Pulmonary Artery Banding
G. RAINLEY WILLIAMS, M.D.

Reduction of blood flow to the lungs by surgical constriction of the pulmonary artery may be advisable in three groups of patients. Perhaps the most widely accepted indication is in the infant with a ventricular septal defect and massive left to right intracardiac shunting. Although most infants with a ventricular septal defect are not difficult to manage medically, a small number exhibit poor weight gain, repeated respiratory infections, atelectasis, and require repeated or even continuous hospitalization. When the managing physician feels that the infant may succumb before reaching a size which would permit direct surgical closure of the ventricular septal defect (about 12 pounds), constriction of the pulmonary artery may be considered as a temporary procedure. When the child becomes large enough, definitive closure of the ventricular septal defect and release of the band are planned. The mortality rate for pulmonary artery banding in this group of patients is acceptably low and clinical improvement is consistently good. There have been too few patients in whom the banding has been corrected at the time of definitive operation to permit assessment of the over-all risk. It does seem likely that as pump oxygenator techniques for infants are perfected, fewer patients with ventricular septal defect will come to preliminary pulmonary artery banding.

The second group in which pulmonary artery banding may be considered is infants with forms of congenital heart disease not amenable to corrective treatment by present techniques, but in which the life-threatening physiologic disturbance is massive pulmonary blood flow. Examples of such defects include single ventricle, truncus arteriosus, and Taussig-Bing complex. When shunting occurs distal to the right AV valve, pulmonary artery banding is a rational form of treatment. The operative mortality in these seriously ill infants is high, but the dramatic improvement which frequently occurs in surviving patients and the hopeless outlook without surgical treatment appear to justify continued investigation of this operative approach.

The third category of patients are those with pulmonary artery hypertension and increased pulmonary vascular resistance. Temporary reduction or damping of pulmonary pressure may allow regression of the existing pulmonary vascular disease. Too little experience has accumulated with this group of patients to comment further at this time. The technique of pulmonary artery banding is simple, but applying it in seriously ill small infants requires careful attention to detail. At operation, a band of teflon cloth, umbilical tape, or similar material is placed about the pulmonary artery and tightened until pulmonary blood flow is sufficiently reduced to produce the desired physiologic result. The end point for banding is either production of a 40-50mm. gradient between the right ventricle and distal pulmonary artery or a reduction of approximately 20 per cent in the distal pulmonary arterial oxygen saturation. The operation is short and at times it is obviously life saving. Continued review of indications and continued study of results will be necessary to assess the final place of this procedure.