MCBU SBED
MANİSA CELAL BAYAR ÜNİVERSİTESİ SAĞLIK BİLİMLERİ ENSTİTÜSÜ DERGİSİ
MANISA CELAL BAYAR UNIVERSITY JOURNAL OF INSTITUTE OF HEALTH SCIENCE
ISSN: 2147-9607

OLGU SUNUMU
CASE REPORT
CBU-SBED, 2022, 9(1): 183-185

Primer Perkütan Translüminal Koroner Anjiyoplasti Sırasında Koroner İçinde Kırılan Stent Shaftı ve Balonun Çıkarılması Olgusu

The Case of Removal of Intracoronary Broken Stent Catheter's Shaft and Its Balloon Trough Femoral Sheat During Primer PTCA

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Gönderim Tarihi / Received:07.05.2021
Kabul Tarihi / Accepted: 01.06.2021
DOI: 10.34087/cbusbed.934415

Öz

Girişimsel kardiyoloji çağında, kateter temelli komplikasyonlar daha sık hale gelmiştir ve girişim yapan doktor bu tür komplikasyonların yönetiminde cerrahlardan daha fazla rol almaktadır. Komplikasyonun doğası ne olursa olsun genellikle kardiyolog tarafından komplikasyonların yönetimi başarılıdır ve cerrahi girişim gerekmez. Ancak özellikle koroner içi yabancı cisimlerin neden olduğu komplikasyonlarda hasta stabilitesi bozulur. Bu yabancı cisimlerin koroner dolaşımdan hızla uzaklaştırılması hastanın durumunu stabilize edebilir. Bundan sonra kalıntıların hasta vücudundan tamamiyle çıkarılması bu komplikasyonların başarılı bir şekilde yönetilmesinin son adımıdır. Burada kırık stent balon şaftı ile RCA'nın total obstrüksiyonu sonucu hemodinamik bozuklukla seyreden, akut inferiyor ST yükselmeli miyokard enfarktüsü (MI) olgusunu sunuyoruz. Başarıyla yakalanan stent kateterinin kırılan kısmı önce koroner damardan sonra vücuttan çıkarıldıktan sonra, hastanın durumu iyiye gitmiş ve müdahaleden kısa bir süre sonra medikal tedavi ile taburcu edilmiştir.

Anahtar Kelimeler: Arter Stentleme, Kement, Koroner, Komplikasyon.

Abstract

In the time of invasive area, catheter based complications is getting more frequent and interventionist deals with this kind of complications' management more than vascular surgeons. Regardless of complication's nature commonly management of complications are successful and requirements of surgery are needless. But the patient stability deteriorates the time of complications especially result of intracoronary foreign bodies. Quick Removal of these foreign bodies from coronary circulation can stabilize patient condition. After that externalization of these kind remnants from patient body is the final step of successfully management of complications. . We herein present an acute inferior ST elevation myocardial infarction (MI) with hemodynamic disturbance because of total obstruction of RCA with broken stent balloon shaft. After successfully catch and removal of broken part of stent catheter, patient's situation was going well and discharged with medical therapy shortly after intervention.

Key Words: Complication, Coronary Artery Stenting, Snare.

1. Introduction

The broken stent-delivery catheter's shaft is a rare and very mortal event during coronary intervention. We report a snare technique for the successful retrieval of stuck delivery catheter partially in proximal RCA and ascendant aorta and removal of delivery catheter trough 6F femoral sheath after successfully stent deployment during ACS [1].

This kind of events could occur due to some factors related to the operator manipulation (such as excessive pushing or inadequate predilatation), to the patient (a calcified or tortuous vessel), or to defects in manufacture [2].
The following retrieval methods have been described: emergency CABG, the snare technique, the wire-braiding technique, and the simple balloon technique [1, 3].

