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I. SURGICAL FORUM—CURRENT CLINICAL AND EXPERIMENTAL RESEARCH IN LIVERPOOL

OPEN-HEART SURGERY IN NEONATES AND INFANTS

D. I. Hamilton

Progress in open-heart surgery has been rapid and rewarding during the past 15 years.

The correction of the more straightforward congenital defects in children carries an operative mortality of under 5%. This figure can also be achieved for the total correction of Tetralogy of Fallot. Most centres have concentrated on children aged 5 years and upwards. Many infants die within the first year of life, some having multiple cardiac defects, others being theoretically more amenable to totally corrective cardiac surgery. The possibility of executing open-heart surgery in infants during their first months of life is under study at the Royal Liverpool Children’s Hospital. Following earlier experiences using hypothermic perfusion, a normothermic method using a disposable bubble oxygenator is currently employed.

Recently nine infants aged 3 weeks to 5 months have undergone open-heart surgery. All were in severe cardiac failure uncontrolled by medical therapy. Weights ranged from 6 lb. 10 oz. to 9 lb. 12 oz. (3 kilograms–4½ kilograms). Pre-operative investigation including cardiac catheterization and ciné-angiography showed that four had total anomalous pulmonary venous return (T.A.P.V.R.), three had ventricular septal defects (V.S.D.), one had an Ostium Primum defect of the inter-atrial septum and one had pulmonary atresia associated with a V.S.D.

Following the induction of general anaesthesia the E.C.G., E.E.G., arterial and venous blood pressure, urinary flow and body temperature are monitored continuously. Frequent estimations of blood gases and pH are made.

A bilateral thoracotomy is preferred as the ductus arteriosus is first isolated and controlled, as this has been patent in some cases. (Its control
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is essential for the safe correction of total anomalous pulmonary venous return.)

A disposable bubble oxygenator has proved to be adequate. The ascending aorta is cannulated for arterial return from the machine and venous blood is drained from the venae cavae by two small plastic cannulae inserted through the right atrial wall. Precision diamond-jawed instruments and fine needles and sutures are employed, the heart being disturbed as little as possible before by-pass is commenced.

A dry quiet field is obtained by cross-clamping the aorta above the coronary artery ostia for periods of up to 20 minutes. Incisions must be carefully sited to avoid damaging coronary vessels and are kept as short as possible.

Results. Eight of the nine infants survived the operation and were returned to the recovery ward. All were placed on I.P.P. ventilation via a Jackson-Rees naso-tracheal tube. There are four survivors as follows:

| T.A.P.V.R. | .. | .. | .. | .. | .. | 2 |
| V.S.D. | .. | .. | .. | .. | .. | 1 |
| Waterston’s anastomosis for pulmonary atresia | .. | 1 |

Conclusion. Open-heart surgery is feasible in the neonate. The total correction of certain lesions causing uncontrollable cardiac failure has been successfully performed. Post-operative care is time consuming and demanding. This subject warrants further investigation and development.

THROMBECTOMY EMPLOYING CONTINUOUS RADIOLOGICAL CONTROL

Averil O. Mansfield

THROMBECTOMY IS AN established method of treatment for ilio-femoral venous thrombosis. Mavor and his colleagues have shown that the results of this operation are improved by the routine use of operative venography and the Fogarty catheter (1969, Brit. J. Surg. 56, 45). This paper describes a method of performing thrombectomy, employing continuous radiological control.

The method consists of the inflation of both the vena caval occlusion catheter and the thrombectomy catheter with radio-opaque material. The thrombectomy catheter is observed, employing a mobile image intensifier, during its passage to the vena cava and also during its subsequent withdrawal.

Advantages of this technique include the following:

Difficulties which may be encountered in negotiating the common iliac vein are diminished by visual control of the catheter. The catheter may be observed to enter a small collateral vein and the risk of inflating a balloon in such a small vessel is minimized.