Primary Percutaneous Coronary Intervention in Anomalous High Anterior Takeoff Right Coronary Artery

Yukarı-Ön Çıkışlı Sağ Koroner Arter Anomalisinde Primer Perkütan Koroner Girişim

Koroner Arter Anomalisinde Primer PCI / Primary PCI in Coronary Artery Anomalous

Adem Bekler, Burak Altun, Ufuk Ozturk, Ahmet Temiz, Emine Gazi
Department of Cardiology, Canakkale Onsekiz Mart University, School of Medicine, Canakkale, Turkey

Paper accepted to be presented at 2nd Kardiyo-Bahar Conference 05-08 March 2015, Cyprus

Özet

Primer perkütan koroner girişim (PCI) da kısa ve uzun dönem mortaliteye etki eden önemli parametrelerden biri de 'door to baloon time' dır. Sorumlu lezyonun oldukça nadir görülen koroner arter çıkış anomalisinin olması ve koroner artere kanülasyon için uygun kateter bulunamaması bu sürenin uzamasına neden olabilir. Burada; literatürdeki ilk vaka olan, akut inferior miyokard enfarktüsü (MI) ile başvuran hastada sorumlu lezyonun yüksek anterior çıkışlı sağ koroner arter (RCA)' nın olduğu nadir görülen koroner anomaliye modifiye edilmiş sol guiding kateter yardımıyla başarılı primer PCI uygulanan vaka sunuldu.

Anahtar Kelimeler

Guiding Kateter; Yukarı-Ön Çıkışlı RCA; Primer PCI

Abstract

One of the important parameters that influence the short and long-term mortality in primary percutaneous coronary intervention (PCI) is door to baloon time. Because culprit lesion is extremely rare anomalous origin of coronary artery and there is no proper catheter for coronary artery cannulation, this period may take longer. Here; the case that is the first in the literature, in which the culprit lesion was high anterior takeoff right coronary artery (RCA) in the patient admitted to hospital with acute inferior myocardial infarction (MI), and in which a successful primary PCI was applied to a rare coronary anomaly with the help of a reshaped left guiding catheter was presented.

Keywords

Guiding Catheter, High Anterior Takeoff RCA, Primary PCI

DOI: 10.4328/JCAM.3357 Received: 03.03.2015 Accepted: 11.03.2015 Printed: 01.08.2014 J Clin Anal Med 2014;5(suppl 4): 499-501
Corresponding Author: Adem Bekler, Department of Cardiology, School of Medicine, Canakkale Onsekiz Mart University, Research and Training Hospital, 17110, Kepez, Canakkale, Turkey. T.: +90 2862635950 GSM: +905055100653 F.: +90 2862635956 E-Mail: adembekler27@gmail.com

Introduction

ST elevation acute coronary syndrome (STE-ACS) is the major reason affecting morbidity and mortality in developed countries. The most effective way of reducing mortality in STE-ACS is initiation of interventional (primary PCI) or thrombolytic therapy as soon as possible. Door to baloon time has been shown to be an important parameter affecting short and long term mortality in STE-ACS, and morbidity ve mortality of the patients with shorter door to baloon time is less than the others.

The incidence of coronary artery anomalies (CAA) are between 0.3% and 1.3% in general population and these patients who are usually asymptomatic may be admitted to the hospital with a variety of clinics, including sudden cardiac death [1]. One of the very rare subtypes of CAA is anomalous right coronary artery (RCA) with high anterior takeoff [2]. Various catheters are used for this anomaly which is quite difficult to cannulate in selective coronary angiography, but this increases the time and the cost of procedure. When patients with rare CAA are admitted to hospital with STE-ACS, because of these difficulties, door to baloon time may increase. However, this problem can be avoided with catheters providing adequate and appropriate back-up [3]. Here, we presented the case in which the culprit lesion was high anterior takeoff RCA and in which cannulation can not be achieved despite the use of numerous catheters, but cannulation and adequate back-up was provided after the use of a reshaped Judkins left guiding catheter.

