

Endovascular coil treatment of a coronary artery aneurysm related to polyarteritis nodosa

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Introduction

Coronary artery aneurysms (CAAs) represent a rare pathology. However, the true burden of CAAs may be currently underestimated. The use of newer imaging technologies, such as computed tomography and magnetic resonance coronary angiography, may assist in unraveling its true prevalence (1). Atherosclerosis is the main etiology of CAAs. It has been reported that 50% of CAAs are due to atherosclerosis (2). Congenital, inflammatory, and connective tissue disorders are the other possible etiological factors that promote CAA development (3-4). Recently, genetic factors have been proposed as an alternative etiology (5). Polyarteritis nodosa (PAN) is an arteritis affecting small- and medium-sized arteries. Renal and gastrointestinal involvement is more frequent. Because reports on coronary involvement in the context of PAN are rare, the natural course of PAN-related CAAs and optimal treatment strategies remain poorly defined.

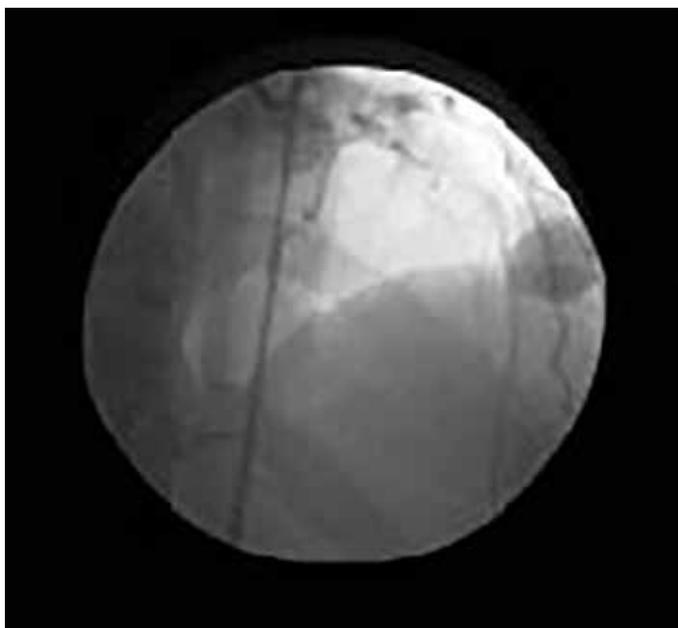


Figure 1. This figure shows the left coronary system on the LAO cranial view. The coronary artery aneurysm arises from the first diagonal branch

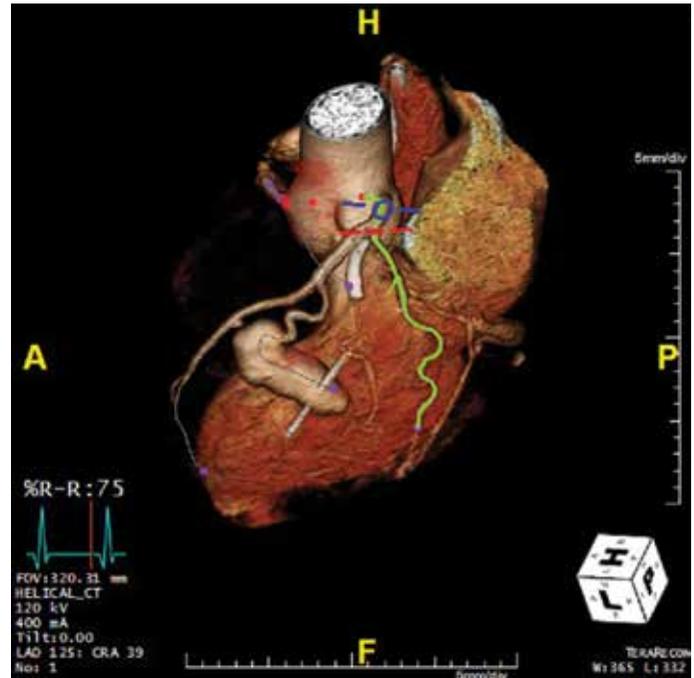


Figure 2. This figure shows a computed tomography coronary angiogram. Evidence of a coronary aneurysm that arises from the first diagonal branch of left anterior descending coronary artery

