CATHETERIZATION PROTOCOL
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Cath Procedure Diagnosis: Balloon Atrial Septostomy (BAS)

Hospitalization Requirement: Temporizing measure, hospitalization implied

Blood on hold (1 unit PRBC): No (type and screen sent, O neg available for neonates)

Pre-Cath Preparation: CBC, INR/PTT, Type & Screen

Cath setting conditions Intubated, ventilated, paralyzed.
Recommended settings:
A. ICU bedside if straightforward BAS (echo-guided)
B. Cath lab if complicated (very floppy inter-atrial septum (IAS) unsuccessful bedside BAS, very thick atrial septum particularly if late presentation or in setting of HLHS) (fluoroscopy +/- echo-guided)

Note: With thick atrial septum, BAS is frequently ineffective in tearing the IAS and often static balloon dilations, cutting balloon dilation, inter-atrial stenting may be indicated.

Cardiac Catheterization:

Catheters: At HSC, two options:

NuMed 6F sheath, 2cc balloon, very stiff balloon
Also 1cc balloon available for very stiff IAS or small infants < 2 kg
end-hole for wire (0.021”) & pressure monitoring if needed
separate port for balloon inflation/deflation

Miller 8F Cook sheath (fits into 7F Cordis sheath), 4cc balloon which is more compliant
No end-hole, one hole for balloon inflation containing stylet which is removed prior to BAS (keep stylet in while introducing catheter into the sheath +/- keeping it in up to balloon inflation to ease catheter across ductus venosus or across atrial septum)

Technical notes:
Balloons are inflated with saline if echo-guided and with contrast if fluoroscopy-guided.
De-air balloon but avoid inflating balloon outside of patient (particularly NuMed) as it increases its profile and decreases manoeuvrability of balloon catheter across atrial septum.

Access:
Obtain access either via femoral vein or umbilical vein.
Extremely difficult to cross PFO via neck veins particularly without a guiding wire.

Technique:
Balloon catheter is then passed into IVC, into RA, through PFO and into LA. Inflate balloon taking special care to avoid atrioventricular valve, pulmonary veins, atrial appendages. Once balloon inflated, pull back to atrial septum to feel tension and ensure entirely in LA. With a rapid, controlled jerk of the balloon, the membranous inferior margin of the foramen ovale is torn to allow improved mixing of pulmonary and systemic circulations. Take special care to stop after pulling into the RA to avoid causing damage to the IVC. Commonly 2-3 jerks of the balloon to ensure a good result.

More difficult if:
Very redundant atrial septum (makes tearing more difficult as balloon/septum are pulled towards RA without tearing the septum)
Thick atrial septum – e.g. HLHS

Post-BAS Management:
Reassess the ASD size echocardiographically and to assess for restriction of flow across the ASD. Once BAS successfully completed, the prostaglandin infusion can be discontinued and a surgical time co-ordinated for definitive repair. BAS is palliative only.

Complications: literature reports range between 0% to 11%.(much less now with echo guidance)
  • Arrhythmias
  • Rupture d/t erroneous positioning - atrial appendage, AV valve, VSD, pulmonary vein
  • Embolizations of ballon fragments and failure of balloon deflation reported
  • Embolic/cerebrovascular events (reference 5)

Documentation:
Procedure note in chart.
Cath diagram only if done in the cath lab.
For all cases, fill out BAS sheet found in the BAS equipment box and submit to Dr. Lee.

References: