3D-MRI enables accurate preoperative diagnosis of extremely unusual great vessels in a neonate with complex congenital heart disease

CASE REPORT

A male neonate (weight 3.7 kg) with pulmonary atresia and a ventricular septal defect (Fallot type) was found to have additional complex aortic anatomy on echocardiography. 3D-MRI under general anaesthesia confirmed that the ascending aorta was connected to a right aortic arch giving rise to the right carotid and subclavian arteries, and that a left-sided aortic arch filled retrogradely from the descending aorta, supplying the left subclavian and left carotid arteries and then the pulmonary arteries via a ductus. There was no anterior communication with the ascending aorta (type D interruption[1]) (figure 1 and online video).

The MRI findings had major implications for the surgical approach. Therapy consisted of a central aortopulmonary shunt and excision of the arterial duct. To prevent tracheal compression, the proximal stump of the duct was fixed at the left posterior chest wall. Intraoperatively there was no anterior tissue strand.

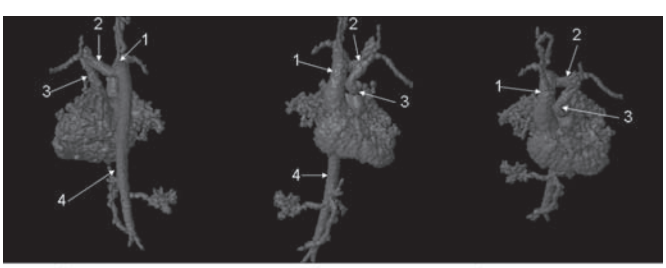

Figure 1 3D-MRI delineating complex double aortic arch anatomy with a left-sided interruption type D between the ascending aorta and left carotid artery. 1, right aortic arch; 2, left aortic arch; 3, ductus arteriosus; 4, descending aorta.

COMMENT

Only three cases of an interrupted double aortic arch type D have been reported.[1,2] This is the first report to show MRI findings confirmed by intraoperative anatomy of an interrupted aortic arch type D which allowed precise preoperative planning.

In cases of complex anatomy of the great vessels, the threshold for MRI scanning should be low to avoid intraoperative surprises.

Thomas Krasemann, Anna Barlow, Trisha Vigneswaran, Aphrodite Tzifa, Conal Austin, Gerald Greil

Department of Paediatric Cardiology, Evelina Children's Hospital, Guy's and St Thomas' NHS Foundation Trust, London, UK

▸ Additional data are published online only at http://adc.bmj.com/content/vol95/issue4

Correspondence to Thomas Krasemann, Evelina Children's Hospital, Guy's and St Thomas' NHS Foundation Trust, Westminster Bridge Road, London SE1 7EH, UK; thomas.krasemann@gstt.nhs.uk

Competing interests None.

Provenance and peer review Not commissioned; not externally peer reviewed.

Patient consent Parental consent obtained.

Accepted 15 January 2010

Arch Dis Child 2010;**95**:255. doi:10.1136/adc.2009.174649

REFERENCES

1. **Dipchand AI**, Williams WG, Hornberger LK. Double aortic arch with interruption proximal to the right carotid artery, bilateral patent ductus arteriosi, and complex congenital heart disease. *Pediatr Cardiol* 2002;**23**:246–7.
2. **Rajaram PC**, Hussain AT, Lakshmikanthan C, *et al.* Type D double aortic arch. Double aortic arch with interruption of its left component proximal to the site of origin of left common carotid artery. *Angiology* 1983;**34**:597–603.

ADC

3D-MRI enables accurate preoperative diagnosis of extremely unusual great vessels in a neonate with complex congenital heart disease

Thomas Krasemann, Anna Barlow, Trisha Vigneswaran, Aphrodite Tzifa, Conal Austin and Gerald Greil

Arch Dis Child 2010 95: 255
doi: 10.1136/adc.2009.174649

Notes