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Safety, Timing and Outcomes of Early Postoperative Cardiac Catheterization Following Congenital Heart Surgery

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Safety, Timing, and Outcomes of Early Postoperative Cardiac Catheterization Following Congenital Heart Surgery

Children Mercy Research Days

May 3rd, 2022

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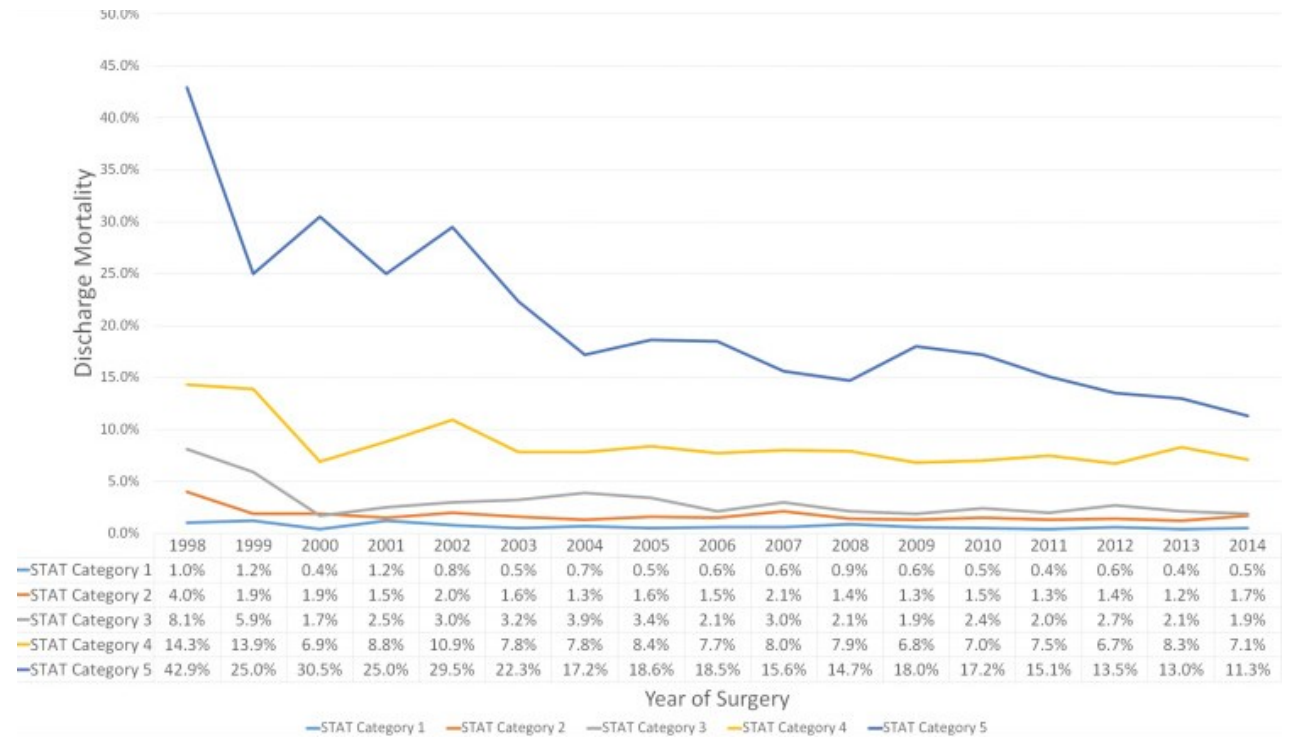


