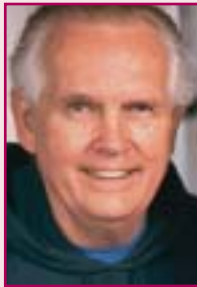


Revascularization in CAD: Life-Saving Decisions

Gustavo Nogareda, MD, FSCAI, FACC; and Ken Gin, MD, FRCPC

CardioCase presentation

Sam's Checkup



Sam, 68, has a history of chronic stable angina precipitated on walking three blocks or climbing two flights of stairs at normal pace (Canadian Cardiovascular Society classification class II).

He has not had a symptomatic myocardial infarction (MI). He presents for a checkup after more than one year without seeing a physician.

His past medical history reveals a sedentary lifestyle, chronic hypertension, and hyperlipidemia, but he is not diabetic and never smoked. Current pharmacologic therapy can be seen in Table 1.

Sam's last stress test was performed in June 2002, showing a low-risk test result (predicts average annual cardiac mortality rate $\leq 1\%$ /year), for which he continued with medical therapy.

Table 1

Sam's daily medications

- Acetylsalicylic acid, 80 mg once daily
- Atenolol, 100 mg once daily
- Simvastatin, 40 mg once daily
- Ramipril, 10 mg once daily
- Nitroglycerine patch, once daily

Furthermore, during the last year, he is found to have severe arthritis in both knees. The arthritis limits his physical activity to the level that he is incapable of performing a new risk stratification stress test.

The patient's arterial blood pressure is systolic 140/80 mmHg in both arms. All pulses are present and symmetric. Sam is 180 cm tall and weighs 101 kg. His jugular vein pressure is 2 cm above the sternal angle and he has no pitting edema.

A resting electrocardiogram (ECG) shows sinus rhythm, left ventricular hypertrophy (LVH), and small R waves in the inferior leads.

What's Your CardioCase Diagnosis?

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

CardioCase *discussion*

What do Sam's tests say?

A 12-lead ECG should be recorded in all patients with angina. A normal ECG does not exclude severe coronary artery disease (CAD), but it does imply normal left ventricular (LV) systolic function and, therefore, a favourable prognosis.

Sam's ECG reveals an inferior wall MI of indeterminant age.

Risk stratification is one of the pivotal activities in medical practice; all patient management decisions are driven by assessment of the patient's prognosis.

Sam is unable to perform an exercise stress test and his ECG shows LVH, which may cause a false positive test. He is, therefore, referred for a Persantine MIBI nuclear scan to assess CAD severity.

At rest, the perfusion test shows mild, reduced uptake in the inferior (white arrows) and anterolateral walls (blue arrows), which markedly worsens with stress in the inferior (white lines), apical, and anterolateral walls (blue lines) (Figures 1 and 2). Left ventricular function is mildly reduced, with an ejection fraction (EF) of 42% (normal $\geq 55\%$).

What is Sam's diagnosis?

Based on these results, Sam is diagnosed with an inferior MI with peri-infarct ischemia (right coronary artery territory), anterior and apical ischemia (left anterior descending artery territory), and

About the author

Dr. Nogareda is an adult and interventional cardiology fellow, University of British Columbia, Vancouver, British Columbia.

Dr. Gin is an associate clinical professor and director, University of British Columbia's post-graduate cardiology training program, Vancouver, British Columbia.

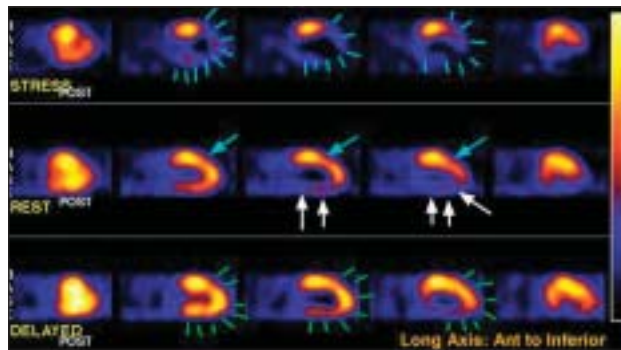


Figure 1. Perfusion test results, long axis.

