



Postoperative Arrhythmia Incidence in Patients with Total Anomalous Pulmonary Venous Connection in Guatemala

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Background

Total anomalous pulmonary venous connection (TAPVC), is a congenital heart defect that requires surgical repair shortly after diagnosis. Post-surgical arrhythmias are expected complications of TAPVC surgical repair.



Few data exist on the incidence of arrhythmias after TAPVC repair in Guatemala. Therefore, we sought to determine the short- and long-term incidence of and risk factors for arrhythmias in patients undergoing TAPVC repair at our institution.

Method

We performed a retrospective longitudinal study of all patients with TAPVC, either isolated or associated with other simple cardiovascular anomalies (RACHS score 1 or 2), who underwent surgical correction between 2007-2017 at the Cardiovascular Surgery Unit of Guatemala. Patients who died before discharge were excluded.

The primary outcomes were arrhythmias in the immediate post-operative period and after hospital discharge.

Descriptive statistics and chi-squared analyses comparing the percentage of arrhythmias by TAPVC type, cardiopulmonary bypass time, and type of atriotomy were performed.

Results

(Table 1)					(Table 2)								(Table 3)						
Patient Demographics					Incidence of and Risk Factors for Arrhythmias before Hospital Discharge								Incidence of and Risk Factors for Arrhythmias after Hospital Discharge						
Sex, n(%)	Female		Male		N=86	N (%)						P Value	N=86	N (%)					P Value
	36 (42)		50 (58)																
Age, mo Med (-IQR-)	At Diagnosis		At Surgery		Presence of arrhythmia	26 (30)						0.53	Presence of	26 (30)					<0.001
	3 (1-9)		5 (2-25)			Type of rhythm	SR	SA	JER	VA	Paced Rhythm			Other	Type of rhythm	SR	SA	JER	
Follow up Time, mo Med -()IQR-()	37 (15-58)				Supracardiac	15 (33)	11 (25)	14 (31)	1 (2)	1 (2)	3 (7)	0.39	Supracardiac	22 (49)	13 (29)	7 (15)	0 (0)	3 (7)	<0.001
						Intracardiac	16 (46)	12 (34)	6 (17)	1 (3)	0 (0)			0 (0)	Intracardiac	33 (94)	0 (0)	0 (0)	
Hospital LOS, d Med -()IQR-()	17 (10-27)				Infracardiac <td>1 (50)</td> <td>1 (50)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td rowspan="2">0.13</td> <th rowspan="2">Infracardiac</th> <td>2 (100)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td rowspan="2"><0.001</td>	1 (50)	1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0.13	Infracardiac	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	<0.001
						Mixed <td>2 (50)</td> <td>1 (25)</td> <td>0 (0)</td> <td>1 (25)</td> <td>0 (0)</td> <td>0 (0)</td> <th>Mixed</th> <td>3 (75)</td> <td>0 (0)</td> <td>1 (25)</td> <td>0 (0)</td> <td>0 (0)</td>	2 (50)	1 (25)	0 (0)	1 (25)	0 (0)			0 (0)	Mixed	3 (75)	0 (0)	1 (25)	
ICU LOS, d Med -()IQR-()	9.5 (5-19)				Longitudinal <td>18 (46)</td> <td>14 (36)</td> <td>5 (13)</td> <td>2 (5)</td> <td>2 (5)</td> <td>0 (0)</td> <td rowspan="2">0.02</td> <th rowspan="2">Longitudinal<td>36 (92)</td><td>1 (3)</td><td>0 (0)</td><td>2 (5)</td><td>0 (0)</td><td rowspan="2">0.02</td></th>	18 (46)	14 (36)	5 (13)	2 (5)	2 (5)	0 (0)	0.02	Longitudinal <td>36 (92)</td> <td>1 (3)</td> <td>0 (0)</td> <td>2 (5)</td> <td>0 (0)</td> <td rowspan="2">0.02</td>	36 (92)	1 (3)	0 (0)	2 (5)	0 (0)	0.02
						Perpendicu- lar to ve- nacavae	15 (33)	10 (23)	15 (33)	1 (2)	1 (2)			3 (7)	Perpendicu- lar to ve- nacavae	22 (49)	12 (27)	8 (18)	
Time on MV, h Med -()IQR-()	66.5 (4-136)				No atriotomy <td>1 (50)</td> <td>1 (50)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td rowspan="2">0.12</td> <th rowspan="2">No atriotomy</th> <td>2 (100)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td>0 (0)</td> <td rowspan="2">0.01</td>	1 (50)	1 (50)	0 (0)	0 (0)	0 (0)	0 (0)	0.12	No atriotomy	2 (100)	0 (0)	0 (0)	0 (0)	0 (0)	0.01
						CPB time, med (SD)	84 (18)				Presence of arrhythmia			63 (17)					
Connection Sub- type n (%)	Supracardiac	Intracardiac	Infracardiac	Mixed	Cross-clamp time, med (SD)	Presence of arrhythmia	54 (22)				0.12	Cross-clamp	Presence of	63 (17)					
	45 (52)	35 (41)	2 (2)	4 (5)		Expectant	Pharmacologic	Electric Cadrioversion/ Defbrillation	Pacemaker	Expectant			Pharmacologic	Electric Cadrioversion/ Defbrillation	Pacemaker				
Arrhythmia management	Sinus Rhythm		SA	JER	Arrhythmia management	Expectant	Pharmacologic	Electric Cadrioversion/ Defbrillation	Pacemaker			Arrhythmia management	Expectant	Pharmacologic	Electric Cadrioversion/ Defbrillation	Pacemaker			
	75 (87)		9 (11)	2 (2)															42 (81)

Table 1: n: number of patients; mo: month; Med: median; IQR: interquartile range; d: day; h: hours; SR: sinus rhythm; SA: supraventricular arrhythmia; JER: junctional escape rhythm; LOS: length of stay; ICU: intensive care unit

Tables 2 & 3: TAPVR: total anomalous pulmonary venous connection; n: number of patients; mo: month; Med: median; IQR: interquartile range; d: day; h: hours; SR: sinus rhythm; SA: supraventricular arrhythmia; JER: junctional escape rhythm; VA: ventricular arrhythmia; LOS: length of stay; ICU: intensive care unit; CPB: cardiopulmonary bypass; SD: standard deviation

Conclusions

To our knowledge, this is the first report of the incidence of and risk factors for post-operative arrhythmias after TAPVC repair in Guatemala. Even though most patients developed arrhythmias post-operatively, less than one-third had persisted after discharge. Supracardiac TAPVC, longer cardiopulmonary bypass time, and atriotomy perpendicular to the cavas were associated with postoperative arrhythmias. We plan to compare our data with post-operative arrhythmia outcomes in other middle-income latin american countries and high-income countries, such as the USA, to better understand the performance of our pediatric cardiac center.