Publication Brief

Cut-Off Values for Transit Time Flowmetry: Are the Revision Criteria Appropriate?

BACKGROUND
Graft Imaging to Improve Patency (GRIIP), a single-center, randomized blinded clinical trial, reported that intraoperative graft assessment with graft revision according to a priori criteria of transit time flowmetry (TTF) and intraoperative fluorescent angiography did not improve graft patency at one year after coronary artery bypass grafting (CABG) when compared with standard intraoperative management.

OBJECTIVE
To investigate whether other TTF values are more predictive of the saphenous vein graft (SVG) failure and/or clinical outcomes and to reassess the TTF criteria used in GRIIP and investigate whether any other factors were predictive of one-year SVG failue and MACE (death, myocardial infarction, repeat revascularization).

METHODS
A case-control retrospective study of a GRIIP imaging group included 65 SVGs, 41 arterial grafts from 44 patients.
- The Novadaq SPY Imaging System imaged grafts after each distal anastomosis and proximally after separation from cardiopulmonary bypass (CPB).
- Transit-time ultrasound flow measurements (2-4 mm Flowprobes) were performed after CPB or completion of all grafts.

Study outcomes were graft patency at 12 months and major adverse cardiac events (MACE; death, myocardial infarction, repeat revascularization).

RESULTS
- Post-op angiography: 21 SVGs were occluded; 1 SVG, > 50% stenosis; all 41 arterial grafts were patent.
- In ROC curve analysis, TTF mean graft flow (MGF) was significantly predictive of one-year SVG failure.
- 31 mL/min for MGF was the best cut-off value (p = 0.017, sensitivity 63.6%, specificity 67.4%). The risk of graft occlusion was 14/28, 50% for grafts with mean flow <31 mL/min and 8/37, 21.6% for grafts with mean graft flow $\geq$ 31 mL/min. Mean flow was therefore a significant predictor of early SVG failure.
- Pulsatility Index (PI), diastolic filling (DF), other TTF values, patient comorbidities, and/or medication at discharge were not predictors of graft failure.
- TTF values were not predictive of MACE.

CONCLUSIONS
- TTF can identify non-functional grafts during CABG.
- TTF can predict one-year SVG patency.
- TTF has questionable value for improving one-year arterial graft patency.

TAKE HOME POINTS
- Study states that intraoperative graft assessment provides the surgeon with an opportunity to improve early graft patency through the identification of occluded parts of the graft.
- It underscores the importance of mean flow as an indicator of graft patency with a 31 mL/min optimum cut off.

References:
Une D, Deb S, Chikazawa G, Kommaraju K, Tsuneyoshi H, Karkhanis R, Singh S, Vincent J, Tsubota H, Sever J, Moussa F, Cohen G, Christakis GT, Fremes SE, "Cut-off values for transit time flowmetry: are the revision criteria appropriate?" Card Surg. 2013;28(1):3-7.(Transonic Reference # 9813AHM)

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