

Occurrence of a slowly growing pseudoaneurysm and restenosis in coronary artery following primary percutaneous coronary intervention in a patient with acute myocardial infarction

Akut miyokard infarktüsli bir hastada primer perkütan koroner girişim sonrası koroner arterde yavaş büyüyen bir yalancı anevrizma ve restenoz oluşması

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Introduction

Coronary artery aneurysm (CAA) formation following coronary interventions is a rare complication of these procedures. We report the case of left anterior descending coronary artery (LAD) pseudoaneurysm that formed following primary percutaneous coronary intervention (PCI) in a patient with acute myocardial infarction (AMI).

Case report

A 43-year-old male patient was admitted to our coronary care unit with the diagnosis of anterior AMI. He had undergone successful balloon angioplasty to the mid LAD 20 months ago (Fig.1A). Coronary angiography (CA) was immediately performed and showed total occlusion in the proximal LAD (Fig.1B) and severe stenosis in the circumflex artery (Cx). The occlusion site was dilated with a 2.5x20mm balloon but post-procedure there was a localized dissection (Fig. 1C) and a stent (3.0x18mm) was successfully implanted. He developed coronary spasm and localized dissection at the distal of the stent after PCI (Fig. 1D), and a second stent (3.0x12mm) was successfully deployed to the distal of the first stent. He remained asymptomatic and echocardiography showed no pericardial effusion. Two weeks later, he started developing chest pain despite adequate medications. Coronary angiography showed a focal crater appearance (6x4.5mm) in the proximal end of the first stent in LAD (Fig. 2A). Figures 2B and 2C demonstrate contrast flow within a tract leading from the artery lumen to the formation consistent with "pseudoaneurysm neck", and Figure 2D shows the aneurysm formation. A decision for follow-up of the aneurysm was made. A stent (2.5x15.0mm) was successfully implanted to the stenotic site in Cx. After six weeks, although he was asymptomatic, CA was performed and there was a slight enlargement in the aneurysm (Fig. 3A). About 6 months later, he was readmitted to our hospital because he had angina during exercise. Coronary angiography showed an 80% stenosis in the just proximal end

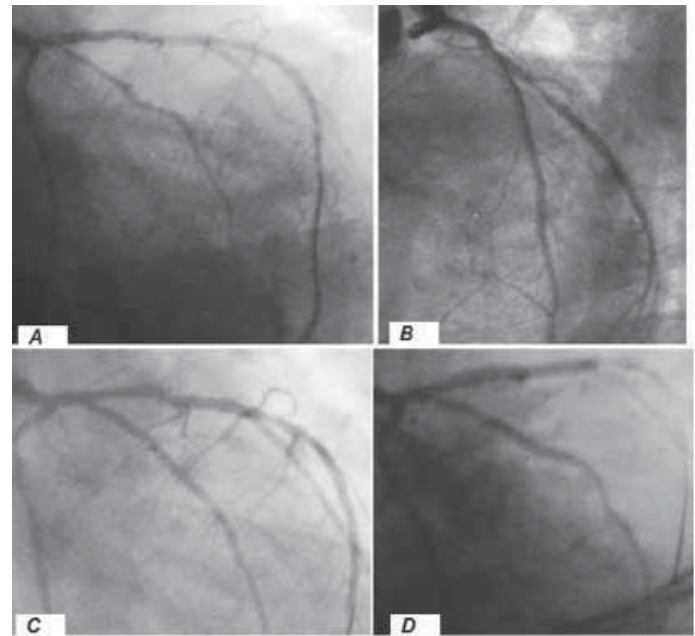


Figure 1. A) Angiographic view of the left anterior descending artery (LAD) after successful balloon angioplasty to the mid LAD (there was no aneurysm); B) Angiographic view of the total occlusion of the proximal LAD; C) Angiographic view of a localized dissection after balloon angioplasty; D) Angiographic view of coronary spasm at the distal of the first stent deployment after percutaneous coronary intervention and the stent was patent

of the aneurysm and it was approximately measured to be 6x6 mm (Fig. 3B). A Jostent coronary graft stent (3.5x16.0mm) was successfully deployed to restenotic and aneurysmal site (Fig. 3C). About 4 years later, CA was performed because he started developing progressive angina

