The Present Status of Corrective Surgery for Congenital Heart Disease

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Beginning with the successful treatment of patent ductus arteriosus in 1938, of coarctation of the aorta in 1942, and of the tetralogy of Fallot in 1944, almost unbelievable strides have been made in the surgical treatment of congenital heart disease, due to the development of satisfactory pump oxygenator systems. It is conservative to say that cardiopulmonary bypass is an established and safe procedure which currently carries an extremely low mortality rate. The once controversial subjects of optimum flow rates, importance of pH changes, nature of gas mixtures and control of temperature, remain of physiologic interest, but practical answers are at hand. Use of bypass in very small infants remains a problem which is apparently being solved at present.

A review of the current status of surgical treatment of specific types of congenital heart disease is generally encouraging. Uncomplicated atrial and ventricular septal defects can be repaired with a mortality rate which compares favorably with that for uncomplicated gastric resections. Surgical relief of congenital stenosis of both aortic and pulmonic valves is accomplished with an even lower immediate mortality rate. The incidence of associated and probably acquired pulmonic infundibular stenosis in older patients with congenital valvular stenosis is a matter of surgical concern and perhaps adds an argument for earlier treatment of valvular stenosis. The great care necessary in the actual performance of aortic commissurotomy to prevent regurgitation has been learned at a disappointing price.

Treatment of tetralogy of Fallot by total correction is a less successful procedure. The necessity of using prosthetic materials in repairing the ventricular outflow tract, adds to the surgical risk. It is certainly true that many satisfactory results can be obtained but there is yet no reason for complacency. The group of complicated congenital defects, transposition, single ventricle, A-V communis, Ebstein’s anomaly and tricuspid atresia remain formidable. Total correction of transposition has been reported, but an extremely high mortality rate remains. Reduction of pulmonary flow in defects associated with large left to right shunts is palliative only.

If further advances in this field equal those of the past few years, the problems mentioned in previous paragraphs will be solved. In the technique of bypass itself, it seems probable that the immediate future will bring improvement in the convenience of the technique, and will permit the establishment of a cardiopulmonary bypass system which should allow prolonged support of the failing heart or other organ systems.

The future of surgical endeavor in treating specific defects is difficult to predict. However, it seems likely that the future will bring a broadening of the indications for surgical correction of uncomplicated septal defects. The use of prosthetic valves can be predicted with some confidence. In the treatment of the tetralogy of Fallot the future will surely bring improvement of present technical methods for dealing with the pulmonary outflow tract. The problem of preliminary shunts and their advisability will be solved by prolonged experience by careful observers, but complicated intracardiac defects probably will continue to offer the greatest challenge in the field. Finally, what must be considered the ultimate in cardiac surgery, the transplantation of an entire heart, seems certain of eventual accomplishment.

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