Prenatal echocardiographic evaluation in pulmonary stenosis correlated with postnatal intervention

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Objective
Reversed flow in ductus arteriosus (DA) means ductal dependence. However, it is difficult to predict the postnatal outcome before birth in moderate pulmonary stenosis and high flow to the lung such as double outlet right ventricle. Our objective was to evaluate the prenatal pulmonary artery (PA) assessment to predict postnatal intervention.

Methods
From 2012 to Feb. 2014, we retrospectively collected 12 fetuses with large ventricular septal defect and outflow stenosis but not atresia at Juntendo University Hospital. We divided three groups based on postnatal management as no treatment (NT; n=4), PA banding (PAB; n=4) and shunting (n=4). Then we assessed the diameter of PA and aorta (Ao), then converted to z-score. Doppler pattern in DA was also evaluated.

Results
PA diameter was significantly larger in PAB (0.54±1.63) group than in NT (-3.56±1.01; p<0.05) group. There were no differences in Ao diameter between the groups (NT=1.67±1.02, PAB=1.61±0.90, shunting=2.51±0.39). In shunt group, mean PA/Ao ratio was 0.62±0.11 and max PA z-score was -2.00. Although 75% of this group had a forward flow in DA, they resulted in shunting.

Conclusion
In PAB, the PA size is usually larger than 0 z-score. As it is difficult to predict the necessity of shunting prenatally in case without reversed DA, we still need to monitor the SpO2 after birth.