

# Trimetazidine in the management of ischemic heart disease in a patient with diabetes mellitus and recurrent angina

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Acute coronary syndromes in diabetic patients often pose therapeutic challenges. Both percutaneous and surgical revascularization procedures have a lower success rate and a greater complication rate in diabetics compared to non diabetic patients. Here we discuss the case of an old diabetic patient with angina recurring 15 year after a CABG operation. Based on coronary anatomy and clinical presentation, several options were considered, including re-do operation, percutaneous revascularization, and medical therapy alone. A combination of PCI and trimetazidine addition to standard medical therapy was eventually chosen. This approach has been very effective and has so far protected the patient from angina.

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**Keywords:** Angina, CABG, diabetes mellitus, ischemic heart disease, management, PCI, trimetazidine

## Case report

An 82-year-old man with a family history of ischemic heart disease was referred to our Coronary Care Unit because of recurrent angina. He had been diagnosed with type 2 diabetes mellitus 16 years previously, and 1 year later had presented with an episode of prolonged chest pain followed by fainting. On that occasion, he was admitted to our Coronary Care Unit, where an acute inferior myocardial infarction was diagnosed. Coronary angiography, performed a few days later, revealed multivessel coronary disease, and the patient underwent coronary artery bypass grafting, with a left internal mammary artery implanted on the obtuse marginal branch of the left circumflex coronary artery and a saphenous graft implanted on the distal right coronary artery. After discharge he was followed regularly by a cardiologist, and had been treated with antiplatelet agents, angiotensin-

converting enzyme inhibitors, calcium channel blockers, nitrates, diuretics, statins, and oral anti-diabetic drugs. He had been asymptomatic, with a normal lifestyle, until 1 week before the present referral, when he began to complain of chest discomfort that was triggered by exercise but promptly relieved by rest.

At the time of his current admission, an electrocardiogram showed complete left bundle branch block, chest radiographs were unremarkable, and an echocardiogram showed left ventricular dilatation, moderate systolic dysfunction (ejection fraction 42%), and inferobasal akinesia.

A dipyridamole echo stress test was performed. With the high dose, the patient complained of chest discomfort, and anterolateral wall dysfunction (akinesia) was observed. Symptoms and regional left ventricular dysfunction were quickly corrected by intravenous aminophylline.

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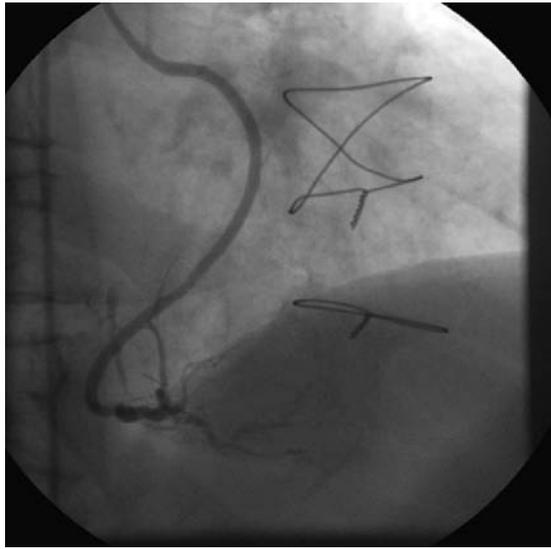


Figure 1. Angiogram showing patency of the venous graft on the distal right coronary artery.

Trimetazidine 20 mg (two tablets three times a day; total 120 mg/day) was added to standard medical treatment and the patient was scheduled to undergo coronary angiography, which was performed 2 days later.

Angiography demonstrated patency of the venous graft on the distal right coronary artery (Figure 1), patency of the left internal mammary artery (LIMA) implant on the marginal branch (Figure 2), and progression of the atherosclerotic disease on the left main/left anterior descending (LAD) arteries, with a tight stenosis in the proximal segment of the LAD artery (Figure 3).

After several options had been considered, given the “protection” offered by the patent mammary

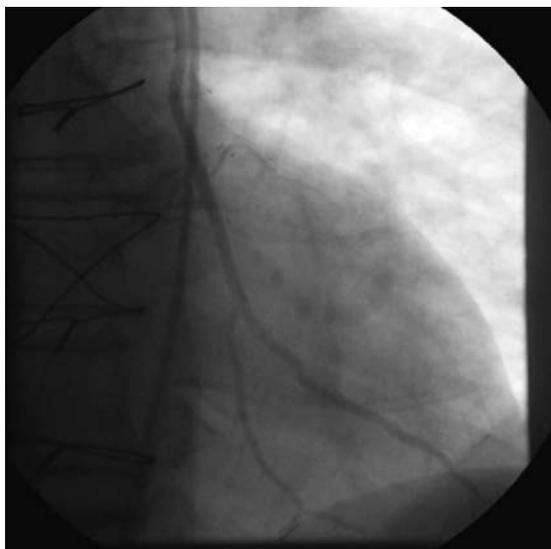


Figure 2. Angiogram showing patency of the left mammary artery implant on the obtuse marginal branch of the circumflex coronary artery.

