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Ventricular Septal Defect Closure in Taussig-Bing Heart: The “Pulmonic Rule”

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Accurate ventricular septal defect patch sizing and tailoring remain challenging in many surgical procedures. Surgical exposure frequently limits complete visualization of the ventricular septal defect. Moreover, examination of the heart cavity under cardioplegic arrest may lead to skewed appreciation of the ventricular septal defect caliber and shape. Here we describe a simple and

safe surgical tip to predict the size and shape of the ventricular septal defect patch in Taussig-Bing malformation before starting extracorporeal circulation. The patch should be circular with a diameter equal to the under pressure, proximal, pulmonary artery diameter.

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The Taussig-Bing heart (TBH) is a rare congenital heart malformation first described in 1939 [1]. The Taussig-Bing heart is characterized by a double-outlet, right ventricle with a large subpulmonary ventricular septal defect (VSD). Surgical repair includes closure of the VSD [2, 3]. The size and shape of the patch is based on observation of the VSD through the pulmonic valve. This appreciation may be skewed by cardioplegic relaxation and limited exposure. We have observed that the size and shape of the VSD is reliably identical to the pulmonic root (Fig 1).

Technique

The pulmonic root is evaluated before decompression by the extracorporeal circulation. After exposure of the heart, we size the midpulmonary trunk with a Hegar dilatator. Then the patch is cut in a circular shape of the same diameter out of a polytetrafluoroethylene patch (0.4 mm in infants and 0.6 mm in children). The extracorporeal circulation is started and the VSD is closed through the pulmonic valve under aortic cross clamping and cardioplegia after transection of the pulmonary trunk. Each stitch is placed by gentle traction on the previous one, and at no time is the entire VSD visualization necessary. A running polypropylene suture of 7-0, 6-0, or 5-0 is used, according to the patient size. The operation is usually completed by an arterial switch.

Comment

The VSD closure necessitates adequate sizing and shaping of the patch. Generally the patch is tailored after a

sometimes difficult complete appreciation of the whole circumference of the defect. Limited exposure through the pulmonic valve in the relaxed heart can be misleading. Correct sizing and shaping of the patch before aortic cross clamping simplifies repair, shortens aortic cross clamping, and limits stress necessary to totally expose the VSD. We recently described a simple and precise way to predict the size and shape of the VSD patch in tetralogy of Fallot, which was found to be circular and of the same diameter as the aortic root [4]. Here we describe another

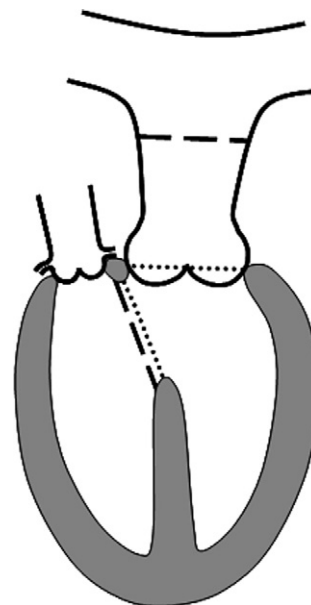


Fig 1. Illustration that the size of the ventricular septal defect (VSD) (dotted line) corresponds to the caliber of the pulmonic valve annulus. The VSD patch is cut in a circular shape with a diameter identical to the midpulmonary trunk (interrupted line).

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rule based on the recent 40 observations of the Taussig-Bing heart. The VSD is also circular and has the same caliber here as the pulmonic valve annulus.

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