

# Endovascular closure of coronary artery to pulmonary artery fistula with giant aneurysm

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A 70-year-old woman with atypical exertional chest pain history and suspicion of vascular malformation was referred to our institution for further diagnosis and treatment. Chest X-ray routinely performed by the general practitioner demonstrated a circularly enlarged shadow of the left border of the heart (Figure 1A).

Computed tomography angiography (CTA) and magnetic resonance (MR) revealed a coronary artery-pulmonary artery fistula arising from the proximal part of the left anterior descending (LAD) artery and emptying into the pulmonary trunk *via* a giant coronary aneurysm (65 mm × 52 mm × 50 mm, mass 95 g) with a large intraluminal thrombus (Figure 1B, C). Coronary angiography (CAG) confirmed the fistula and demonstrated no significant stenosis of the coronary arteries (Figure 1D, Supplementary material, Videos S1, S2).

A retrospective analysis of CTA performed two years earlier for other indications revealed the presence of an unrecognized fistula with an aneurysm measuring 47 mm × 49 mm × 43 mm.

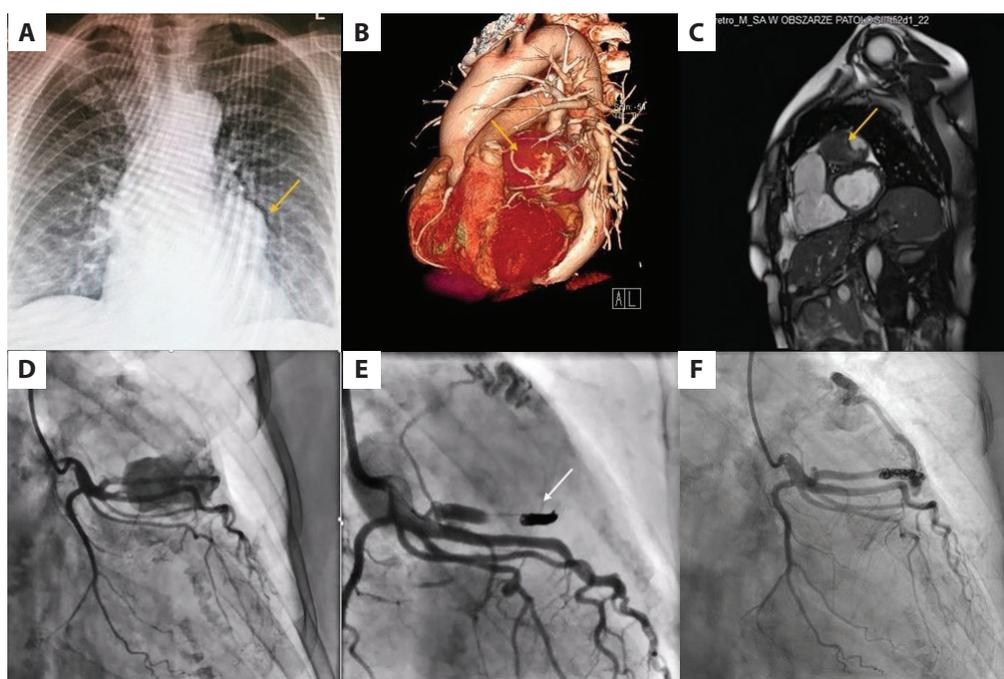
Considering the progression of the aneurysm size, by the decision of the Heart Team, the patient was qualified for the endovascular closure of the fistula with endovascular coiling.

The procedure was performed using the right radial approach with the EBU 3.5 7 F guide catheter. Four coils (Optima Coil System, BALT USA LLC) were implanted into the fistula resulting in complete occlusion of the fistula feeding vessel (Figure 1E, Supplementary material, Video S3). The periprocedural period was uneventful, and the patient was discharged from the hospital the next day.

Review, six months after the procedure, showed full resolution of symptoms and return to normal activities. CTA and MRI demonstrated a reduction in the aneurysm size to 61 × 49 × 48 mm (mass 75 g). Coronary angiography showed complete closure of the connection between the fistula and the aneurysm, but with the preserved minor coronary artery-pulmonary artery connections, possibly as a result of pre-existing multiple drainage sites to the pulmonary artery (Figure 1F, Supplementary material, Video S4). Considering the reduction of symptoms and the size of the aneurysm, we decided on conservative treatment and further patient follow-up.

The prevalence rates for coronary-pulmonary artery fistulas (CPAF) range from 0.32% to 0.68% and most commonly terminate in the main pulmonary artery [1, 2]. Although CPAFs can be found incidentally and remain asymptomatic, in some cases, they have a significant hemodynamic effect and lead to complications, e.g., the formation of giant coronary artery aneurysms (GCAA), as in the case of our patient. Presentations of GCAA include cardiac symptoms of angina and myocardial infarction, probably caused by compression of the coronary artery by aneurysm and a coronary artery steal phenomenon [3, 4]. Moreover, pulmonary artery embolism due to aneurysmal thrombus formation and signs of mediastinal mass and cardiac compression, such as superior vena cava syndrome, may also occur [5].

Currently, we do not have recommendations for the treatment of CPAF and GCAA. The decision should be made as a team, based on the hemodynamic significance of the fistula and the risk of procedure-related complications.



**Figure 1.** **A.** An anteroposterior chest X-ray showing a circularly enlarged shadow of the left heart border (the arrow). **B.** A 3-dimensional reconstruction of computed tomography angiography with a giant aneurysm (the arrow). **C.** Magnetic resonance imaging presenting a giant coronary aneurysm with a large intraluminal thrombus (the arrow). **D.** Angiographic view of the left coronary artery (LCA) showing the fistulous path originating in the left anterior descending artery. **E.** Angiographic view of LCA after endovascular closure of the coronary artery-pulmonary artery fistula with coils (the arrow). **F.** Control angiographic view after 6-month follow-up

### Supplementary material

Supplementary material is available at [https://journals.viamedica.pl/kardiologia\\_polska](https://journals.viamedica.pl/kardiologia_polska).

### Article information

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### REFERENCES

1. Kim MiS, Jung JIm, Chun HoJ. Coronary to pulmonary artery fistula: morphologic features at multidetector CT. *Int J Cardiovasc Imaging*. 2010; 26(Suppl 2): 273–280, doi: [10.1007/s10554-010-9711-3](https://doi.org/10.1007/s10554-010-9711-3), indexed in Pubmed: 20878252.
2. Lim JJ, Jung JIm, Lee BY, et al. Prevalence and types of coronary artery fistulas detected with coronary CT angiography. *AJR Am J Roentgenol*. 2014; 203(3): W237–W243, doi: [10.2214/AJR.13.11613](https://doi.org/10.2214/AJR.13.11613), indexed in Pubmed: 25148179.
3. Angelini P. Coronary-to-pulmonary fistulae: what are they? What are their causes? What are their functional consequences? *Tex Heart Inst J*. 2000; 27(4): 327–329, indexed in Pubmed: 11198303.
4. Junco-Vicente A, Flórez P, Suárez A, et al. Uncommon giant fistula in the circumflex coronary artery. *Kardiol Pol*. 2020; 78(7-8): 794–795, doi: [10.33963/KP.15390](https://doi.org/10.33963/KP.15390), indexed in Pubmed: 32458673.
5. Mawatari T, Koshino T, Morishita K, et al. Successful surgical treatment of giant coronary artery aneurysm with fistula. *Ann Thorac Surg*. 2000; 70(4): 1394–1397, doi: [10.1016/s0003-4975\(00\)01762-8](https://doi.org/10.1016/s0003-4975(00)01762-8), indexed in Pubmed: 11081907.