

Case Report

A Rare and Avoidable Complication of Percutaneous Coronary Intervention: Stent Trapped in the Left Main Coronary Artery and Its Unusual Treatment

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Entrapment of catheter components during cardiac interventions is rare but can cause life-threatening complications and sometimes requires emergency surgical treatment. This case study describes a 52-year-old male who had unstable angina pectoris and underwent stent insertion into the left circumflex artery. Unfortunately, the coronary stent and the balloon catheter were trapped while crossing the angulated segment between the left circumflex and left main coronary artery. The stent catheter was removed by an unusual trans-catheter approach. The interventional cardiologist should keep in mind that angulated segments may reduce the successful rate of coronary stenting and contribute to the stent entrapment complication.

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Coronary stents have been developed to prevent acute coronary closure and reduce restenosis after coronary angioplasty. The increasing use of coronary stents has been accompanied by several complications. Stent entrapment has been reported previously, with or without emergency surgical treatment.^{1,2} Here we report a patient suffering from such a rare and dangerous complication of percutaneous coronary intervention (PCI).

Case presentation

A 52-year-old male was admitted to the hospital with acute coronary syndrome. Selective coronary angiography demonstrated an 80% tubular stenosis in the left circumflex coronary artery (LCX) (Figure 1). We planned to treat it with a drug-eluting stent after predilatation with a 2.5 × 18 mm balloon (Figure 2). We attempted to insert the 3.0 × 24 mm Endeavor stent into the

LCX but failed to cross the proximal part of LCX. During these manipulations the balloon was stripped from the stent (Figure 3). We tried to push and withdraw the stent but failed. The stent catheter did not move, even with forceful manipulation. Finally, the stent and balloon catheter became disconnected from the proximal shaft of the balloon catheter. There was no chest discomfort nor any electrocardiographic changes during the procedure.

At this point the guiding catheter was in the aorta, the guide wire was in the middle part of the LCX, and the proximal part of stent was in the aorta, the mid part in the left main coronary artery and the distal part in the LCX (Figure 3).

We inserted a new guide wire, crossed the unexpanded stent and placed the new guide wire in the distal LCX. Over this guide wire we inserted a 1.5 × 10 mm balloon to the proximal part of the stent in the aorta and inflated it under 4 atm pressure

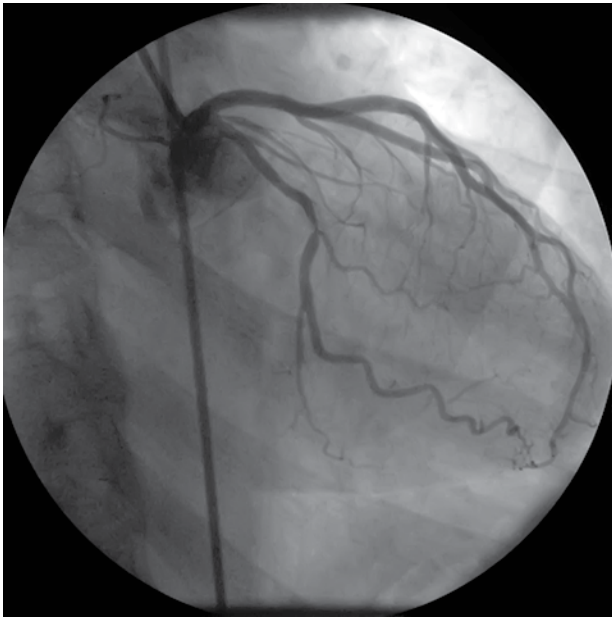


Figure 1. Tubular stenosis (80%) in the mid left circumflex coronary artery.

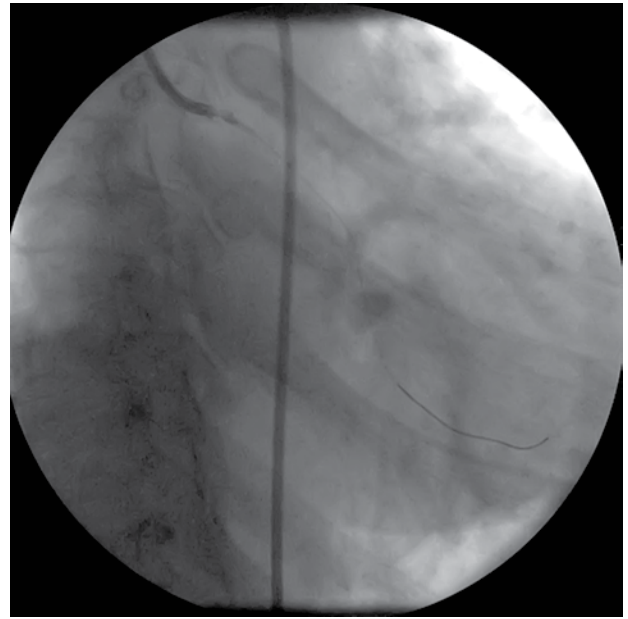


Figure 3. The stent without balloon in the left main coronary artery.

