You are never too old

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Abstract

The case is reported of a 77-year-old man with a resuscitated cardiac arrest caused by an anterior acute myocardial infarction who underwent thrombolysis with streptokinase. Although coronary angiography revealed three-vessel disease with good distal vessels suitable for surgical revascularization, the patient refused to undergo the operation. He remained symptomatic on conventional medical therapy for about 14 months when, because of his poor compliance with his treatment and progression of the coronary artery disease, his cardiac symptoms became more frequent, reducing his quality of life. Cardiac rehabilitation and high-dose trimetazidine (120 mg/day) were used as additional means of optimizing his medical treatment, achieving a progressive relief of symptoms and an improvement in his quality of life, with good compliance.

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Case report

A 77-year-old man, asymptomatic and well until September 2003, suffered a resuscitated cardiac arrest while running to catch a train. Once resuscitated, he was transferred to the local General Hospital, where he was found to have an anterior acute myocardial infarction, and underwent thrombolysis with streptokinase.

Before this episode, the patient reported general good health. He had a normal body mass index. He had smoked about 15 cigarettes per day since he was 19 years old. He had a family history for coronary artery disease (CAD): one brother had undergone percutaneous coronary intervention, and two sisters had suffered an acute myocardial infarction. He had been taking antihypertensive drugs (amlodipine 10 mg) for the past 8 years, but had never reported cardiac symptoms or dyspnea in the past. On several occasions he was found to have high concentrations of cholesterol (total 286 mg/dL; low-density lipoprotein 203 mg/dL) and impaired fasting glucose (glycemia 120 mg/dL), but he had never taken the prescribed lipid-decreasing drug (pravastatin) or adopted a low-fat diet.

An echocardiogram before his discharge from hospital showed concentric left ventricular hypertrophy (septum 12 mm, posterior wall 11.5 mm), a dilated left ventricle (left ventricular end-diastolic diameter [LVEDD] 66 mm, left ventricular end-systolic diameter [LVESD] 46 mm) with a reduced left ventricular ejection fraction [LVEF] (41%), severe anterior wall hypokinesia, and apical akinesia (*Figure 1*).

Carotid vascular EchoDoppler showed the presence of bilateral hyperechogenic plaques without significant stenosis (<40%) at the carotid bulbs.

Submaximal exercise nuclear scintigraphy showed a fixed defect of the anterior wall and a reversible perfusion defect of the anterior wall and apex (*Figure 2*).

The patient refused to undergo cardiac catheterization. After 10 days he was discharged from hospital in a generally good condition. Medical therapy at discharge was aspirin, a β-blocker (bisoprolol 7.5 mg), an angiotensin converting enzyme (ACE) inhibitor (perindopril 8 mg), furosemide 25 mg, and a statin (pravastatin 20 mg).

One month after the acute myocardial infarction, the patient was seen in the outpatient clinic and clinical examination showed a good control of blood pressure and heart rate (56 beats/min). Biochemistry

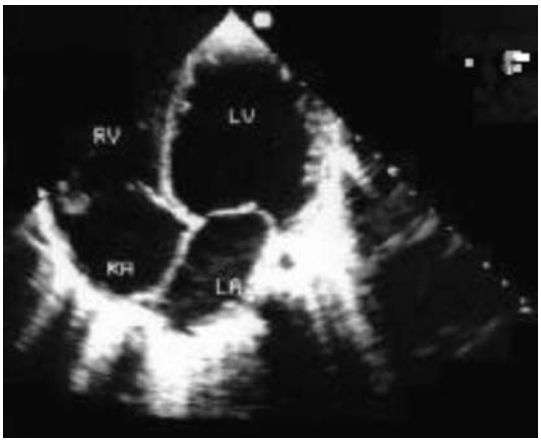

Figure 1. Pre-discharge echocardiogram.

confirmed an impaired fasting glucose (glycemia 118 mg/dL), but the patient refused to perform an oral glucose tolerance test. Total cholesterol and low-density lipoprotein cholesterol were respectively 235 mg/dL and 148 mg/dL. The dose of pravastatin was increased to 40 mg.

An electrocardiogram showed sinus rhythm and signs of a previous anterior myocardial infarction. The echocardiogram was substantially unchanged compared with that before discharge. In order to evaluate the presence of reversible myocardial ischemia, the patient was prescribed a maximal exercise electrocardiogram that he refused because he said he was feeling well. For the same reason, he refused to undergo outpatient cardiac rehabilitation.

