CASE REPORT

A rare complication of percutaneous closure of coronary artery fistula: Inability to retrieve coil

Koroner arter fistülünün perkütan kapanmasının nadir komplikasyonu: Koil ayrılmaması

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Summary– Coronary fistulae may lead to coronary steal phenomenon or considerable volume overload on the cardiac chambers, causing significant hemodynamic problems. Coronary fistulae can be closed either surgically or percutaneously. Percutaneous closure is frequently performed with coil embolization or a vascular plug. Although percutaneous closure has significant advantages, such as a shorter duration of hospitalization and no sternal scarring, several complications, including coil embolization or failure to retrieve the device, may occasionally occur. In the current report, a patient with a left coronary to right atrium fistula who declined to have surgery underwent percutaneous coil embolization. However, after release of the coil, the catheter could not be retrieved using the standard anti-torque mechanism.

Özet– Koroner arter fistülleri kalp boşlukları üzerine önemli hacim yükü veya koroner çalma fenomenine yol açarak önemli hemodinamik sorunlara yol açabilirler. Koroner arter fistüllerinin kapanması hem cerrahi hem de perkütan yol ile yapılabilir. Perkütan kapama sıklıkla koil embolizasyonu veya damar tıkacı ile yapılmaktadır. Perkütan kapama daha az hastane kalış süresi ve sternum üzerinde nedbe olması gibi önemli avantajlarına rağmen, koilin embolizasyonu veya nadir görülen cihaz ayrılmasının yapılamaması gibi komplikasyonları vardır. Bu olgumuzda, sol ana koroner arter ile sağ atriyum arasındaki fistül perkütan yolla kapatılmış ancak koil ayrılması standart anti-tork manevrasına rağmen yapılamamıştır.

Coronary fistulae may lead to coronary steal phenomenon or considerable volume overload on the cardiac chambers, causing significant hemodynamic problems. Coronary fistulae can be closed either surgically or percutaneously. Percutaneous closure is frequently performed with coil embolization or vascular plug. Although percutaneous closure has significant advantages such as shorter duration of hospitalization and no sternal scarring, several complications including coil embolization or failure to retrieve the device, can rarely be encountered. In current report, a patient with a left coronary to right atrium fistula who rejected surgery, underwent percutaneous coil embolisation. However after release of coil the catheter could not be retrieved by standard anti-torque mechanism.

Abbreviations:

ECG	*Eelectrocardiography*
LMCA	*Left main coronary artery*
TTE	*Transthoracic echocardiogram*

CASE REPORT

A 43-year-old male presented with chest pain and dyspnea on exertion. Auscultation revealed a continuous murmur heard best at the left sternal border. An extensive evaluation was performed with electrocardiography (ECG) and 2-dimensional transthoracic echocardiogram (TTE). The TTE and ECG results were unremarkable. A nuclear myocardial perfusion scan showed an area of reversible ischemia involving the anterior wall of the left ventricle. Cardiac catheterization was performed to investigate the cause of the ischemia.

Cardiac catheterization revealed a fistula draining into the right atrium from the left main coronary artery

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(LMCA) (Fig. 1a, Video 1*). The patient declined a surgical option, but was considered as a suitable candidate for percutaneous closure with coil. A 7-F Judkins Left 4 catheter (Medtronic, Inc., Minneapolis, MN, USA) as inserted in the LMCA. An 8-mm x 20-cm spiral soft platinum coil (Cook Medical, LLC, Bloomington, IN, USA) was delivered into the fistula via a Cantata 2.5 Duo microcatheter (Cook Medical, LLC, Bloomington, IN, USA) (Fig. 1b, Video 2*). Control images confirmed that the fistula was completely occluded (Video 3*). The wire could not be detached from the coil due to proximal tortuosity of the fistula. Despite use of a guideliner (Vascular Solutions Inc., Minneapolis, MN, USA), which increased support (Fig. 1c), further attempts at removal was unsuccessful. Manual force was applied to retrieve the device. The coil was separated from the wire (Fig. 1d). A small piece of broken wire, which was probably connected to the coil, was observed outside of the catheter. The guideliner was sent over the piece of wire and advanced up to the coil connection point. Supported by the guideliner, the wire was removed and taken out of the catheter manually. The patient was discharged uneventfully with dual antiplatelet therapy. No cardiovascular events were observed at 3 months of follow-up.

DISCUSSION

Coronary fistulae are defined as the presence of an abnormal connection between the coronary arteries and the low-pressure vascular area or the cardiac cavity. The clinical significance of coronary fistulae is associated with the amount of blood flow through the fistula segment, volume overload on heart chambers, and coronary steal phenomenon.[1] Coronary fistulae can be closed with surgery or a percutaneous approach when clinically significant.[2–5] Complications after percutaneous closure are rare, and most commonly include embolization to a distal vascular bed beyond the fistula. In our case, removal from the delivery system after release of the coil was inhibited due to proximal tortuosity. The coil was retracted by force and removed from the delivery system by breaking it.

Forced manual tracking mav result in retrieval of the whole coil and thrombosis in a proximal vessel segment. Hence, before traction, a second wire should be placed in the donor vessel to ensure the means for intervention in case of complication. In the current case, since standard detachment could not be achieved, forced traction with the support of a guideliner was performed. However, compressing the wire with a balloon placed and inflated at the site of the wire-coil attachment before traction might be a safer strategy to prevent potential complete proximal dislodgement of the whole coil. Before coil embolization, the proximal segment of the fistula tract must be evaluated in terms of tortuosity. In the cases where removal of the device cannot be achieved and the patient rejects surgery, removal by breaking it with manual forced traction can be an alternative strategy.

*Supplementary video file associated with this article can be found in the online version of the journal.

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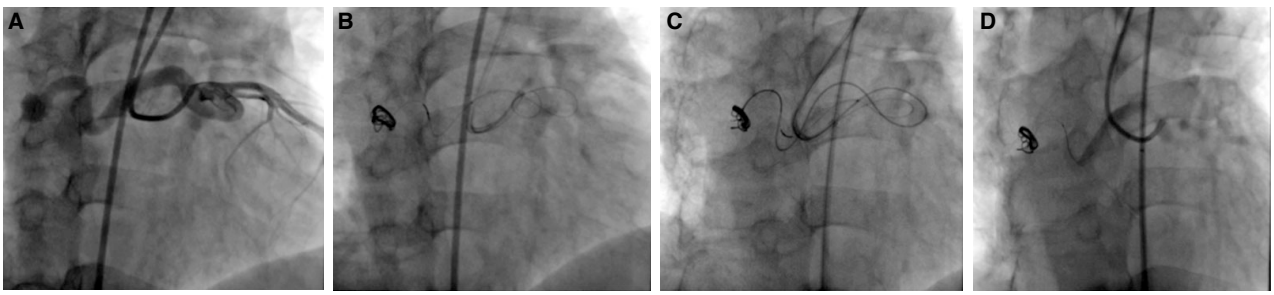

Figure 1. (A) Coronary angiography imaging shows a fistula draining into the right atrium from the left main coronary artery. **(B)** Coil inserted into the fistula tract segment before retrieval. **(C)** Failure to retrieve coil despite supporting guideliner catheter. **(D)** Retrieval of coil with small piece of wire seen with contrast agent in the proximal segment indicating closure of the fistula.

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Keywords: Coronary fistula; coil unretrieval; percutaneous closure.

Anahtar sözcükler: Koroner fistül; koil ayrılmaması; perkütan kapama.