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Right Atrial Lines as Primary Access for Postoperative Pediatric Cardiac Patients

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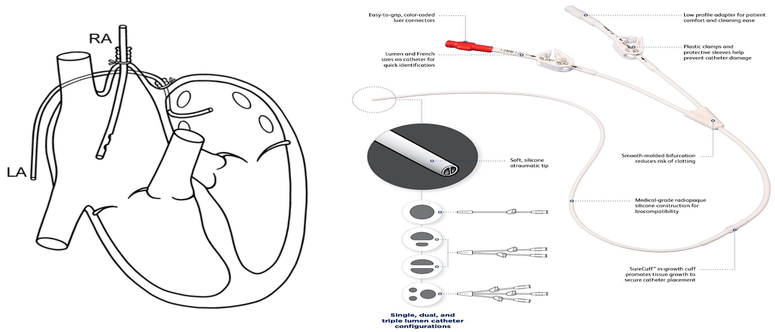
Introduction

- Right atrial lines (RAL) are widely used in some institutions for limited periods of time as routine postoperative care (1-7)
- In single ventricle patients, these lines play a significant role in preservation of vessels that are a part of palliative pathways
- Despite their generalized use, there is limited data on factors associated with their complications and long-term use (1-7)
- Aim
    - To characterize the use of RALs as primary access in the postoperative care of neonatal and pediatric patients after cardiothoracic surgery and to identify risk factors associated with RAL complications.



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BD-19819 Hickman, Leonard, Broviac CVC Brochure, BD Tempe, AZ, USA

Results

- 692 patients underwent 815 RAL placements during cardiothoracic surgery between January 2011 and June 2018
- Median age was 22 days (IQR 7-134), and median weight was 3.6 kg (IQR 3.1-5.3)
    - Neonates accounted for 53.5% and single ventricle physiology for 35.4%
    - 38% underwent palliation surgeries (shunts and cavo-pulmonary connections)
    - Median RAL duration was 11 days (IQR 7-19) and median RAL removal to hospital discharge time was 0 days (IQR 0-3)
- Survival to hospital discharge reached 95.5%

- Complications
    - Thrombosis (1.7%)
    - Migration (1.7%)
    - Malfunction (1.4%)
    - Infection (0.7%)
- Adverse events due to these complications (1.4%)
    - Anemia requiring transfusion (n=1)
    - Tamponade requiring pericardiocentesis (n=3)
    - Pleural effusion requiring chest tube (n=2)
    - Need for antimicrobials for bacteremia (n=6)

- Multivariable logistic regression demonstrated that
    - RAL duration (OR 1.01, p 0.006)
    - Palliation surgery (OR 2.38, p 0.015)

  were independent factors associated with complications

Fully adjusted multivariable logistic regression to ascertain for factors associated with RAL complications

Predictor	*OR (95% Confidence Interval)*	*p-value*
Year	1.14 (0.95 - 1.37)	0.161
Age Child vs Neonate	1.67 (0.24 - 11.57)	0.768
Age Infant vs Neonate	1.64 (0.71 - 3.83)	0.611
Weight	0.99 (0.88 - 1.11)	0.822
Prematurity (No vs Yes)	0.54 (0.22 - 1.3)	0.166
Syndrome/association (No vs Yes)	1.48 (0.64 - 3.42)	0.361
Non-cardiac abnormalities (No vs Yes)	1.03 (0.44 - 2.42)	0.954
Genetic diagnosis (No vs Yes)	0.81 (0.29 - 2.27)	0.691
Surgical palliation (No vs Yes)	2.42 (0.82 - 7.14)	0.108
Shunt (No vs Yes)	0.61 (0.23 - 1.58)	0.304
RAL type double lumen vs triple lumen	3.99 (0.51 - 31.29)	0.595
RAL type single lumen vs triple lumen	7.06 (0.35 - 140.94)	0.303
Right atrial line duration (days)	**1.01 (1 - 1.02)**	**0.008**
Single ventricle physiology (No vs Yes)	0.86 (0.33 - 2.27)	0.765

Final model after backwards variable selection to identify factors associated with RAL complications

Predictor	*OR (95% Confidence Interval)*	*p-value*
Surgical palliation (Yes vs No)	2.38 (1.18-4.81)	**0.015**
Right atrial line duration (days)	1.01 (1-1.02)	**0.006**

*OR: odds ratio, RAL: right atrium line

Methods

- Observational retrospective cohort study
- Single center
- Pediatric cardiac patients who underwent RAL placement during cardiac surgery
- January 2011 - June 2018

Conclusions

- The use of RALs as primary access in postoperative pediatric cardiac patients seems to be feasible and safe
- Our overall incidence of complications from prolonged use remained similar or lower to the reported with short-term use of these lines (1-7)
- While line duration and palliation surgeries were associated with complications, severity of illness could be a confounding factor

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