# How to convince the surgeon to revascularize stenosis of the left main coronary artery in a patient with severe aortic stenosis?

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A 71-year-old woman presented with progressive dyspnea (New York Heart Association functional class III) without chest pain. She had a history of hypertension, dyslipidemia, chronic obstructive pulmonary disease, and chronic kidney disease. Electrocardiography showed first-degree atrioventricular block and left ventricular hypertrophy. Transthoracic echocardiography revealed severe aortic stenosis (AS; aortic valve area, 0.7 $cm^2$; mean gradient, 49 mm Hg) with preserved left ventricular ejection fraction (60%) and mild systolic pulmonary artery hypertension (42 mm Hg). Surgical aortic valve replacement (SAVR) was indicated, and the patient was referred for preoperative coronary angiography.

Coronary angiography showed severe ostial stenosis of the right coronary artery (RCA) (Supplementary material, *Figure S1*) and a nonsignificant plaque at the ostium of the left main coronary artery (LMCA) (FIGURE 1A; Supplementary material, *Figure S2*; *Videos S1, S2*, and *S3*). However, damping in the aortic curves was observed despite using a 5F diagnostic catheter in optimal position (Supplementary material, *Figure S3*). Therefore, we decided to further investigate the LMCA plaque by assessing the instantaneous wave-free ratio (iFR) both in the left anterior descending (LAD) and circumflex arteries (LCx). The iFR was 0.67 and 0.75 in the LAD and LCx, respectively, with a pressure jump on the pullback at the LMCA ostium (FIGURE 1B). We completed the investigation with intravascular ultrasound (IVUS), which showed a minimal lumen area of 5.8 $mm^2$ at the LMCA ostium (FIGURE 1C).

The patient underwent SAVR (with bioprosthesis) in addition to coronary artery bypass grafting (the left internal mammary artery to the LAD and 3 saphenous grafts to 2 marginal branches and the RCA). At 6 months, the patient was doing well and was free of symptoms.

The prevalence of significant coronary artery disease ranges from 25% to 50% in patients with severe AS.[1] The association between AS and ostial coronary lesions is relatively common. Because of its important impact on short- and long-term outcomes,[2,3] special attention should be paid to not miss any ostial stenosis, particularly of the LMCA, as angiograms could be wrongly reassuring. Careful hemodynamic and angiographic analysis may guarantee an optimal management of such high-risk patients.

Although fractional flow reserve and iFR represent the gold standard for functional assessment of coronary lesions, the iFR value remains controversial for the evaluation of LM stenosis and of any lesion in patients with AS.[4] A different cut-off was even proposed in this latter setting (0.83 instead of 0.89).[5] Therefore, combining adjunctive technologies such as IVUS, which is an anatomical (not functional) tool, might improve our ability to accurately assess the severity of LMCA stenosis in these patients.

## SUPPLEMENTARY MATERIAL

Supplementary material is available at www.mp.pl/kardiologiapolska.

## ARTICLE INFORMATION

**CONFLICT OF INTEREST** None declared.



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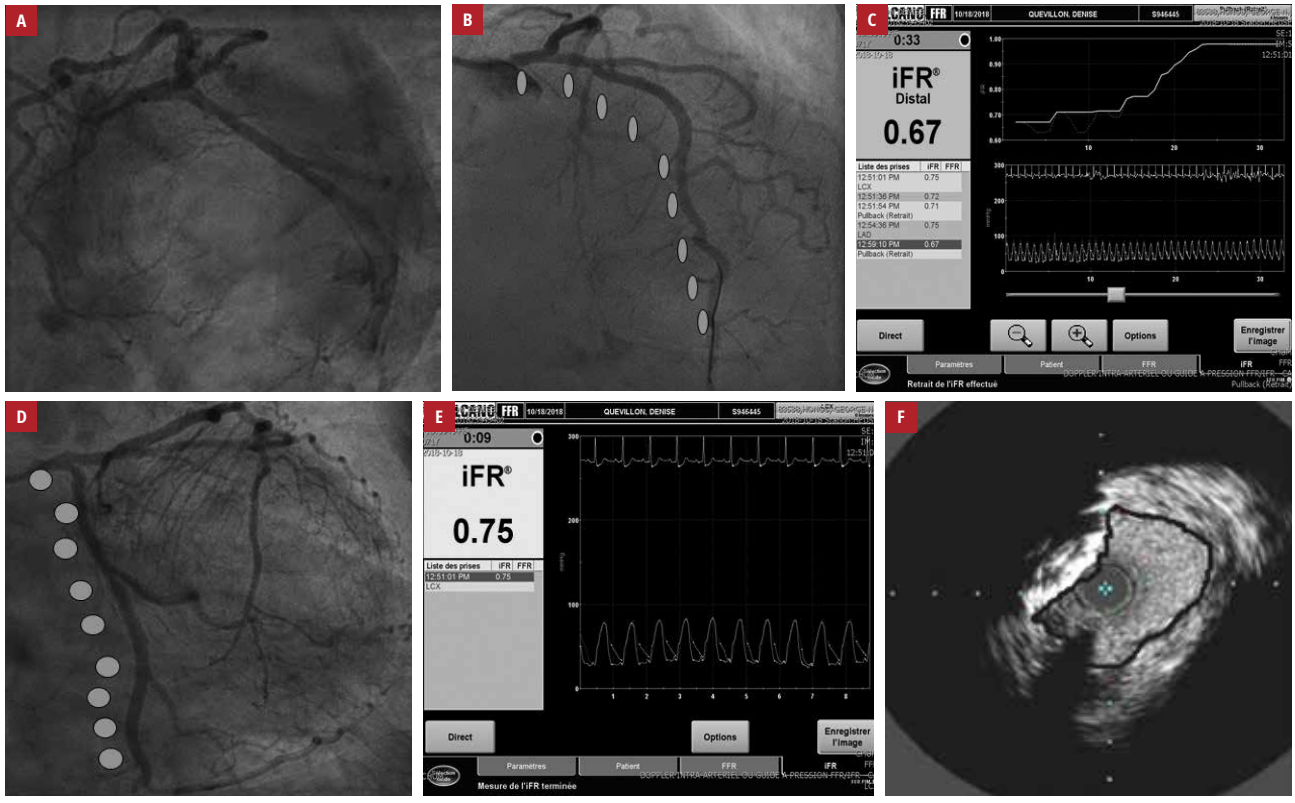


**FIGURE 1** Coronary angiography, hemodynamic data, and adjunctive technologies (instantaneous wave-free ratio [iFR] and intravascular ultrasound [IVUS]) for left main coronary artery (LMCA) disease investigation: **A** – a left anterior oblique caudal (spider) view showing nonsignificant plaque of the LMCA ostium; **B**, **C** – positive iFR measurement in the left anterior descending artery with a pressure increase on the pullback at the LMCA ostium. **D**, **E** – positive iFR measurement in the circumflex artery with a pressure increase on the pullback at the LMCA ostium. **F** – IVUS of the LMCA showing the reduced minimal luminal area at the ostium (5.8 $mm^2$). Ovals in **B** and **D** indicate the direction of the pullback from distal to proximal.

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