CASE REPORT

Infected pseudoaneurysm of the left anterior descending artery

Ashish Madkaiker, Neethu Krishna, Natarajan Kumaraswamy, Praveen Varma

Amrita Institute of Medical Sciences and Research Centre, Cochin, Kerala, India

Correspondence to
Dr Ashish Madkaiker,
ashishmadkaiker@gmail.com

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SUMMARY

Primary percutaneous transluminal coronary angioplasty (PTCA) with the insertion of a stent is a well-established procedure for management of coronary artery disease. Infected pseudoaneurysms following PTCA and stenting are very rare and have poor outcomes if not managed properly. We are presenting a case of a man aged 50 years with infected pseudoaneurysm of the left anterior descending artery following multiple percutaneous interventions for coronary artery disease. In this paper, we have described the presentation, diagnosis and management of this patient and have discussed the aetiology and management options of infected pseudoaneurysm affecting coronary arteries.

BACKGROUND

Aneurysms following coronary artery stenting are rare amounting to 0.3–6%, most of which are pseudoaneurysms¹ and even rarer are infected pseudoaneurysms and very few cases have been reported in the literature.² Pseudoaneurysms tend to have poor outcomes if not suspected and diagnosed early and managed properly. We report a case of a man aged 50 years who developed an infected pseudoaneurysm of the left anterior descending artery (LAD) following multiple percutaneous interventions for coronary artery disease and was treated successfully surgically.

CASE PRESENTATION

A man aged 50 years, known case of coronary artery disease and type II diabetes mellitus, who was on optimal medical management presented with sudden onset of chest pain and breathlessness. On evaluation, he was diagnosed to have acute anterior wall ST elevation myocardial infarction (STEMI). Coronary angiogram revealed tight lesion of LAD amounting to 95% stenosis, non-dominant right coronary artery with 99% stenosis and 40% stenosis of the left circumflex artery (LCX). Subsequently, he underwent primary percutaneous transluminal coronary angioplasty (PTCA) with the insertion of a drug-eluting stent (DES) to LAD.

Six days later, the patient suffered STEMI involving anterior wall. A repeat coronary angiogram revealed LAD in stent thrombosis. He underwent thrombus aspiration and improved.

Four days after second intervention, the patient again had chest pain and was diagnosed to have STEMI involving anterolateral wall. Coronary angiogram showed new tight lesion of LCX amounting to 90% stenosis. PTCA and stenting of

LCX were performed with DES and he was discharged after 2 days.

Two days after discharge, the patient presented to our hospital with high-grade fever with chills and features of acute pulmonary oedema. Blood culture sent after admission to the hospital revealed *Pseudomonas aeruginosa*. The patient was stabilised with antibiotics, diuretics and inotropic support. On third day, patient's condition deteriorated and required intubation. Echocardiogram showed severe left ventricular dysfunction with an ejection fraction of 30%, regional wall motion abnormality in LAD and LCX territory, mild-to-moderate grade mitral regurgitation, mild-to-moderate grade of pulmonary arterial hypertension. A repeat coronary angiogram was performed which showed a large pseudoaneurysm of LAD artery in the proximal part of the stent (figure 1). Correlating with his clinical finding and reports of investigations, a diagnosis of infected pseudoaneurysm was made. He was taken up for surgery on an emergent basis. Urine and endotracheal secretions sent for culture did not grow any organism.

TREATMENT

Surgery was performed using cardiopulmonary bypass and cardioplegic arrest.

Infected pseudoaneurysm measuring 4 cm was found arising from proximal LAD. The pseudoaneurysm was opened and pus was drained (figure 2). Coronary artery stent was extracted. Pseudoaneurysm cavity was thoroughly debrided (figure 3). Proximal and distal ends of the pseudoaneurysm were ligated. LIMA was grafted to LAD and SVG to major obtuse marginal (OM2) and left posterior descending artery.

OUTCOME AND FOLLOW-UP

The patient was weaned off cardiopulmonary bypass with the support of intra-aortic balloon pump (IABP). The patient had uncomplicated postoperative stay. IABP was removed on the second postoperative day. His pus culture also revealed *P. aeruginosa* and he was treated with sensitive antibiotics.

