Anomalous ductus arteriosus connection and its relationship with right aortic arch

Haiyan Cao, Mingxing Xie, Liu Hong, Yuan Peng, Yi Zhang, Xiaoyan Song, Qingchang Chen.
Department of Ultrasound, Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China.

Objectives
To analyze the sonographic features of anomalous ductus arteriosus (DA) connection in fetus, and to investigate the relationship between anomalous ductal connection and right aortic arch (RAA).

Methods
Detailed fetal echocardiography was performed on 5080 pregnant women referring to our hospital from 2014 to 2018. The three-vessel-trachea (3VT) view, DA transverse and long-axis view were chosen to observe the connection, course, dimension and flow direction of DA. A left/right/double-sided DA or aortic arch was determined by its relative position to trachea. The presence of vascular ring was evaluated in 3VT view. Other associated cardiovascular anomalies were also evaluated during the examination.

Results
Forty-one fetuses (gestational age 25.4±3.5 weeks) had anomalous DA connection according to detailed fetal echocardiography. A right-sided aortic arch was detected in all 41 cases. Twenty-nine fetuses (29/41) demonstrated a right-sided DA which abnormally connected between pulmonary trunk (PT) or right pulmonary artery (RPA) and descending aorta (DAo). The other twelve cases (12/41) revealed a left-sided DA abnormally connected between left pulmonary artery (LPA) and left subclavian artery (LSA). No vascular ring around the trachea was detected in all 41 cases. Five cases (5/41) were isolated anomalous DA connection with RAA, while the rest 36 cases (36/41) all demonstrated associated cardiac anomalies, including tetralogy of Fallot (14/41), pulmonary atresia (9/41), double outlet right ventricle (6/41), transposition of the great arteries (3/41) and other cardiac anomalies. Reversed flow across DA was observed in thirteen (13/41) cases.

Conclusion
In our study, anomalous arterial duct connection is always associated with right aortic arch and other cardiac anomalies, with the right-sided DA more frequently seen than the left-sided DA.