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CARDIOVASCULAR FLASHLIGHT
Cardiovascular surgery

Anomalous connection of the left common carotid artery to the main pulmonary artery independent of patent ductus arteriosus

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An 8-day-old female infant presented with post-natal respiratory distress. Colour Doppler imaging showed patent ductus arteriosus (PDA), ventricular septal defect, atrial septal defect, and severe pulmonary artery hypertension. Right-sided aortic arch, left common carotid artery (LCCA) arising from the distal pulmonary artery, aberrant left subclavian artery, and PDA connecting the main pulmonary artery (MPA) with the right-sided descending aorta were detected using computed tomography angiography and confirmed by intraoperative observation (*Panels A–E*). CHARGE syndrome was diagnosed in the patient based on whole-exome gene sequencing. The patient recovered shortly and was discharged after surgical procedures including ligation and division of the PDA, reimplantation of the LCCA to the ascending aorta (*Panel F*), and repair of the ventricular septal defect and atrial septal defect. Remarkably, no ductal tissue was observed at the reimplantation site of the LCCA.

Anomalous connection of the LCCA to the MPA is very rare in congenital aortic arch anomalies. These congenital aortic arch anomalies were widely considered to be originated from abnormal regression patterns during arch development and lead to the LCCA connecting to the pulmonary artery through the ductus arteriosus (*Panel G*), known as hypothetical double aortic arch of Knight and Edward. This theory was challenged by the presence of a fibrous ligament, which is suspected to be an independent arterial ligament, observed intraoperatively in a case of LCCA connecting to the main pulmonary. Here, we report of LCCA connected to the MPA directly, with a persistent patent duct, suggesting that the MPA in LCCA anomalies is not always connected by PDA and other developmental abnormalities such as malseptation of aortic sac may be involved. Anyhow, further research and more attention in clinical practice are necessary.

Consent: Written informed consent was obtained from the parent of the patient.

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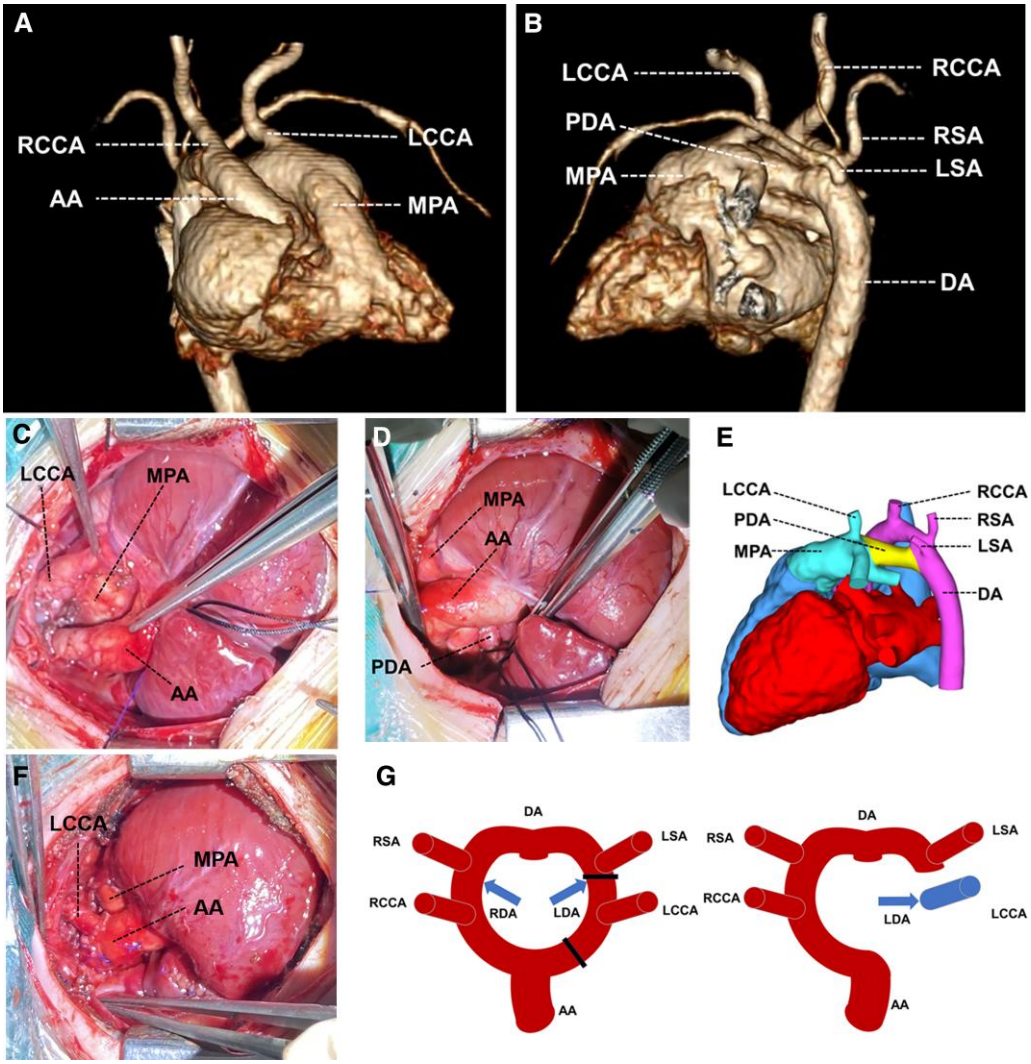

AA, ascending aorta; DA, descending aorta; RCCA, right common carotid artery; LCCA, left common carotid artery; RSA, right subclavian artery; LSA, left subclavian artery; MPA, main pulmonary artery; LDA, left ductus arteriosus; RDA, right ductus arteriosus; PDA, patent ductus arteriosus.

Conflict of interest: None declared.

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Data availability

For the privacy of the patient in this cardiovascular flashlight case, detailed data will be available on reasonable request to corresponding author.