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## Microaxial Support After Orthotopic Heart Transplantation

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# Microaxial support after orthotopic heart transplantation

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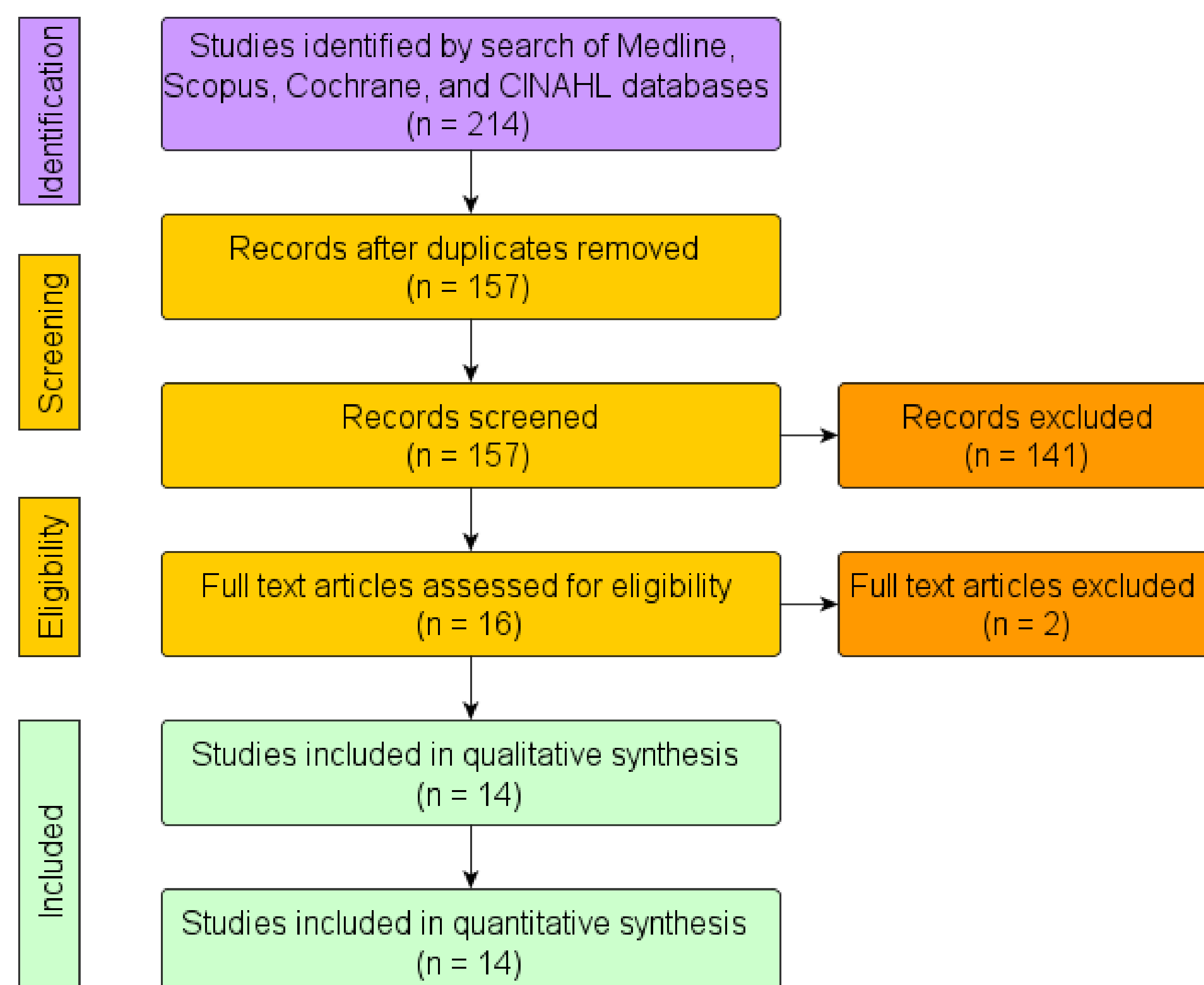
## Introduction and Objective

- Impella is a temporary ventricular support device intended for short term use (<4 days for the Impella 2.5 and Impella CP, and ≤ 6 days for Impella 5.0 and LD).
- There has yet to be a study investigating the outcomes of microaxial support for patients who previously underwent heart transplantation.
- We aimed to assess utilization patterns of microaxial mechanical circulatory support after heart transplantation in adults and adolescents.