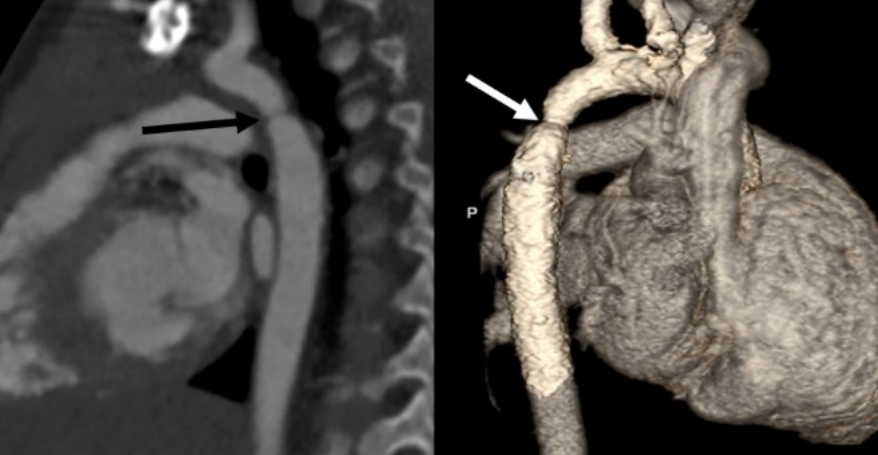
Disclosures

- None

Background

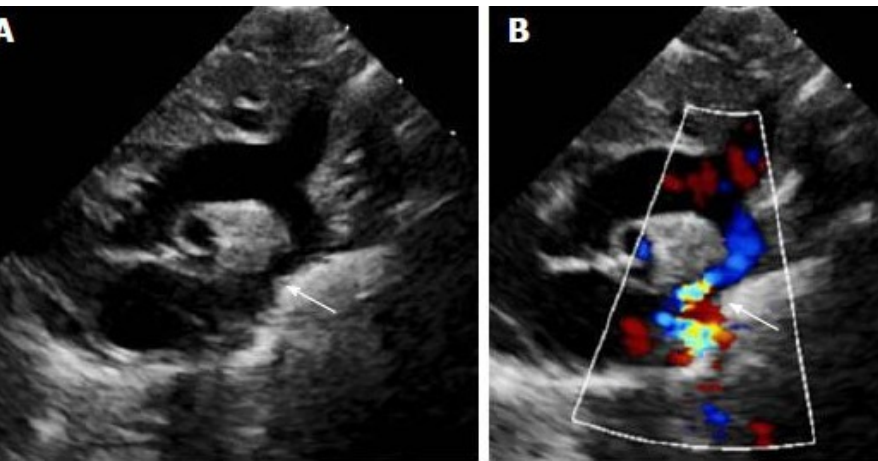
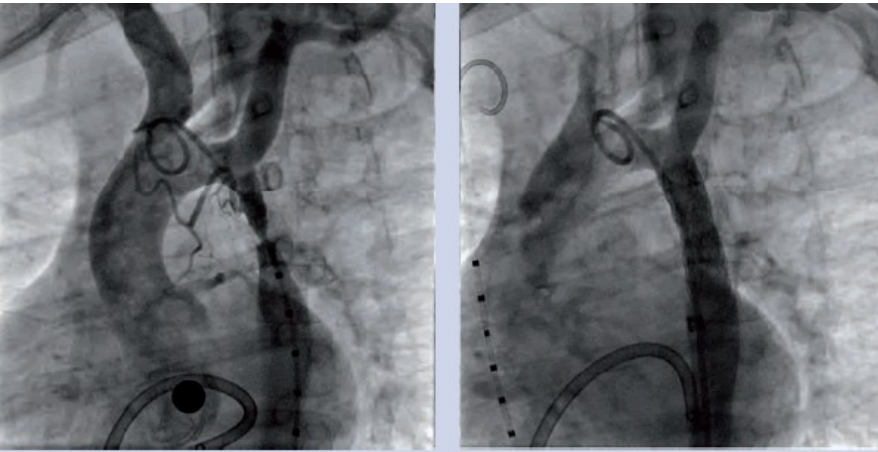
- Improvements in outcomes following congenital heart surgery
 - 3.1% discharge mortality
- There remains a high rate of morbidity and mortality
- Residual post operative lesions remain a common cause of morbidity and mortality





Background

- Different modalities for assessing residual lesions
 - Echo
 - Transthoracic
 - Transesophageal
 - CT Angio
 - Cardiac Catheterization



Background

- Early postoperative cardiac catheterizations (EPOCC) were considered high risk and often delayed, especially in patients on extracorporeal support (ECMO)
- Few studies have shown that it is safe to perform a catheterization within six weeks and even within 30 days of surgery.
- There remains significant institutional variability in timing and willingness to perform early post op catheterization.
- Lack of understanding on impact of EPOCC on hospital outcomes

Aim

- Describe our experience with EPOCC and its impact on patient management, length of stay, and duration of mechanical ventilatory support.

Methods

- Single center, retrospective cohort study
- Patients who underwent congenital heart surgery between January 1, 2010-December 31, 2019
- Cardiac catheterization within 30 days of surgery
- Exclusion:
 - Cath solely for left atrial decompression on ECMO
 - Endomyocardial biopsy
 - Routine balloon atrial septostomy post hybrid procedure

