

News and Views from the Literature

Angioplasty

Expanded Use of Distal Embolic Protection Devices in Primary Angioplasty

Reviewed by Alan C. Yeung, MD

Division of Cardiovascular Medicine, Stanford University School of Medicine, Stanford, CA

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Distal protection devices have been shown to be effective in preventing distal embolization of debris in saphenous vein graft interventions. Randomized clinical trials have shown that distal protection can reduce the rate of major adverse cardiac events (Saphenous Vein Graft Angioplasty Free of Emboli Randomized [SAFER] trial, RR: 0.51), mainly as reflected in the myocardial infarction rate. Comparison of distal balloon occlusive devices versus filter devices has been shown to have similar effects (FilterWire EX Randomized Evaluation [FIRE] trial).¹

The use of the filter device in primary angioplasty for ST elevation myocardial infarction may provide benefit, especially in the right coronary arteries, which often have a heavy thrombus burden. Clinical studies have shown that up to 80% of cases may have myocardial microvascular damage leading to diminished myocardial blush score and persistent ST elevation.² Angiographically, 9% to 15% of the cases show clear evidence of distal emboli. Possible complications involving the use of FilterWire (Boston Scientific Corporation, Natick, MA) include ease of use of the device (profile of 3.9F), the presence of side branches making distal protection less effective, and the definition of effectiveness in these acutely ill patients (because all patients will have myocardial necrosis).

Mechanical Prevention of Distal Embolization During Primary Angioplasty: Safety, Feasibility, and Impact on Myocardial Reperfusion

Limbruno U, Micheli A, DeCarlo M, et al.

Circulation. 2003;108:171–176.

This study enrolled 53 patients with ST elevation myocardial infarction with reference lumen diameter of greater than 3 mm. The operators stated the following protocol: First, cross the occlusion primarily with the

FilterWire; if this is not possible, pre-dilate with a 1.5 mm balloon. Second, deploy the FilterWire before any major side branch or 2–3 cm beyond a total occlusion. Patients from an existing database were case matched according to infarct-related artery, pre-percutaneous coronary intervention, Thrombolysis in Myocardial Infarction (TIMI) flow grade, gender, and age.

The FilterWire was primarily successful in 89% of the patients. If seven patients who required pre-dilation are included, the success rate increases to 94%. Macroscopic particles were visually detected in 34% of the cases. Most of these particles were composed of fresh thrombus, platelets, and red blood cells. Foam cells, smooth muscle cells, cholesterol clefts, and calcifications were not observed.

Compared with the matched group, the FilterWire group had less IIb/IIIa inhibitor use, a 5-minute longer needle-to-balloon time, higher TIMI 3 flow grade (98% vs 85%, $P = .03$), lower frame counts (22 vs 31, $P = .005$), and higher percentage of grade 3 myocardial blush score (66% vs 36%). The FilterWire group also had greater ST segment resolution and lower peak creatine kinase levels. Multivariate analysis showed that FilterWire use is the only independent predictor of effective reperfusion markers.

This study certainly showed that the use of FilterWire is feasible and safe in primary angioplasty in ST elevation myocardial infarction. Fifty-eight percent of the interventions were in the left anterior descending or circumflex artery, dispelling the notion that distal protection may only be important in the right coronary artery. The authors did not discuss TIMI flow rate in the unprotected side branches, which may be important when the side branch is large; “kissing” filters may be possible for balloon angioplasty but not for stenting.

It is likely that in the future we will be using distal protection devices in many of our patients who present with acute coronary syndrome. One of the major concerns Gruentzig had when he first performed percutaneous transluminal coronary angioplasty (PTCA) 25 years ago was distal embolization. Fortunately, he did not perform the initial angioplasty in patients with saphenous vein grafts or acute myocardial infarction; otherwise, there would be no PTCA as we know it today. ■

References

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2. Henriques JP, Zijlstra F, Ottervanger JP, et al. Incidence and clinical significance of distal embolization during primary angioplasty for acute myocardial infarction. *Eur Heart J*. 2002;23:1112–1117.

Atherosclerosis

The Relationship Between Inflammation and Atherosclerotic Events

Reviewed by Karol E. Watson, MD, PhD

Program in Preventive Cardiology, University of California Los Angeles, Los Angeles, CA

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It is now recognized that atherosclerosis is an inflammatory disease.¹ Chronic, subclinical inflammation appears to be one mechanism explaining the increased risk of atherosclerotic events, regardless of the amount of obstruction produced by a given atherosclerotic lesion. In the inflammatory model of atherosclerosis, it is the degree of inflammation, not the degree of obstruction, that causes acute atherosclerotic events, such as unstable angina and myocardial infarction. If, indeed, inflammation underlies acute coronary syndromes, then inflammatory cytokines, such as interleukin-6 (IL-6), interferon- γ (IFN), and C-reactive protein (hsCRP) should be elevated in patients with acute coronary syndromes and in patients at risk for future cardiovascular events. Two recent articles address this phenomenon and are reviewed below.

Concentrations of Interleukins, Interferon, and C-Reactive Protein in Stable and Unstable Angina Pectoris

Yamashita H, Shimada K, Seki E, et al.

Am J Cardiol 2003;91:133–136.

In this study, 131 Japanese subjects were evaluated. Of these, 79 subjects had known atherosclerosis, and 52 were age- and gender-matched control subjects. Of the 79 individuals with known atherosclerosis, 40 patients presented with unstable angina, and 39 patients had stable atherosclerotic disease. All patients had blood drawn by peripheral venipuncture for measurement of interleukins, IFN, and hsCRP. All three groups were of similar age, gender distribution, and body mass index; however, the prevalence of cardiac risk factors was significantly greater in both the stable and unstable atherosclerosis groups. There were no significant differences in risk fac-