

Publication:

Graft revision after transit time flow measurement in off-pump coronary artery bypass grafting

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Eur J Cardiothorac Surg. 2000 Mar;17(3):287-93.

DOI: 10.1016/S1010-7940(00)00332-8

**Abstract****Objective**

To determine whether coronary graft patency can be predicted by transit time flow measurement (TTFM).

Methods

From May 1 1997 to December 31 1998, TTFM was prospectively evaluated in 409 patients undergoing coronary artery bypass grafting (CABG) without cardiopulmonary bypass (CPB). All grafts (1145) were tested with TTFM.

Results

Thirty-seven out of 1145 grafts (3.2%) were revised in 33 patients (7.6%). In six cases (18.1%) use of CPB was necessary during revision due to hemodynamic instability. The remaining patients underwent revision

off-pump. Thirty-four grafts (91.9%) were revised for both low flow and abnormal flow curve patterns. Findings at revision included: thrombosis of the anastomosis (n=6), stenosis at the toe or heel of the anastomosis (n=8), coronary flap or dissection (n=5), dissection of the internal mammary artery (n=5), graft kinking (n=4), flap at proximal anastomosis (n=1), coronary stenosis distal to the graft (n=3), and no findings (n=2). After revision all flow values and flow patterns improved.

Although three additional grafts (8.1%) were revised for low flow (<7 ml/min) despite normal flow patterns, there were no findings at revision and flow values and curves remained unchanged after revision.

Postoperatively, one patient developed a stroke (3%), one had an acute myocardial infarction (MI) (3%), one had a sternal wound infection (3%), and one required prolonged ventilatory support (3%).

Conclusion

Evaluation of TTFM is valuable in determining the status of a coronary graft after CABG. Correct interpretation of flow patterns allows for correction of abnormalities prior to chest closure.

Medistim comments

The D'Ancona group considered all flow parameters (Q, DF, PI), flow curves and assessed for competitive flow using compression of native vessel. They also assessed TTFM before chest closure.

The conclusion is that TTFM reliably can detect technical errors leading to prompt graft revisions. The authors emphasise the need to assess all flow parameters as well as the flow curves for improved surgical outcome.

The authors emphasize that the flow curves should always be coupled with EKG tracing to correctly differentiate the systolic from the diastolic flow.