A case of successful thrombectomy with coronary angioplasty balloon in a totally occluded right coronary artery

Total tıkalı sağ koroner artere koroner anjiyoplasti balonuyla başarılı trombektomi

İbrahim Halil Kurt

Department of Cardiology, Adana Numune Education and Research Hospital, Adana, Turkey

Introduction

The main goal in both the mechanical and thrombolytic approaches towards acute ST elevation myocardial infarction (STEMI) is to remove the thrombus from coronary arteries. High intracoronary thrombi materials often leads to failure effective percutaneous coronary intervention (PCI) results. Use of intracoronary devices is associated with a lower 30-day mortality in patients with STEMI (1). Thrombectomy with simple to use devices, is another attractive option for interventionalists (2). We present a case of successful embolectomy in the right coronary artery (RCA) using intracoronary Fogarty balloon technique.

Case Report

A 43 years old male patient was admitted to our clinic for chest pain. After establishing the diagnosis of acute inferior STEMI, he was given streptokinase 1.5 millionU/h. His arterial blood pressure was 110/70 mm Hg and pulse - 76/min.Coronary angiography was performed due to recurring chest pain within 24 hours after thrombolytic therapy. In coronary angiography, total occlusion of the RCA at the proximal site by the thrombus (Fig. 1) and retrograde filling at the left distal to the RCA were observed. The lesion was passed by the help of intermediate guide wire and balloon support. Excessive thrombus burden was observed. Despite repeated dilations of lesions by the balloon, there were no any change in the thrombus burden (Fig. 2). Thrombus extended from proximal of the RCA up to distal RCA. Then, balloon was inflated at 3-4 atmospheric pressure while it was in distal RCA, and was withdrawn towards proximal RCA into the guiding catheter while it was slightly inflated (Fig. 3). After balloon was withdrawn into the guiding catheter, it was inflated more at 1-2 atm. When it was ensured that the balloon contained the entire guiding catheter, whole system (guiding catheter, balloon and guide wire) was removed from femoral artery. Fresh thrombotic material in one piece (3-4 cm) was observed inside the

Figure 1. Left anterior oblique view of the totally occluded proximal segment of right coronary artery

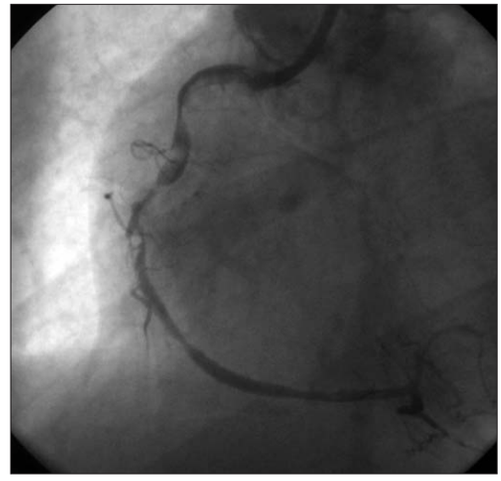

Figure 2. Left anterior oblique view of advanced thrombus formation in right coronary artery (RCA) after passing a guidewire through totally occluded RCA

Address for Correspondence/Yazışma Adresi: Dr. İbrahim Halil Kurt, Department of Cardiology, Adana Numune Education and Research Hospital, Adana, Turkey
Phone: +90 322 458 32 52 Fax: +90 322 459 51 63 E-mail: ibrahimhalilkurt@gmail.com

The case was presented at the XXIII. National Congress of Cardiology, 19-23 November, 2007, Antalya, Turkey

Anadolu Kardiyol Derg
2008; 8: 381-92

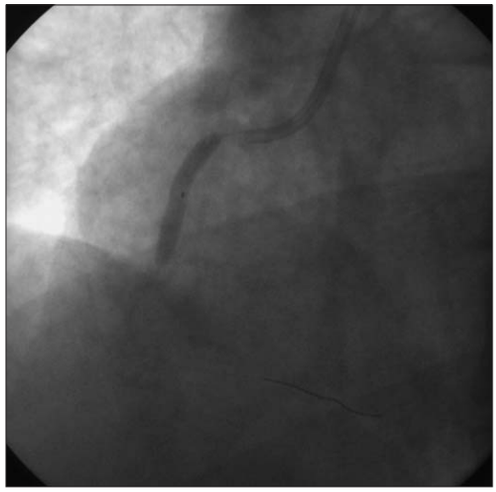

Figure 3. Coronary angioplasty balloon inflated at proximal right coronary artery

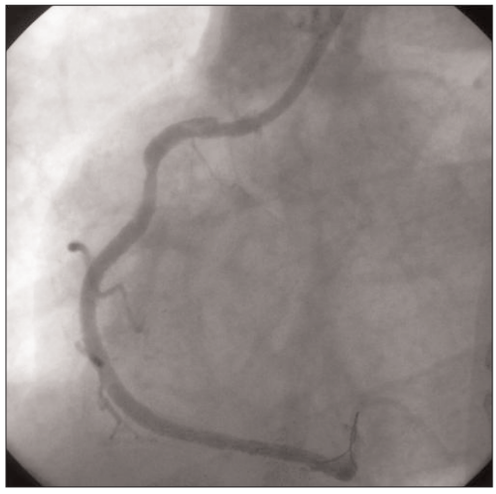

Figure 4. Clearance of all thrombi in right coronary artery after balloon thrombectomy

