

# Using Judkins Left Catheter for Coil Embolization of Right Coronary Artery-to-Pulmonary Artery Fistula

## Sağ Koroner Arter-Pulmoner Arter Fistülüne Koil Embolizasyonu için Judkins Sol Kateter Kullanımı

Öztürk Demir<sup>1\*</sup>, Timor Omar<sup>1</sup>, İnanç Artaç<sup>1</sup>, Muammer Karakayalı<sup>1</sup>, Yavuz Karabağ<sup>1</sup>, İbrahim Rencüzoğulları<sup>1</sup>

### ABSTRACT

During the percutaneous occlusion of a coronary artery-to-pulmonary artery fistula (CPF), to prevent the retrograde migration of the coil, maintaining the coaxiality of the guide catheter and fistula origin and providing reliable catheter support is highly important. Here, we described the percutaneous occlusion of a right coronary artery-to-pulmonary artery fistula (CPF). With many types of catheters, we were unable to have strong catheter support; eventually we achieved adequate coaxiality and reliable catheter support with a 4Fr Judkins left. To our knowledge, it is the first case in the literature, that a Judkins left guide catheter is used for the occlusion of a right-sided fistula.

Key Words: Arterio-arterial fistula, coil embolization, catheter, coronary artery fistula

### Öz

Bir koroner arter-pulmoner arter fistülünün (CPF) perkütan oklüzyon işlemi sırasında, kullanılan koil materyalinin retrograd migrasyonunun önlenmesi için, guide kateterin ve fistül ağzının koaksiyel olması ve güvenilir bir kateter desteğinin sağlanması oldukça önemlidir. Biz, bu vakamızda bir sağ koroner arter-pulmoner arter fistülünün (CPF) perkütan oklüzyon işlemi tanımladık. Pek çok kateter ile denememize rağmen güçlü bir kateter desteği elde etmede başarılı olamadık. En sonunda bir 4Fr Judkins sol guide kateter ile yeterli koaksiyelliği ve güvenilir bir kateter desteğini elde ettik. Bizim bildiğimiz kadarı ile bu vaka, literatürde bir Judkins sol guide kateterin, sağdan köken alan bir fistülün kapatılması işleminde kullanıldığı ilk olgudur.

Anahtar Kelimeler: Arterio-arteriyel fistül, koil embolizasyonu, kateter, koroner arter fistülü

1.Department of Cardiology Kafkas University Faculty of Medicine, Kars-Turkey

Gönderilme Tarihi: 15/07/2023

Kabul Tarihi: 06/11/2023

Yayınlanma Tarihi: 29/02/2024

\*Corresponding Author

Öztürk Demir

Şehitler Mh, Ahmet Arslan Cd, No 53, Yıldız Evler Sitesi, D blok, Daire 17, Merkez-Kars

Phone:+90 541 258 5029, E-mail: dr.dozdar@gmail.com

ORCID: 0000-0002-5656-058X

Cite this article: Demir Ö, Omar T, Artaç İ, Karakayalı M, Karabağ Y, Rencüzoğulları İ. Using Judkins Left Catheter for Coil Embolization of Right Coronary Artery-to-Pulmonary Artery Fistula. Agri Med J. 2024; 2(1): 40-41

## Introduction

During the percutaneous treatment of coronary artery-to-pulmonary artery fistula (CPF), operators occasionally face challenges for maintaining the coaxiality of the guide catheter and fistula origin and a strong catheter support. Here, we presented a CPF case, in which it needed a left-sided guide catheter to place in right sided fistula to maintain accurate coaxiality, particularly when a coil material is used.

## Case Report

A 47-year-old male, without known cardiac disease history, presented with chest pain and effort dyspnea with New York Heart Association class 2 (NYHA2). The 12-lead surface electrocardiogram at the time of admission was with sinus rhythm and free of ischemic changes. Troponin I was 106.9 ng/L (normal range: 0.01-19.8 ng/L). The echocardiography findings included left ventricular ejection fraction of 60% and minimal tricuspid regurgitation. The QP/QS ratio was 1.5. The increased pulmonary flow had not impacted right ventricular diameter or function. Right ventricle diameters measured from base and mid were 31 mm and 36 mm, respectively. The length of the right ventricle was 58 mm. Regarding right ventricular functions, tricuspid annular plane systolic excursion (TAPSE) and longitudinal velocity of the tricuspid annulus (S') were 22 mm and 11.5 cm/sec, respectively. The coronary artery angiogram revealed no coronary artery disease but a right coronary artery (RCA)-to-pulmonary artery fistula (CPF) (Figure 1a). Examinations did not reveal any other cardiac anomalies accompanying CPF.

