

## **Isolated right-sided congenital diaphragmatic hernia: prenatal MRI assessment of mediastinal shift**

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### **Objective**

To develop a mediastinal shift angle (MSA) measurement method applicable to right-sided diaphragmatic hernia (RCDH) in fetal MRI and to validate the predictive value of MSA in RCDH.

### **Methods**

27 fetuses with isolated RCDH and 53 normal controls were included in our study. MSA was measured on an axial image at the level of four-chamber view of the fetal heart. The angle between the sagittal midline landmark line and the left boundary landmark line touching tangentially the lateral wall of the left ventricle was used to quantify MSA for RCDH. Appropriate statistical analyses were performed to determine whether MSA can be regarded as a valid predictive tool for postnatal outcomes. Furthermore, predictive performance of MSA was compared with that of lung area to head circumference ratio (LHR), observed/expected LHR (O/E LHR), total fetal lung volume (TFLV), and observed/expected TFLV (O/E TFLV).

### **Results**

MSA was significantly higher in RCDH group than in control group. MSA, LHR, O/E LHR, TFLV, and O/E TFLV were all correlated with postnatal survival, pulmonary hypertension (PH) and extracorporeal membrane oxygenation (ECMO) therapy ( $P < 0.05$ ). Value of the AUC demonstrated good predictive performance of MSA for postnatal survival (0.901, 95%CI: (0.781-1.000)), PH (0.828, 95%CI: (0.661-0.994)) and ECMO therapy (0.813, 95%CI: (0.645-0.980)), which was similar to O/E TFLV but slightly better than TFLV, O/E LHR and LHR.

### **Conclusion**

We developed a measurement method of MSA for RCDH for the first time and demonstrated that MSA could be used to predict postnatal survival, PH, and ECMO therapy in RCDH.