**Supplementary Files**

**Supplementary Table S1**

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| Table S1. Pre BCPS catheterization data |   |   |   |
| Variables | APBF (+) |   | APBF (-) | P-value |
|   |   | Median (IQR)  |   | Median (IQR)  |   |
| **Catheterization data** |  |  |  |  |
|  | Hemoglobin (g/dL) | 13.4 (11.6-15.7) |  | 13.9 (12.3-15.3) | 0.528 |
|  | Pulmonary artery pressure (mm Hg) | 16.0 (12.3-21.8) |  | 14.0 (12.0-18.0) | 0.175 |
|  | Left atrial pressure (mm Hg) | 7.0 (5.0-9.5) |  | 6.0 (5.0-8.0) | 0.204 |
|  | Transpulmonary gradient (mm Hg) | 8.5 (5.8-11.0) |  | 8.0 (5.0-11.0) | 0.660 |
|  | Systolic ventricular pressure (mm Hg) | 81.0 (72.8-90.0) |  | 79.0 (73.0-87.0) | 0.122 |
|  | End-diastolic pressure (mm Hg) | 9.0 (7.0-11.0) |  | 9.0 (7.0-11.0) | 0.612 |
|   | Aortic oxygen saturation (SO2, %) | 76.0 (72.5-84.5) |   | 77.0 (73.0-83.0) | 0.687 |

**Supplementary Table S2**

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| Table S2. Preoperative variables influencing mortality after BCPS in 38 patients with APBF |
| Variables | Univariate Model |   | Multivariate Model |
|   | P-value | HR | 95% CI |   | P-value | HR | 95% CI |
| **Characteristics** |  |  |  |  |  |  |  |
| Genetic anomalies | **0.015** | 7.736 | 1.486-40.274 |  | **0.011** | 44.464 | 2.357-838.924 |
| Extracardiac anomalies | **0.024** | 7.262 | 1.302-40.507 |  | **0.023** | 31.866 | 1.624-625.278 |
| UAVSD | **0.005** | 8.896 | 1.943-40.723 |  |  |  |  |
| CoA | 0.300 | 3.047 | 0.371-25.036 |  |  |  |  |
| T (P) APVC | 0.870 | 0.045 | 0.000-4777 |  |  |  |  |
| Heterotaxy | 0.470 | 2.185 | 0.262-18.213 |  |  |  |  |
| **Previous palliations** |  |  |  |  |  |  |  |
| APS | 0.623 | 0.769 | 0.269-2.195 |  |  |  |  |
| PAB | 0.209 | 2.519 | 0.597-10.628 |  |  |  |  |
| Ductus stent | 0.774 | 1.363 | 0.164-11.331 |  |  |  |  |
| DKS | 0.359 | 0.375 | 0.046-3.049 |  |  |  |  |
| Number of palliation | 0.572 | 1.240 | 0.588-2.612 |  |  |  |  |
| **Pre-BCPS catheterization** |  |  |  |  |  |  |
| PAP  | 0.471 | 1.043 | 0.930-1.170 |  |  |  |  |
| LAP | 0.080 | 1.169 | 0.982-1.392 |  |  |  |  |
| TPG | 0.251 | 0.875 | 0.696-1.099 |  |  |  |  |
| SVP | **0.015** | 1.054 | 1.010-1.100 |  | **0.002** | 1.089 | 1.032-1.149 |
| EDP | **0.005** | 1.294 | 1.080-1.552 |  |  |  |  |
| SaO2 | **0.034** | 1.197 | 1.103-1.413 |  |  |  |  |
| PA Index | 0.407 | 1.005 | 0.994-1.016 |  |  |  |  |
| **Pre-BCPS echocardiogram** |  |  |  |  |  |  |
| Reduced VF | 0.096 | 5.379 | 0.741-39.031 |  |  |  |  |
| AVVR moderate or severe | 0.543 | 0.772 | 0.335-1.779 |  |  |  |  |
| **BCPS operative variables** |  |  |  |  |  |  |
| Age at BCPS | 0.391 | 0.971 | 0.909-1.038 |  |  |  |  |
| Weight at BCPS | 0.575 | 0.954 | 0.808-1.125 |  |  |  |  |
| CPB time | 0.734 | 1.001 | 0.993-1.010 |  |  |  |  |
| Need AXC | 0.980 | 0.982 | 0.234-4.118 |  |  |  |  |
| Bilateral BCPS | 0.145 | 4.852 | 0.579-40.651 |  |  |  |  |
| Separate APBF | **0.033** | 4.739 | 1.131-19.850 |   |   |   |   |

**Supplementary Figure Legends**

**Supplementary Figure S1**

Flowchart demonstrating the outcomes for all patients undergoing bidirectional cavopulmonary shunt (BCPS) procedure.

**Supplementary Figure S2**

Kaplan-Meier curves comparing the transplant-free survival after BCPS in patients with APBF regarding the source of the pulmonary blood flow. APBF: ante-grade pulmonary blood flow.

**Supplementary Figure S3**

Kaplan-Meier curves comparing the time to Fontan completion in patients with and without APBF. The patients associated with APBF took significantly longer to reach Fontan completion (p<0.001 by log-rank test). APBF: ante-grade pulmonary blood flow.

**Suplementary Figure S4**

Kaplan-Meier curves comparing the transplant-free survival after BCPS in patients with concomitant APBF and those with late APBF. APBF: ante-grade pulmonary blood flow.

**Supplementary Figure S5**

Advantages and disadvantages of APBF. APBF: ante-grade pulmonary blood flow.