

Long-Term Arrhythmia Outcomes in Adults with Repaired Tetralogy of Fallot

Zachary Falk¹, Jeffrey Moak², Annette Aldous³, Seiji Ito², Anitha John²

¹GWU School of Medicine and Health Sciences, Washington, DC

²Children's National Medical Center, Department of Cardiology

³GWU Milken School of Public Health

BACKGROUND

Tetralogy of Fallot (TOF) is the most common cyanotic congenital heart disease in adults, accounting for up to 10% cases^{1,2}. While 30-40-year survival is excellent at 85%-90%, patients are at risk of arrhythmias and sudden cardiac death (SCD) after repair^{3,4}. The objective was to determine the frequency of various arrhythmias and assess therapies used to treat each type.

METHODS

A retrospective review was conducted of all adults with repaired TOF ($n=242$) from the Washington Adult Congenital Heart Program at Children's National Medical Center. Data were extracted from patient charts and analyzed in R, Version 4.1. We used a Chi-squared Goodness of Fit test to compare frequency of any arrhythmia with the 43% reported by Khairy et al.⁵

RESULTS

With a mean age of 38.1 years (55% female, 64% white), and mean follow-up duration of 30.2 years, 29.8% of the cohort ($n=72$) developed at least one arrhythmia, significantly lower than the 43% previously reported ($\chi^2=17.3$; $p < 0.0001$). The most frequent was ventricular tachycardia ($n=37$). Medical therapy had a 41.6% success rate; ablation ($n=27$) carried a 74.1% success rate. Devices (PM=9; ICD=28) were implanted in 37 patients (ICD, 67.8% primary prevention). Twelve patients with ICDs had shocks (3 inappropriate), nine had antitachycardia pacing, and six had both. In our series, there were no cases of SCD.

CONCLUSION

The frequency of arrhythmias in adults with repaired TOF approximates 30% in our cohort, less than what has been reported previously. Catheter ablation was effective for those who failed medical therapy. Future investigation will aim to identify risk factors associated with the development of various arrhythmias.

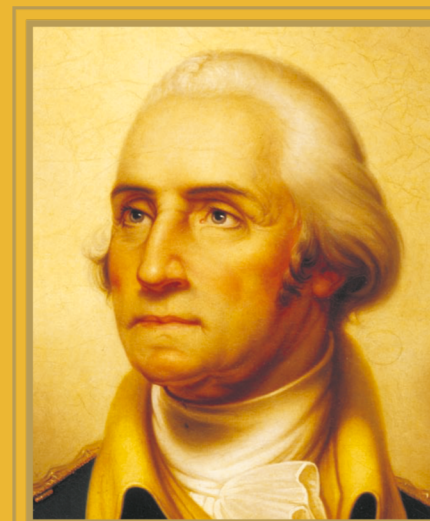


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DISCUSSION

Our data indicates that in a cohort of 242 adult patients, the frequency of arrhythmias is significantly less than what has been reported. While improved surgical technique may play some role, our hypothesis was that the frequency would be greater due to more robust diagnostic capability, especially in ambulatory monitoring.

Arrhythmia Type	Response to medical therapy	Response to ablation	PM implant	ICD implant	ICD therapies
Sick sinus syndrome (n=1)	0	0	1	0	0
3rd degree AV block (n=8)	0	0	8	0	0
Atrial tachycardia (n=22)	9	3	0	0	0
AVNRT (n=1)	0	1	0	0	0
Atrial flutter (n=25)	5	9	0	0	0
IART (n=5)	2	3	0	0	0
Atrial fibrillation (n=9)	3	1	0	0	0
PVC's (n=7)	5	1	0	0	0
Ventricular tachycardia (n=37)	6	2	0	28	12

Figure 1. Frequency and management summary of arrhythmias organized by subtype

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DISCLOSURE INFORMATION

We have no relevant disclosures to report.