

Coronary steal syndrome: A greedy neighbour!

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A 71-year-old male, known for quadruple coronary artery bypass grafting in 2002 (left internal mammary artery [LIMA] to the left anterior descending [LAD] coronary artery and first diagonal branch and two saphenous vein grafts, to the first marginal and the intermediate arteries), was admitted for unstable angina in 2019. A cardiac positron emission tomography-computed tomography (PET-CT) showed moderate-to-severe ischemia in the distal LAD territory and a coronary flow reserve below 1.0, related to coronary steal (Fig. 1A, B). Coronary angiogram revealed a subtotal ostium stenosis of the saphenous veins' grafts to the intermediate artery — treated by percutaneous coronary intervention with drug eluting stent implantation (Resolute Onyx 4.0 mm × 18 mm, Medtronic MN, USA) — and an unligated LIMA side branch (Fig. 1C).

Subsequently, using left transradial access, transcatheter occlusion of the LIMA side branch was performed with one vascular plug (MVP[®]

18 mm-MicroVascular plug, Reverse Medical, Medtronic) (Fig. 1D–F) and two hydrocoils (AZUR[®] Hydrocoil Pushable-18, Terumo, Tokyo, Japan) deployed through a 21G Terumo-Progreat[®] microcatheter. The two hydrocoils were added since there was persistent flow post MicroVascular plug deployment, probably in relation with the double antiplatelet therapy and the 5000 UI of heparin injected after radial puncture.

At 3 month follow-up, the patient was free of angina and the cardiac PET-CT showed complete coronary flow reserve normalization and significant improvement of the LAD ischemia (Fig. 1G, H). The coronary angiogram at 6 months, showed a very good result with a complete occlusion of the LIMA side branch (Fig. 1I).

Coronary steal due to an unligated LIMA side branch is a potential cause of reversible ischemia in coronary artery bypass grafting patients. A transcatheter approach using vascular plugs and coil embolization, provides good results.

Conflict of interest: None declared

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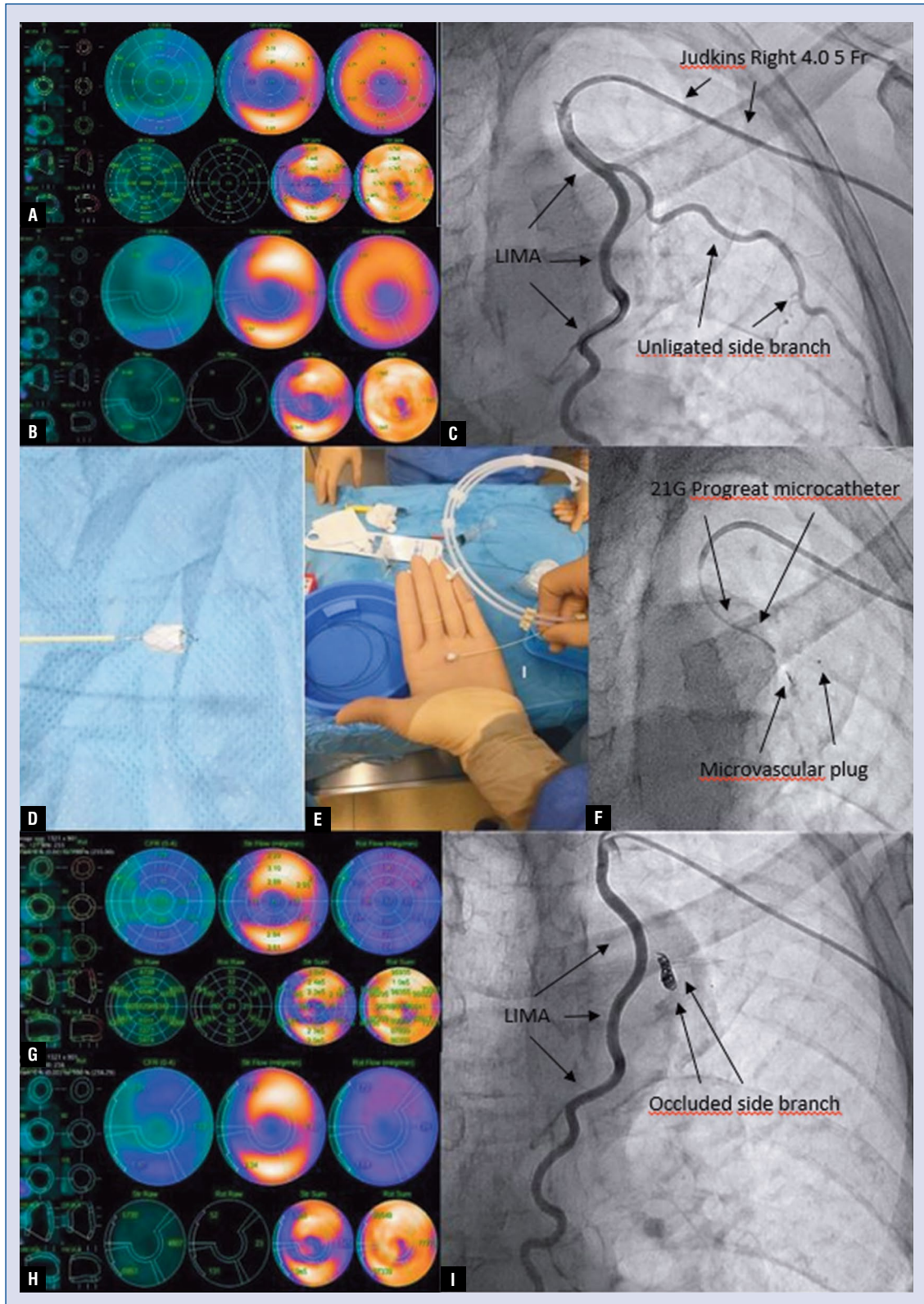


Figure 1. A. Positron emission tomography-computed tomography (PET-CT) before side branch occlusion showing ischemia in 18% of the left ventricle in the distal left anterior descending coronary artery territory; B. Signs of coronary steal with coronary flow reserve below 1.0; C. Coronary angiography showing the unligated side branch; D, E. Reverse Medical MVP® 18 mm-MicroVascular plug; F. MicroVascular plug deployment; G, H. PET-CT post side branch occlusion showing no residual ischemia and complete coronary flow reserve normalization; I. Final coronary angiography showing the occluded side branch; LIMA — left internal mammary artery.