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Intraoperative transit-time flow measurement and high-frequency ultrasound in coronary artery bypass grafting: impact in off versus on-pump, arterial versus venous grafting and cardiac territory grafted [Get access](#)

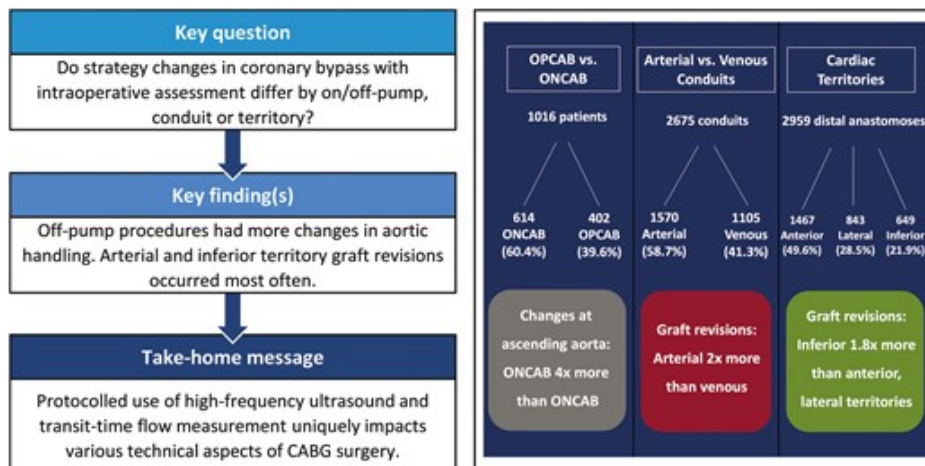
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Abstract



OBJECTIVES

Despite society guideline recommendations, intraoperative high-frequency ultrasound (HFUS) and transit-time flow measurement (TTFM) use in coronary artery bypass grafting (CABG) has not been widely adopted worldwide. This retrospective review of the REQUEST (Registry for Quality assessment with Ultrasound Imaging and TTFM in Cardiac Bypass Surgery) study assesses the impact of protocolled high-frequency ultrasound/TTFM use in specific technical circumstances of CABG.

METHODS

Three REQUEST study sub-analyses were examined: (i) For off-pump (OPCAB) versus on-pump (ONCAB) procedures: strategy changes from preoperative plans for the aorta, conduits, coronary targets and graft revisions; and for all REQUEST patients, revision rates in: (ii) arterial versus venous grafts; and (iii) grafts to different cardiac territories.

RESULTS

Four hundred and two (39.6%) of 1016 patients undergoing elective isolated CABG for multivessel disease underwent OPCAB procedures. Compared to ONCAB, OPCAB patients experienced more strategy changes

regarding the aorta [14.7% vs 3.4%; odds ratios (OR) = 4.03; confidence interval (CI) = 2.32–7.20], less regarding conduits (0.2% vs 2.8%; OR = 0.09; CI = 0.01–0.56), with no differences in coronary target changes or graft revisions (4.1% vs 3.5%; OR = 1.19; CI = 0.78–1.81). In all REQUEST patients, revisions were more common for arterial versus venous grafts (4.7% vs 2.4%; OR = 2.05; CI = 1.29–3.37), and inferior versus anterior (5.1% vs 2.9%; OR = 1.77; CI = 1.08–2.89) and lateral (5.1% vs 2.8%; OR = 1.83; CI = 1.04–3.27) territory grafts.

CONCLUSIONS

High-frequency ultrasound/TTFM use differentially impacts strategy changes and graft revision rates in different technical circumstances of CABG. Notably, patients undergoing OPCAB experienced 4 times more changes related to the ascending aorta than ONCAB patients. These findings may indicate where intraoperative assessment is most usefully applied.

Clinical trial registration number

ClinicalTrials.gov: NCT02385344

Keywords: [Coronary artery bypass grafting](#), [High-frequency ultrasound](#), [Transit-time flow measurement](#)

Topic: [aorta](#), [coronary artery bypass surgery](#), [ultrasonography](#), [conduit implant](#), [intraoperative care](#), [preoperative care](#), [surgical procedures](#), [operative](#), [tissue transplants](#), [heart](#), [transplantation](#), [off-pump coronary artery bypass](#), [multi vessel coronary artery disease](#), [fluid flow](#)

Subject: [Coronary Disease](#), [Mechanical Circulatory Support](#)

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