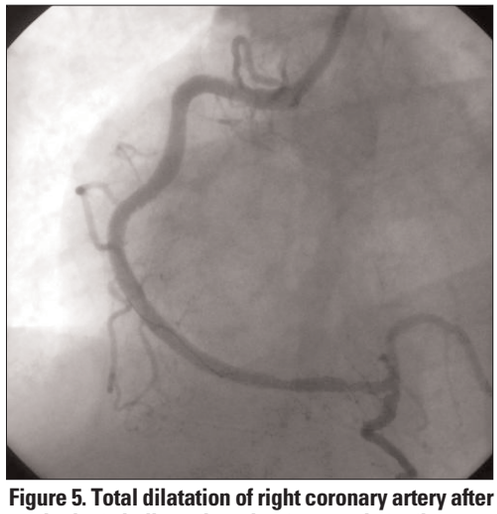

Figure 5. Total dilatation of right coronary artery after angioplasty balloon thrombectomy and stenting

guiding catheter. A new guiding catheter was inserted in RCA ostium and it was seen that almost all thrombi within the artery were cleared (Fig. 4). Then, stent was inserted inside medium and proximal stenosis and TIMI-3 flow was established (Fig. 5). During and after the procedure no complication occurred and the procedure was completed. No complications occurred in the patient followed in coronary intensive unit and at 1-month control.

Discussion

Excessive thrombus burden in coronary arteries is among the important factors affecting the success of intervention and its association with poor prognosis is well known (3). Thus, currently several thrombectomy devices are used in order to remove thrombus burden of thrombotic lesions in STEMI, when thrombolytic therapy and percutaneous coronary intervention fail to provide adequate improvement (4, 5). Although it is rare, thrombectomy procedure with special filters and protective devices has been reported to be successful with Fogarty maneuver (6). We considered angioplasty balloon as Fogarty catheter in order to remove the thrombus from the arteries in our patient presenting with STEMI and scheduled for PCI due to unavailability of accessory devices. We chose balloon thrombectomy procedure mainly because the patient was young with large ischemic area and his chest pain persisted. Low tortuousness of the RCA and large artery diameter allowed easy performance of the procedure. On the other hand, some complications may occur during use of other thrombectomy methods. These methods have their own limitations and advantages (7). Major complications of mechanical thrombectomy devices include distal embolization, dissection, perforation and no-reflow phenomenon (8). The absence of no-reflow phenomenon and dissection in our patient despite no use of distal protection device may be explained by the marked decrease in the present coronary thrombus burden with use of effective thrombectomy. After first balloon inflation, there was spiral like dissection throughout RCA, but no dissection was further seen in serial angiographic views. Case of coronary perforation has been reported following use of thrombectomy devices (9). We believe that younger age of the patient and well-developed RCA decreased his risk for perforation. It was found that stent insertion after thrombectomy for thrombotic lesions in STEMI had more favorable effects on left ventricular function compared to direct stent insertion. However, cover stent was used in order to affix thrombus to artery wall in thrombotic lesion but this is not recommended due to very high rates of restenosis (10).

Conclusion

We report a case of successful balloon thrombectomy procedure in a patient with STEMI. Application and safety of this procedure need to be tested in the large clinical study.

References

1. Nakatani D, Sato H, Sakata Y, Mizuno H, Shimizu M, Suna S, et al. Effect of intracoronary thrombectomy on 30-day mortality in patients with acute myocardial infarction. Am J Cardiol 2007; 100: 1212-7.
2. Kapoor R, Kapoor JR. Primary percutaneous coronary intervention. N Engl J Med. 2008; 358: 431.
3. HenriquesJP, Zijlstra F, Frequency and sequelae of ST elevation acute myocardial infarction caused by spontaneous distal embolization from unstable coronary lesions. Am J Cardiol 2003; 91: 708-11.
4. Ischinger T. X-Sizer Study Group. Thrombectomy with the X-Sizer catheter system in the coronary circulation: Initial results from a multi-center study. J Invasive Cardiol 2001; 13: 81-8.
5. De Rosa S, Cirillo P, De Luca G, Galasso G, Esposito G, Leosco D et al. Rheolytic thrombectomy during percutaneous coronary intervention improves long-term outcome in high-risk patients with acute myocardial infarction. J Interv Cardiol 2007; 20: 292-8.

