

Percutaneous Left Main Coronary Artery Intervention in a Case of Dextrocardia

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A 58-year-old man was referred to our hospital with unstable angina and a history of essential hypertension. A chest radiograph showed a right-sided cardiac apex and a gastric air bubble (Fig. 1). His electrocardiogram showed a negative P wave, a QRS complex and T wave in lead I, and low voltage in leads V₃ through V₆ (Fig. 2). Echocardiograms showed a left-sided liver and dextrocardia, with normal left ventricular systolic function.

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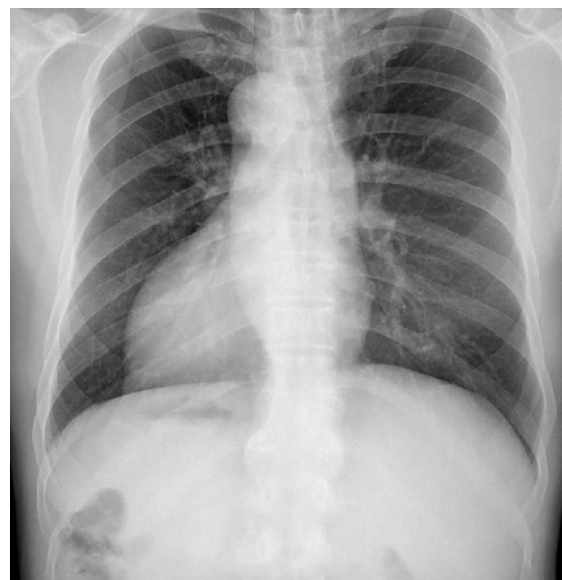


Fig. 1 Chest radiograph shows a right-sided aortic arch and gastric air bubble.



Fig. 2 Electrocardiogram shows a negative P wave, QRS complex and T wave in lead I, and low voltage in leads V₃ through V₆.

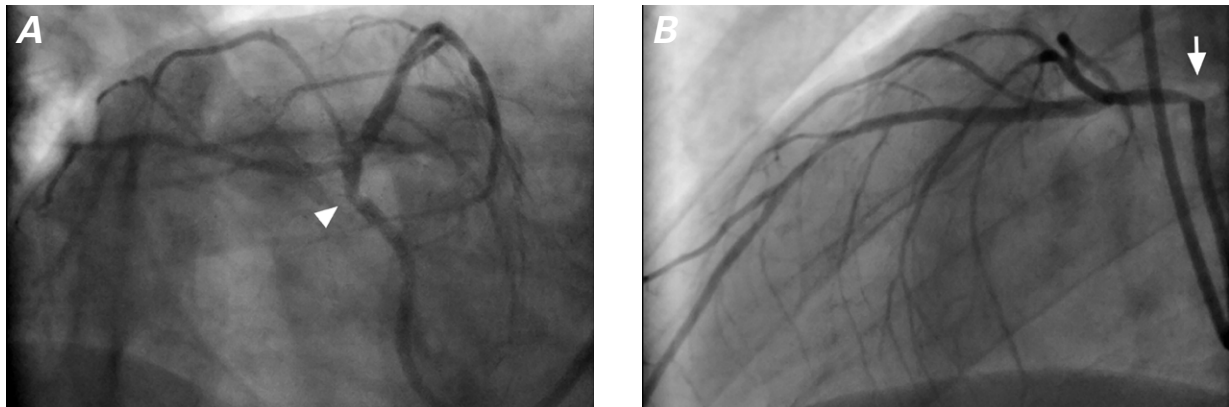


Fig. 3 Coronary angiograms in **A)** 60° right anterior oblique and **B)** 45° left anterior oblique views show a significant (70% diameter) stenosis in the left main ostium (arrowhead) and a lesion in the proximal left anterior descending coronary artery (arrow).