Case Report

A 36-year-old male with a history of prior percutaneous coronary intervention (PCI) to the right coronary artery (RCA) presented with stable angina pectoris and claudication of the right lower extremity to our institution. Left heart catheterization demonstrated a chronic total occlusion of the RCA stent with bridging collaterals. The left coronary angiogram revealed non-obstructive lesions within the left circumflex coronary artery and a large CAA in the left anterior descending (LAD) coronary artery (Fig. 1, Video 1). Left ventriculography showed inferior hypokinesia but normal wall motion elsewhere. To further elucidate the origin of this CAA, a coronary computed tomography was performed, which demonstrated a 40 45-mm contrast-filled CAA arising from the first diagonal branch of the LAD (Fig. 2). The lower extremity angiogram also demonstrated a popliteal artery aneurysm on the right side. The case was discussed with the cardiothoracic surgery team. A decision was made to surgically treat the popliteal artery aneurysm followed by PCI to the CAA. While the patient was waiting for peripheral artery surgery, he developed sudden right lower limb pain. Emergency surgery revealed a ruptured popliteal artery aneurysm, which was treated successfully. The pathology report of the surgical specimen was consistent with polyarteritis nodosa (PAN). Three weeks after his peripheral artery surgery, the patient underwent left heart catheterization to close the CAA. The first diagonal branch of the LAD artery was coiled successfully with four 3x4-mm coils (Terumo, Japan). Angiography performed 15 min after coil implantation



Figure 3. This figure shows the left coronary system on the LAO cranial view 15 min after the coil was released. There is residual contrast agent leakage into the aneurysm

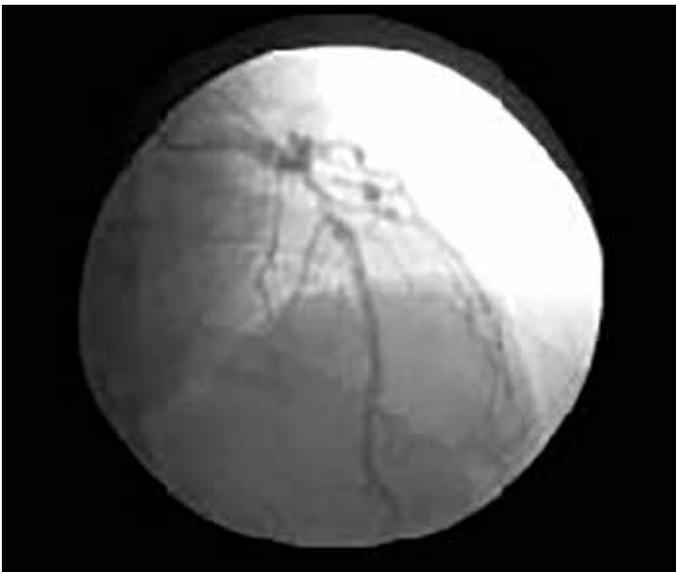


Figure 4. This figure shows the left coronary system on the LAO cranial view 6 months after the procedure. There is no residual leak, and the aneurysm is completely occluded

demonstrated a mild-to-moderate leakage into the aneurysm (Fig. 3, Videos 2 and 3). However, at that point, the procedure was completed without complication, and another control angiogram was planned. Control coronary angiography performed 6 weeks later revealed a CAA that was completely occluded without any residual leakage (Fig. 4, Video 4). The patient was angina free 6 months after coil implantation.

Discussion

PAN is a systemic vasculitis characterized by the inflammatory necrosis of small- and medium-sized arteries. It can cause arterial aneurysms and, consequently, ischemia or

infarction. Other cardiovascular complications of PAN include heart failure, pericarditis, and hypertension. PAN frequently affects renal and gastrointestinal arteries with multiple microaneurysms. The involvement of coronary arteries with a single aneurysm is rare. The rationale for treating a CAA is based on the reported complications that are associated with the CAA. These include spontaneous rupture, thromboembolism, angina, fistula formation, and sudden death (6). Data involving both surgical and percutaneous interventions have been reported in the literature. Most of the published percutaneous approaches include polytetrafluoroethylene (PTFE)-covered stents (7-8). Few published cases have described coil embolization in the CAA (9), but the CAAs in none of these cases are related to PAN. To the best of our knowledge, our case is the first to report coil embolization to treat a PAN-related CAA. Coil embolization may provide a safer long-term result than PTFE-covered stents that are known to be associated with relatively high restenosis and late stent thrombosis rates. Our case demonstrated that in the context of favorable coronary anatomy and localization, percutaneous coil embolization is a feasible option to treat PAN-related CAAs.