Case Report

55 year old male patient with typical anginal pain in last 6 hours was admitted to our hospital. There were no risk factors for coronary artery disease except smoking. There were 2/6 systolic murmur on mitral valve area in cardiac auscultation, and ST elevation in the inferior leads and reciprocal ST depression in leads V1-V3 on admission electrocardiography. The patient with wall motion abnormalities on echocardiography was taken to the catheter laboratory for primary PCI with the diagnosis of acute inferior MI. In left coronary angiography via the femoral artery, cannulation of the left main coronary artery was achieved with Judkins left 6-F catheter and no significant lesions in the left coronary system was determined (Figure 1). RCA could not be displayed with Judkins guiding catheters of different sizes and then aortography was performed. In aortography RCA was observed as ghost-like image (Figure 2), and despite the use of, respectively, Amplatz left and right (AR-AL), right coronary bypass (RCB) and multipurpose guiding catheters, cannulation still was not achieved. Finally, Judkins left 6-F guiding catheter was reshaped manually by increasing the primary and secondary slopes up to 100-110 degrees, and quite good cannulation and sufficient back-up was provided. In the imaging, high anterior takeoff of RCA and in the mid-region of RCA thrombosed lesion causing 99% stenosis was determined (Figure 3). RCA lesion was passed through by 0,014 inch AsahiTM floppy guidewire (Asahi Intecc, Aichi, Japan) and after predilatation by 2.0 mm*20 mm Alvimedica Invader® balloon (Alvimedica, Istanbul, Turkey), 2.75 mm*24 mm BiomimeTM sirolimus eluting stent (Meril Life Sciences, Vapi, India) was implanted and the lesion had <10% residual stenosis at the end of the procedure (Figure 4). There was no complication during the procedure and two days later the patient was discharged uneventfully.



Figure 1. Angiogram showing no significant stenosis in the left anterior descending and circumflex artery.

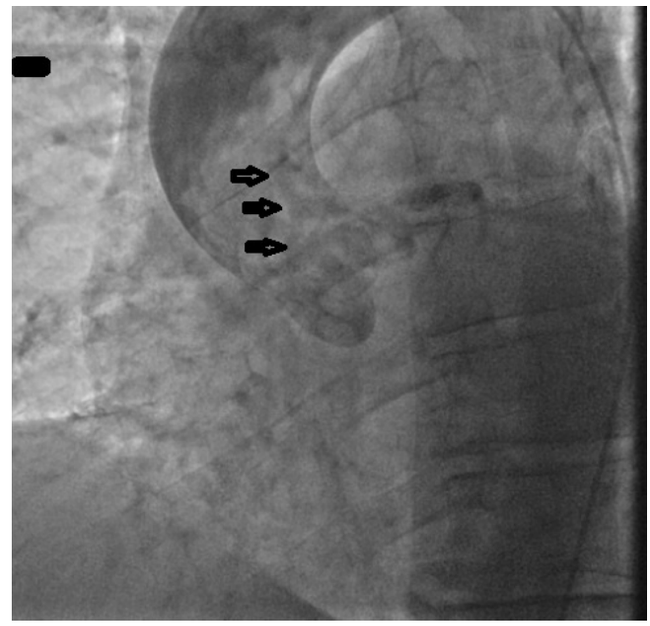


Figure 2. Aortogram showing ghost-like image the orifice of the high anterior takeoff right coronary artery.

Discussion

In STE-ACS cases which account for approximately 30% of all cases of ACS, reperfusion therapy plays a key role in reducing morbidity and mortality and reperfusion therapy can be performed by primary PCI which is an invasive way or by thrombolytic therapy. One of the most important factors influencing the decision of primary PCI is door to baloon time and this time is recommended to be under 90 minutes in patients with STE-ACS for effective benefits and every minute over 90 minutes increases mortality. But unfortunately, in some patients taken to the catheter laboratory for primary PCI, complexity of the culprit lesion and presence of CAA restricting cannulation or adequate back-up may increase this time.

The frequency of CAA in the general population has been re-



Figure 3. Coronary angiogram of the high anterior takeoff right coronary artery (RCA) engaged with reshaped Judkins left 6-F guiding catheter and showing critical stenosis in the mid-RCA.



