BIVENTRICULAR PACING LEADS TO A SUSTAINED INCREASE IN CARDIAC INDEX IN INFANTS WITH ELECTRICAL DYSSYNCHRONY FOLLOWING SURGERY FOR CONGENITAL HEART DISEASE

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Background: Following surgery for congenital heart disease (CHD) with cardio-pulmonary bypass (CPB), there is a known decrease in cardiac index (CI) in the 1st post-operative 24 hrs. Electrical dyssynchrony, manifest by prolonged QRS duration (QRSd) may be an important factor. We hypothesized that simultaneous pacing of left and right ventricles (biventricular pacing; BiVp) continuously after surgical repair of CHD leads to sustained increase in cardiac index.

Methods: We prospectively recruited infants with CHD < 4 mo of age undergoing surgery on CPB. Infants were randomized, regardless of QRS duration, to receive standard of care or standard of care + BiVp. Infants randomized to BiVp received atrial, RV and LV leads. Continuous BiVp (atrial tracking) was initiated upon return to ICU. Hemodynamics were assessed at least every 3 hours for the 1st 24 hours and at least every 6 hours thereafter up to 48 hours. CI was measured using mass spectroscopy for oxygen consumption. Primary outcome was the change in CI over the 1st 48 post-operative hours.

Results: 20 infants (3.5±0.6kg) were enrolled. Controls pts (n=10) with normal QRS durations for age had consistent improvement in CI in the 1st 48 hrs, while those with prolonged QRS durations showed delayed recovery of CI. In infants with a prolonged baseline QRS, BiVp led to normalization of CI recovery (p=0.008, Fig 1) and systolic BP (p=0.04) over 48 hours.

Conclusion: BiVp in infants with post-operative electrical dyssynchrony leads to improved recovery of CI and BP.