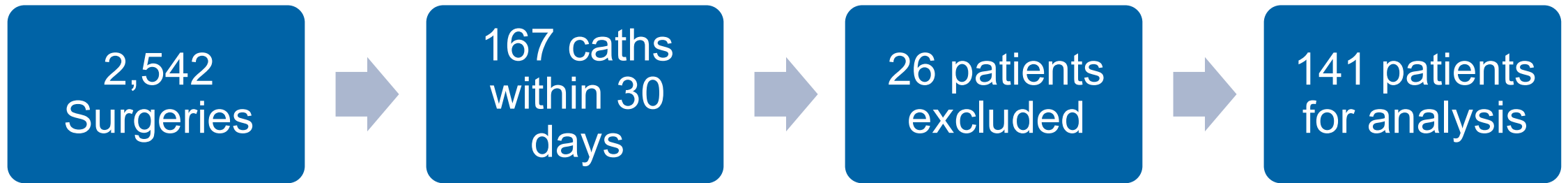
Methods: Variables Collected

- Patient demographic and clinical variables
- Timing of cardiac catheterization
- Indication for cardiac catheterization
- Complications of catheterization
- Duration of mechanical ventilation and ECMO support
- Duration of CICU and hospital length of stay

Methods

- Compared clinical variables between patients who underwent early and late EPOCC
 - Early EPOCC: Cardiac catheterization less than or equal to 72 hours post op
 - Late EPOCC: Cardiac catheterization greater than 72 hours post op
- Routine statistics using IBM SPSS, version 28

Results



Results-Timing

- Median time from surgery to EPOCC was 10 days
 - Range 1-30 days
- Early EPOCC: 26 patients (18.4%)
- Late EPOCC: 115 patients (81.6%)

Results - Patient Characteristics

	Early EPOCC (≤72 hours)	Late EPOCC (>72 hours)	P Value
Median Age, months	3.0	1.5	0.02*
Median Weight, kg	5.4	3.9	0.006*
Mechanical Ventilation prior to EPOCC	85%	63%	0.04*
Arrhythmia prior to EPOCC	30%	23%	0.40
Median Vasoactive Inotropic Score (VIS)	6.0	7.5	0.20
ECMO Prior to EPOCC	50%	19%	0.002*

Results - Patient Characteristics

RACHS-1 SCORE

	Early EPOCC (≤72 hours)	Late EPOCC (>72 hours)
2	7	27
3	6	36
4	4	21
5	0	3
6	5	20
N/A	4	8

