Hybrid stenting of restrictive atrial septum in an infant with hypoplastic left heart syndrome after hybrid stage 1 palliation

The prognosis of children born with hypoplastic left heart syndrome (HLHS) has improved in the last decade. Survival rates are up to 70% for Fontan completion in published series. The most important problem with HLHS patients is restrictive interatrial communication, which decreases survival. In recent years, a transcatheter approach to urgent atrial septal perforation and balloon septoplasty and/or atrial septal stenting have been offered.

A 4.5-month-old boy, who underwent hybrid Norwood stage 1, bilateral pulmonary artery banding and ductal stenting with the diagnosis of HLHS when he was 10 days old, was referred to our hospital because of severe hypoxemia, dyspnea, and acidosis. Echocardiography revealed that the main problem was restrictive interatrial communication, and urgent catheterization was planned (Fig. 1A-D/please see the next page). Both femoral veins were obstructed, so a hybrid approach was chosen. The right atrium was reached through a right thoracotomy, and a 7 F sheath was placed into the atrium. Under transesophageal echocardiography and fluoroscopy guidance, a wire was positioned in the left upper pulmonary vein after looping in the left atrium, and a 9 x 18-mm cobalt iliac stent was put in the interatrial septum (IAS) (Video 1-2). The patient was extubated on the 3rd postoperative day and discharged on the 7th postoperative day.

When vascular access becomes a challenge in complex situations, stent implantation into the atrial septum can be performed by a hybrid approach through thoracotomy.

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Figure 1. A-D. (A) 2D echocardiographic view of interatrial septum; the bulging to the right side. (B) Color Doppler echocardiographic view of interatrial septum; notice the restrictive color jet. (C) Angiographic view guidewire and sheath passing through the interatrial septum; arrow shows a patent ductus arteriosus stent. (D) Angiographic view after deploying the interatrial stent; arrow shows a patent ductus arteriosus stent

Video 1. Echocardiographic evaluation of the interatrial septum before and after interatrial stenting

Video 2. Catheter intervention of interatrial stenting

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