

CASE REPORT

Exclusion of a coronary aneurysm with a polyurethane-covered stent

Poliüretan greft stent ile koroner anevrizmanın dışlanması

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Summary– A coronary artery aneurysm is a challenging clinical situation due to the lack of sufficient evidence from randomized controlled studies and the lack of consensus on a management strategy. The present case is a description of the exclusion of a middle segment aneurysm of the left circumflex coronary artery using a PK Papyrus covered stent (Biotronik, AG, Bulach, Switzerland). The final images were favorable.

Özet– Koroner arter anevrizması randomize kontrollü çalıřmalardan elde edilen kanıtların yetersizliğine baėlı olarak zorlayıcı bir klinik durumdur. Olgumuzda, sirkümfleks arter orta segmentteki anevrizmanın PK Papyrus (Biotronik, AG, Bulach, Switzerland) greft stent ile dışlanması takdim ettik. Bitiř görüntüleri uygundu.

The clinical manifestation of a coronary artery aneurysm (CAA) varies according to the clinical scenario; it may be discovered as an incidental finding on cardiac imaging or as the result of acute coronary syndrome (ACS). Treatment options include medical management, surgery, and percutaneous coronary intervention (PCI).^[1] This report is a description of a patient who underwent coronary angiography for ACS. CAAs were identified in the angiographic examination in addition to the culprit lesion.

CASE REPORT

A 63-year-old patient, who was overweight and had a history of dyslipidemia and coronary artery disease with 2 stents implanted in the left anterior descending coronary artery (LAD) 13 years earlier, was admitted to the emergency department following an episode of prolonged typical chest pain at rest. The admission electrocardiogram showed T-wave inversion in leads III and aVF, and the serum high-sensitivity cardiac troponin T level on admission was 63 ng/L (normal: <14 ng/L) and peaked at 434 ng/L. His past medical history included a motorcycle accident

with a left diaphragm injury 4 years prior to the current admission. The patient underwent early coronary angiography for non ST-segment elevation myocardial infarction. The examination revealed no in-stent restenosis in the LAD, intermediate stenosis of the distal LAD, and significant stenosis of the third marginal branch and the distal left circumflex coronary artery (LCX). In addition, an aneurysm of the middle segment of the LCX and a smaller aneurysm of the first marginal artery were observed (Fig. 1a). The third marginal artery and the distal LCX were treated via angioplasty with the implantation of 2 stents (Biofreedom 2.75 mmx18 mm and Biofreedom 2.25 mmx24 mm; Biosensors International Ltd., Singapore).

A coronary computed tomography angiography (CCTA) scan characterized the aneurysm of the middle LCX as a fusiform lesion with a mural thrombus 10x9 mm in diameter and 20 mm in length, and an ectatic lesion at the level of the first obtuse marginal

Abbreviations:

ACS	Acute coronary syndrome
CAA	Coronary artery aneurysm
CCTA	Coronary computed tomography angiography
LAD	Left anterior descending coronary artery
LCX	Left circumflex
PCI	Percutaneous coronary intervention

Received: November 11, 2018 Accepted: December 21, 2018

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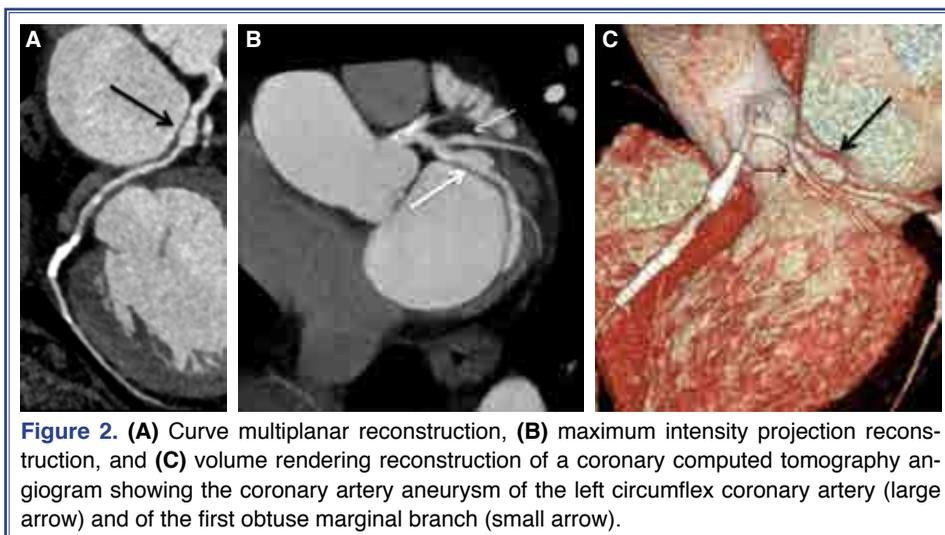
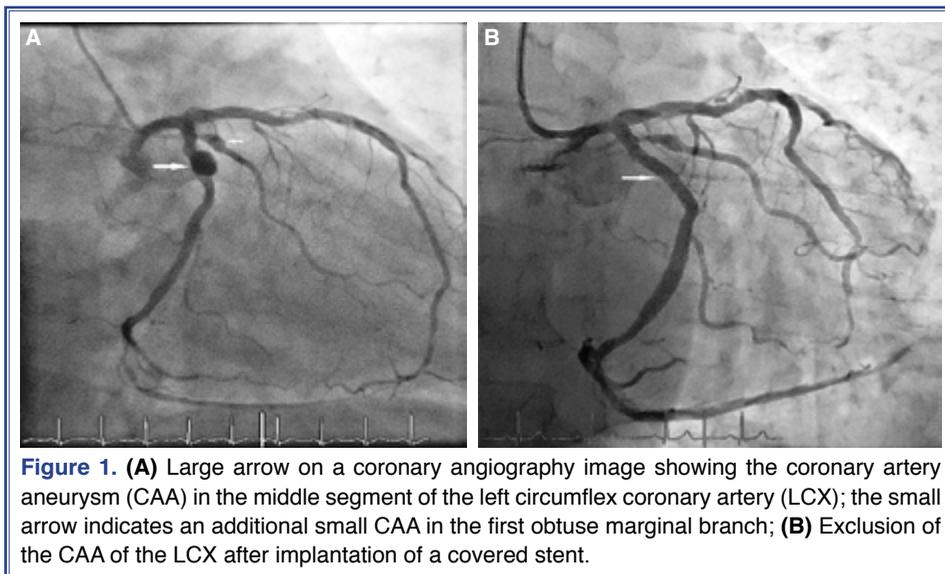
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branch with a diameter of 3x3 mm (Fig. 2). The heart team recommended percutaneous treatment of the LCX aneurysm and medical management for the lesion of the marginal branch. Using a 6-F guiding catheter, a polyurethane-covered stent (PK Papyrus, 3.0x26 mm; Biotronik AG, Berlin, Germany) was implanted through the aneurysmal segment and post-dilatation was performed with a 3.5-mm noncompliant balloon with favorable angiographic results (Fig. 1b). The procedure was uneventful, the aneurysm was completely sealed, and the patient was discharged the next day with recommended therapy of lifelong aspirin, statins, angiotensin-converting enzyme inhibitors, and 12 months of clopidogrel. At a 5-month follow-up, the patient was without symptoms.