Figure 4. Angiogram showing good flow in the high anterior takeoff righ coronary artery after primary percutaneous coronary intervention.

ported to be between 0.3% -1.3%, and these patients who are usually asymptomatic may present with a variety of clinics including sudden cardiac death [1]. High anterior takeoff RCA anomaly is an extremely rare subtype of all CAA [2]. Therefore, no case has been reported so far in which this extremely rare anomaly is culprit lesion for acute STE-ACS and from this perspective, the case that we reported is the first case in the literature. Recently Marchesini et al. reported that there were only 5 coronary anomalies in 1015 patients with STE-ACS admitted to their centers and they mentioned about the complexity of two cases and reported that presence of CAA as culprit lesion in STE-ACS complicates primary PCI procedure [4]. Komatsu et al. determined high anterior takeoff RCA anomaly in a patient admitted with non-ST elevation ACS and they could not achieve selective cannulation of RCA with standard catheters and they stented the lesion in RCA with the help of DIO Thrombus Aspiration Catheter [3]. In another case, Turgut et al. thought that in a patient without ACS who has angina refractory to medical treatment, the culprit lesion causing symptoms was chronic total occlusion in high anterior takeoff RCA, and they achieved the cannulation of RCA with the help of RCB guiding catheter [5]. On the other hand, in their study conducted in 837 patients, Akgun et al. showed that there was only one high anterior takeoff RCA in 49 patients in which cannulation of the RCA could not be achieved and selective cannulation may be achieved by reshaping the left Judkins catheter [6]. For providing adequate back-up in RCA anomalies arising from the left sinus valsalva, Cohen et al. showed in two cases that Judkins left guiding catheter can be used and Caliskan et al. showed that multipurpose Hockey Stick guiding catheter can be used [7,8].

As a result, when rare seen high anterior takeoff RCA is the culprit lesion in STE-ACS, to provide adequate support for selective cannulation and primary PCI, manually reshaped Judkins left guiding catheter can be used as we did in our case. Also, this method can contribute to the reduction of morbidity and mortality by reducing procedure time and the amount of opaque.

Competing interests

The authors declare that they have no competing interests.

References

1. Angelini P, Velasco JA, Flamm S. Coronary anomalies: incidence, pathophysiology, and clinical relevance. Circulation 2002;105(20):2449-54.
2. Tarhan A, Kehlibar T, Yilmaz M, Aslan Y, Pancaroglu C, Yigit S, et al. Right coronary artery with high takeoff. Ann Thorac Surg 2007;83(5):1867-9.
3. Komatsu T, Yaguchi I, Yufu T. Successful percutaneous coronary intervention of an anomalous right coronary artery with high anterior takeoff using a DIO thrombus aspiration catheter. J Invasive Cardiol 2012;24(9):185-7.
4. Marchesini J, Campo G, Righi R, Benea G, Ferrari G. Coronary artery anomalies presenting with ST-segment elevation myocardial infarction. Clin Pract 2011;1(4):28.
5. Turgut O, Tandogan I, Dizman R. Use of the RCB guide in PCI of a chronic total occlusion in an anomalous right coronary artery with high anterior takeoff. J Invasive Cardiol 2009;21(4):70-2.
6. Akgun T, Tanboga IH, Oduncu V, Kurt M, Cimen AO, Bitigen A. Reshaping the left Judkins catheter for a right coronary angiogram in the anomalous aortic origin of the right coronary: killing two birds with one left Judkins. Turk Kardiyol Dern Ars 2012;40(6):513-7.
7. Caliskan M, Ciftci O, Gullu H, Alpaslan M. Anomalous right coronary artery from the left sinus of Valsalva presenting a challenge for percutaneous coronary intervention. Turk Kardiyol Dern Ars 2009;37(1):44-7.
8. Cohen MG, Tolleson TR, Peter RH, Harrison JK, Sketch MH Jr. Successful percutaneous coronary intervention with stent implantation in anomalous right coronary arteries arising from the left sinus of valsalva: a report of two cases. Catheter Cardiovasc Interv 2002;55(1):105-8.

How to cite this article:
Bekler A, Altun B, Ozturk U, Temiz A, Gazi E. Primary Percutaneous Coronary Intervention in Anomalous High Anterior Takeoff Right Coronary Artery. J Clin Anal Med 2014;5(suppl 4): 499-501.