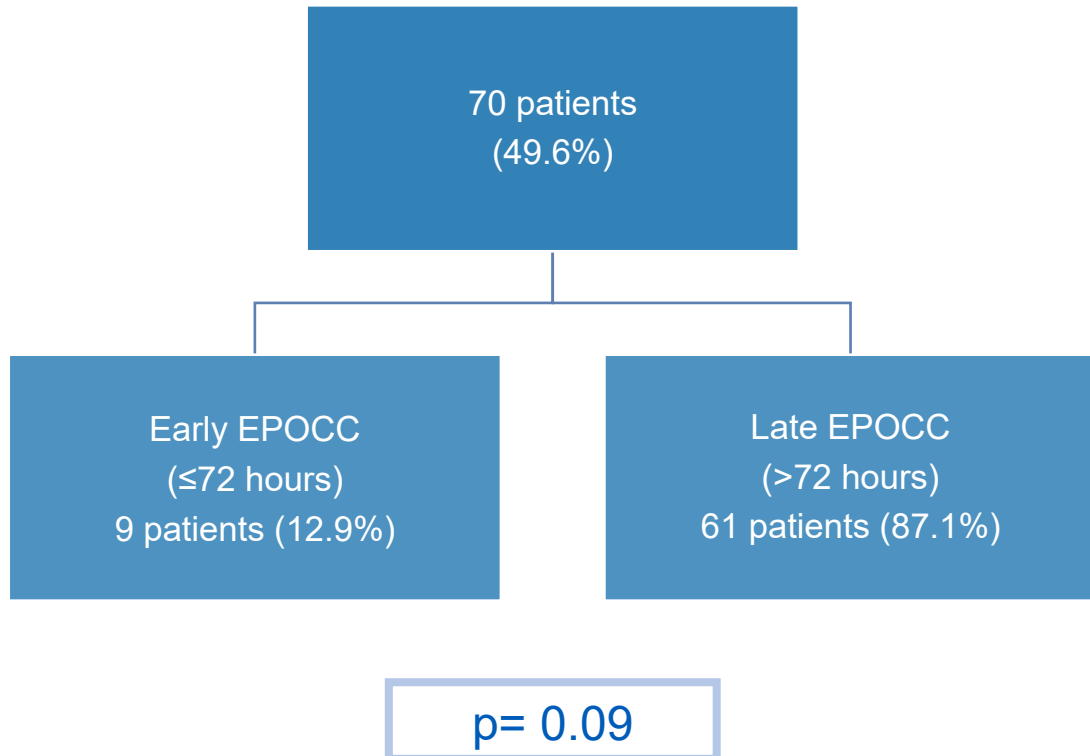
p= 0.67

STAT Category

	Early EPOCC (≤72 hours)	Late EPOCC (>72 hours)
1	0	6
2	9	29
3	5	21
4	7	29
5	5	28

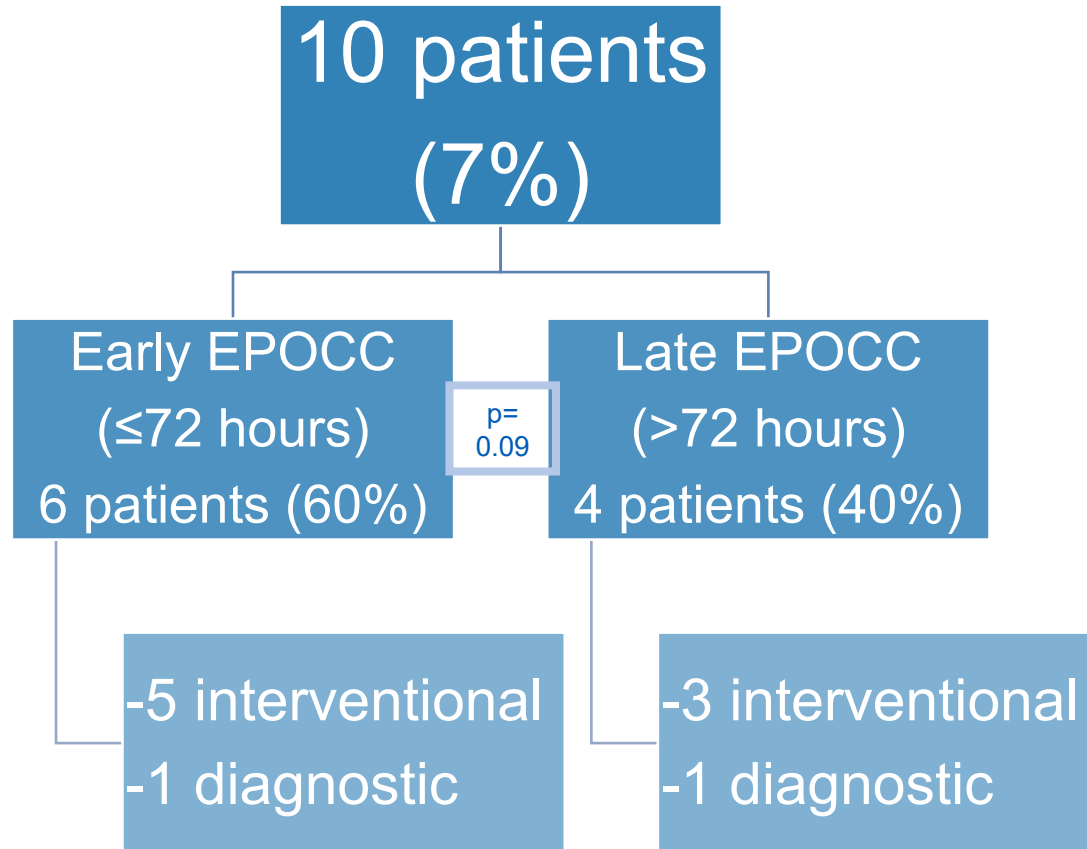
p= 0.68

Results-Interventions



- Most common location of intervention:
 - Aortic Arch (n=9)
 - Balloon dilation or stent placement
 - Atrial Septum (n=9)
 - Septostomy or stent placement
 - Collateral occlusion (n=9)
 - AP collateral or VV collateral
 - Combination procedures (n=13)

Results - Complications



- Complications occurred in:
 - 8 interventional cath
 - 2 diagnostic only cath
- Complication Types:
 - Arrhythmia/ST segment changes* (n=5)
 - Cardiac arrest requiring brief chest compressions (n=3)
- There were no deaths or strokes

Results - Outcomes

	Early EPOCC (≤72 hours)	Late EPOCC (>72 hours)	P Value
CICU LOS (days)	17.9	28.0	0.09
Hospital LOS (days)	29.6	49.9	0.16
Mechanical Ventilation (days)	11.4	13.4	0.11
Duration of ECMO (days)	7.0	15.0	0.06

Conclusions

- Low occurrence of complications with EPOCC
 - No serious complications such as death or stroke
- No significant differences in outcomes for CICU LOS, Hospital LOS, mechanical ventilation duration, or ECMO duration
 - Though the early EPOCC group did have shorter lengths of time for each of the variables
- Earlier catheterization may result in earlier intervention and a resultant decrease in extracorporeal support, ICU, and hospital length of stay.

Limitations

- Retrospective nature
- Small sample size

Future Directions

- Comparing imaging modalities and cath findings
 - Echo findings
 - CT angio
- Further analysis of subgroups
 - Class of congenital heart disease

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Questions?

