Reconstruction of the RVOT with a conduit

Lifetime follow up

Akademisk avhandling

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Avhandlingen baseras på följande arbeten:

I Kristofer Skoglund, Peter Eriksson, Gunnar Svensson, Mikael Dellborg. Homograft reconstruction of the right ventricular outflow tract in adults with congenital heart disease: a systematic review.
Interact CardioVasc Thorac Surg 2015; doi:10.1093/icvts/ivv264.

II Kristofer Skoglund, Malin Berghammer, Peter Eriksson, Gunnar Svensson, Ulf Thilén, Mikael Dellborg. Decline in Self-reported Health (EQ-5D) over Time after Surgical Reconstruction of the Right Ventricular Outflow Tract: A Longitudinal Cohort Study of 103 Patients.
Congenit Heart Dis. 2015;10:E54-E59.

III Kristofer Skoglund, Gunnar Svensson, Ulf Thilén, Mikael Dellborg, Peter Eriksson. National registry study of RV to PA conduits: Impact of transcatheter pulmonary valve replacement in adults.
Submitted

IV Kristofer Skoglund, Gunnar Svensson, Ulf Thilén, Mikael Dellborg, Peter Eriksson. Predictors of Long-term Outcome after RV to PA Conduit Surgery and Reintervention.
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ABSTRACT

Background: The use of a conduit is an established surgical method for reconstruction of the right ventricular outflow tract in congenital heart disease. The most commonly used conduit is a homograft. Its limited durability makes reinterventions almost inevitable but the actual durability of a conduit in the adult population is poorly described. The introduction of transcatheter pulmonary valve replacement (TPVR) has expanded the possibilities for conduit reintervention but the impact of this new technique on clinical practice is unknown. Furthermore, little is known on the influence of reinterventions on quality of life. Conduit surgery and reintervention is among the most common surgical procedures in adult congenital heart disease but relative lack of knowledge complicates decision making.

Method: Paper 1: The PubMed database was searched in May 2015 with the terms "homograft AND pulmonary valve," generating 665 hits. Studies involving more than 50 patients with a mean or median age >18 years were included. Papers 2–4: The Swedish registry of congenital heart disease (SWEDCON) was used to collect data. Patients were identified by codes for classification of surgical procedures and a group variable specific for patients with a conduit.

Results: Paper 1: Six studies with a cumulative total of 560 patients were found and included. Perioperative mortality was 0%–2.9%, and long-term mortality was 2%–8.8% at 8.1–10 years. Reinterventions of homografts were common during patients' lifespans, with a 10-year event-free survival of 78%–80%. Early postoperative echocardiographic or magnetic resonance imaging defects appear to predict rapid homograft degeneration. *Paper 2*: Data on quality of life (EQ-5D) from the first and latest visit were collected from 103 patients with a mean age of 31 years. Mean time from first to latest visit was 3 years. Health perception (mean EQ-VAS) declined from 84.4 (SD=14.6) at the first visit to 78.6 (SD=18.3) at the latest visit (P=0.001). This decline was not observed in patients with reinterventions between visits (n=18). Low EQ-VAS was associated with symptoms and NYHA class II–IV. Problems in the EQ-5D dimension "usual activities" were more common in patients with reinterventions (25%) than in those without reinterventions (7%) (P=0.04). *Paper 3*: From 2000 to 2014, there was an increase in the number of adult patients with conduits from 122 to 536, including 60 surgical conduit replacements, 40 TPVRs, and 176 new conduit implantations. There was a significant increase in new implantations (P=0.007) and surgical conduit replacements (P=0.024) across all three time periods. Patients with new implantations were older (median age, 32 years) compared with those in the reoperation and TPVR groups (median age, 26 years), with the majority of patients having tetralogy of Fallot (57%). The majority of conduit reinterventions were surgical also after the introduction of TPVR in 2007, with no significant difference regarding diagnosis, gender, age, or previous number or longevity of conduits between surgical replacement and TPVR. *Paper 4*: A total of 574 patients with a conduit (mean age 36.1 years) were identified. Tetralogy of Fallot represented the largest group (45%). There were 769 operations and 50 TPVRs. Long-term survival after the first conduit operation (mean age 20.2 years) including perioperative mortality (<1%) was 93% at 20 years. The most common cause of death was cardiac-related. Higher age at first conduit operation was associated with an increased mortality risk. Event-free survival was 77% and 54% at 10 and 20 years, respectively. Ten-year event-free survival after the first conduit reintervention (n=176) was 70%, significantly lower than after the first conduit operation (P=0.04). Higher age at the first conduit operation had a protective association, whereas male gender and complex malformations were associated with an increased risk of further reintervention.

Conclusion: Patients perceive a decline in their health over time after right ventricular outflow tract surgery. This decline was not observed in patients with further reinterventions. The number of patients with a conduit is increasing, and reinterventions for conduits are common. Since the introduction of TPVR, less than half of all patients with conduit failure are treated by this technique.Long-term mortality after conduit surgery and reinterventions is low, but the need for conduit reinterventions is substantial. Perioperative mortality is low in relation to cardiac-related death.

Keywords: congenital heart disease • RVOT surgery • conduit • quality of life • outcome • TPVR

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