2. Case Report

We presented, here, the case with acute inferior MI. The case was 73 years old male, who was presented with hyper acute inferior ST elevated myocardial infarction. He was diagnosed and treated for hypertension and hyperlipidemia. His history revealed that, Coronary artery stenting for LAD and RCA was performed in 2017 and 2019 for treatment of stable coronary artery disease. He had been no complains until administration to hospital. But his family had premature coronary heart disease.
He had two hour lasting chest pain and pressure sensation on chest during administration. His conciseness was open but anxiety and sweeting were present. His blood pressure and pulse rate was (100/70 and 59) respectively. During physical examination apical systolic murmur (1/4) were auscultated and pulses were weak. His ECG shows bradycardia (59 /min) and ST elevation in inferior derivations. Transthoracic echocardiography revealed inferolateral hypokinesia in LV, also LVEF % 40, first degree mitral insufficiency and type I diastolic dysfunction at emergency unit. His blood tests were normal except elevated troponin I level at administration. After cardiology consultation, he was accepted catheterization laboratory. Enoxaparin 1 mg/kg SC, 300 mg acetyl salicylic acid, 60 mg prasugrel PO was administrated. After that Coronary angiography revealed RCA total ostial obstruction and long previously implanted stent in mid RCA and no critical stenosis in left coronary system open stent was observed in LAD. (Figure 1A, B). RCA was wired with PT2 (0,014 coronary guide wire) and ballooned with 2.0/20 mm coronary balloon. (Figure 1 C) After balloon, RCA was visualized and % 70-80 sequential lesions and haziness were observed. (Figure 1 D) 3.0/40 mm Evermine™ Drug Eluted stent (Everolimus with biodegradable polymer) was implanted and stent balloon was deflated. During removal of deflated balloon, stent shaft was broken and it seated in partly inside of proximal RCA and ascending aorta. And RCA flow disturbed to TIMI I-0. (Figure 2 E, F). Amplatz Goose Neck™ Snare Kit (GN 1000) was used and catheter proximal parts captured and removed to ascendant aorta and further draw to outside the body through 6F femoral arterial sheath. (Figure 2 G)
After procedure, control angiography was performed and TIMI III RCA flow and no residual stenosis or remnant was observed. Tirofiban infusion and atorvastatin, nitrate, diltiazem were initialized. One day of procedure cardiac blood markers mildly elevated but clinical presentation remarkably improved and echocardiography showed % 45 LVEF. Two days later, patient was discharged. Patient had LVEF %50 and functional class NYHA 4 and no symptoms during control examination at 1 month later after discharge.

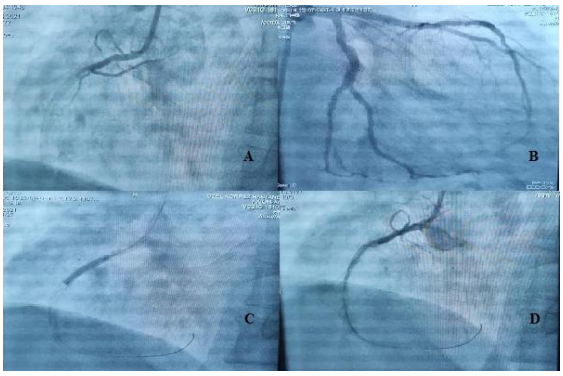

Figure 1. Coronary Angiography and Primer PTCA-Stenting of RCA

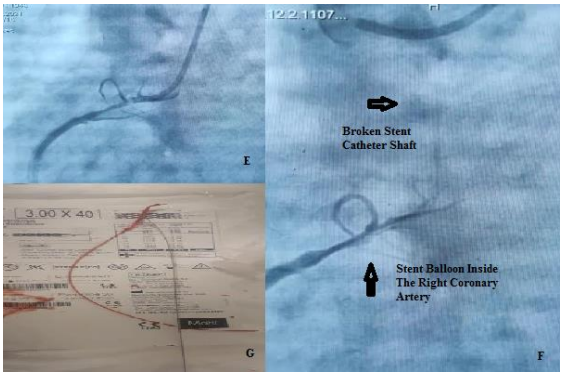

Figure 2. Broken Catheter Shaft and Its Removal

3. Discussion

Coronary stent fracture (SF) is a rare complication with high morbidity and mortality, defined as the discontinuity of any part of the stent structure detected on angiography [1]. SF was first revealed in bare metal stents (BMS) [2] and although its incidence varies by stent type, it has been reported to be between 1-8% in various studies [3]. Despite the advanced stent technology, Kuramitsu et al. found the incidence of SF in the everolimus eluting stent (EES) to be 2.9% [4]. Many risk factors have been supposed to predispose coronary SF. coronary calcification, ostial stent location, abnormal forces that concentrate on the struts and lead to metal fragility, tortuosity (especially in RCA), overlapping of stents, increase in stent length, dynamic movement of the vessel during repetitive cardiac contractions and consequently exposure to distortion forces, coronary ectasia / aneurysm and balloon over dilation are some of these factors [5, 6].

Fractures or detachments of stents may result in in-stent restenosis (ISR), acute, sub-acute or late stent thrombosis (ST), pseudo aneurysm formation, embolic events, acute myocardial infarction (as in our case), hemodynamic collapse or even sudden cardiac death (SCD) [1,6]. SF can be an isolated single strut fracture (the least severe form) or, as in our case, complete transverse fracture and separation of the stent segments leading to dislocation of the stent (the most severe form). Total separation has been associated with increased clinical adverse outcomes (i.e. ST and ISR) [6]. Various stent retrieval techniques have been described in the literature in case of stent loss (or dislocation). These include loop snare, endovascular snare device, and forceps, twisting guide wire technique, small angioplasty balloon, and basket retrieval apparatus or pressing the stent toward the wall of the blood vessel by a balloon [5, 6]. In our case, we performed successful retrieval using Amplatz Goose Neck™ Snare Kit (GN 1000)

4. Conclusion

In our opinion, quick management of this kind of complications is vital. Especially in acute settings and presence of experienced cardiologist complications can be managed successfully. All interventional cardiologists should gain experience the usage of macro and micro snare. This can reduce the need of surgery during complication management. Our experience suggests that quick removal of foreign bodies from coronary circulation and patient body is vital and lifesaving intervention during acute coronary syndromes.

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