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Case Report

The Crushing of the Undersized Stent to the Coronary Vessel Wall and Renal Stent Implantation as the Bail-out Strategy for Revascularization in a Patient with Acute Myocardial Infarction and Coronary Artery Ectasia

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Abstract

Acute ST-elevation myocardial infarction with coronary artery ectasia is rare and difficult to treat. The complication rate is high in percutaneous intervention. At the same time, a standard treatment cannot be performed due to the lack of sufficient studies. In this case, complex complications and a different solution technique are presented. Here, we present our experience with a case of acute inferior myocardial infarction in a 62-year-old man with an ectatic right coronary artery and a 1-year follow-up report.

Keywords: Acute myocardial infarcts; coronary; renal stent; under expanded.

Akut Miyokard Enfarktüsü ve Koroner Arter Ektazisi Olan Hastada Düşük Çaplı Stenti Kurtarma Stratejisi Olarak Koroner Damar Duvarına Ezilmesi ve Renal Stent İmplantasyonu

Özet

Koroner arter ektazisinin eşlik ettiği akut ST yükselmeli miyokard enfarktüsü nadirdir ve tedavisi zordur. Perkütan girişimde komplikasyon oranı yüksektir. Aynı zamanda yeterli çalışmaların olmaması nedeniyle standart bir tedavi de yapılamamaktadır. Bu vakada karmaşık komplikasyonlar ve farklı bir çözüm tekniği sunulmaktadır. Burada, sağ koroner arter ektazisi olan 62 yaşındaki erkek hastada akut inferior miyokard enfarktüsü olgusuyla ilgili deneyimimizi ve 1 yıllık takip raporumuzu sunuyoruz.

Anahtar sözcükler: Akut myokard infarktus; koroner; renal stent; underexpanse stent.

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Introduction

Percutaneous coronary intervention in coronary artery ectasia is challenging and portends a high risk of no-reflow and distal embolization.[1,2] In a recent study, no-reflow occurrence was observed in vessels with infarct-related artery diameter >4.0 mm^2. Therefore, the success of interventions in aneurysmal vessels is low. Herein, we report our experience with acute inferior myocardial infarction and ectatic right coronary artery (RCA) in a patient, who underwent a stent implantation and developed a "no-flow phenomenon."

Case Report

A 62-year-old man was admitted to our hospital with complaints of chest pain. He was a heavy smoker and had hypertension. Electrocardiography revealed >2 mm ST-segment elevation in leads DII, DIII, and aVF. Right coronary angiography showed an occluded lesion in the proximal segment after the aneurysmal ostium. The lesion was crossed with a floppy guidewire. Predilatation was performed with the 2.0×12 mm and 2.5×15 mm balloons (Invader, Alvimedica, Türkiye), and (Invader, Alvimedica, Türkiye). A distal thrombolysis in myocardial infarction (TIMI)-I flow was obtained. Thrombectomy was performed with a thrombus aspiration catheter because of the high thrombus burden. Subsequently, an intracoronary bolus abciximab dose with 0.25 mg/kg was administered, and the infusion dose was continued at a maintenance dose of 0.1 mg/kg/min. A bare-metal stent (4.5×37 mm; Emphesos II, Alvimedica, Türkiye) was implanted into the lesion. "No-reflow phenomenon" was observed after the stent implantation. Post-dilatation was planned with a non-compliant (NC) balloon, but it could not be advanced through the ostium of the stent. We administered 50 micrograms of adenosine intracoronary. A distal TIMI-II flow was obtained, and we continued the abciximab infusion (Fig. 1).

