EDITORIAL

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Coarctation of the Aorta

Recently there has been a great revival of interest in coarctation of the aorta since it has been found possible to correct the abnormality surgically. As in the case of other errors of development, congenital atresia of the oesophagus, the 'blue baby' of Fallot's tetralogy and the patent ductus arteriosus, the discovery of operative means of alleviating the condition has been accompanied by a great stimulus to the clinical investigation and understanding of these patients. Partly this must be due to the collection of such cases in centres where a surgeon is known to be interested in their treatment, for this gives unparallelled opportunities for the investigation of a number of individuals suffering from a disease, which under ordinary circumstances is only encountered on relatively few occasions in any one clinician's life.

Sir Thomas Lewis' classification of the condition is still of value. He, like Bonnet, divided coarctations into two types; an infantile, where there is a generalized narrowing of the aorta from the origin of the left subclavian artery to the ductus arteriosus, and an adult type where there is an abrupt constriction or even obliteration of the aorta at the insertion of the ligamentum arteriosus. All individuals with coarctation of the aorta are prone to show other abnormalities of development. These may involve either the heart and great vessels, e.g., a left superior vena cava or a patent interventricular septum; or the body at large, e.g., hypospadias or solitary kidney. The infantile type of coarctation is so often associated with numerous and severe abnormalities that the individual seldom reaches adult life, but the short coarctations pass unrecognized until some complication, such as endocarditis, supervenes. Possibly the condition is much commoner than is generally realized, and in more than one series of post-mortem examinations it reached a figure between 0.1 and 0.2 per cent.

These patients often present a typical clinical picture which will probably be recognized more frequently in the future. There is hypertension in the upper extremities, hypotension in the lower, with weak or absent pulsation of the femoral arteries. The collateral circulation which develops in the intercostal vessels and their connections causes grooving of the borders of the ribs and a bruit may be heard over these abnormal vessels. It is usually detected above and below the scapulae and in the axillae, we have heard such a systolic murmur in the enlarged inferior epigastric vessels. The diagnosis is confirmed by such refinements as cardio-angiography, when the actual extent of the stenosis is visualized and the possibility of its being operable can be forecast with some accuracy. Oscillometric studies in the lower limbs also provide contributory evidence.

The prognosis for these patients before the introduction of surgical treatment was poor, 50 per cent. died before they were 40 and 90 per cent. before 50 years of age. The common causes of death (Maud Abbott) being congestive heart failure, rupture of aorta or heart, cerebral haemorrhage and bacterial endocarditis. The symptoms of those who live are variable but may be severely incapacitating. Breathlessness and palpitations after exertion are common and may proceed to giddiness and collapse. Claudication after exercise is seen in some, undue tiredness, cough and headache have all been described.

It is to Crafoord of Stockholm to whom

must go the credit for evolving and successfully carrying out the first excision of an aortic coarctation. Crafoord had already shown that when the aorta had been clamped distal to the subclavian artery during a difficult case of patent ductus arteriosus for 27 minutes, that no harmful changes occurred in the tissues it supplied. Since patients with coarctation have such an excellent collateral circulation it was felt that occlusion of their aortae would be even less likely to cause damage. Thus on October 19th, 1944, the first coarctation was successfully excised and an end to end suture of the aorta performed through a lateral transpleural approach. As a result the patient obtained good pulsations in both lower limbs, whilst the blood pressure in the arms which had been 230/115 fell to 180/90. Twenty-four patients have now been submitted to the operation and the results are most encouraging, only the passage of time can show what effect it will have on the ultimate prognosis for these individuals.

In 1944 Blalock described experiments on dogs in which he was anastomosing the subclavian and pulmonary arteries. He suggested that it might be possible to perform an anastomosing operation on patients with coarctation. This suggestion may be of value in those rare cases with a long aortic stenosis who occasionally survive to adult life. In such individuals it may be possible to tie the large left subclavian artery distally and use the proximal end to implant by end to side anastomosis into the aorta distal to the coarctation. This has, in fact, been done recently by Crafoord on an adult and it may prove to be yet another step forward in the correction of these developmental abnormalities of the great vessels.

During the last ten years we have seen remarkable advances made in the surgical treatment of congenital anomalies of the cardio-vascular system and perhaps it is not too optimistic to expect further developments in this field. Patients with patent ductus, Fallot's tetralogy and now aortic coarctation have all been successfully operated upon. The next horizon should be an intracardiac one and if some method can be devised of maintaining the oxygen supply to the higher centres whilst such manipulations are undertaken, it seems not without the bounds of possibility that patent interventricular septum, mitral stenosis and a host of other crippling diseases may be alleviated by surgery.

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