Impact of Target Coronary Artery Stenosis Severity Measured by Instantaneous Wave-Free Ratio on Bypassed Graft Patency

Almas Tolegenuly [1], Arslan Mamedov [2], Rimantas Benetis [3]

[1]Department of Cardiac, Thoracic and Vascular Surgery, Hospital of Lithuanian [2]University of Health Sciences Kauno Klinikos, Medical Academy, Lithuanian [3]University of Health Sciences, Eivenių 2, LT-50009 Kaunas, Lithuania

Abstract:

Background: This study aimed to assess the impact of the measurement of the degree of target coronary artery stenosis using the instantaneous wave-free ratio (iFR) on patency of attached grafts.

Materials and Methods: A total of 86 grafts were assessed by computed tomography angiography (CTA) after coronary artery bypass grafting (CABG) in 24 patients with multivessel coronary artery disease (CAD). The iFR was evaluated for all target coronary arteries. The coronary artery stenoses were divided into three groups based on the iFR value: iFR < 0.86 (group 1); iFR 0.86–0.90 (group 2); and iFR > 0.90 (group 3).
Results: CTA was performed at 192 ± 44 days (range: 80–318 days). The correlation coefficient (r) between iFR and failed grafts was 0.332 (p = 0.035). Graft failure was detected in three grafts (8.1%) for group 1, in two grafts (8.3 %) for group 2, and in four grafts (16%, all arterial grafts) for group 3. Statistically significant differences were found between groups 1 and 3 (p = 0.041) and between groups 2 and 3 (p = 0.044). No significant differences were found between groups 1 and 2 (p = 0.228).

Conclusions: The degree of coronary artery stenosis measured by iFR is a risk factor for attached graft failure. In a coronary artery where the iFR was haemodynamically non-significant, a higher rate of graft failure was detected.

Keywords: coronary artery bypass grafting; instantaneous wave-free ratio; graft failure, computed tomography angiography