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Fetal interatrial stent implantation

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Objective

The aim of this study is to report a series of cases with hypoplastic left ventricle and severely restrictive foramen ovale who underwent a fetal interatrial stent implantation.

Methods

A review of fetal and postnatal medical records and images of patients with hypoplastic left heart syndrome and a severely restrictive foramen ovale selected for fetal cardiac intervention was performed. For fetal interatrial stent implantation, after fetal paralysis and sedation, and under continuous ultrasound guidance, a 18 G needle was introduced in the fetal atrium and then across the interatrial septum, where a coronary stent (2.5 x 8 mm or 2.5 x 12 mm) was deployed.

Results

There were four fetuses with hypoplastic left heart syndrome and a severely restrictive foramen who underwent an interatrial stent implantation. Median maternal age was 38 years old (range 20-38), and median gestational age at intervention was 28.1 weeks of gestational age (range 27.5 to 30.3). There were 2 fetuses with hypoplastic left ventricles, 1 fetus with a borderline left ventricle who had undergone a fetal aortic valvuloplasty, and 1 fetus with a dilated left ventricle, severe mitral regurgitation and a previous fetal aortic valvuloplasty. The first intervened patient died after the procedure and perforation of the coronary sinus was observed in the fetal autopsy. In the other three cases the intervention was technically successful with no fetal demise nor maternal complications. Fetal magnetic resonance was performed in these patients before the procedure and between 4 to 8 weeks after the fetal stent implantation, showing an initial nutmeg lung pattern suggesting pulmonary lymphangiectasia that improved significantly in 2/3 cases. The 3 patients were born at 39 weeks of gestation with more than 3 kilograms and none of them required a neonatal atrial septostomy.

Conclusion

Fetal stent implantation is a feasible and technically challenging procedure, and in our small series of cases none of the newborn needed an urgent atrial decompression.