6. Eggebreht H, Baumgarten D, Naber C, Dirsh O, Haude M, Erbel R. Extraction of large intracoronary thrombus in acute myocardial infarction by percutaneous Fogarty: intentional abuse of a novel interventional device. Catheter Cardiovasc Interv 2002; 55: 228-32.
7. Constantinides S, Lo TS, Been M, Shiu MF, Tizun J, Fernandez Sanchez-Villaran E et al. Guide-wire rupture as a complication of coronary angioplasty. Early experience with a helical coronary thrombectomy device in patients with acute coronary thrombosis. Heart 2002; 87: 455-60.
8. Kotani JI,Nanto S,Mintz GS,Kitakaze M,Ohara T,Morozumi T et al. Plaque gruel of atheromatous coronary lesion may contribute to the no-reflow in patients with acute coronary syndrome. Circulation 2002; 106: 1672-7.
9. Constantinidis S, Lo TSN, Been M, Shiu MF. Early experience with a helical coronary thrombectomy device in patients with acute coronary thrombosis. Heart 2002, 87: 455-60.
10. Greckens U, Muller R, Cattelaens N, Herchenbach, Grube E. The new coronary stent graft JoStent: first clinical experience. J Am Coll Cardiol 1998; 31 (Suppl): 414A. (abstract)

An unusual Brugada syndrome case

Nadir görülen bir Brugada sendromu vakası

Cihan Örem, Gülhanım Kırış, İsmet Durmuş, Şahin Kaplan, Ömer Gedikli, Merih Baykan, Mustafa Gökçe, Şükrü Çelik

Department of Cardiology, Faculty of Medicine, Karadeniz Technical University, Trabzon, Turkey

Introduction

Brugada syndrome (BS) is characterized by right bundle branch block (RBBB) pattern with ST-segment elevation in right precordial leads and a propensity for sudden cardiac death due to ventricular arrhythmias. We present the case of a 20-year-old man with an episode of syncope followed by ventricular fibrillation (VF)-induced cardiac arrest.

Case Report

A 20-year-old man who had developed syncope recovered completely during his transport to the nearest hospital. Electrocardiogram (ECG) findings in the emergency department were as follows: 1) J waves in many leads without ST elevation, with a simultaneous Mobitz type II second-degree atrioventricular (AV) block (Fig.1), 2) atrial fibrillation (AF), and 3) monomorphic ventricular tachycardia (VT). During his examination, the patient suddenly lost consciousness and his ECG revealed VF. Direct current countershocks were delivered immediately. Cardiopulmonary resuscitation was performed and the patient was intubated. He was transferred to our hospital for further examination and therapy. Shortly after his arrival at our hospital, he was extubated.

Our evaluation of the patient's medical history revealed that he had been the victim of a traffic accident one week prior. He had been rarely taking analgesic medication (Tenoxicam, 20 mg orally) for widespread aches produced by the accident. He had no personal history of arrhythmia, syncope or seizure, and no family history of sudden death. He was not taking any other medications beyond the prescribed analgesic. His electrolyte levels, chest x-ray, echocardiography, and coronary angiogram were normal. His cerebral computerized tomography was also normal. His ECG revealed a RBBB and coved-type marked ST elevation together with negative T waves in the V1-V3 leads (Fig. 2). The patient was diagnosed with type 1 BS.

The patient was followed for recurrence of arrhythmias for 5 days. No antiarrhythmic drugs were prescribed. He was then transferred to another hospital for electrophysiological study (EPS). According to the EPS report, the related times and intervals were within the normal ranges. Ventricular tachycardia was not induced by extra-stimulus. Due to typical Brugada type ECG and cardiac arrest attack, implantable cardioverter defibrillator was implanted.

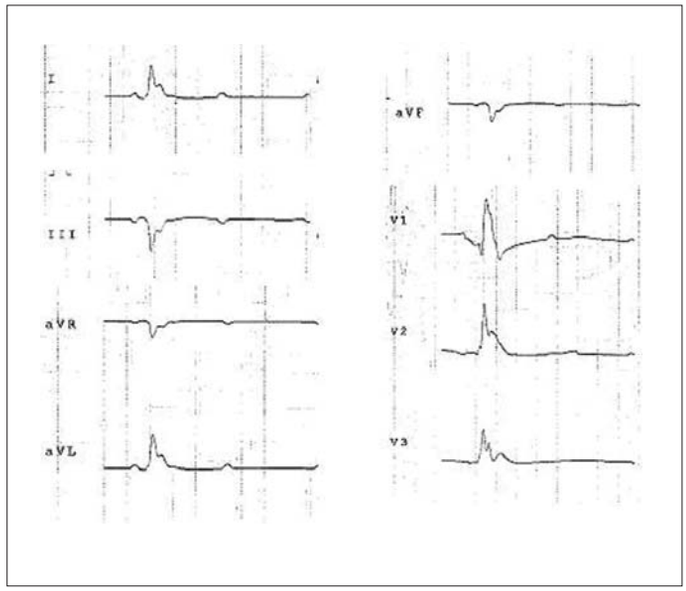

Figure 1. J waves in many leads and Mobitz type II second-degree atrioventricular block

Address for Correspondence/Yazışma Adresi: Cihan Örem, MD, Karadeniz Technical University Medical Faculty Department of Cardiology Trabzon, Turkey
Phone: +90 462 377 57 07 Fax: +90 462 325 05 18 E-mail: corem71@yahoo.com