After 2 days, the control angiography showed a high thrombus burden in the RCA, and the stent was determined to be undersized and malapposed. Due to the large diameter of the artery, a renal stent implantation was planned. The outside of the stent was passed with the Fielder FC (Asahi Intecc, USA). Starting from the distal, the malapposed stent was crushed with the 2.0×12 mm, 2.5×12 mm, and 3.5×20 mm NC balloons (Mozec, Meril, India). After the malapposed stent was entirely crushed to the wall, three renal stents (5×19 mm, 6×18 mm, 6×4 mm; Herculink, Abbott, USA) were implanted in an overlapping manner (Fig. 2). The patient was transferred to the intensive care unit. After three days, the patient was discharged with no complaints. After a 1-year follow-up, multidetector coronary angiography revealed that the stent was open (Fig. 3).

Discussion

This case highlights the complex challenges associated with percutaneous coronary intervention in patients with acute myocardial infarction and coronary artery ectasia. Recent studies have noted an increased incidence of no-reflow in infarct-related arteries with diameters exceeding 4.0 mm^2. Consequently, interventions in aneurysmal vessels carry a higher risk of no-reflow and distal embolization, often resulting in lower procedural success rates.[1,2] Furthermore, the presence of thrombus can obscure the true diameter of the aneurysm, complicating the selection of an appropriately sized stent.[2] This difficulty in achieving optimal stent placement is linked to a higher likelihood of early stent thrombosis.

In cases where there is a significant mismatch between vessel diameter and the stent, as encountered in our case, achieving proper apposition of the stent struts to the vessel wall can be challenging, even with high-pressure balloon inflation. As a bailout strategy, non-coronary stents of larger diameters may be utilized. Although no prospective randomized trials are available, retrospective case–control studies have provided valuable insights. Pourdjabbar et al.[3] reported that renal stents could be implanted in the left main coronary artery with large diameters in select cases. Similarly, Çamci et al.[4] documented that renal stents could be used effectively in ectatic vessels during acute coronary syndrome, with mid-term outcomes comparable to those of bare-metal stents.

In our case, the coronary stent was undersized and malapposed, and attempts to cross it with a hydrophilic guidewire were unsuccessful. We therefore proceeded to crush the coronary stent against the vessel wall and implanted three bare-metal renal stents, ultimately achieving a distal TIMI-III flow.