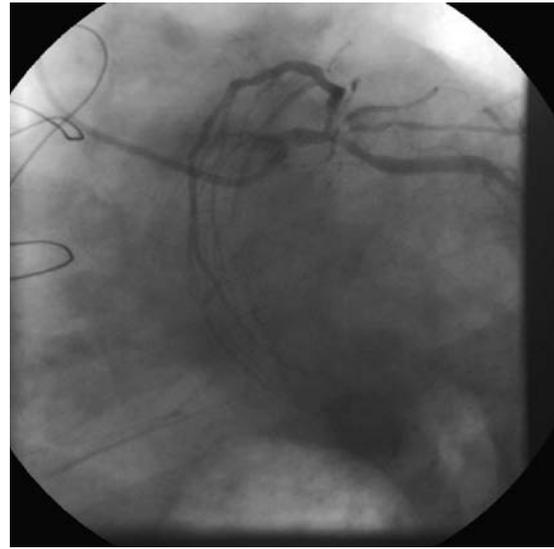


Figure 3. Angiogram showing progression of the atherosclerotic disease on the left main/left anterior descending (LAD) arteries, with a tight stenosis in the proximal segment of the LAD artery.

artery on the marginal branch, the left main/LAD artery segment was dilated with a balloon and implanted with a  $3.5 \times 23$  mm stent (Figure 4).

The postprocedural course was uneventful, with a minor increase in the serum creatinine concentration that reverted quickly to normal, with no other side effect.

At the 4-week follow-up visit, the patient was fully asymptomatic and enjoying a normal life; results of an echo-dipyridamole test were negative.

### Discussion

This Case Report is of an elderly patient with diabetes and severe coronary artery disease who had undergone CABG 15 years previously after an acute coronary syndrome. That revascularization procedure, combined with aggressive medical treatment, assured the patient of prolonged survival and a good quality of life. Progression of his coronary atherosclerosis on native vessels eventually precipitated recurrent angina, with inducible ischemia in the LAD artery territory.

Several therapeutic options were considered for the management of this patient, including re-operation, percutaneous revascularization, and medical treatment.

- The surgical option was initially considered for the presence of a left main obstruction in this diabetic patient, but was discarded after evaluating the risk of a repeat operation for only one graft.
- Medical treatment alone was felt not to be adequate to provide optimal treatment of an acute coronary

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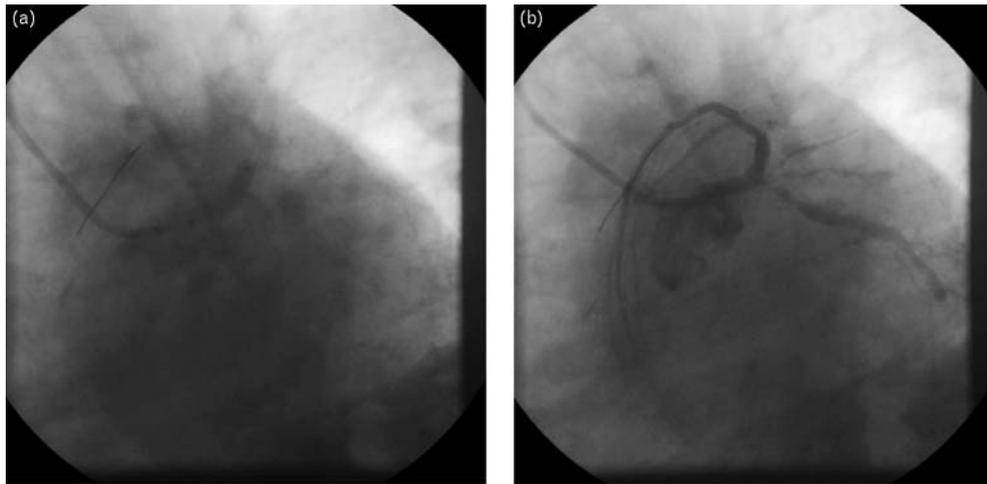


Figure 4. Angiograms showing (a) balloon dilatation of the left main/LAD artery segment and (b) implanted  $3.5 \times 23$  mm stent.

syndrome in a patient in whom recanalization of the culprit lesion was technically feasible.

- Percutaneous coronary intervention alone was not deemed adequate because of the diffusion of the atherosclerotic lesions to distal coronary segments, which prevented a complete myocardial reperfusion.

In the event, a strategy of medical treatment based on a metabolic agent, trimetazidine, followed by percutaneous revascularization of the left main/LAD artery lesion was applied. The revascularization procedure was well tolerated by the patient, who was sent home 2 days later.

Follow-up at 1 month confirmed the success of the treatment strategy, with complete remission of symptoms.

### Comment

Diabetes mellitus is closely associated with coronary heart disease. The prevalence of coronary artery disease increases from 2–4% in the general population to a figure as high as 55% among adult patients with diabetes [1]. The management of ischemic heart disease in diabetic patients remains a challenge. Macrovascular and microvascular disease limit the efficacy of revascularization procedures and increase the risk of early and late complications. Correction

of the alterations in cardiac metabolism that are associated with diabetes mellitus may represent an innovative and effective therapeutic approach in the management of this group of patients.

The mechanism of action of trimetazidine, which is based on a switch from utilization of fatty acids to that of glucose, makes this drug the ideal treatment for angina pectoris in patients with diabetes [2,3]. Furthermore, pretreatment with trimetazidine has been shown to limit myocardial damage associated with revascularization procedures [4].

In the patient described here, a strategy of trimetazidine administration followed by PCI, in addition to standard medical therapy, was safe and effective in controlling his symptoms of recurrent angina. ■

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