

Tachyarrhythmia following Norwood Operation: A Single Center Experience

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Introduction: Bradyarrhythmias are known risk factors for death following Norwood operation. Tachyarrhythmias are common following repair of congenital heart disease, and may be associated with increased morbidity and mortality. The purpose of this study was to determine the incidence of tachyarrhythmia in patients following Norwood operation.

Methods: Retrospective chart review of all patients who underwent stage I Norwood procedure from 1/1/2002 to 9/1/2011 (n=100). Data collected included demographics, shunt type (modified Blalock-Taussig shunt (mBTS) or Sano shunt) cardiopulmonary bypass (CPB), cross clamp and circulatory arrest times, type of tachycardia and need for antiarrhythmic medication at discharge.

Results: Data regarding arrhythmia was available for 98 patients. Operative mortality after Norwood was 20% (19/98). Tachyarrhythmia occurred in 33/98 patients (34%). Operative mortality was 9% (3/33). There was no difference in mortality in those with tachycardia compared to those without (p=0.33). Causes of mortality in those with a tachycardia included cardiac arrest (n=2) or circulatory collapse requiring ECMO (n=2), respiratory arrest (n=1) and dural sinus venous thrombosis (n=1). There was no significant difference in the incidence of arrhythmia based on shunt type (p=0.23) where 8/32 underwent palliation with mBTS, and 25/66 with a Sano shunt. There was a significant association between male gender and duration of circulatory arrest for the development of arrhythmia (p=0.003 and p=0.02 respectively). Of the 33 patients with arrhythmia after Norwood operation, the distribution was as follows: atrioventricular reentry (AVRT): n= 17; junctional ectopic tachycardia (JET): n=6; atrial flutter (AFL): n=2; atrial ectopic tachycardia (AET): n=4; wide complex tachycardia: n=1; ventricular tachycardia (VT): n=2. One patient had AVRT and JET. Thirty patients survived to hospital discharge with 23 receiving anti-arrhythmic therapy. Twenty received monotherapy with: Amiodarone (n=1), Digoxin (n=9), Sotalol (n=9) and Propranolol (n=1). Three patients received dual therapy with digoxin and flecainide (n=1) or amiodarone (n=2).

Conclusion: Post-operative tachyarrhythmia is common, occurring in 34% of our patients after Norwood operation. Shunt type was not associated with tachycardia. Male gender and longer circulatory arrest times are significant risk factors associated with the development of a tachyarrhythmia. Tachycardia was not associated with increased risk of death.