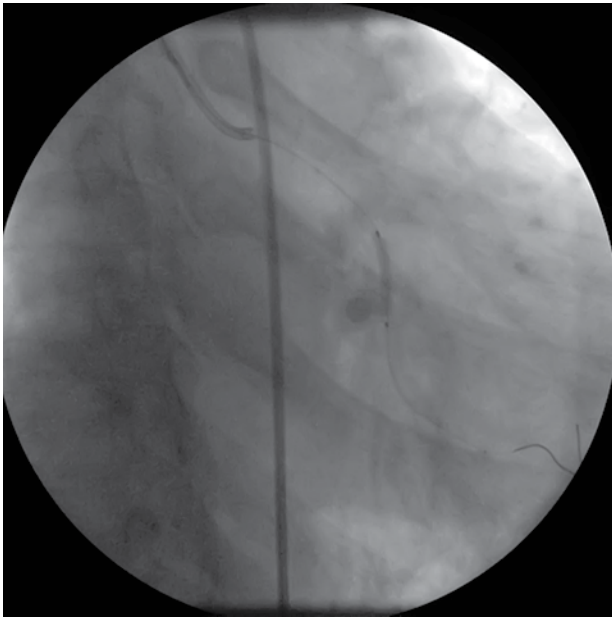


Figure 2. Predilatation of the circumflex artery with a 2.5 × 18 mm balloon.

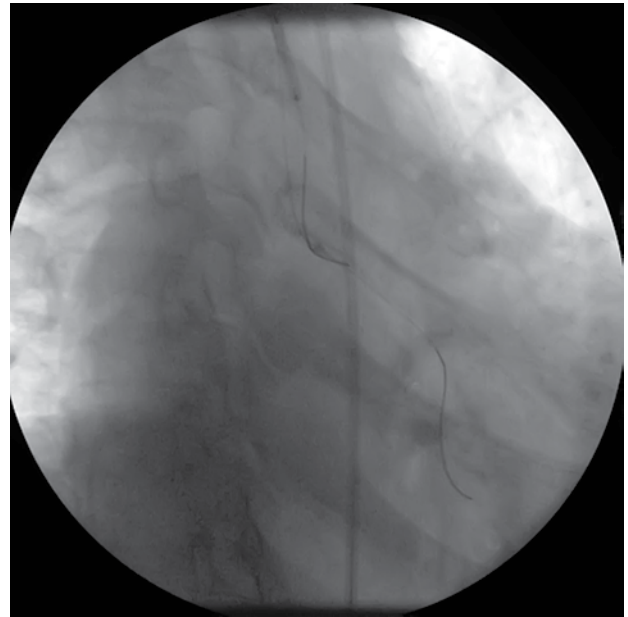


Figure 4. Double guide wire on the unexpanded stent in the left main coronary artery.

(Figure 4). After this the stent started moving. We withdrew the stent into the aorta and inflated the balloon to 20 atm pressure. Then we were able to move the destroyed stent to the femoral sheath (Figure 5). The patient was fully heparinised and underwent minor surgery for stent removal from the femoral artery.

Later, we performed PCI on the other side using

an extra backup catheter (Figure 6). The patient was treated successfully (Figure 7).

Discussion

Stent entrapment is a rare and dangerous complication of PCI. Entrapment of a coronary stent as

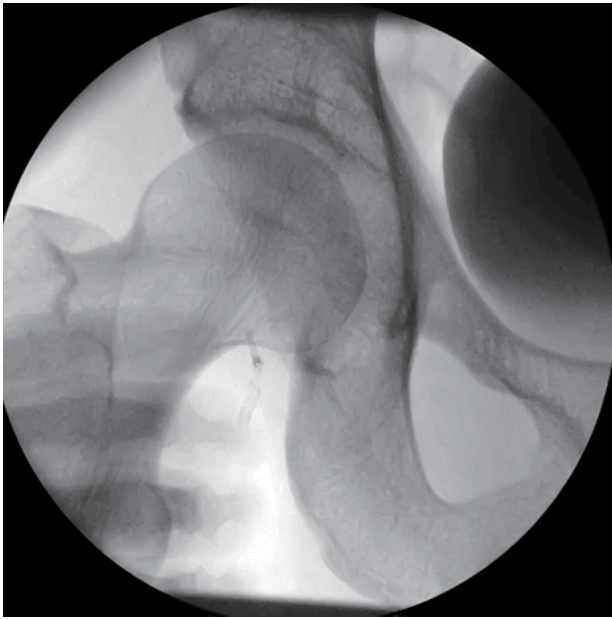


Figure 5. Destroyed stent in the femoral sheath.

