Novel Method of Surgical Preparation for Transcatheter Completion of Fontan circulation: creation of an extracardiac pathway.

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Objectives: We report creation of a novel surgical preparation for transcatheter completion of extracardiac Fontan circulation.

Methods: Nine lambs underwent surgical preparation; inferior vena cava (IVC) was cut with right atrium (RA) rim and anastomosed end-to-end with the inferior end of a Gore-tex conduit. A nitinol ring was placed around the IVC near the anastomosis. The SVC was cut and connected end-to-end with the RA auricle. Upper segment of Gore-tex tube was opened and connected to RA to allow free flow of IVC blood. The superior end was closed using PTFE membrane and a stented segment harvested from Contegra conduit was interposed between the superior end and the SVC for smooth transition. Fontan completion (opening of the SVC connection and closure of the fenestration) was attempted at 1-3 months following surgery. Animals were sacrificed just after (n=7) and 3 months after completion (n=2).

Results: All lambs were successfully preconditioned with one postoperative death due to SVC-RA occlusion, one elective sacrifice after 2-months to assess pathway integrity and seven successful completions. Autopsy findings showed widely patent IVC and SVC and covered stents well deployed to completely occlude fenestration.

Conclusions: A new method of surgical preparation and its subsequent transcatheter completion of extracardiac Fontan is created. This surgical preparation opens new frontiers for transcatheter and hybrid techniques for extracardiac Fontan completion.