About 1 year later, the patient had stopped taking his pravastatin and was not regularly taking his furosemide. When seen in the outpatient clinic, he was complaining of chest pain and dyspnea on low-to-mild effort (Canadian Class 2, New York Heart Association [NYHA] Class 2–3). He also reported occasional episodes of paroxysmal nocturnal dyspnea. Clinical examination, blood pressure, and heart rate were unremarkable. A new exercise test was performed, but was

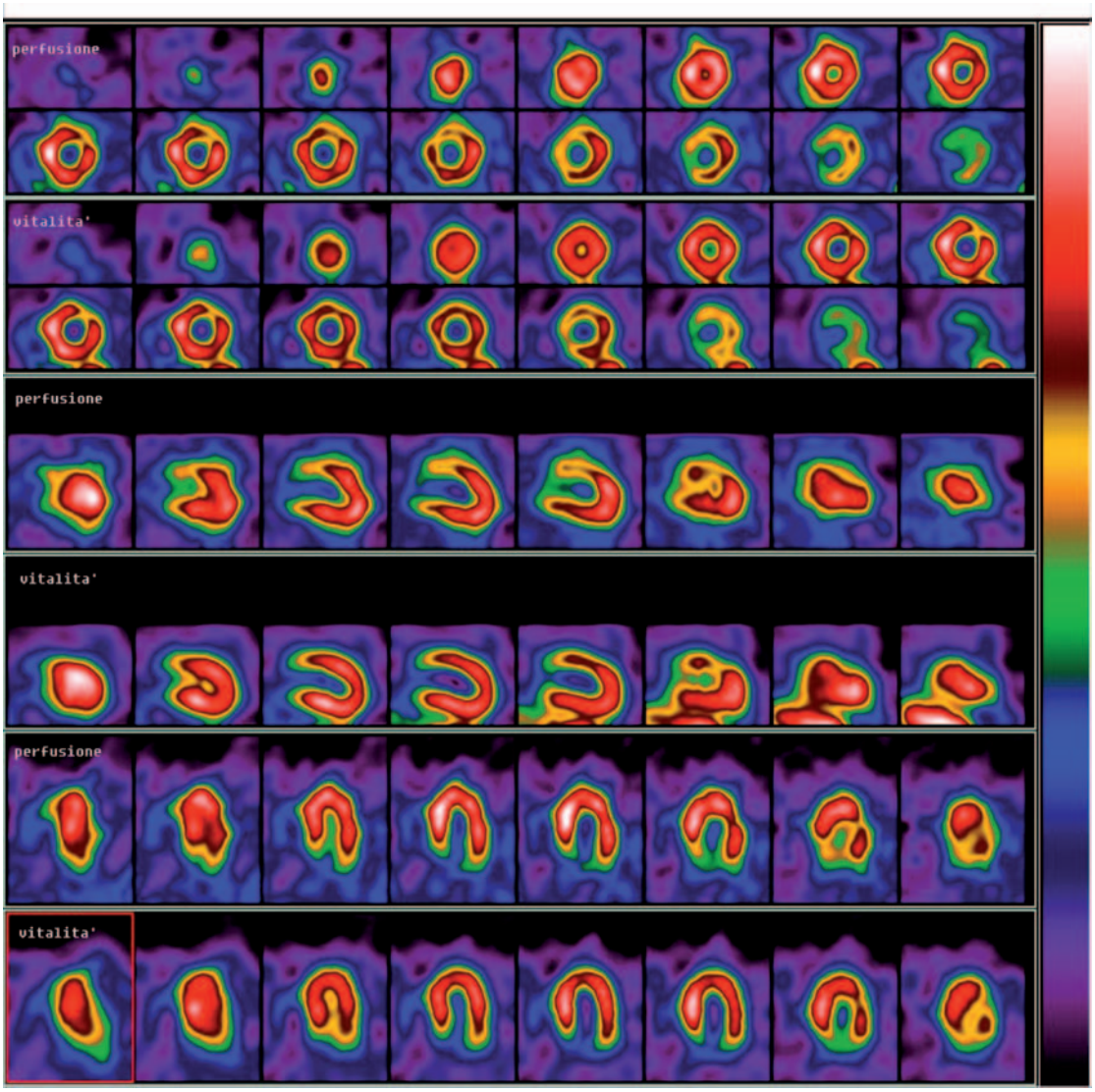

Figure 2. Pre-discharge submaximal exercise nuclear scintigraphy.