## Methods

- A total of 214 articles resulted from searching the nine databases during the initial search (15 June 2021). Data were extracted from article texts, tables, and figures (Figure 1).
- Continuous data were represented with medians and IQRs (analyzed via Kruskal-Wallis Rank Sum tests), while categorical data were represented as percentages (analyzed via chi-squared tests). Survival data were compared via log-rank tests.
- R statistical software, version 4.1.0 (R Foundation for Statistical Computing, Vienna, Austria) was used for data analyses. P-values of <0.05 were considered statistically significant.

**Figure 1** PRISMA flow diagram showing search strategy



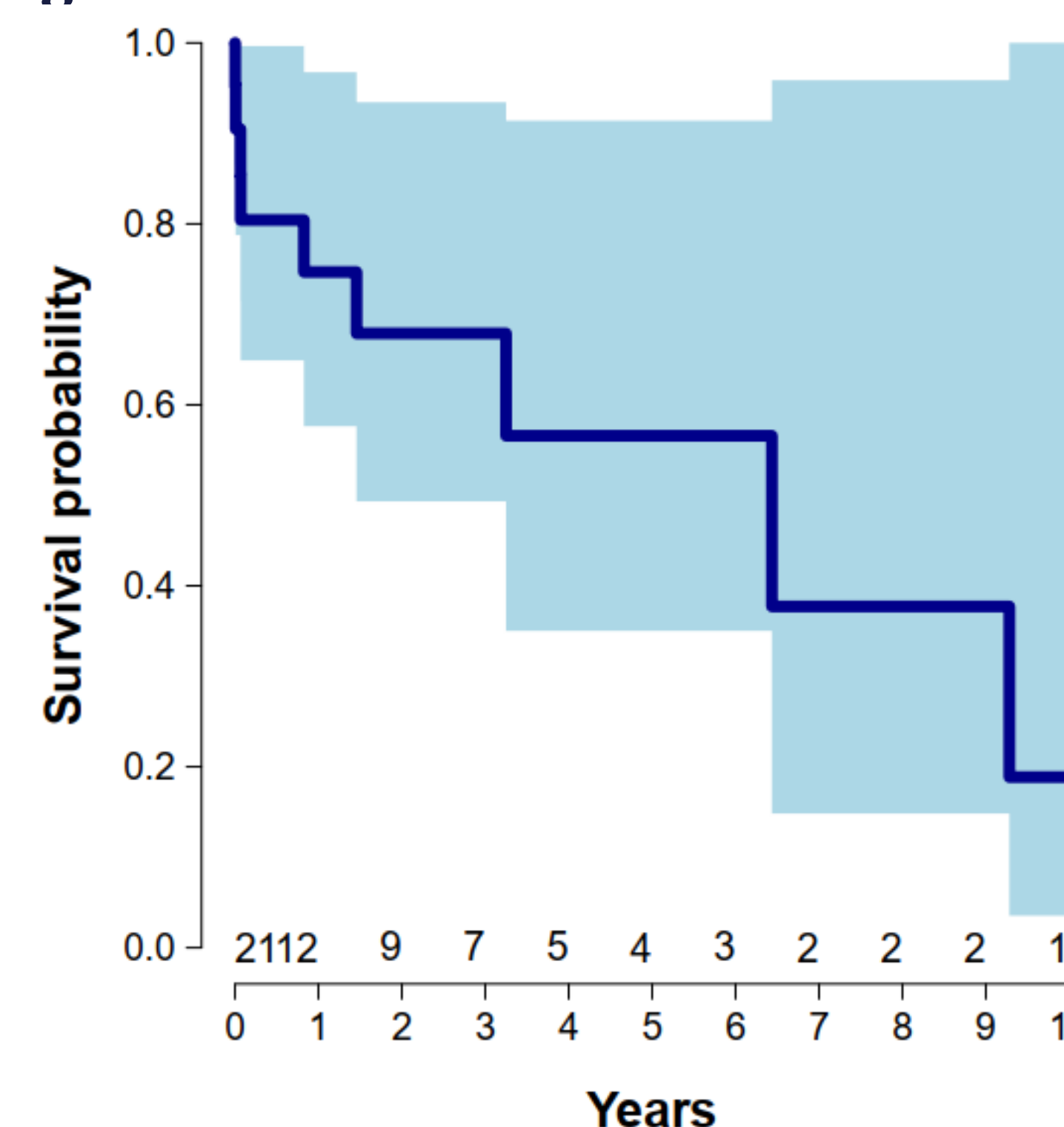
## Results

- This study involved 21 patients, which included 15 adults and 6 adolescents.
- In adults, primary RV graft dysfunction was seen in 40% (6/15) and acute graft rejection was present in 46.7% (7/15).
- In all adolescents the indication for Impella was graft rejection (acute 50.0% (3/6), chronic 33.3% (2/6), and unspecified 16.7% (1/6)).
- Biventricular support was required in 6.7% (1/15) of adults and in 83.3% (5/6) of adolescents (p<0.01) (Table 2).

