

Creation of a de-novo-fenestration by a cutting balloon technique in a child with failure of an extra-cardiac conduit Fontan circulation

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Introduction:

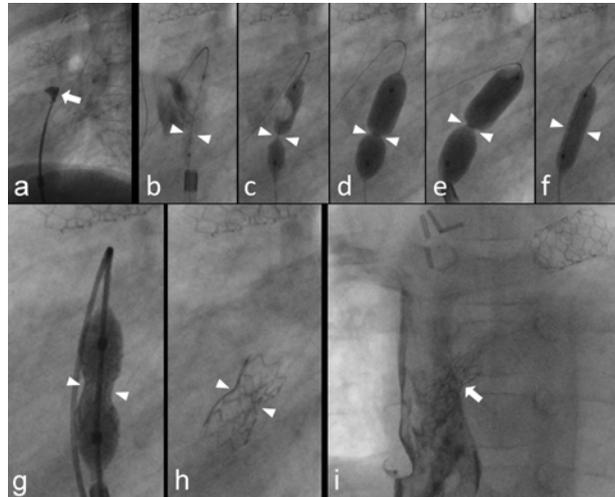
In patients with a failing Fontan circulation based on an increased trans-pulmonary pressure gradient (TPG) at rest or exercise, de-novo creation of a communication between the Fontan conduit and the atrium is a possibility to increase cardiac output and decrease systemic venous pressures even if an extra-cardiac synthetic conduit was used for TCPC (total caval pulmonary anastomosis). However, in some patients this procedure remains challenging. We present a patient in whom a cutting balloon technique became necessary to dilate the conduit-atrial wall junction before a stent could be placed to maintain patency.

Method:

Retrospective case study.

Results:

In a child with plastic bronchitis and abnormal TPG as symptoms of a failing TCPC, transcatheter fenestration was performed. With mechanical force a trans-septal Brockenbrough needle was advanced through the extracardiac Fontan conduit (gelatin coated polyester) and the atrial wall to place a guide wire. A long sheath could not be advanced because of the rigidity of the material. A series of conventional balloon dilations with high-pressure balloons did not achieve an increase in size of the novel communication. Thus a cutting balloon was used to successfully create a fenestration. To maintain patency finally a butterfly-shaped stent was implanted. No complications occurred.



The figure shows fluoroscopic images in lateral (a-f) or a-p projection (g-h). a) Puncture with the transseptal needle at the marked position in the Fontan conduit. b-e) Unsuccessful conventional balloon dilatation with balloons of increasing size (b: 3mm, c: 5mm, d: 6mm, e: 8mm) of the newly created communication between the Fontan conduit and the atrium. f) Successful cutting balloon dilatation (4mm). g) Placement of a pre-mounted Palmaz-Genesis stent (7mm balloon). h) Stent with the desired residual waist. i) Shunt from the Fontan-conduit into the atrium.

Conclusion:

Cutting balloon dilation can be an option to achieve adequate sized fenestrations in failing Fontan patients when conventional balloon dilation fails, especially when rigid conduit materials were used.