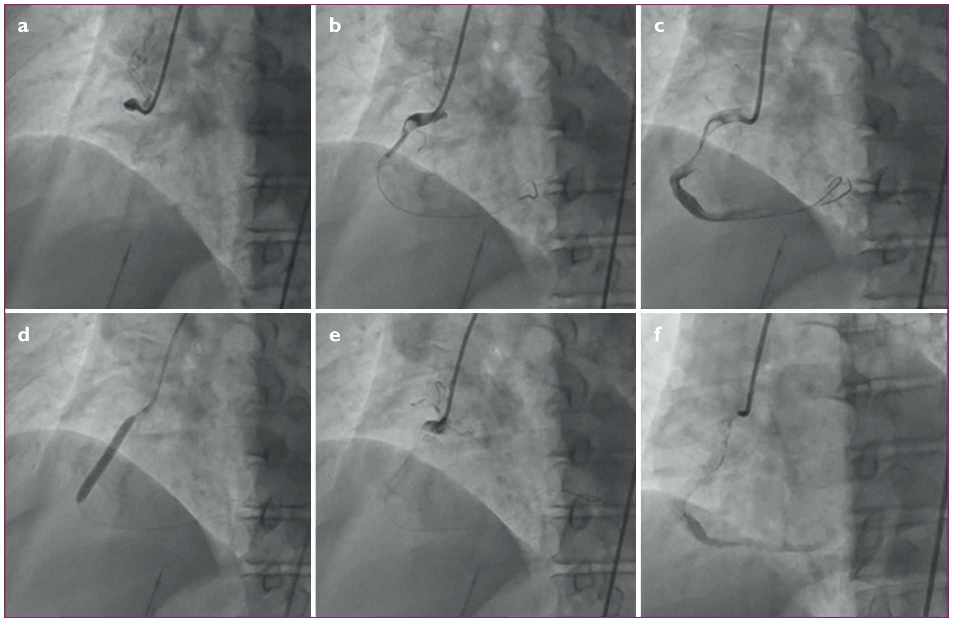

Figure 1. (a) The ostium in the right coronary artery was occluded. (b) The lesion was crossed with a floppy guidewire. Predilatation was performed with 2.0×12 mm and 2.5×15 mm balloons. (c) Thrombolysis in myocardial infarction (TIMI)-III flow was observed after balloon expansion. (d) A bare metal coronary stent was implanted into the lesion. (e) No flow was observed after stent implantation. (f) After adenosine administration, a distal TIMI-I flow was obtained.

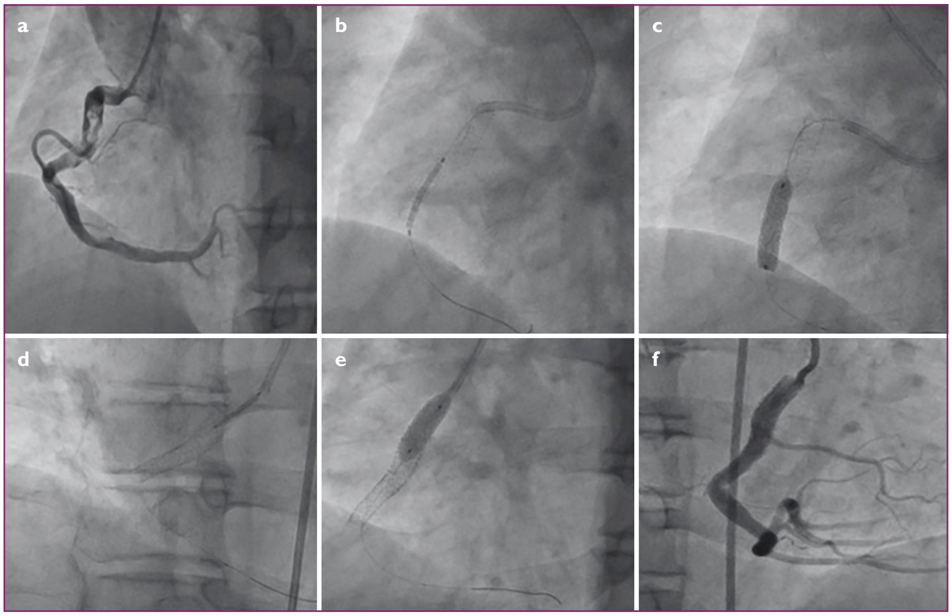

Figure 2. (a) In the control angiography, residual thrombus was detected in the right coronary artery lumen, and the stent was undersized and malpositioned. (b,c) The outside of the stent was passed with the Fielder XT. (d, e) After the malapposed stent was completely crushed against the wall using non-compliant balloons, three bare metal renal stents (5×19 mm, 6×18 mm, 6×4 mm; Herculink, Abbott, USA) were implanted in an overlapping manner. (f) All stents were fully expanded, and a distal thrombolysis in myocardial infarction-III flow was ensured.

Figure 3. Multidetector coronary angiographic image of right coronary artery renal stenting after 1-year of follow-up.

Conclusion

In this case, we describe our bail-out strategy in a patient with coronary artery ectasia and the "no-reflow phenomenon." The crushing of the undersized stent to the wall and renal stent implantation resulted in successful revascularization of the infarct-related artery. In addition, multidetector coronary angiography performed at the end of the 1-year follow-up showed that the long-term outcome of renal stents could be good.

Disclosures

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

Authorship Contributions: Concept – A.E.; Design – A.İ.D.; Supervision – A.G.; Funding – M.R.S.; Materials – M.M.G.; Data collection and/or processing – M.M.G.; Data analysis and/or interpretation – U.Y.; Literature search – A.E.; Writing – A.E.; Critical review – A.E.

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