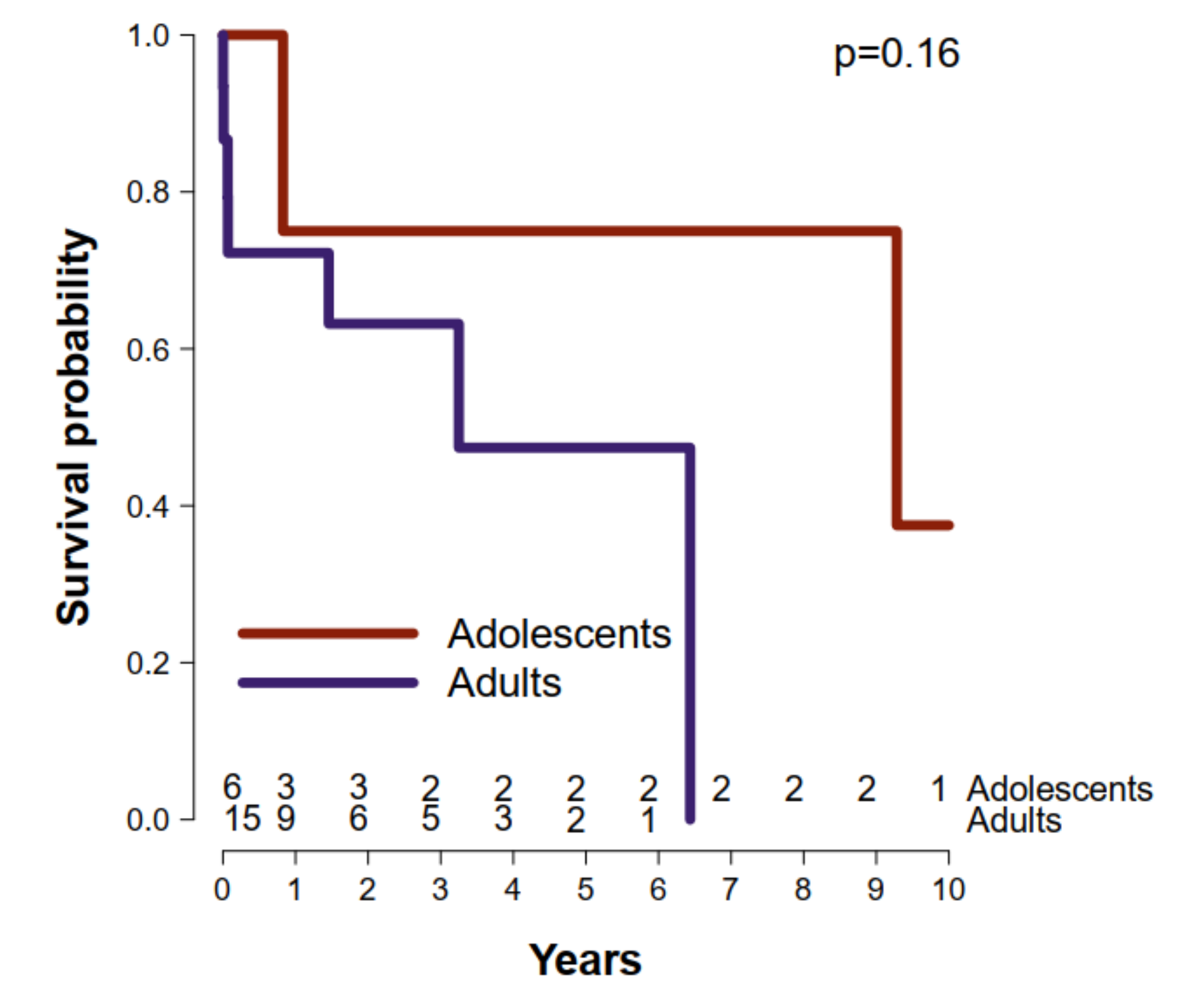
Variable	Adults (n=15)	Adolescents (n=6)	Total (n=21)	P
Age, median [IQR]	52 [37.0, 58.5]	16.5 [14.5, 17.8]	38 [18, 57]	<0.01
Male, % (n/N)	60.0 (9/15)	50.0 (3/6)	57.1 (12/21)	1.00
Weight (kg), median [IQR]		63.2 [46.7, 67.2]		
Replantation, % (n/N)	6.7 (1/15)	16.7 (1/6)	9.5 (2/21)	1.00
Age of graft (years), median [IQR]	0.3 [0.0, 2.6]	0.9 [0.2, 7.0]	0.8 [0, 3]	0.51
Heart Transplant Indication, % (n/N)				
Ischemic Cardiomyopathy	6.7 (1/15)	0 (0/6)	4.8 (1/21)	1.00
Non-Ischemic Cardiomyopathy	26.7 (4/15)	50.0 (3/6)	33.3 (7/21)	0.61
Congenital Heart Disease	0 (0/15)	33.3 (2/6)	9.5 (2/21)	0.13
Unknown	66.7 (10/15)	16.7 (1/6)	52.4 (11/21)	0.11
Echocardiogram Findings, % (n/N)				
Biventricular Dysfunction	13.3 (2/15)	50.0 (3/6)	23.8 (5/21)	0.22
Right Ventricular Dysfunction	13.3 (2/15)	0 (0/6)	9.5 (2/21)	0.91
Tricuspid Regurgitation	0 (0/15)	50.0 (3/6)	14.3 (3/21)	0.02
Mitral Regurgitation	6.7 (1/15)	33.3 (2/6)	14.3 (3/21)	0.37
Thrombus	13.3 (2/15)	0 (0/6)	9.5 (2/21)	0.91
Right Coronary Artery	6.7 (1/15)	0 (0/6)	4.8 (1/21)	1.00
Right Ventricle	6.7 (1/15)	0 (0/6)	4.8 (1/21)	1.00

- Overall improvement was observed both in median LV ejection fraction (23.5% [11.2-28] to 42% [37.8-47.2], p=0.01) and cardiac index (1.9 [1.4-2.6] to 3.0 [2.5-3.2], p=0.02) after Impella therapy.
- Subgroup analyses lost statistical significance except for LVEF in adults (12.5% [10-21] to 40.5% [32.5-44], p=0.03) .

