Long-Term Outcomes of Patients Following Surgical Repair of Truncus Arteriosus Communis

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PURPOSE

To study the long-term outcomes of patients after surgical repair of truncus arteriosus (TA) and highlight the associated mortality, morbidity, and reintervention rates.

BACKGROUND

Truncus arteriosus (TA) is formed when the common blood vessel in the heart fails to divide into the aorta and pulmonary artery. This causes the oxygen-poor blood to mix with the oxygen-rich blood before it is pumped into the body. Consequently, truncus arteriosus is a cyanotic congenital heart defect that is fatal for the newborn if left untreated. However, there currently no consensus within the medical community regarding the optimal repair of TA. Children's National has instead been using non-invasive femoral vein homografts as the general protocol for TA repair. The current guidelines for TA repair are to surgically separate the pulmonary and systemic pathways via a right-ventricle to pulmonary artery (RV-PA) conduit. However, according to Thoracic Surgeons Congenital Heart Surgery Database (STS), there is a surgical mortality of 9.2% in children and 10.8% in neonates using this technique for repair. Additionally, almost all of the conduits require reinterventions later in life. Therefore, we hypothesize that RV-PA conduits established via non-invasive femoral vein homografts instead will have lower rates of reintervention and mortality. This is primarily due to the reasoning that femoral vein homografts have been utilized for other congenital heart conditions to show better survival and reintervention rates.

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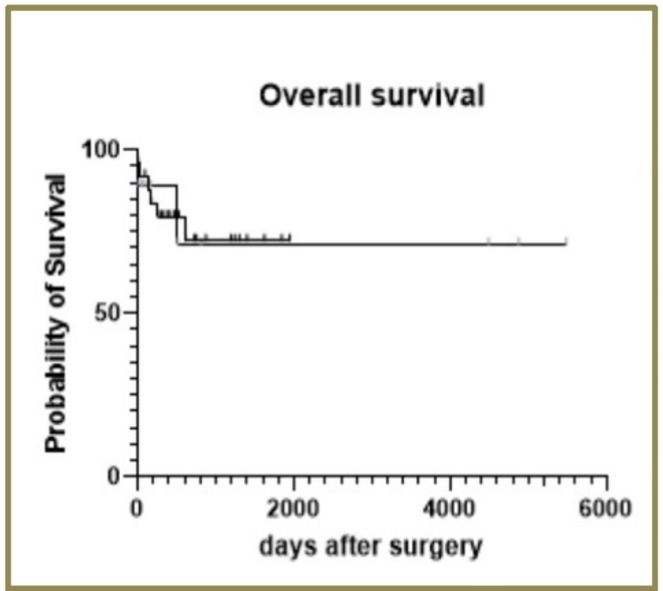

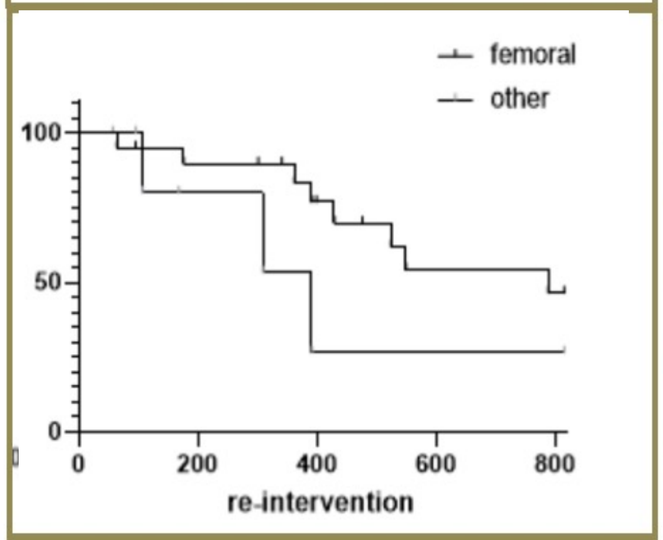

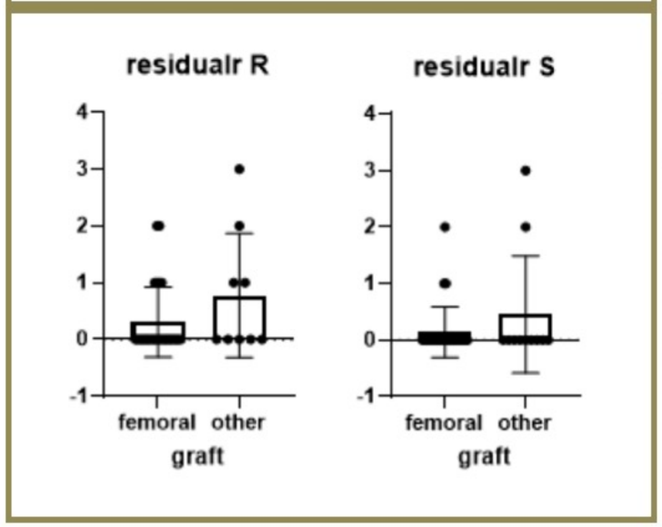

METHODS

Retrospective review was conducted of all infants who underwent surgical truncus arteriosus repair between January 2006 and July 2020 in the institutional database. Our primary outcomes were operative and long-term survival. Secondary outcomes included long-term reintervention rates, length of hospital stay and outcomes of RV-PA conduits. Kaplan-Meier curves were utilized to identify differences in survival and freedom for reintervention.

RESULTS

Thirty-six patients underwent TA repair with mean follow-up of 3.2 years [0.04-15]. Median age was 7 days [3-164] and median weight was 2.96 kg [1.6-6.4] at surgery. Eighteen patients (50%) had type A1, 11 (30.6%) A2, and 7 (19.4%) A4. Nine patients (25%) had preoperative moderate or more truncal valve insufficiency. Femoral vein homografts (FVH, n=26) and other (aortic/pulmonary, Goretex, n=10) were used for right ventricle to pulmonary artery connection. Median hospital stay was 33 days [11-210].

There were 3 operative mortalities. Long-term mortality was seen in 5 patients caused by septic-shock, multi-organ failure, cardiac-arrest and unknown reasons. Freedom from overall and surgical reintervention were 51.7% and 69.44% after median of 548 and 837 days post-surgery, respectively. Freedom from reintervention for FVH and other conduits were 47.6% and 62.5% after median of 1185 and 837 days post-surgery, respectively. Surgical truncal valve reintervention was performed in 13.9% of patients.

CONCLUSION

Surgical repair of TA has excellent operative outcomes with continued need for long-term reinterventions on the right ventricular outflow tract and truncal valve. FVH conduit is comparable to other homografts for TA repair with a satisfying mid-term outcome.