Complications of a ventriculoatrial shunt necessitating thoracic surgery

Case illustration

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Pulmonary infarction as a symptomatic manifestation of multiple thromboemboli caused by a ventriculoatrial (VA) shunt is exceptional in adults. Late complications that are life-threatening and necessitate cardiopulmonary surgery have not been reported earlier. The authors report the case of a 31-year-old man who was referred to their service for recurrent hemoptysis and dyspnea 12 years after insertion of a VA shunt. The distal portion of the VA shunt remained in the patient’s right atrium after an earlier unsuccessful attempt to remove it.

On general examination, the patient exhibited elevated jugular venous pressure. Laboratory data confirmed anemia and elevated values for the patient’s sedimentation rate and white cell count. Arterial blood gas analysis indicated hypoxemia and hyperventilation. Computed tomography scanning of the thorax revealed a large aneurysm of the left basilar pulmonary artery (Fig. 1 left). Angiography in the patient’s pulmonary arteries also revealed occlusion of the right upper lobe branch (Fig. 1 right) and multiple peripheral perfusion defects in both lungs. Using right-sided cardiac catheterization, pulmonary artery pressure was measured at 58/20 mm Hg (normal 25/10 mm Hg) and pulmonary vascular resistance at 325 dyne/cm$^2$ (normal 155–255 dyne/cm$^2$).

A one-stage radical surgical intervention was performed. After bilateral thoracotomies with transverse sternotomy (clamshell incision) were undertaken, the left lower lobe was resected (Fig. 2 left) and bicaval cannulation for cardiopulmonary bypass was instituted. The distal draining portion of the shunt containing the loose thrombi was removed from the right atrium. Because any further reduction of functional lung parenchyma or pulmonary circulation was assumed to be critical, an endarterectomy of the apical segmental artery of the right upper lobe branch was performed while the patient was in circulatory arrest at a temperature of 18°C. Weaning from cardiopulmonary bypass was uneventful.

Postoperatively, the main problem encountered was severe pulmonary hypertension despite the pulmonary endarterectomy. However, the patient was weaned from the ventilator after 3 weeks. Follow-up angiography of the pulmonary arteries showed patency of the apical segmental artery (Fig. 2 right). Eight weeks postoperatively, the patient was discharged from the hospital.

In conclusion, this clinical history stresses the potentially lethal late cardiopulmonary complications of a VA shunt in an adult and contributes new aspects in their treatment.