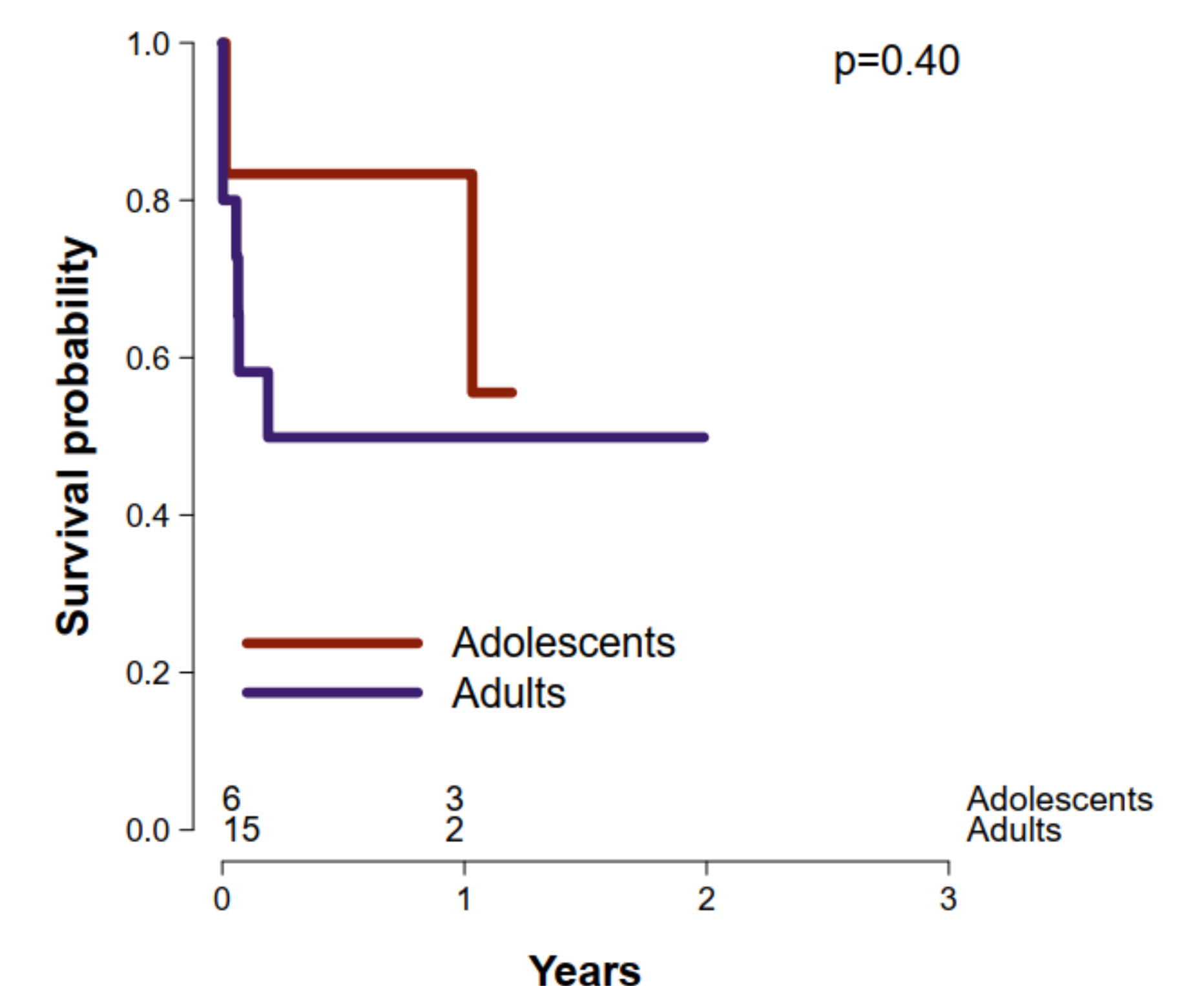
**Figure 2** Overall Survival after Heart Transplantation



**Figure 3** Survival after Heart Transplantation



**Figure 4** Survival after Impella Implantation



## Conclusions

- Indications for microaxial support appear to vary between adult and adolescent patients.
- Overall improvement in LVEF and cardiac index was observed, however, with suboptimal survival to discharge.

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