



# Intracoronary dual lumen evaluated by high-vision coronary angioscopy

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## Case description

An 80-year-old man with a history of pacemaker implantation due to atrioventricular block and bare-metal stent implantation at mid-left anterior descending artery (LAD) due to angina pectoris was admitted to our hospital because of silent myocardial ischemia. On admission, his electrocardiogram showed normal sinus rhythm with wide QRS waveform under ventricular pacing, and echocardiogram showed no left ventricular wall motion abnormalities. Coronary angiography demonstrated 75% in-stent restenosis at the mid-LAD (Fig. 1a). Fractional flow reserve (FFR) at the distal LAD revealed low FFR value of 0.63. FFR pull-back from distal LAD significantly increased to 0.98 at the proximal LAD, which showed 25% stenosis on coronary angiography; there was no significant pressure gradient at the mid-LAD, which had 75% in-stent restenosis (Fig. 1a, b). To assess the decrease of FFR value at the proximal LAD,

we performed optical frequency domain imaging (OFDI), which revealed an intracoronary wall partition that divided the lumen into two chambers (Fig. 1c). Subsequently, high-vision coronary angioscopy (Forwardlooking<sup>®</sup>, OVALIS, Osaka, Japan) was performed. Coronary angioscopy clearly demonstrated fibrous wall partition with a red thrombus that was similar to the finding on OFDI (Fig. 1d).

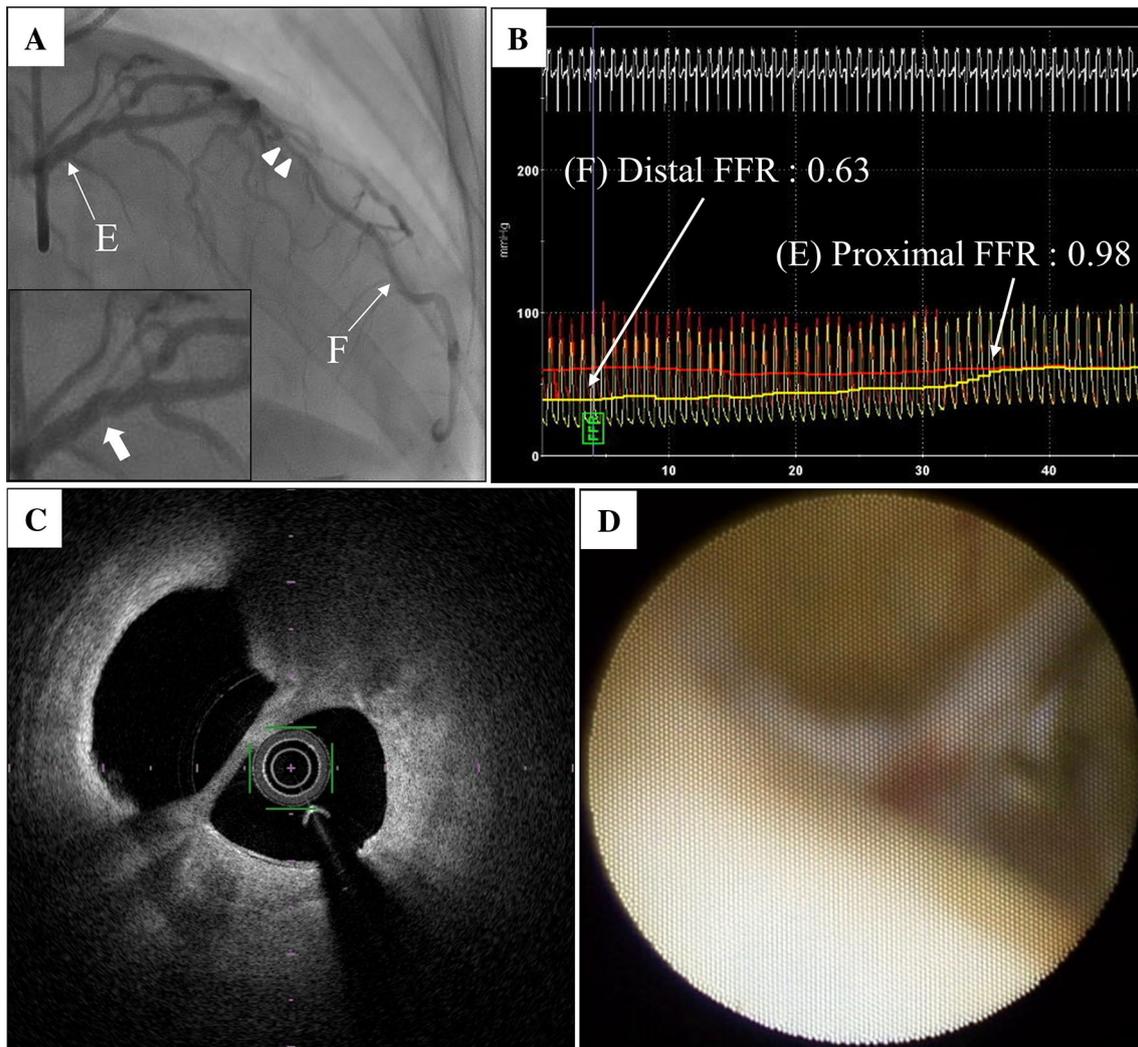
In this case, although coronary angiography showed mild stenosis at the proximal LAD, OFDI revealed intracoronary multiple lumens, generally known as “lotus root-like appearance” that have been reported as being possible critical functional stenosis [1, 2]. OFDI was a useful modality in providing two-dimensional information regarding intracoronary dual lumen. Furthermore, coronary angioscopy was performed to confirm precise evaluation under direct vision, and it clearly elucidated the three-dimensional structure. To the best of our knowledge, this is the first report to confirm intracoronary dual lumen evaluated by coronary angioscopy.

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**Fig. 1** **a, b** White arrowheads indicate 75% in-stent restenosis in the mid-left anterior descending artery (LAD). Fractional flow reserve (FFR) assessment indicates significant increase of FFR value at the proximal LAD with mild stenosis on coronary angiography. Distal FFR of 0.63 increases to 0.98 at the proximal LAD. White arrow

indicates the point showing significant increase of FFR value. **c** Optical frequency domain imaging at the proximal LAD demonstrates two lumens divided by fibrous tissue. **d** Coronary angiography findings at the proximal LAD shows fibrous partition with red thrombus, dividing the lumen into two lumens

Our case suggested that coronary angiography might be a useful technique to diagnose such multiple intracoronary structures.

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### Compliance with ethical standards

**Conflict of interest** The authors declare that they have no conflict of interest.

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