk, formes by the union of the corresponding umbilical vein with veins issuing from the vitelline (yolk sac) plexus these trunks represent the right and left horns of the sinus venosus so that the common atrium may justifiably be termed a commom sinuatrial chamber.

Early in the fourth week the heart tube undergoes a striking change. the pericardium has been increasing in length proportionately with the heart, but now the heart tube begins to grow more rapidly than the pericardium and, as a result, the bulboventricular tube bulges ventrally and caudally, forming a U-shaped loop of which the bulb forms the right limb and the ventricle the left. On account of this loop-which is a conspicuous feature throughout the fourth and fifth weeks-a deep bulbouentricular notch is apparent on the outside of the heart and a corresponding bulboventricular ridge projects into the interior. The dorsolateral recesses of the pericarduium deepen and approach one another and their opposed walls fuse, completing the myo-epicardial covering of the heart and converting its broad dorsal attachment into a dorsal cardiac mesentery. This dorsal mesocar dium is transient and when it breaks down early in the fourth week a passage is established across the pericardial cavity from side to side dorsal to the heart. This persists as the transrerse sinus of the

pericardium. While these changes are occurring in the bulboventricular region, the atrial part is not unaffected, for the atrioventric-ular opening moves cranially and to the left, and both parts of the common atrial or sinuatrial chamber grow cranially into the pericardial cavity dorsal to the ventricle. Owing to these changes the atrioventricular canal for a time connects the left atrium to the ventricle and venous blood from the right side has to pass through both atria.

At this stage, reached about the middle of the fourth week, the bulbus cordis communicates with the dorsal aorta through the first pair of aortic arches, and these are connected with the capillary plexus associated with the developing cerebral vesicles. From this plexus the primitive head vein passes caudally, but it ends blindly before it reaches the heart. The intersegmenal arteries are beginning to grow out from the dorsal aorta on each side but they have not yet established connexions with the corresponding veins, the postcardinal veins, which later drain the body wall