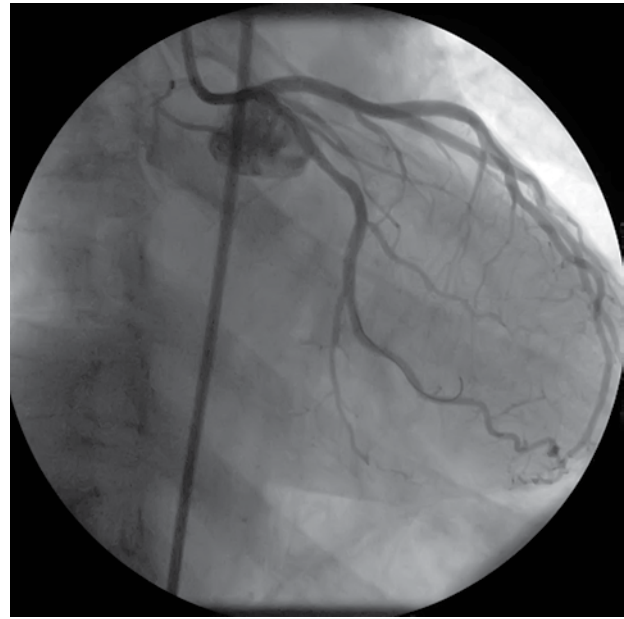


Figure 7. Percutaneous coronary intervention with an extra back-up catheter (b).

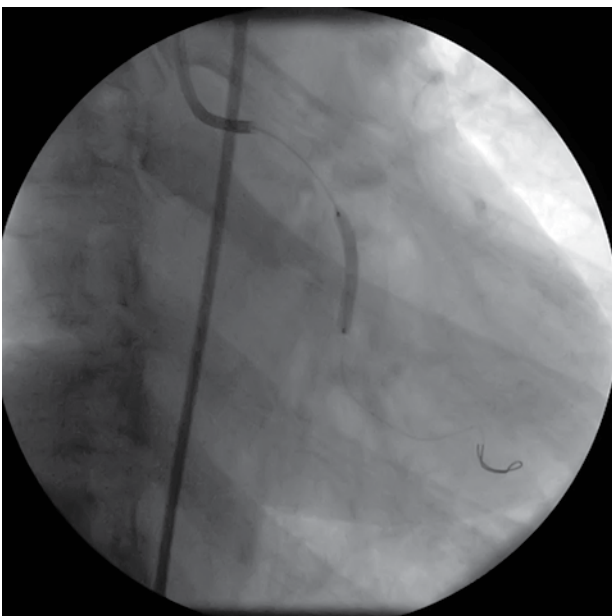


Figure 6. Percutaneous coronary intervention with an extra back-up catheter (a).

a complication is rare.¹⁻³ These complications may be life-threatening and require emergency surgical treatment.

An angulated coronary anatomy, coronary calcification and a long stent may predispose to stent entrapment. Their poor tractability, flexibility, and conformability may cause stents to become entrapped in

the coronary artery. Strategies such as using the buddy-wire technique or inserting an open cell or a shorter stent may improve the success rate of stenting in angulated coronary artery trees. After stent entrapment occurs, the stent remains closed and constitutes a site for thrombus formation.⁴

Usually, a transcatheter approach for retrieving the stent is better, faster and safer than a surgical one.⁵ Surgical intervention is another option for the removal of catheter materials.^{1,2,6} Before resorting to surgical intervention, alternative methods of overcoming this complication can be tried very carefully. If the stent becomes dislodged from the balloon catheter, physicians may try to retrieve it with a snare wire or use another balloon to deploy the stent. Here we describe another alternative, where we inserted a small balloon in the proximal part of the stent in the aorta and inflated it under low pressure, allowing retrieval of the stent.

We believe that a stent entrapped in the left main coronary artery should be removed as rapidly as possible to avoid sudden death. Entrapment of catheter and catheter materials can have catastrophic results. A transcatheter approach with retrieval systems should be considered first. Surgical intervention provides another option to remove catheter materials. Patients should be fully heparinised. Physicians should be aware that extremely angulated segments may reduce the success rate of coronary stenting.

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