CARDIAC AND PULMONARY REPLACEMENT

EDITORIAL: CARDIAC TRANSPLANTATION FOR AUXILIARY CIRCULATORY SUPPORT

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In this issue, Khaghani and associates report their experience with heterotopic cardiac transplantation in infants and children. This study is a welcome addition to the literature from the group at Harefield, which has assembled an extensive experience with this procedure.

The concept of using the transplanted heart as an auxiliary pump was introduced in 1964.^{1,2} These studies demonstrated that the auxiliary heart, placed in parallel with the animal's own heart, could sustain the circulation when the native heart was nonfunctional. This concept of assisted circulation now has been widely applied in the use of mechanical support, such as ventricular assist devices. It has been applied sporadically in clinical cardiac transplantation, and this report summarizes the experience in infants and children.

The authors report that in a total of 1278 cardiac transplants, 104 (8.1% of the total experience) were placed in the intrathoracic, heterotopic position. This report focuses on 12 infants and children, nine of whom survive. The indications that the authors cite are (1) presence of fixed high pulmonary vascular resistance, (2) availability of undersized donors, and (3) the expectation of a degree of recipient heart recovery. It is encouraging that all patients

showed a decrease in pulmonary artery pressure and all showed a normal growth pattern.

It seems probable that the application of auxiliary cardiac support, both with transplants and with mechanical devices, will continue. The use of this approach for transplantation into patients with high, fixed pulmonary vascular resistance seems established. The further development of ventricular assist devices similarly will usually use this approach in preference to in situ replacement of the heart. Its usefulness in treating patients with reversible myocardial disease is intriguing but not yet established.

The increasingly severe shortage of donor hearts has resulted in the use of marginally acceptable organs, and the use of such transplants as auxiliary pumps has certain advantages. Similarly, as cardiac xenografts approach clinical use, the auxiliary position rather than in situ replacement has appeal in this experimental area with uncertain outcome.

Finally, a comment about nomenclature: The term *heterotopic* is nonspecific and refers to placement of the heart in any abnormal position. In the literature of experimental cardiac transplantation, *heterotopic* often refers to cervical or abdominal placement of the heart. The term *piggyback* is flip-pant and should be discarded. I recommend the terms *auxiliary* and *parallel*, as used in the original publications of this technique. These terms appropriately describe the function of the transplant, which supplements cardiac function by working in parallel with the native heart.

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