10. OTHER CATHETERIZATION LABORATORY TECHNIQUES AND INTERVENTIONS: ATRIAL SEPTAL DEFECT CREATION, TRANSSEPTAL PERICARDIAL DRAINAGE, FOREIGN BODY RETRIEVAL, EXERCISE AND DRUG TESTING.

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CREATION OR ENLARGEMENT OF AN ATRIAL SEPTAL DEFECT

Rashkind and Miller reported the “Creation of an Atrial Septal Defect without Thoracotomy: a palliative approach to complete transposition of the great vessels” in 1966. Although a transcatheter technique to treat congenital heart disease had been reported more than ten years earlier, the impact of Rashkind and Miller’s report on patients with d-transposition of the great arteries and on interventional cardiology in general cannot be overstated. Balloon atrial septostomy (BAS) offered effective palliation for d-transposition of the great arteries and it is still used routinely in these patients.

Balloon septostomy is ideal for a patient with a thin septum primum and a left atrium large enough to accommodate a relatively large balloon. Unfortunately, many patients who would benefit from an atrial level defect do not fit these criteria. Other techniques and procedures including blade atrial septostomy, balloon septoplasty (balloon dilation of the interatrial septum using static balloons) and stenting the interatrial septum, have emerged to manage these patients.

Balloon Atrial Septostomy (BAS)

The most common indication for BAS (Fig. 10-1) is the newborn with d-transposition of the great arteries. We continue to perform BAS “routinely” on patients with d-transposition of the great arteries and an intact ventricular septum, even though the majority could be managed with PGE1 prior to neonatal surgery. Following BAS, PGE1 is discontinued. Despite the use of PGE1, an occasional patient will not mix well and can only be resuscitated with an emergent BAS. Infants with d-transposition of the great arteries and ventricular septal defect may also have some improvement in systemic oxygenation following BAS and they may also benefit from left atrial decompression.

We do not routinely perform BAS in newborns with obligatory interatrial shunts: patients with obligatory right-to-left shunts, those with pulmonary atresia and intact ventricular septum (PA/IVS) and those with tricuspid atresia, rarely develop a restrictive atrial defect. Furthermore, the goal in most patients with PA/IVS is to promote blood flow through the right ventricle; BAS would be counterproductive. Although BAS has been used in the past for patients with obligatory left-to-right shunts, e.g. left atrio-ventricular valvar atresia, we currently prefer to use other techniques.
The details of managing the newborn with d-transposition are beyond the scope of this discussion. Prior to performing BAS one needs to know the diagnosis from echocardiography. A thorough echocardiogram should be performed, this to include evaluation of atrial septal anatomy. In addition, abnormalities which would make BAS more difficult, such as juxtaposition of the atrial appendages or a left superior vena cava with a large coronary sinus, should be identified. In the occasional patient with a large true ASD, BAS will not be necessary. For the rare patient who is markedly cyanotic and unstable despite PGE1, an abbreviated echo can be performed while arrangements are being made for an immediate BAS. Remember to type and cross-match blood.

The basic technique for BAS has not changed since described in 1966 and is performed from either the femoral or umbilical vein using a 6 or 7F sheath depending on which balloon is used. The balloon catheter can be introduced