

# Coronary stent entrapment

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## Abstract

A 64-year-old woman with a history of coronary artery bypass and coronary angioplasty with unexpanded stent entrapment blocked in the circumflex coronary artery and left main is now presenting with crescendo angina pectoris. The Department of Cardiovascular Surgery established that a new surgical intervention presents a very high risk. In this condition, we decide for elective percutaneous coronary intervention for stent restenosis, which is a very difficult procedure in the particular condition of unexpanded stent blocked in the circumflex coronary artery and left main.

**Key words:** percutaneous coronary intervention, unexpanded stent entrapment.

## Case report

We report a case of a 64-year-old woman, obese, hypertensive, diabetic, under insulin therapy, with coronary artery bypass with internal mammary artery on the left anterior descending coronary artery (LAD) and internal saphenous vein on the first diagonal coronary artery (DI) carried out 9 years ago, and transluminal percutaneous

angioplasty with bare metal stent (BMS) in the left main (LM) and circumflex arteries (CX) carried out 15 months before the present evolution.

After 3 months from the first coronary stenting she was referred to our cardiology department for an angiographic re-examination due to recurrence of angina. At that moment her coronary angiogram revealed a narrowing in the proximal LAD, followed by chronic occlusion in the second segment, patent left internal mammary artery (LIMA) graft, chronic occlusion on the right coronary artery (RCA), and 90% ostial CX stent restenosis (Figure 1). Percutaneous coronary intervention (PCI) with stenting in the LM to the CX was carried out. Predilatation was undertaken using a balloon, 3/20 mm, inflated to 12–14 atm, and then with a balloon, 3.5/20 mm, to 12–14 atm. After that, insertion of an everolimus drug eluting stent, 4/38 mm, in LM and CX I-II was attempted. Failure to pass the stent in CX II was followed by an attempt to withdraw it; because of its length and bending as it was being withdrawn, the unexpanded stent was dislodged from the coronary balloon. Furthermore, a balloon of 2/15 mm was inserted and inflated to attempt stent retrieval, but it was unsuccessful, the stent being pushed in the LM to CX I, a proximal segment remaining in the aorta. Afterwards, stent retrieval with a lasso was attempted. The proximal part was caught, but as it was retracted the proximal end was pulled apart and the wire was threaded into the aorta, the distal end remaining in the LM (Figure 2). We decided to stop the procedure

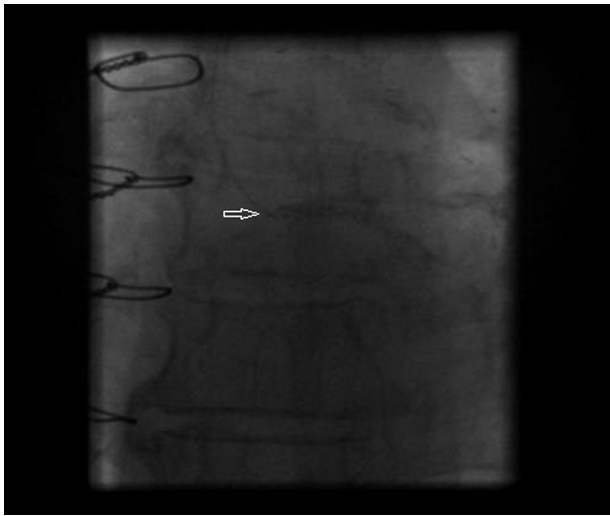


**Figure 1.** 90% ostial CX stent restenosis

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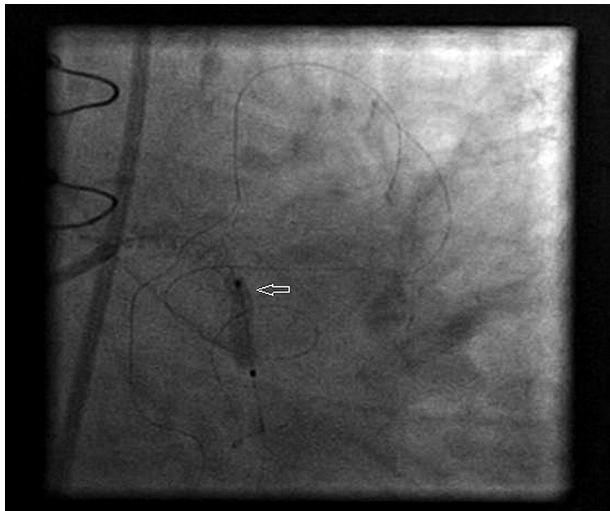
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**Figure 2.** LM stent entrapment with proximal wire threaded into the aorta



**Figure 3.** The progression of the CX stenosis to subocclusion



**Figure 4.** Bare metal stent 3.0/12 mm inflation to 16 atm



**Figure 5.** Final result of LCX angiography, with unexpanded stent remaining in the LM

at this point. The Department of Cardiovascular Surgery was requested to establish a surgical intervention, which is temporised due to its high surgical risk. Following maximal anti-angina therapy and anticoagulant therapy, the patient's course was uneventful for 9 months.

Currently the patient is hospitalised for crescendo angina pectoris. A new coronarography was undertaken to check the lesion development, revealing the fixed position of the unexpanded entrapped stent with the progression of the CX stenosis to subocclusion (Figure 3).

Finding an optimal solution became a multidisciplinary effort between the Interventional Cardiology Department, Cardiovascular Surgery Department, and the Coronary Intensive Care Department.

The Department of Cardiovascular Surgery established that a new surgical intervention presents a very high risk. Nevertheless, the progression of the in-stent

restenosis required an urgent solution. We decided to take a chance with a new percutaneous coronary intervention.

At this point, crossing with a new stent through the wires at the distal end of the LM-CX was successfully performed with a guide wire, then balloon predilatation was performed, 1.5/20 mm to 15 atm and 2.5/15 mm to 12 atm, followed by a BMS 3.0/12 mm insertion to 16 atm (Figure 4), with optimal distal flow of the re-stenosed area, the unexpanded stent remaining in the LM (Figure 5).

## Discussion

The described case is rarely met in practice, but it is important due to the danger the patient is facing. Unexpanded stent entrapments in coronary arteries must be retrieved as soon as possible. The first interventions that are taken into account are those pertaining to interventional cardiology, e.g. the use of the "buddy wire" technique or the insertion of a shorter stent in the anatomical area with marked angulations and bends. Another balloon can also be used for stent expansion or inflation at low pressure and stent removal, a technique without success in the presented case. Another option would be to remove the stent surgically. If these procedures are temporised, anticoagulation is employed [1–4].

Among the most frequent causes for unexpanded stent entrapment in the coronary artery are the following: coronary anatomy with marked angulations, and infiltration and calcific stenosis that require the use of longer stents, both cases being found in our patient [1, 2, 5].

The case is specific due to the fact that the unexpanded stent was entrapped in the LM due to a successful angioplasty in the CX, a large coronary artery responsible for recurrent angina symptoms, by successfully crossing the angioplasty devices through the entrapped stent.

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