

# Management of coronary air embolism during coronary stenting

Postępowanie w przypadku zatoru powietrznego tętnic wieńcowych podczas implantacji stentów wewnątrzwieńcowych

Atac Celik<sup>1</sup>, Ozcan Ozeke<sup>2</sup>

<sup>1</sup>Gaziosmanpasa University, Tokat, Turkey

<sup>2</sup>Akay Hospital, Ankara, Turkey

## Abstract

Coronary air embolism is a rare complication of cardiac catheterisation. We describe an alternative method of managing this complication which may be preferable to conventional methods.

**Key words:** coronary air embolism, aspiration catheter

Kardiol Pol 2010; 68, 6: 716–718

## INTRODUCTION

Coronary air embolism is a rare complication of cardiac catheterisation ranging in incidence from 0.1 to 0.3%, and is almost always iatrogenic [1]. It occurs mostly when catheters used for vascular procedures have not been adequately aspirated and flushed. The introduction or withdrawal of a balloon catheter or guidewire can also cause this complication. The rupture of a balloon during high inflation, and the movement of air from catheter to coronary system during intracoronary medication, are rare causes [2].

## CASE REPORT

A 65 year-old woman was referred for percutaneous coronary intervention to left anterior descending artery (LAD) due to her persistent angina, despite a revascularisation procedure of right coronary lesion after a myocardial infarction one month previously. Following cannulation of the left coronary system with a 6 F left Judkins guiding catheter, she was given a bolus of 5,000 IU unfractionated heparin intravenously. A 0.014" high torque floppy guidewire was used to pass the 60–70% distal lesion of LAD (Fig. 1). 100 micrograms of nitroglycerin was injected into the coronary system to resolve distal vasospasm due to guidewire irritation. After intracoronary medication, the vasospasm was resolved but, unfortu-



**Figure 1.** Significant lesion of distal left anterior descending coronary artery

nately, total occlusion of LAD (caused by a large bubble of air injected accidentally) was seen in cine images, firstly at the

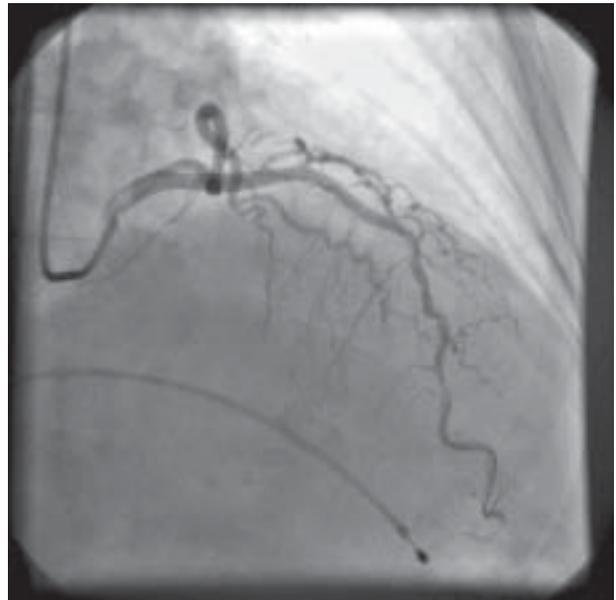
---

### Address for correspondence:

Atac Celik, Gaziosmanpasa University, 60250 Tokat, Turkey, e-mail: dretaci@yahoo.com



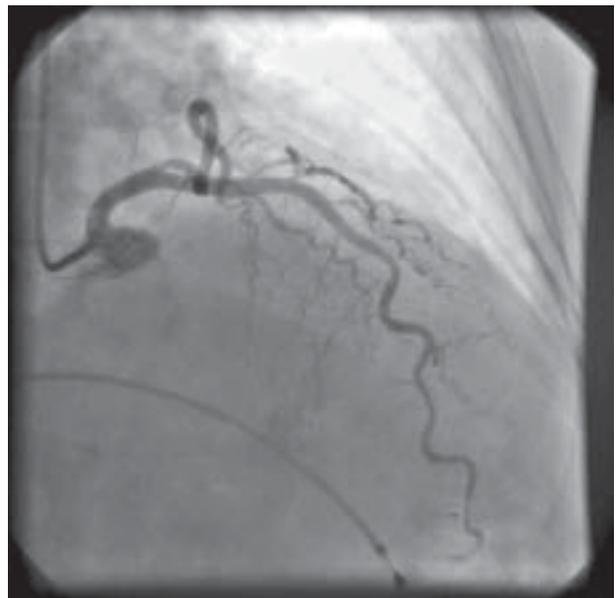
**Figure 2.** Bubble at the mid-portion of left anterior descending coronary artery



**Figure 4.** Distal TIMI 3 flow after the bubble aspiration



**Figure 3.** Bubble at the lesion site of left anterior descending coronary artery



**Figure 5.** Final image of lesion after the stent implantation

mid-portion of LAD (Fig. 2) and finally proximal to the lesion site (Fig. 3). After the ST segment elevation seen on the monitor, the patient suffered immediate serious chest pain and because of the symptomatic bradycardia, a temporary transvenous pacemaker was implanted. Rather than pushing the bubble forward and then waiting for it to resolve spontaneously ('pushing method') or inflating a balloon inside the bubble ('balloon method'), we tried to suck the bubble with the

help of a monorail intracoronary thrombus aspiration catheter (6 F WWN Medtronic). After the aspiration, distal TIMI 3 flow was maintained (Fig. 4). No thrombus material was seen in the aspirated material. Finally, a successful direct stent implantation (2.25 × 8 mm bare metal stent) was made as planned, resulting in no residue (Fig. 5) with a concurrent drug therapy according to in current guidelines (the patient was already taking ASA 300 mg/day, atorvastatin 80 mg/day, metoprolol

50 mg/day, perindopril 5 mg/day, and clopidogrel 75 mg/day because of the revascularisation one month previously).

## DISCUSSION

This case shows that intracoronary thrombus aspiration catheter systems can be used safely and harmlessly to resolve intracoronary air embolisms. This procedure is preferable to the other two ways described: the pushing method may provide a smaller infarct (but still an infarct) while the balloon method may damage the coronary site without lesion by inflating the balloon inside the bubble. It is possible that the cause of the embolism is a thrombus, or combined air and

thrombus. But, the absence of a thrombus in the aspirated material leads us to the diagnosis of pure air embolism. This technique may not be successful in cases where the bubble is smaller than in our case, or where aspiration of multiple bubbles can be hard to manage.

## References

1. Khan M, Schmidt DH, Bajwa T, Shalev Y. Coronary air embolism: incidence, severity, and suggested approaches to treatment. *Cathet Cardiovasc Diagn*, 1995; 36: 313–318.
2. Dib J, Boyle AJ, Chan M, Resar JR. Coronary air embolism: a case report and review of the literature. *Catheter Cardiovasc Interv*, 2006; 68: 897–900.