CASE IMAGE

Treatment of a fistula between coronary and pulmonary arteries with simultaneous use of two microcatheters for antegrade coil embolization

Antegrad koil embolizasyonuyla iki mikrokateterin eşzamanlı kullanarak koroner ve pulmoner arterler arasındaki fistülün tedavisi

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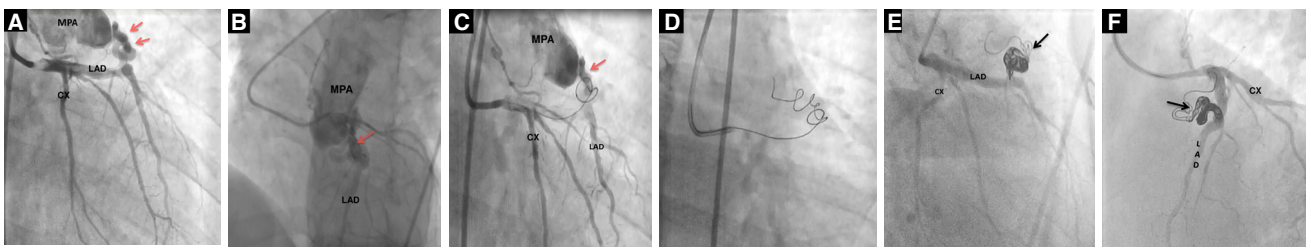
A 57-year–old female patient presented due to stable angina pectoris that had been present for 10 months. The physical examination findings did not reveal any abnormality, and electrocardiography indicated a regular sinus rhythm. Bedside transthoracic echocardiography revealed normal left ventricular systolic function, and no regional wall motion abnormalities were observed. Abnormal diastolic turbulent flow was detected in the pulmonary trunk. Myocardial perfusion imaging with technetium-99m-2-methoxyisobutylisonitrile revealed a reversible perfusion defect in the anterior and anteroseptal walls. Therefore, the patient was referred for diagnostic coronary angiography (CA), which exposed a large coronary artery fistula (CAF) between the left anterior descending artery (LAD) and the main pulmonary artery (MPA), without stenosis (Fig. 1A, B, Videos 1, 2*). Since the patient's symptoms were caused by myocardial ischemia resulting from coronary steal phenomenon associated with the CAF, a decision was made to perform percutaneous closure of the CAF originating from the LAD. A 7-F extra back-up 4 guiding catheter (XB; Cordis Corp., Milpitas, CA, USA) was introduced into the left main coronary artery via the right femoral arterial route. An Echelon 10 microcatheter (Medtronic, Inc., Minneapolis, MN, USA) was used as an inner catheter inside the guiding catheter, and was easily advanced into the coronary artery. A 0.014-inch guidewire (Codman Agility; DePuy Synthes, Raynham, MA, USA) was introduced into the fistula. Additional injections of contrast material into the coronary artery showed that the coil was in the correct position, and it was then released from the delivery cable (Fig. 1C). Despite successive attempts, the coil could not be placed, as it repeatedly entered the pulmonary artery through the fistula due to high turbulent flow (Fig. 1D, Video 3*). In addition to the existing catheter, a Corsair microcatheter (Asahi Intecc Co., Ltd., Aichi, Japan) was used, and 2 coils were introduced simultaneously (Video 4*). Interlacing of the coils and increased coil mass aided in keeping the coils inside the fistula. The fistula was closed successfully with 7 coils. A control coronary angiography showed that the coronary fistula was completely sealed, and improved flow to the mid and distal LAD was observed (Thrombolysis in Myocardial Infarction flow score of 3) (Fig. 1E, F, and Videos 5, 6*). CAF is a rare anomaly that allows for blood outflow into the cardiac chamber, coronary sinus, vena cava, pulmonary artery, or pulmonary vein. The majority of CAFs originate from the right coronary artery or the LAD. Almost all CAFs are asymptomatic; however, CAFs can lead to heart failure and myocardial ischemia due to the coronary steal phenomenon. Therefore, symptomatic CAFs need to be treated with percutaneous intervention or surgery. If it is difficult to keep the coil inside the fistula due to high flow, simultaneous introduction of 2 catheters and 2 coils can achieve interlacing of the coils, and the fistula can be closed successfully.



Figures– Coronary angiography in the right caudal and left cranial angiographic views show the presence of a fistula between the main pulmonary artery and the left descending artery (red arrowheads) **(A and B)**. The images demonstrate that initially the coil embolization failed due to severe flow inside the pulmonary artery **(C and D)**. A control coronary angiography in the right caudal and left cranial angiographic views showed complete closure of the fistula (black arrowhead) **(E and F)**.

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