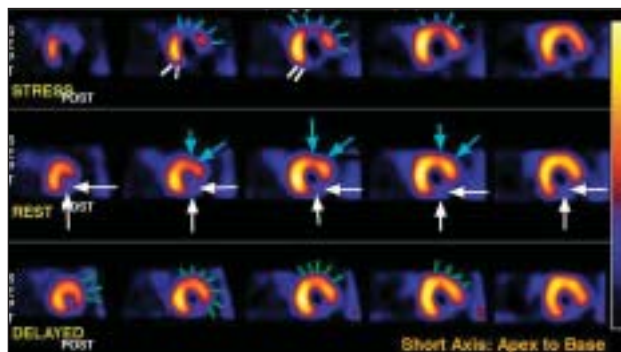


Figure 2. Perfusion test results, short axis.

anterolateral ischemia (circumflex artery territory) accompanied by mild LV systolic dysfunction. Multiple reversible defects (in two or more coronary artery territories) and quantitatively large myocardial perfusion defects are markers of a high-risk test. This high-risk pattern is highly specific for multivessel CAD.

Based on this information, Sam is referred for coronary angiography, as patients with left main or multivessel CAD and LV dysfunction are those who benefit most from myocardial revascularization (prolonged survival).

Coronary angiography is coherent with the risk stratification perfusion test and shows severe triple-vessel CAD with an EF of 35% LVEF (Figures 3 and 4).

How is Sam treated?

Sam's coronary anatomy makes complete revascularization feasible with percutaneous coronary angioplasty (PCA) or coronary artery bypass grafting (CABG). Those patients who have no particular high-risk conditions for either revascularization technique and in whom equivalent degrees of revascularization can be achieved by whichever revascularization method, are eligible for PCA and CABG.

After being told about the nature, risks, and benefits of the two revascularization strategies, Sam opts for PCA. Ad hoc PCA, with the implantation of three stents, is immediately carried out without complication (Figures 5 and 6).

Sam is discharged from hospital 24 hours later. The discharge medications consist of: clopidogrel, 75 mg daily and acetylsalicylic acid, 325 mg daily for one month to prevent thrombosis of the implanted stents. His long-term daily medications are acetylsalicylic acid, 81 mg; atenolol, 50 mg; ramipril, 10 mg, and simvastatin, 20 mg.

This combined therapy reduces the annual risk

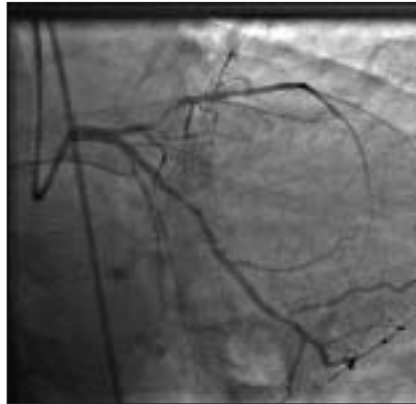


Figure 3. Coronary angiography results.

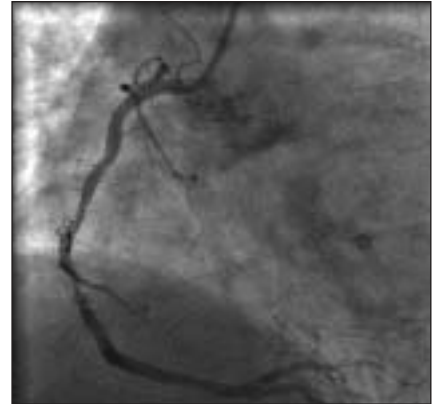


Figure 4. Coronary angiography results.



Figure 5. Angioplasty result.



Figure 6. Angioplasty result.

of developing a new MI in up to 80% of patients. In addition, as he has been completely revascularized, Sam's nitroglycerine patch is discontinued.

In Sam's case, risk stratification allowed the correct diagnosis of multivessel CAD and LV dysfunction; this led to successful revascularization and improvement of angina, as well as improved survival. 