Coronary angiography and computed tomography angiography in the diagnosis of extrinsic compression of left internal mammary artery
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A 82-year-old man with a previous coronary artery bypass graft was admitted to our hospital for recurrent and refractory episodes of rest angina with electrocardiographic signs of anterior myocardial ischemia.

Coronary angiography revealed a three-vessel obstructive disease, whereas selective angiography of bypass grafts showed a patent saphenous vein graft (SVG) to the obtuse marginal branch, and a diastolic, dynamic obstruction of the distal tract of the left internal mammary artery (LIMA) to the left anterior descending artery (Fig. 1).

In order to assess the course and the anatomical relationships of the LIMA within the mediastinum, a computed tomography angiography was performed.

Computed tomography angiography showed an extrinsic compression of the LIMA by the SVG, which crossed and

![Fig. 1](attachment:image.jpg)

Selective angiography showing dynamic, diastolic obstruction (asterisk) of the left internal mammary artery to the left anterior descending artery. LIMA, left internal mammary artery.

![Fig. 2](attachment:image2.jpg)

Computed tomography coronary angiography: curved multiplanar reconstruction showing the course of the left internal mammary artery to the left anterior descending artery with focal compression by the saphenous vein graft. LIMA, left internal mammary artery; SVG, saphenous vein graft.
surrounded the anterior segment of the arterial graft proximal to the distal anastomosis to the native artery (Figs 2 and 3).

A sirolimus-eluting stent was deployed in the distal LIMA with complete disappearance of the dynamic obstruction (Fig. 4). A Cypher stent (Cordis, Johnson & Johnson, Miami Lakes, Florida, USA) was chosen for its radial force and for a previous successful utilization in a patient with external bypass compression [1]. Postprocedural angiography of the SVG to the obtuse marginal branch excluded any compression or deformation by the stent positioned in the LIMA (Fig. 5).

Intraluminal narrowing due to intimal hyperplasia is the main process responsible for late failure of arterial grafts [2]. However, intraluminal obstruction may also be determined by alternative mechanisms.

Few reports of partial obstruction due to extrinsic compression have been described: two cases of fixed compression, by chest drain and by coronary artery pseudoaneurysm, respectively, and one case of dynamic
compression during systole by chest drain [3–5]. In each of the three cases, as in our report, the correct diagnosis allowed effective treatment of the anomaly and restoration of normal flow within the graft.

To our knowledge, this is the first report showing a dynamic, symptomatic compression of the LIMA by a SVG.

Given its accuracy in the visualization of bypass grafts [6], computed tomography angiography allowed a precise diagnosis of the external compression of the LIMA, thus avoiding further anatomical evaluation by invasive devices such as intravascular ultrasound.

References