Conclusion

Coil embolization may be an alternative therapeutic transcatheter approach for PAN-related CAAs.

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Video 1. This video shows the left coronary system on the LAO cranial view. The coronary artery aneurysm arises from the first diagonal branch.

Video 2. This video shows the left coronary system on the LAO cranial view with the microcatheter that was used to implant the coils.

Video 3. This video shows the left coronary system on the LAO cranial view 15 min after the coil was released. There is residual contrast agent leakage into the aneurysm.

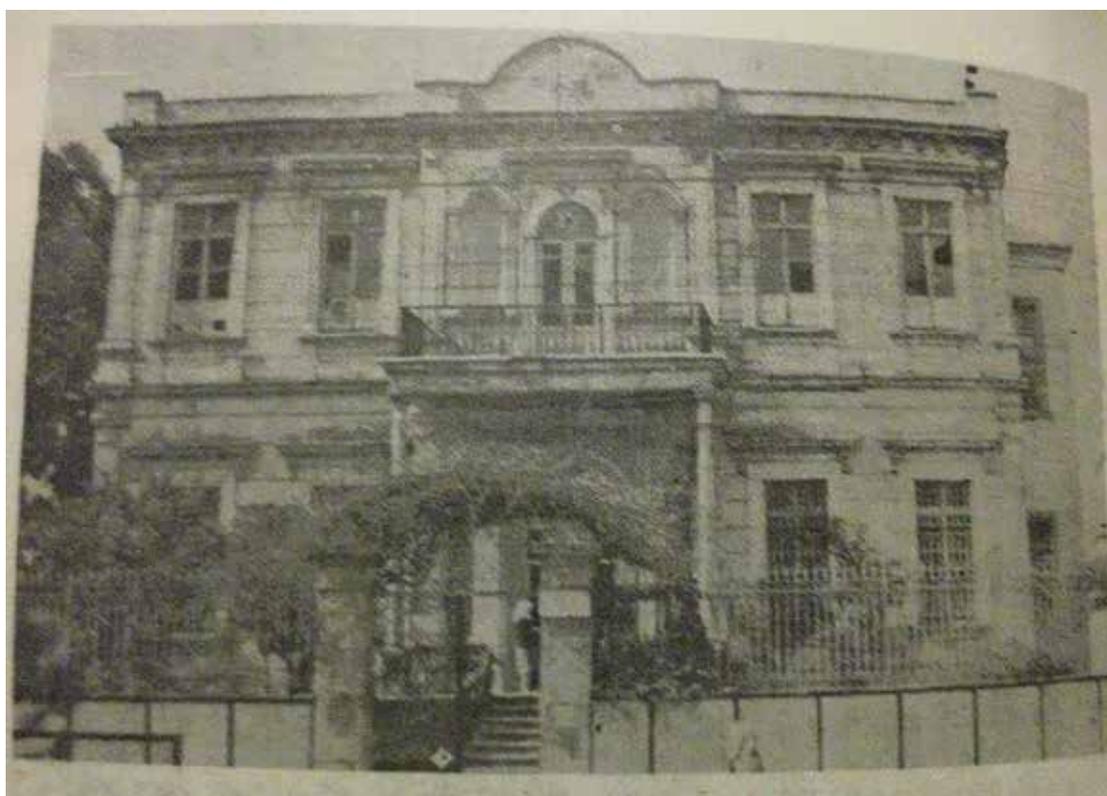
Video 4. This figure shows the left coronary system on the LAO cranial view 6 months after the procedure. There is no residual leak, and the aneurysm is completely occluded.

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Prof. Dr. İstemi Nalbantgil's collections. Many future cardiologists attended the Karataş middle school.