DISCUSSION

A CAA is defined as vessel dilation exceeding the diameter of the reference vessel by more than 1.5-fold.^[2] A CAA is most commonly related to atherosclerosis, followed by congenital, inflammatory, and connective tissue disorders. CAA associated with trauma, drugs such as cocaine and amphetamines, PCI, and infection has also been described.^[3] In the present case, while atherosclerosis remains the most probable underlying condition, a traumatic origin following a motorcycle accident with a documented injury to the left diaphragm cannot be excluded. Of note, CAA of the LCX artery was not documented in the patient's cardiac history at the time of the first angioplasty



of the LAD artery. While most CAAs are incidental findings observed during coronary angiography or a CCTA scan and the patients are asymptomatic, CAA may cause ACS due to vessel occlusion at the level of the aneurysm or distal embolization of thrombotic material. Rupture of the aneurysm is a rare but life-threatening complication, one that is likely underdiagnosed because of the high risk of sudden death following tamponade.^[1,4]

The management of a CAA is challenging due to the lack of sufficient evidence from randomized, controlled studies and the absence of a consensus on a management strategy. Treatment choices include medical therapy, PCI with covered stents or coil embolization, and surgery. Medical strategies consist of antiplatelet treatment or anticoagulation; however, there is little comparative research.^[1] Recently, no in-hospital mortality was reported in a surgical case series of 15 patients; at 4 years of follow-up, 1 patient with Marfan syndrome had died as a result of pneumonia-associated sepsis and 2 patients had died due to non-cardiac illness. Resection/ligation of the CAA with concomitant reconstruction of the coronary vessel or solitary coronary artery bypass graft was performed depending on the size of the CAA.^[5]

Coronary covered stents, usually implanted to treat coronary perforations, may be deployed to exclude a CAA as a less invasive alternative to surgery. In one case series, 7 patients with a CAA were treated with a polytetrafluoroethylene-covered stent (Jostent; Jomed GmbH, Rangendingen, Germany) and followed-up at 35±8 (range: 21–44) months. The results revealed no major adverse cardiac events in-hospital and 1 patient who was found to have restenosis during follow-up and underwent repeat PCI.^[6] PCI of a CAA with a covered stent may be challenging, as the device is more rigid and bulky than a standard coronary stent and advancement in calcified and/or tortuous vessels may be difficult. Moreover, any side branch in the stented segment will likely be occluded. There are also constraints in terms of the maximum diameter and length of the devices. Finally, covered stents can be associated with greater stent thrombosis rates compared with standard metallic stents.^[1,7] The first publication on the implantation of a PK Papyrus stent (Biotronik AG, Berlin, Germany) to treat a CAA was in 2015.^[8] Due to its covered, single-stent design, the PK Papyrus stent has a small crossing profile and greater flexibility.^[1]

In conclusion, despite the lack of comparative data, percutaneous management of a CAA appears to be a valuable option, if the size and location of the lesion are suitable, as was the case in our patient. Newer generation covered stents, and notably the Papyrus polyurethane-covered stent, have an improved profile and are less rigid than earlier devices, allowing for use in the treatment of a broader spectrum of lesions.

Peer-review: Externally peer-reviewed.

Conflict-of-interest: None.

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

Authorship contributions: Concept: M.C., M.R., F.R.; Design: M.C., F.R., A.L.H.; Supervision: F.R., M.R.; Materials: A.L.H., L.V.; Data collection: A.L.H., L.V.; Literature search: M.C., M.R.; Writing: M.C.

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Keywords: Coronary artery aneurysm; covered stent; percutaneous coronary intervention.

Anahtar sözcükler: Koroner arter anevrizması; greft stent; perkütan koroner girişim.