As there was a continuous shunting flow resulting in coronary steal, this was likely the etiology of the dyspnea on exertion. The decision was made to pursue the percutaneous coil embolization. The fistula originated from the RCA ostium. Despite using a distal anchor balloon with Judkins right, Amplatz right, and left guide catheters, adequate support for the microcatheter could not be achieved. When we exchanged to 4Fr Judkins left, we successfully engaged the tip toward the fistula origin with complete coaxiality and maintained solid catheter support. Afterwards, we successfully occluded the fistula using a pushable 2 cm x 2 mm microcoil (Azur peripheral coil system, MicroVention, Inc. Tustin, CA 92780 USA) through a Progreat microcatheter (Terumo Interventional System, Tokyo, Japan) (Figure 1b).

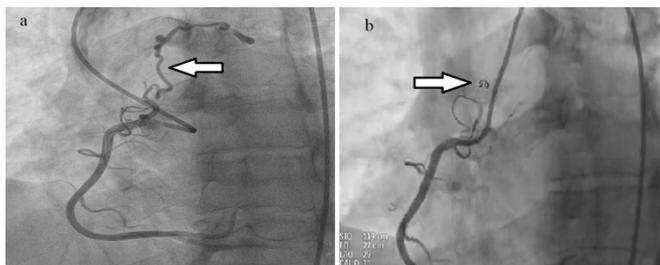


Figure 1. (a) Angiographic view showing the fistula originating from right coronary artery.

(b) After coil embolization, the fistula was totally occluded. The arrow indicates the coil.

## Discussion

During the percutaneous occlusion of a CPF, to prevent the retrograde migration of the coil material, it is crucial to maintain the coaxiality of the guide catheter and the fistula origin and providing reliable catheter support. However, sometimes it is difficult for operators to achieve these. So far, various guide catheters such as Judkins (1), Extra back-up (2), Amplatz (3), and Simmons (4) have been used for coil embolization of CPF. In our case, we were unable to maintain coaxiality and accurate

placement of the catheter to the ostium of RCA originated fistula with right Judkins, right 4 and left Amplatz 1 catheters. When we exchanged to the left Judkins 4, we achieved coaxiality and strong support, consequently we occluded the fistula. Due to several factors such as catheter shape and variability in vessel origin, appropriate placement of catheter to the vessel ostium and maintaining a strong catheter support could be challenging, occasionally (5). In our case, even with proper placement of Judkins right 4 catheter to RCA ostium, it was unable to maintain a solid support. It needed a longer back up. Consequently, Judkins left 4 catheter provided firm support after positioning it in to the RCA ostium. To our knowledge, it is the first case in the literature that a Judkins left guide catheter was used for occlusion of a right-sided CPF. In conclusion, in some cases, using the Judkins left guide catheter might increase the success of the coil embolization procedure of right-sided CPF.

**Conflict of Interest:** None declared by the authors.

**Funding sources:** None declared by the authors.

**Ethics Committee Approval:** Not required.

**ORCID and Author's contributions:** Ö.D. (0000-0002-5656-058X): Data collection and processing. T.O. (0000-0002-2481-0505): Main idea and planning. İ.A. (0000-0003-2694-8978): Literature Review. M.K. (0000-0001-7385-120X): Spelling. Y.K. (0000-0002-8156-315X): Review and correction. İ.R. (0000-0002-0070-9197): Data Analysis and interpretation.

**Acknowledgement:** None declared by the authors.

## REFERENCES

1. Nambiar M, Maingard J, Li K, et al. COILUMICA: Coil embolization of a coronary artery to pulmonary artery fistula via novel dual lumen micro catheter technique. *CVIR Endovasc*. 2020;3(1):83.
2. Sulemankhil I, Mohamed AH, Gilani SA. Coronary-Pulmonary artery fistula repair with coil embolization: A single center experience. *Cureus*. 2022;14(8):e28407.
3. Cuevas CI, Sánchez-Recalde A, Pereda LR, Moreno R. Transcatheter closure of a complex fistula from the right coronary artery to the pulmonary artery using microcoils and a radial approach. *Rev Esp Cardiol*. 2008;61(1):10-12.
4. Rubimbura V, Girod G, Delabays A, et al. Case report: Coronary-Pulmonary fistula closure by percutaneous approach: learning from mistakes. *Front Cardiovasc Med*. 2022;8:779716.
5. Chawla R, Ahamad W, Sharma V. Techniques to overcome difficulty in device deliverability to lesion in complex PCI. *Curr Cardiol Rev*. 2020;16(2):117-124.