

SCA 103

**REAL-TIME MONITORING OF HEMODYNAMIC CHANGES DURING BEATING-HEART CORONARY SURGERY.**

Velissaris T<sup>1</sup>, Jonas M<sup>2</sup>, Herbertson M<sup>3</sup>, Gill R<sup>3</sup>, Hett D<sup>3</sup>, Ohri S<sup>4</sup>  
*Departments of Cardiothoracic Surgery<sup>1</sup>, Anesthesia<sup>2</sup>, Cardiac Anesthesia<sup>3</sup>, and Cardiothoracic Surgery<sup>4</sup>, Southampton General Hospital, Southampton, Hampshire*

**Introduction:** Cardiac displacement and target immobilization can result in acute and significant reductions in cardiac output during off-pump coronary revascularization (OPCAB). Cardiac output monitoring using thermodilution techniques is unable to track acute hemodynamic changes such as those encountered in OPCAB. We investigated real-time hemodynamic changes during OPCAB using the PulseCO™ continuous cardiac output monitoring system.

**Methods:** Fourteen patients with normal ventricular function undergoing multi-vessel OPCAB by the same surgeon underwent intraoperative, continuous, real-time monitoring of their cardiac index (CI), stroke volume index (SVI) and systemic vascular resistance using the PulseCO™ system. The system was calibrated using the lithium dilution technique for cardiac output measurement. Preload and inotropic management were standardized.

**Results:** There were immediate and significant reductions in CI and SVI following application of the mechanical stabilizer. Mean arterial blood pressure fell proportionally less due to compensatory tachycardia and vasoconstriction. There was a progressive partial recovery of the hemodynamic parameters, which reached a plateau 6 minutes after application of the stabilizer (figure 1). At that point

the cardiac index reached 90.5±9.1% of baseline values (2.65±0.45 vs. 2.94±0.50 L/min/m<sup>2</sup>) during grafting of the left anterior descending artery, while inferior recovery was observed during grafting of the obtuse marginal (82.6±10.0%, 2.28±0.51 vs. 2.75±0.48 L/min/m<sup>2</sup>) and posterior descending (85.9±10.5%, 2.42±0.51 vs. 2.83±0.50 L/min/m<sup>2</sup>) coronary arteries. Full hemodynamic recovery only occurred following removal of the stabilizing device.

**Conclusions:** Significant and rapid hemodynamic deterioration occurred during distal anastomoses in OPCAB. These adverse changes were amplified by greater cardiac displacement employed when grafting the less accessible coronary targets. Real-time cardiac output monitoring with the PulseCO™ system enables tracking of the acute hemodynamic changes encountered in OPCAB.

