# Graft Flow Evaluation with Intraoperative Transit-Time Flow Measurement in Off- Pump versus On-Pump CABG – A propensity score analysis

Graft Flow Evaluation with Intraoperative Transit-Time Flow Measurement in Off- Pump versus On-Pump CABG – a propensity score analysis

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Objective: Quality control during coronary artery bypass surgery is imperative for early detection of technical issues. We compared transit-time flow measurement (TTFM) parameters between on pump coronary artery bypass (ONCAB) and off pump (OPCAB) procedures. This was performed with the intention of determining TTFM parameters specific for each type of procedure.

Methods: The database of the multicenter REQUEST study was retrospectively reviewed to compare TTFM parameters between on and off-pump procedures. Only single grafts were included (i.e., no sequential grafts or Y/T grafts). Primary endpoints were mean graft flow (MGF), pulsatility-index (PI), diastolic filling (DF), and backflow (BF) variations for each between-group comparison. To control for between group differences we used propensity score matching (PSM).

Results: Of 1016 patients in the REQUEST registry, 847 had at least a single graft for which TTFM was performed. Of these, 513 patients (60.6%) underwent ONCAB and 334 (39.4%) OPCAB, corresponding to 1050 ONCAB grafts (61.1%) and 669 OPCAB grafts (38.9%). Mean arterial pressure (MAP) during measurements was higher in the OPCAB group. After PSM, we were left with 312 well balanced pairs. In these matched patients, MGF was higher for ONCAB vs. OPCAB (32mL/min vs. 28mL/min, respectively, for all grafts, $P<0.001$). This trend was true for arterial grafts (ONCAB 30mL/min, OPCAB 27mL/min, $P=0.002$) as for venous grafts (ONCAB 35mL/min, OPCAB 31mL/min, $P=0.0057$). PI was lower in the ONCAB group (2.1 vs. 2.3, for all grafts, $P<0.001$). The BF was also lower in ONCAB than in OPCAB (0.6 vs. 1.3, respectively, for all grafts, $P<0.001$).

Conclusion: In this retrospective analysis of the REQUEST study, ONCAB MGF was higher than OPCAB MGF and ONCAB PI and BF were lower than OPCAB PI and BF, even though MAP was consistently higher during measurements in the OPCAB patients. This might be attributed to coronary vasodilation caused by global myocardial ischemia during cardioplegic arrest in patients undergoing ONCAB. These data may have clinical implications and raise the question whether specific benchmark TTFM values should be set for ONCAB vs OPACB procedures.

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## Additional Resources

- https://files.aievolution.com/prd/aat2101/abstracts/abs_2204/AATSabstracttable1.docx