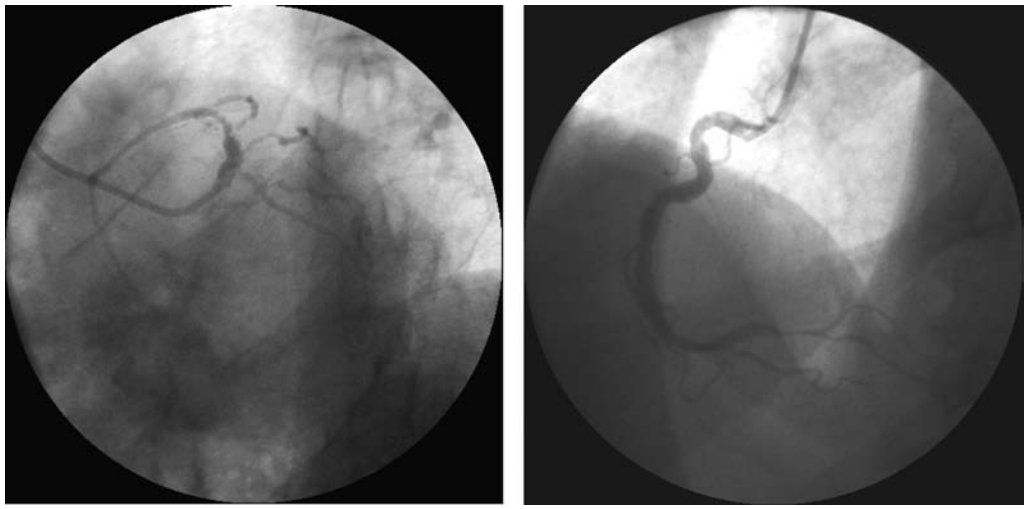

Figure 3. Coronary angiography (performed February 2005).

stopped because of worsening dyspnea and chest pain at medium-to-low workload, without electrocardiographic changes. On this occasion, the patient was offered coronary angiography, which he accepted. An echocardiogram showed a dilated left ventricle (LVEDD 71 mm, LVESD 50 mm), LVEF 34%, with anterior and lateral hypokinesia and apical akinesia.

Coronary angiography was performed in February 2005 and showed three-vessel disease, with good distal vessels (*Figure 3*). In view of the coronary angiography, surgical revascularization was proposed, which the patient declined.

Transdermal nitrates were prescribed, but were stopped after 2 weeks because of skin irritation. Medication with oral isosorbide dinitrate three times a day was therefore started.

In November 2005, the patient was again admitted to hospital for worsening symptoms: he reported an increase in the number of anginal episodes, which now occurred at low levels of exercise (one flight of stairs), and dyspnea. Physical examination showed signs of NYHA Class 3 heart failure. At the time of admission to hospital, the patient was taking an ACE inhibitor, a β-blocker for which he had halved the dose, a diuretic occasionally, a statin, and an antiplatelet agent, but in the summer he had stopped taking nitrates, because of poor compliance and lightheadedness. Biochemistry showed hypercholesterolemia (total cholesterol 265 mg/dL) and hyperglycemia (glycemia 121 mg/dL).

A chest X-ray revealed cardiomegaly and, initially, pulmonary edema, which reversed after intravenous furosemide. He was administered a vertical quality-of life-visual analog scale and scored 4/10. The patient agreed to undergo a 3 week inpatient cardiac rehabilitation programme. This programme was followed by 3 months outpatient cardiac rehabilitation cycles involving 3 sessions of exercise per week.

The patient was discharged from hospital again, receiving bisoprolol 7.5 mg, trimetazidine 40 mg three times a day, perindopril 8 mg, atorvastatin 40 mg, furosemide 25 mg three times a day, aldactone 100 mg twice daily, and aspirin 100 mg. After 3 months, when he entered the outpatient cardiac rehabilitation cycle, he reported a significant improvement in symptoms and was asymptomatic for low-to-mild levels of exercise. Physical examination was unremarkable and there were no signs of heart failure.

About 7 months later, when the patient returned for his second cycle of outpatient cardiac rehabilitation, he did not report episodes of chest pain and he had slight dyspnea for moderate levels of exercise. An echocardiogram revealed that left ventricular dimensions had reduced (LVEDD 60 mm; LVESD 40 mm) and the ejection fraction had increased to 42%. A recovery of contractile function was observed in the anterior and lateral walls.

The vertical quality-of-life visual analog scale was again administered and the patient scored 7/10.

Comment

This case depicts the classical elderly patient with CAD who is reluctant to take drugs and does not want to undergo invasive procedures. This man was treated appropriately for his acute myocardial infarction and underwent an early conservative management in relation to his age. Despite receiving adequate β-blockade, as suggested by the low heart rate, and having adequate control of blood pressure, after an initial period of clinical stabilization the patient had episodes of angina in the morning hours that suggested the need for a better 24 h control of myocardial ischemia. Because of his general good

condition and the absence of serious comorbidities, in this patient there was a clear indication for myocardial revascularization; however, he refused to undergo surgical procedure. For this reason, the optimization of medical treatment was the main therapeutic target, aimed not only at reducing the frequency and severity of anginal attacks, but also at improving quality of life and life expectancy.

In elderly patients with ischemic heart disease, quality of life must be the one of most important objectives of medical practice. There are several tests available to investigate the subjective perception that the individual has about his own quality of life; these may be divided into generic and illness-specific tests. Among the first group, the vertical visual analog scale is one of the simplest tests to be administered to elderly people: on a 10 cm line marked every 1 cm, patients are asked to score their present quality of life, with 0 being the worst ever and 10 being the best ever [1,2].

