



SNS COLLEGE OF ALLIED HEALTH SCIENCES
SNS Kalvi Nagar, Coimbatore - 35
Affiliated to Dr MGR Medical University, Chennai



DEPARTMENT OF CARDIO PULMONARY PERFUSION CARE
TECHNOLOGY

COURSE NAME : PRINCIPLES OF PERFUSION TECHNOLOGY I

II nd YEAR

TOPIC : VENTS AND SUCKERS



SUCKERS AND VENTS



- The pump **suckers** allow to salvaged the blood from the operative field to be returned to the circuit via the reservoir
- The vent (sumps) catheters are used for venting the left heart during CPB surgery, by selecting an adequate sizes, and the length of hole and the tip model according to the site which dedicated to placing the vent
- All vents should be tested before use briefly immersing the tip of the vent in a pool of blood at the operative site to confirm its suctioning effect
- Avoid excessive negative pressures is important , which can cause hemolysis
- This may be accomplished by use of a one way negative pressure relief valve in the vent line, or by inserted a small gauge needle in the vent line to relive pressure



CARDIAC VENTING



- The ventricles are unable to eject the blood during the period of arrest, so the vent must be placed to protect the heart from distension
- The left side of the heart receives blood from the **bronchial arteries and Thebesian veins**
- The right side of the heart receives blood from the **coronary sinus and leakage around the venous cannulae**



COMMON SITES (VENTS)



The common sites for placing vents are;

- The aortic root
- The right superior pulmonary vein
- The left ventricular apex
- Pulmonary artery , the left atrium or the left ventricle



SOURCES OF BLOOD RETURN



- **Normal sources** of blood returning to the left heart include bronchial , cephalic and pulmonary veins
- **Abnormal sources** include an LSVC, PDA, systemic to pulmonary shunt, septal defects, anomalous systemic venous drainage and aortic regurgitation



REASONS FOR VENTING



Reason for venting the heart during CPB;

- Prevent distension of the heart
- Reduce myocardial rewarming
- Improve surgical exposure
- Evacuate air from the cardiac chambers during the de airing phase of the procedure
- Create a dry surgical field, especially during the distal coronary anastomosis phase of CABG surgery



VENTING OF RIGHT HEART



- The venous cannulae effectively vent the right side of the heart, keeping it empty of blood except for any 'leakage' past the cannula
- This can be minimized by using bicaval cannulation and caval snares
- When antegrade cardioplegia is administered, releasing the caval snare will permit venting of cardioplegia solution returning via the coronary sinus to the right heart
- Placement of the pulmonary arterial vent will keep the right ventricle empty of fluid



METHODS OF VENTING



Venting can be achieved by ,

- The aortic root cardioplegia cannula – this method does not allow venting during cardioplegia administration
- The right superior pulmonary vein – a vent is passed into the left atrium and through the mitral valve into the LV
- The left ventricular apex
- The pulmonary artery – this may not be effective at venting the LV when there is aortic regurgitation with a competent mitral valve.



COMPLICATIONS



Complications of venting

- Damage to the LV wall due to excessive suction
- LV wall rupture if inadequately closed at the end of the bypass period
- Sump may introduce air into the left heart and carries the risk of systemic air embolism

Complications of suctioning

- Hemolysis
- Fat globule formation
- Activation of coagulation and fibrinolysis
- Platelet injury and loss
- Cellular aggregation
- Gaseous microemboli
- Bring the fat, bone, lipids and other debris from the surgical field that may aggravate the systemic inflammatory response and microcirculatory dysfunction