Angina due to obstructive coronary artery disease with atrial fibrillation

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A 78-year-old Caucasian woman with hypertension, dyslipidaemia, and a family history of vascular disease presented with a recent onset of shortness of breath and angina occurring during moderate physical activity (Canadian Cardiovascular Society Class II). She had a diagnosis of permanent atrial fibrillation 2 years before, which was treated with a rate-control strategy with metoprolol 25 mg b.i.d. and oral anticoagulation with apixaban 5 mg b.i.d. (CHA2DS2-VASc and HAS-BLED scores were 4 and 2, respectively, and her weight was 74 kg). An episode of haematuria requiring temporary suspension of apixaban was recorded about 2 months after therapy was started.

On examination, she presented an irregular heart rhythm, with a heart rate of 98 b.p.m., a blood pressure of 115/65 mmHg, and an oxygen saturation of 98%. Her cholesterol was 246 mg/dL, low-density lipoprotein 108 mg/dL, and high-density lipoprotein 50 mg/dL. High-sensitivity troponin, N-terminal pro-B-type natriuretic peptide, blood sugar, and renal function were normal. An electrocardiogram (ECG) showed atrial fibrillation and non-specific ST-T wave abnormalities (Figure 1). An echocardiogram showed a preserved ejection fraction (55%) with normal regional wall motion, mild aortic stenosis, trivial mitral regurgitation, mild atrial enlargement, and no signs of diastolic dysfunction.

In your normal clinical practice, which test would you do at this stage?

An exercise ECG was excluded because atrial fibrillation could mimic or mask ECG repolarization abnormalities during exercise. Moreover, this exam has lower sensitivity and specificity in the elderly and in females. A coronary computed tomography (CT) scan was not considered given the patient’s high heart rate and age. In fact, it is common in the elderly to find inconclusive coronary CT scans due to extensive coronary calcifications. We performed an exercise myocardial perfusion nuclear scan, showing a moderate reversible perfusion deficit at the level of the inferior wall.1

Treatment

Beta-blocker therapy was optimized by increasing the dose of metoprolol to 50 mg b.i.d. Indeed, high heart rate increases myocardial oxygen consumption and reduces oxygen delivery to the heart, shortening diastolic coronary perfusion, and myocardial relaxation. Simvastatin 20 mg was also recommended due to off-target cholesterol levels. There was no indication for the use of ivabradine (which does not decrease heart rate in the presence of atrial fibrillation) or non-dihydropyridine calcium antagonists as the heart rate was well-controlled by beta-blockers. Apixaban 5 mg b.i.d. was continued.

After 3 months of optimized medical therapy, the patient still reported effort angina. Her heart rate was about 80 b.p.m., blood pressure 110/70 mmHg, oxygen saturation 99%, and low-density lipoprotein 70 mg/dL. Ranolazine 375 mg b.i.d. was started and the dosage increased to 500 mg b.i.d. after 3 weeks of well-tolerated therapy. The choice of ranolazine was based on the fact that the blood pressure was rather low, thus giving preference to

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antianginal drugs without haemodynamic effects. Symptoms, however, did not improve.

A coronary angiography was performed, showing a significant stenosis of the mid-right coronary artery (Figure 2A). A new-generation drug-eluting stent was successfully implanted after starting clopidogrel, aspirin, and pantoprazole 40 mg (Figure 2B). After discharge, dual antithrombotic therapy with apixaban 5 mg b.i.d. and clopidogrel 75 mg o.d. was chosen because the bleeding risk was considered to be higher than the ischaemic risk in this patient (single, short stent implanted, right coronary artery involved, no history of acute coronary syndromes, and single-vessel coronary artery disease).2,3
One month later, the patient was asymptomatic with no reported adverse events.

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