Angina due to vasospasm in an elderly patient with heart failure

Mario Marzilli*

Cardiovascular Medicine Division, Pisa University Medical School, Via Paradisa 2, 56100 PISA, Italy

The patient is a 70-year-old woman with recurrent episodes of angina and a recent non-ST-segment elevation myocardial infarction. She had been taking medications for hypertension and hypercholesterolaemia for several years, including metoprolol 50 mg b.i.d., aspirin 100 mg, and atorvastatin 10 mg. In February 2017, she was referred to our outpatient clinic for exertional dyspnoea. A treadmill electrocardiogram performed at that time was negative for inducible ischaemia.

Four months later, the patient was still symptomatic for exertional dyspnoea and recurrent chest pain that radiated to both arms and lasted several minutes; peripheral oedema (+/++) was also noted. The transthoracic echocardiogram showed akinesia of the proximal inferior wall, inferior interventricular septum, and all apical segments with a moderate reduction in systolic function (EF 35%), mild mitral regurgitation, and pulmonary hypertension. The treating physician increased the dosage of furosemide.

Two months later, the patient presented to the emergency room for intense, long-lasting (h) constrictive chest pain radiating to the right arm that was associated with hypotension. She was admitted to hospital due to several similar episodes of chest pain at home during the preceding days. At physical examination, bilateral pulmonary rales were present and her blood pressure was 95/65 mmHg. The blood chemistry was as follows: hsTn, 247 ng/mL; creatine kinase-myocardial band, 6.98 mg/L; brain natriuretic peptide, 2077 pg/mL; white blood cells, 9.0 x 10³; red blood cells, 3.6 x 10⁹; platelets, 175 x 10³; haemoglobin, 12.1; haematocrit, 35.4%; mean cell volume, 97; mean cell haemoglobin, 33; glucose, 208; creatinine, 2.7; Tot prot, 6.6; Na, 136; K, 5.6; Cl, 102; aspartate transaminases, 48; international normalized ratio, 0.98.

A non-ST-segment elevation myocardial infarction was diagnosed and the patient was admitted to the cardiac care unit. When she reached us, she was asymptomatic for angina. An electrocardiogram (EKG) (Figure 1), a chest X-ray (Figure 2), and a transthoracic echocardiography were immediately performed. The echocardiogram showed akinesia of the proximal inferior wall, inferior interventricular septum, and all apical segments with a moderate reduction in systolic function (EF 35%), mild mitral regurgitation, and pulmonary hypertension (pulmonary arterial pressure 50 mmHg). She was in sinus rhythm (heart rate was 78 b.p.m.), had normal S1-S2, olosystolic murmur (2/6 L) at the apex with a blood pressure of 110/70 mmHg. Bilateral pulmonary rales were present at lung auscultation, but there was no presence of peripheral oedema.

Taking into account her age, comorbidities, and renal impairment, a medical therapy strategy was adopted, including metoprolol 50 mg b.i.d., isosorbide dinitrate 20 mg t.i.d., aspirin 100 mg, and atorvastatin 20 mg.

In the following days, renal function improved, but the number of chest pain episodes increased, and the patient was referred for coronary angiography (Figure 3). A severe obstruction of the distal left main was found and successfully stented (Figure 4).

Surprisingly enough, 3 days after the procedure, the patient complained of recurrent angina, which was responsive to sublingual nitroglycerine. Medical therapy was modified, substituting metoprolol 25 mg b.i.d.

*Corresponding author. Tel: +393287291353, Email: mario.marzilli@med.unipi.it

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with diltiazem 60 mg t.i.d. and adding trimetazidine 20 mg t.i.d. Symptoms improved and the patient was discharged home with the following therapy:

- Diltiazem 60 mg t.i.d.
- Isosorbide mononitrate 20 mg t.i.d.
- Trimetazidine 20 mg t.i.d.
- Aspirin 100 mg o.d.
- Clopidogrel 75 mg o.d.
- Atorvastatin 40 mg o.d.
- Furosemide 50 mg t.i.w.

After being at home, she consulted her family doctor who stopped the calcium channel blocker and

Figure 1  EKG at admission.

Figure 2  Chest X-ray at admission.

Figure 3  Coronary angiography.

Figure 4  Coronary angiogram following stenting of the left main distal stenosis.
trimetazidine, and he put her back on beta-blocker therapy. A few weeks later, the patient was readmitted for worsening dyspnoea and recurrent angina (Figure 5). In the cardiac care unit, intravenous furosemide was given, the beta-blocker was progressively discontinued, and trimetazidine and diltiazem were reintroduced. Pulmonary congestion and symptoms strikingly improved (Figure 6).

Comments

In this patient, an association was observed between beta-blocker use and worsening angina. Conversely, the combination of a calcium channel blocker and trimetazidine was associated with a marked improvement in symptoms. Symptom control was followed by objective amelioration:
the brain natriuretic peptide level dropped from 1713 to 989 pg/mL and the pulmonary hypertension was reduced from 55 to 38 mmHg.

Considerations

Angina in elderly patients is commonly associated with multiple comorbidities. The peculiarities of this patient are the persistence of angina after stenting of a tight distal stenosis of the left main stem and the worsening of symptoms whenever a beta-blocker was prescribed (Figure 7). Both observations suggest a possible vasospastic mechanism that could be responsible for the precipitating angina. The marked improvement in symptoms and cardiac function with a combination of trimetazidine and calcium channel blockers suggests how important it is to use a tailored choice of antianginal agents for each patient.

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