FETAL AORTIC VALVULOPLASTY: EXPERIENCE OF TWO CASES

Valentina Gesuete[1], Anna Balducci[1], Antonella Perolo[2], Elisabetta Mariucci[1], Gabriele Egidy Assenza[1], Maurizio Brighenti[1], Luca Ragni[1], Gaetano Domenico Gargiulo[3], Gianluigi Pilu[2], Andrea Donti[1]

[1] Pediatric Cardiology Unit, IRCCS Azienda Ospedaliero-Universitaria di Bologna
[2] Obstetric Unit, IRCCS Azienda Ospedaliero-Universitaria di Bologna
[3] Pediatric Cardiac Surgery Unit, IRCCS Azienda Ospedaliero-Universitaria di Bologna

Background:

Fetal aortic stenosis may progress to hypoplastic left heart syndrome with a poor prognosis. We report two cases of fetal aortic stenosis treated with fetal aortic valvuloplasty using ballon valvuloplasty.

Cases report:

After fetal anesthesia by intrafunicular injection fentanyl and contextual curarization, an ultrasound-guided balloon aortic valvuloplasty was performed in two fetuses with severe aortic stenosis and left ventricular dysfunction at 28 weeks of gestational age between July 2021 and March 2022. Under continuos echocardiography guidance, a 18-gauge cannula with a stylet needle was introduced into the maternal abdomen and directed from the fetal thorax to left ventricular apex, aiming toward the aortic valve (Figure 1).

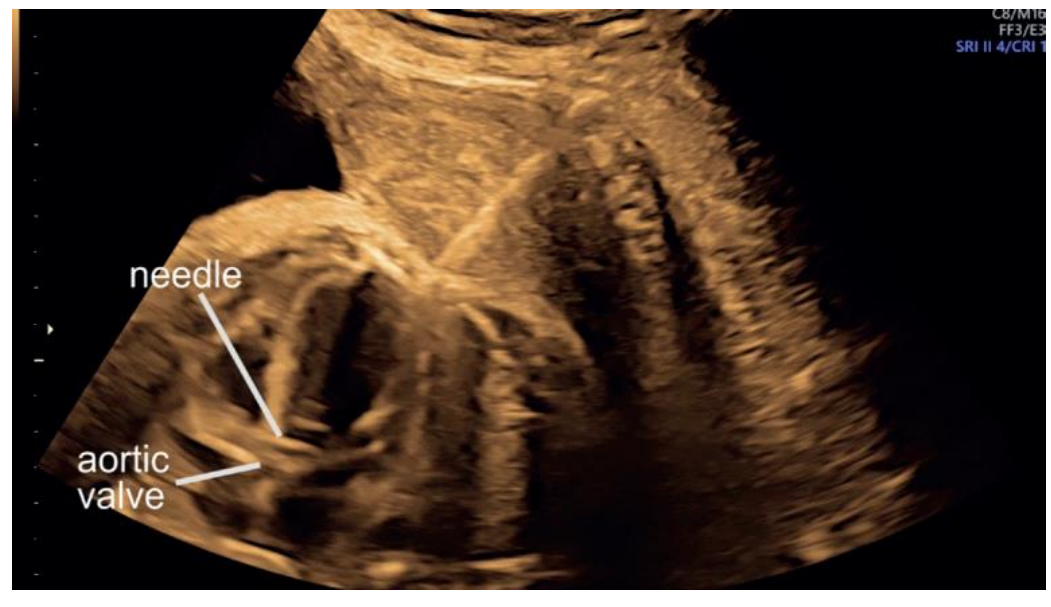

Figure 1

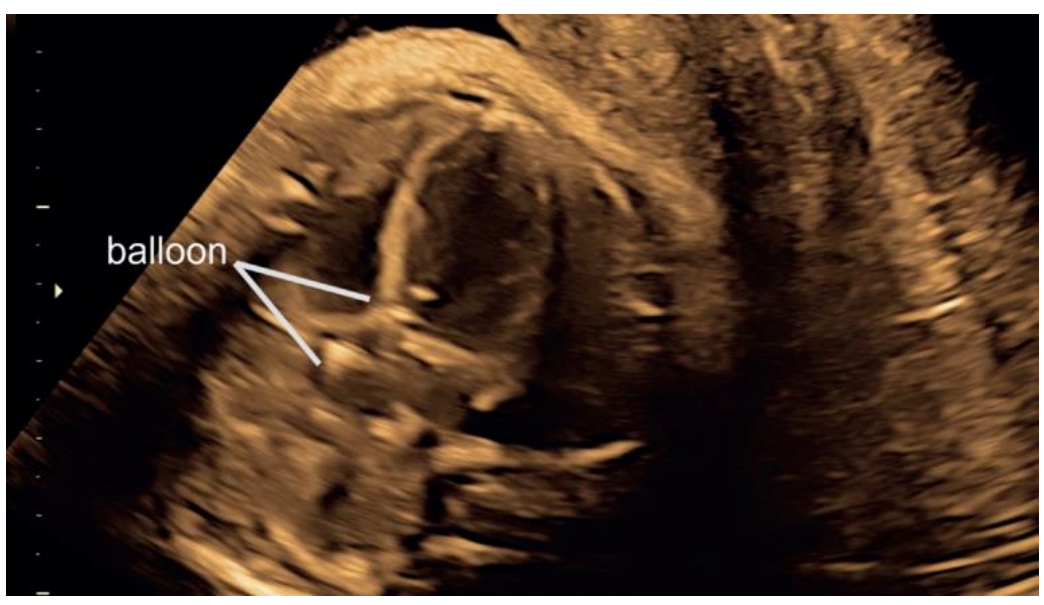

Figure 2

After advancing the cannula just beneath the aortic valve, the stylet needle was removed and a 0.014 in guide wire was introduced across the valve. A 3 x 12 mm (15 atm, case 1) and a 3,5 x 10 mm (case 2) ballon was used and the balloon was inflated five times (15 atm, case 1) and four times (14 atm, case 2) (Figure 2).

In the first fetus, mild pericardial effusion developed and resolved within 48 h. In the second case, severe bradycardia occurred so fetal intracardiac administration of adrenaline was performed with resumption of an adequate heart rate. In addition, a mild pericardial effusion developed and resolved in a few days. No maternal complications occurred in either case.

The first fetus was delivered by elective Caesarian section with a birth weight of 3,5 kg at 38 weeks of gestation. Postnatal echocardiography showed bicuspid aortic valve with severe stenosis and moderate left ventricular disfunction. The infant was started on inotrope therapy to improve cardiac function and underwent two aortic balloon dilatations that resulted in residual moderate aortic regurgitation and stenosis. At the time of this writing, he was 10 months and doing well in follow up.

The second infant was delivered by elective Caesarian section with a birth weight of 3,2 kg at 38 weeks + 5 days of gestation. Postnatal echocardiography showed a diminutive left ventricle, severe aortic stenosis and parachute mitral valve with severe mitral stenosis. He underwent aortic balloon dilatation. At the time of this writing, he was 5 days of life and required prostaglandin and high-dose inotrope therapy.

Conclusions:

Fetal aortic valvuloplasty seems to be a feasible procedure. It has been reported that it has the potential to prevent progression to hypoplastic left heart syndrome in selected foetuses with severe aortic stenosis. We have reported our initial experience.