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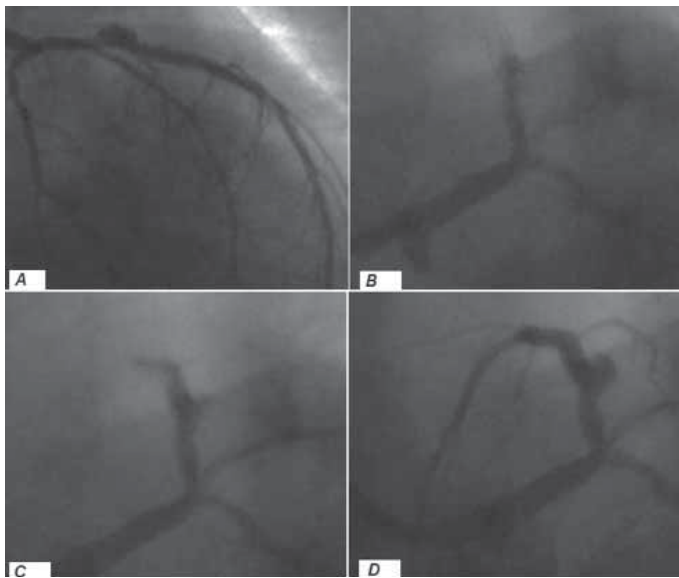


Figure 2. Coronary angiography performed after two weeks. A) Angiographic view of a focal crater appearance in the proximal edge of the first stent in the left anterior descending artery (LAD); **B and C)** Angiographic views of contrast flow within a tract leading from the artery lumen to the aneurismal formation consistent with "pseudoaneurysm neck" and **D)** Angiographic view of the aneurysm formation in the proximal LAD

despite adequate medications for last one year. Coronary angiography showed severe in-stent restenosis between the distal part of the graft stent and the proximal part of the second stent in LAD (Fig. 3D), while Cx and RCA were patent. He underwent coronary bypass surgery and was well on follow-up.

Discussion

Coronary artery aneurysm is defined as coronary dilatation which exceeds the diameter of normal adjacent segments or the diameter of the patient's largest coronary vessel by 1.5 times (1). In our case, the patient developed a new aneurysm at the proximal site of the first stent in LAD after primary PCI. There was a localized dissection after balloon angioplasty but dissection or an aneurysm angiographically was not visualized after first stent deployment. After two weeks, the angiographic appearances of the aneurysm were consistent with type I perforation (extraluminal crater without extravasation) according to Ellis classification (2). An explanation for an aneurysm at angioplasty site may be related to the result of perforation into coronary adventitial layer (confined rupture, pseudoaneurysm) (3). In our case, it also may be such result due to the localized dissection despite of successful first stent deployment or during second stenting procedure, while the first stent was crossed with the guide wire, deep vessel injury also may be developed, which cannot be clearly seen at that time. Topol et al. (4) reported type I perforation was associated with a higher restenosis rate. We also performed close clinical and angiographic follow-up of the aneurysm. The aneurysm grew slowly in size over a few months and restenosis developed, and were successfully treated with a stent graft. Coronary stent grafts have also been used successfully for a broad range of indications including coronary perforations and aneurysms. However, Gercken et al. (5)

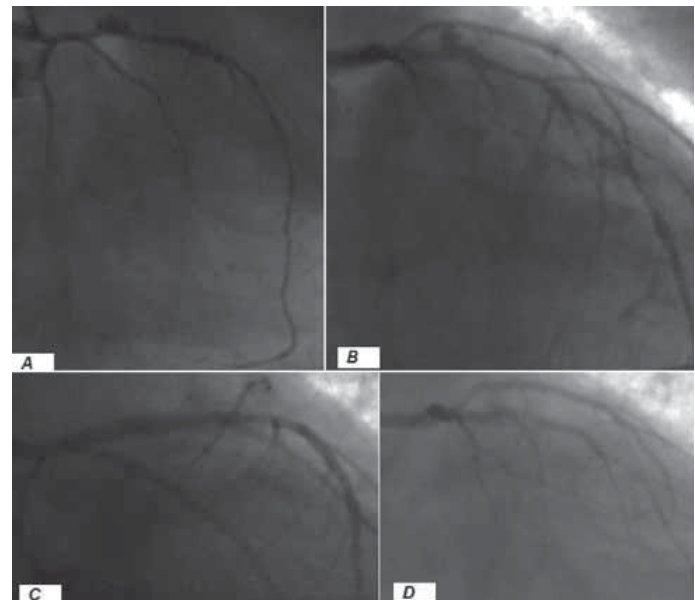


Figure 3. A) Angiographic view of enlargement in the aneurysm dimension in the proximal left anterior descending artery (LAD) after six weeks; **B)** A six-month follow-up angiographic view of significant enlargement in the aneurysm dimension and a severe restenosis adjacent to proximal end of the aneurysm; **C)** Control angiogram showing successful coronary graft stent deployment; **D)** About 4 years later, angiogram showing severe in-stent restenosis between the distal part of the graft stent and the proximal part of the second bare stent in the proximal LAD

reported intimal re-narrowing in the graft stent edges and approximately restenosis rate of 30%. Also, in our case, in-stent restenosis developed at the distal edge of the graft stent.

Conclusion

The early CAA may occur during primary balloon angioplasty and stenting in AMI. The follow-up CA should intermittently be performed because of their propensity for growth and the increased risk of restenosis. The use of coronary stent graft may also become a clinically useful method; however, in-stent restenosis may developed at very long-term also.

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