

SOP for Donor Retrieval Surgery

Preparation in Cardiac OT before departure of retrieval team

1. Place 4 litres of CUSTODIOL Cardioplegia (can also use St Thomas's or other crystalloid cardioplegia as per unit preference) solution, @ 4⁰C.
2. Surgical kit must include a sternal saw, a sternal spreader, aortic cross clamp, long vascular clamp for IVC, needle holders for 3'0' and 4'0' prolene sutures, long scissors, large right angle clamps and long 8-10" forceps. Long silk ties, one 4 '0' prolene suture, one aortic root or root-vent cannula. Cotton tapes. Two sterile packed basins. Three nos bowel bags. Additional few 3'0' and 4'0' prolene sutures. 4'0' merselene sutures if required. Silk sutures for pericardial cradle and needle holders.
3. 3-5 litres of ice slush and chilled saline solution in an ice chest
4. Triple bag technique
 - a. First bag contains 1 litre chilled custodiol and heart
 - b. Second bag contains first bag and 1 litre of ice slush
 - c. Third bag contains the second bag.
The first bag is placed in the second bag face down and second bag is placed in the third bag face down

DONOR SURGERY

Operative Steps

Upon Arrival

1. Call Transplant chief to indicate arrival at the site of donor harvest.
2. Ascertain the organs to be taken and specific plans for each donor retrieval team.
3. Assess patient's hemodynamic status. If necessary, optimize hemodynamic status by volume loading and weaning beta adrenergic pressers and beginning alpha agents to maintain perfusion.
4. Review ECG, echo, coronary angiograms, antibody status (i.e. HIV, Hep B, C, CMV, EBV)
5. Confirm blood type

Operative assessment

1. Perform sternotomy, and create a pericardial cradle with sutures.
2. Feel Ao, PA, LA, RA for thrills
3. Examine the heart for wall motion, scars and contusions

4. Palpate and observe the coronary arteries for atherosclerosis
5. Dissect out Aorta and Pulmonary artery, IVC, SVC
6. Place cotton tapes around the ascending aorta
7. Place a silk tie around the SVC, above the azygous, and place a ligature around the azygous

Confirmatory phone call

1. Notify the transplant center if the heart is acceptable.
2. Give an estimate of cross clamp time and travel time to allow planning to minimize ischemic time, particularly if prolonged reperfusion is necessary in the case of a reoperation or previously placed LVAD.

Organ recovery

1. Scrub prior to cannulation and ligation of the aorta and IVC by the liver/kidney team.
2. IVC should be vented infradiaphragmatic through the infrarenal IVC in cases where cardiac retrieval is planned.
3. Administer 30,000 U Heparin intravenously
4. Securely cannulate cardioplegia cannula, and attach clamped cardioplegia perfusion line.
 - The initiation of the clamping and perfusion sequence is initiated by the cardiac team.
 - Securely tie the azygous between triple ties, (two ties towards the donor organ)
 - Ask the anaesthetist to withdraw CVP line, Tie SVC above the Azygous,
 - Clamp IVC flush with the diaphragm (be aware of abdominal surgeons commencing perfusion prior to IVC clamp, the right heart would distend and heart would be rendered unusable.
 - Announce clamping aorta prior to Clamp Aorta,
 - Note time of aortic cross clamp
 - Infuse with Custodiol solution (30-40 mL/kg) at a hydrostatic pressure of 50 mm Hg for 6 to 8 minutes
 - Abdominal organ perfusion can commence alongside cardiac perfusion.
 - Hemisection the IVC anteriorly to vent the right heart.
 - Cut left superior pulmonary vein to vent the left heart.
 - Submerge the heart in slush solution
 - Place a sucker in the IVC to collect warm effluent.
5. Watch closely for inadequate venting and RV or LV distension, particularly if the lungs are being harvested, as the lung perfusate will return to the left atrium which must be adequately vented.
6. Once the cardioplegia is completed excise the heart

- Divide the IVC flush with the pericardium
 - Divide the aorta at the arch
 - Divide the pulmonary veins flush with the pericardium (unless the lungs are being retrieved then leave a small cuff of atrium attached to the veins.)
 - Divide the main PA at its bifurcation.
7. Place the retrieved heart in a basin of ice slush and ice cold saline
 8. Inspect the valves for defects and vegetations
 9. Check for the presence of a patent foramen ovale
 10. Insure there is an adequate rim of atrial tissue next to the coronary sinus
 11. Triple pack as per recommendation (see above)
 12. Complete documentation in the donor records of cardiac donor operating team, names and hospital
 13. Inform retrieval and onset of transportation times. Polite thanks and bye byes to ICU staff, retrieval transplant coordinator, anaesthetists, the liver team as well as staff.

Tips & Pitfalls

- Make sure the liver/kidney and pulmonary teams do not start infusion of perfusate until the heart is adequately vented, i.e. IVC partially divided and RSPV vented
- Avoid RV and LV distension
- Avoid damaging the coronary sinus
- Avoid damaging the SA node.
- One can mark the anterior-most location on the Aorta, PA, SVC and IVC with small suture marks for orientation at the recipient site. If you do this then do mention in accompanying notes.