DISCUSSION

Infected pseudoaneurysm following coronary artery stenting is a rare complication, but one with a high likelihood of a devastating outcome if not timely diagnosed and appropriately intervened. Wu *et al*² have reported 15 cases of infected coronary artery pseudoaneurysms until 2008 with an overall mortality rate of 53%. The patient with infected

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Figure 1 Image of coronary angiogram showing pseudoaneurysm (arrow).

pseudoaneurysms can present anytime, from the immediate postintervention period to up to 11 months later.² In our case, the patient presented at around 2 weeks after the initial procedure, which is similar to cases reported by Furtado *et al.*³ and Lim *et al.*⁴ Our patient was treated at other hospitals and presented to us after 14 days of initial symptoms. In this period, he underwent repeated coronary interventions, and exact details of those were not available to us. All available information was obtained only by interviewing patients and relatives and available documents. In the absence of necessary investigations to review, it was difficult for us to explain the exact aetiology for sudden increase in severity of LCX lesion from 40% to 90% stenosis. Since in our case, the patient had undergone thrombus

Figure 2 Arrow pointing at pus drained out once the aneurysm was opened.

Figure 3 Arrow points at the aneurysmal sac after debridement also the communication with the left anterior descending artery is seen.

aspiration for LAD in stent thrombosis, we attribute this progression of LCX lesion to retrograde migration of thrombus.^{5 6} However, since LCX had an existing lesion causing 40% stenosis, the possibility of plaque rupture cannot be ruled out.

Pseudoaneurysm of LAD commonly presents with fever, chest pain, breathlessness and worsening of primary symptoms.²⁻⁴ Coronary angiogram remains the gold standard for diagnosis of a coronary aneurysm defined as dilation of lumen more than 50% of the adjacent segment. Intravascular ultrasound has an advantage over coronary angiogram in differentiating true and pseudoaneurysm and also detecting the entry site of an aneurysm.¹ CT angiography, coronary magnetic resonance angiography and real-time 3D echocardiography are also useful tools for detecting coronary aneurysms.¹

It has been found that DES have a higher likelihood of developing an infective complication. The reasons for this could be incomplete endothelialisation of the DES, blunting of the innate local inflammatory response and increasing susceptibility to hyperinflammation and sepsis.⁴ Apart from DES, recurrent percutaneous access in a short time interval and use of vascular sheath that has been in place for more than 24 hours are attributed to increased incidence of stent infection.⁷ The most common organism associated with pseudoaneurysms is *Staphylococcus aureus* followed by *P. aeruginosa*.²

Pseudoaneurysm being a rare complication; clear guidelines for the management have not been laid down and data available from individual case reports are the only available source of information for planning management. These cases have been managed medically, surgically and by interventional procedures. As per the largest available series, 80% of the patients were managed surgically of which only 50% survived, while those patients managed medically, conservatively or by percutaneous interventions were associated with poor outcomes.²

According to practice guidelines for infection prevention for vascular and interventional radiology procedures: currently, there is no indication for prophylactic antibiotics in routine angiography and uncomplicated stenting.⁷

However, prophylactic antibiotics are recommended in a situation when an arterial sheath will be kept overnight, for those undergoing multiple endovascular procedures or in patients before a second procedure within 7 days. One gram cefazolin is the recommended drug for prophylaxis and in patients who are allergic to penicillin, vancomycin or clindamycin is recommended.⁷ With increasing numbers of centres performing PTCA and stentings, maintaining proper standards of sterility is important.

Learning points

- ▶ In the setting of multiple percutaneous procedures, clinical features of infection should not be taken lightly.
- ▶ Our patient underwent pseudoaneurysm exclusion and revascularisation of the left anterior descending artery and left circumflex artery territory by which we were able to revascularise and at the same time prevent complications of pseudoaneurysm rupture or thromboembolic episodes in future.
- ▶ Myocardial protection appears to be the key in these difficult cases and postsurgery, these patients may need high inotropic supports and intra-aortic balloon pump for maintaining stable haemodynamics.
- ▶ In our case, early diagnosis leading to an early and timely intervention resulted in the good outcome.

Contributors AM was the first assistant for the surgery, involved with preoperative and postoperative management of this patient, prepared the design and drafted all sections of the manuscript. NeK helped the study team for the development of manuscript design, acquisition of the data and collected the related articles for

preparing the manuscript. PV performed the surgery and approved the final version of the manuscript submitted. NaK reviewed the manuscript and provided necessary inputs.

Competing interests None declared.

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