Fig. 2. Arterial switch repair with the great artery transection at the level of the APW and incorporation of defect margins into the arterial reanastomosis.

reported patch closure of the APW and ventricular septal defect concomitant with a Senning atrial baffle repair. Both of these infants were first seen and were operated on at older ages (7 and 3 months respectively) than our patient, and both were found at necropsy to have significant pulmonary vascular disease. Accelerated progression of occlusive pulmonary vascular disease has been associated with d-TGA,⁷ particularly when combined with a left-to-right shunt.⁸ Coexisting D-TGA and APW should manifest a similar propensity toward early development of pulmonary vascular changes. Pulmonary hypertension has been suggested as a significant risk factor when assessing operability of APW⁹ and may be a significant factor in the outcome of operations performed on older patients.

The surgical repair described here provides the advan-

tages of a conventional arterial switch without extensive additional technical difficulty and is commonly performed before development of pulmonary vascular disease. Transection of the great arteries at the level of the APW in this case allowed the margins of the defect to be incorporated in the reanastomosis of the great vessels, and the coronary transfer could therefore be accomplished in the normal manner. A distal APW (Richardson type II or III) or an abnormality of coronary artery anatomy might not have been amenable to this surgical approach.

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ANTERIOR TRANSLOCATION OF THE RIGHT PULMONARY ARTERY TO PREVENT BRONCHOVASCULAR COMPRESSION IN A CASE OF TRUNCUS ARTERIOSUS AND TYPE A INTERRUPTED AORTIC ARCH

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The normal aortic arch produces a wide and harmonious curve that encircles the origin of the right pulmonary

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Accepted for publication May 22, 1995.

J THORAC CARDIOVASC SURG 1996;111:672-4

artery and the left pulmonary main bronchus. Relative shortening of the ascending or descending aorta (for instance after an arterial switch for transposition of the great arteries or after direct repair of a type A interrupted aortic arch) may produce a compression of these ele-

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0022-5223/96 \$5.00 + 0 12/54/66608

Fig. 1. *Left*, Relationship between the great arteries. The origin of the descending thoracic aorta has a caudal direction. *Middle*, Schematic representation of the potential compression of the right pulmonary artery after surgical correction. The descending thoracic aorta, connected to the underface of the ascending aorta, creates a narrow neo-aortic arch. *Right*, Anterior translocation of the right pulmonary artery over the ascending aorta prevents compression of the origin of the right pulmonary artery and provides more space for the left main bronchus.

ments. Anterior translocation of the right pulmonary artery over the aorta prevents its compression and seems recommended in some cases of type A interrupted aortic arch. A case of anterior translocation of the right pulmonary artery over the aorta during initial repair of a type 1 truncus arteriosus and a type A interrupted aortic arch is presented. This maneuver (akin to the Lecompte maneuver¹) should be considered in some cases of interrupted arch to avoid compression of the right pulmonary artery or of the left main bronchus.

A 5-month-old infant was transferred to our institution from a nonindustrialized country for failure to thrive and multiple episodes of cardiac decompensation. On admission on November 7, 1994, a type 1 truncus arteriosus with a perimembranous restrictive ventricular septal defect and type A interrupted aortic arch was diagnosed (Fig. 1, *left*). A few days after admission, intubation was necessary because of bronchopneumonia and pulmonary edema. The patient was put on an emergency list for a small-sized homograft. Controlled hypercapnia and hypoxemia were maintained to keep a balanced ratio between the pulmonary and systemic resistance. As soon as a homograft became available, the patient underwent a corrective procedure (surgeon, B. F.) with cardiopulmonary bypass and a 15-minute hypothermic circulatory arrest. The ventricular septal defect was enlarged and an internal

hemitube of polyester fiber was used to connect the left ventricle to the truncal valve. The ductus was divided, the descending aorta was mobilized as much as possible, and the descending aorta was directly anastomosed under the ascending aorta. This maneuver produced a posterior displacement of the ascending aorta, with a significant reduction of the space between the ascending and the descending aorta. It became evident that the right pulmonary artery would become constricted by the neo-aortic arch (Fig. 1, *middle*). The origin of the right pulmonary artery was therefore divided, brought up in front of the truncal root, and sutured back onto the pulmonary bifurcation. This maneuver was easy to perform because the right pulmonary artery was dilated. A 13 mm aortic homograft was used to connect the right ventricle to the pulmonary bifurcation. The postoperative course was uneventful, although partial compression of the left pulmonary bronchus was documented by bronchoscopy during the first 15 postoperative days. Three months later, magnetic resonance imaging showed no compression of the bronchus (Fig. 2), and the child was free of symptoms.

Compression of the pulmonary arteries or tracheobronchial tree is a recognized complication after corrective operations on ventriculoarterial connection anomalies. Before the Lecompte maneuver was introduced, this complication was encountered after an arterial switch for

Fig. 2. Magnetic resonance imaging study showing the anterior translocation of the pulmonary artery (arrow) over the truncal root and the narrow space within the neo-aortic arch. Note the posterior concavity of the ascending aorta.

transposition of the great arteries, especially when the arteries had an anteroposterior arrangement. Similarly, this complication has also occurred after one-stage repair of truncus arteriosus with interrupted aortic arch.^{2,3} In both situations, the corrective procedure pulls the ascending aorta posteriorly. The proximal part of the ascending aorta is brought deep (as the neo-aorta) on the aortic root in the case of transposition, and the middle or distal part of the ascending aorta is tracted posteriorly by the descending aorta (sutured to its underface) in the case of type A interrupted aortic arch. In this type of interrupted arch, the descending aorta is not connected to any brachiocephalic artery and curves immediately posteriorly and caudally from the ductus arteriosus (Fig. 1, *left*). Even after appropriate mobilization, the descending thoracic aorta may reach only the middle part of the ascending aorta and may create a significant posterior traction on

the ascending aorta. The curve of the newly constructed aortic arch is less ample, and the space between the ascending and descending aorta is narrowed (Fig. 1, *middle and right*). Measures aimed at reducing the risk of a bowstring effect on the right pulmonary artery or left main bronchus include a wide mobilization of the ascending aorta, head vessels, and descending aorta, or interposition of a graft between the ascending and the descending aorta. Anterior translocation of the pulmonary artery over the aorta prevents compression of the pulmonary arteries (mainly the right pulmonary artery) and leaves the left main bronchus alone to occupy the narrow space between the ascending and the descending aorta (Fig. 1, *right*). In January 1995, Rao and coworkers⁴ reported a patient who, after one-stage repair of truncus arteriosus with a type B interrupted arch, had compression of the right pulmonary artery. The compression was relieved during a second operation by transposing the right pulmonary artery in front of the ascending aorta. As in our case, anterior translocation of the right pulmonary artery should be considered during the initial operation of a one-stage repair of a truncus arteriosus associated with a type A interruption of the aortic arch. In this situation, the pulmonary arteries are usually dilated and the connection of the descending to the ascending aorta (the truncal root) is frequently performed at a more caudal level than in the other types of aortic arch interruption. In type B interrupted arch, pulmonary translocation should probably be considered if compression of the right pulmonary artery is considered likely.

Addendum

Unfortunately this child died in April 1995, 5 months after the operation. There was no opportunity for a postmortem diagnosis.

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