In the clinical management of elderly patients with coronary artery disease, it is important to take into account their general clinical condition, and the presence of comorbidities, which may aggravate ischemic heart disease and interfere with pharmacological or interventional therapy, or both [3]. In spite of improvements in the techniques of percutaneous and surgical revascularization, these interventions are associated with increased periprocedural mortality and morbidity. The incidence of periprocedural stroke is about 3.5%, and may represent a further cause of functional limitation, disability, and reduction in future quality of life. Similarly, percutaneous revascularization procedures in the elderly have a lesser percentage of success and a greater incidence of complications in comparison with those in younger patients [4]. Finally, the recent COURAGE (Clinical Outcomes Utilizing Revascularization and Aggressive Drug Evaluation) study has shown no benefit of interventional procedures in patients with chronic stable angina [5].

For all these reasons, revascularization (whether surgical or transcatheter) in elderly patients should be reserved for those with refractory angina in spite of maximal medical therapy, and those in whom angina compromises quality of life, the instrumental activities of daily living, or, even more so, the activities of daily living. Among other things, the anatomical characteristics of CAD, such as multivessel disease and distal coronary atherosclerosis, may limit the possibility of and opportunity for revascularization. The only study that has compared the effects of medical therapy and of revascularization on the quality of life in patients older than 75 years, the Trial of Invasive Versus Medical Therapy in Elderly Patients (TIME), has shown that optimized medical therapy is as effective as myocardial revascularization in improving 1-year quality of life, symptoms, and cardiovascular events [6].

In elderly patients, conventional antianginal therapy with nitrates, β-blockers, and calcium antagonists may be associated with a greater incidence of significant adverse effects. These are dependent, not only upon the hemodynamic actions of the drugs (effect on blood pressure and heart rate), but also on altered pharmacokinetics, linked to changes in body composition and renal and hepatic dysfunction and to a greater risk of interactions of the antianginal drugs with other medications used to treat comorbidities [7].

Addition of adjunctive treatment with metabolic agents, such as trimetazidine, to the standard care of elderly patients with ischemic heart disease may be particularly useful in the treatment of angina. In fact, in the elderly, the chronic reduction in blood flow caused by diffuse multivessel and distal coronary atherosclerosis may cause diffuse hibernation of the myocardium. Several studies have shown that the metabolic effect of trimetazidine may improve the efficiency of hibernated myocardium, through more efficient utilization of glucose in areas of myocardium with reduced oxygen availability, with a parallel improvement in left ventricular function [8,9].

The patient described here was an ideal candidate for a metabolic approach to treatment, because of the progressive reduction in his functional capacity and the progressive increase in incidence of chest pain. Furthermore, he was receiving adequate β-blockade, and therefore adjunctive hemodynamic therapy could have had limited results: several studies have shown that, in patients receiving adequate β-blockade, the adjunct of a hemodynamic agent does not increase ischemic threshold or improve symptoms [10–12].

The association of optimal medical therapy and cardiac rehabilitation may add an additional benefit in exercise tolerance and in terms of secondary prevention [13]. Cardiac rehabilitation and education in physical activity may also improve the control of several cardiovascular risk factors, such as diabetes, dyslipidemia, and arterial hypertension, reducing the amount of drugs used for the control of these risk factors and ischemia, and improving adherence to treatment, especially in elderly patients in whom the presence of comorbidities necessitates polytherapy. Nevertheless, although cardiac rehabilitation improves functional capacity in both young and elderly patients, the latter are often excluded from cardiac rehabilitation programs. Benetti et al [14] have shown that, in the elderly patients, cardiac rehabilitation increases functional performance and leads to a meaningful improvement of the quality of life.

The effect of metabolic treatment with trimetazidine on left ventricular function may also have prognostic

implications, because left ventricular function is one of the most important determinants of long-term outcome and development of heart failure in patients with CAD [15,16]. Recent studies have shown that trimetazidine improves left ventricular function and quality of life in elderly patients with ischemic cardiomyopathy, and improves survival in patients with coronary artery disease [9,17].

Conclusion

The clinical history of this patient represents a typical clinical example of ischemic CAD in an elderly patient with a poor compliance to medical treatment. This case also shows that the association of cardiac rehabilitation and optimal medical therapy represents a valid alternative to revascularization, not only in those patients for whom surgery is contraindicated, but for most patients with CAD. The adjunct of a metabolic drug, such as trimetazidine, to optimal medical therapy and exercise represents a supplementary tool to reduce the incidence and severity of symptoms, and to increase exercise tolerance and quality of life. The improvement in left ventricular function may have a beneficial effect, not only on global functional performance, but also on long-term prognosis. ■

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