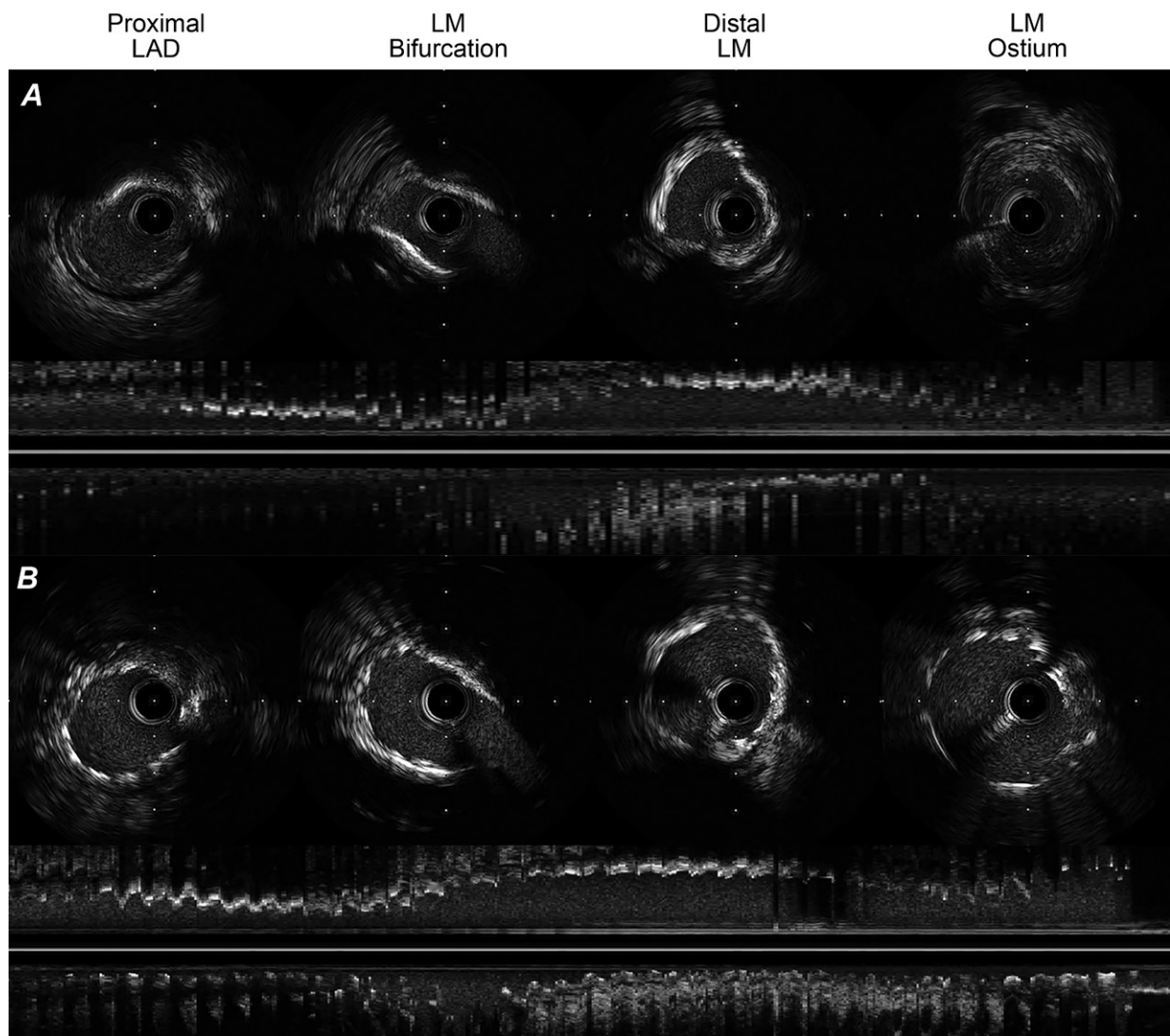


Fig. 4 A) Pre-intervention intravascular ultrasound (IVUS) images from the proximal left anterior descending coronary artery (LAD), the left main (LM) bifurcation, the distal LM, and the LM ostium reveal diffuse, calcified, atherosclerotic stenosis from the LM ostium (minimal luminal area, 4.5 mm²) to the proximal LAD (minimal luminal area, 4.1 mm²). **B)** Post-intervention IVUS images from the same perspectives show relatively good stent apposition and focal, incomplete stent expansion, caused by severe calcification.

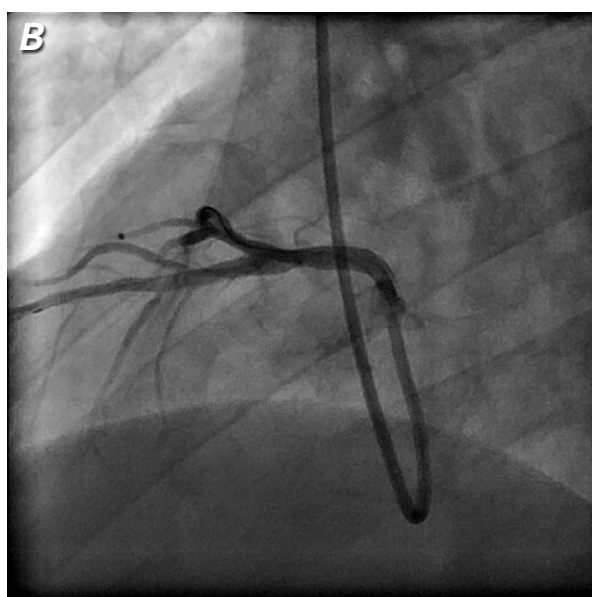
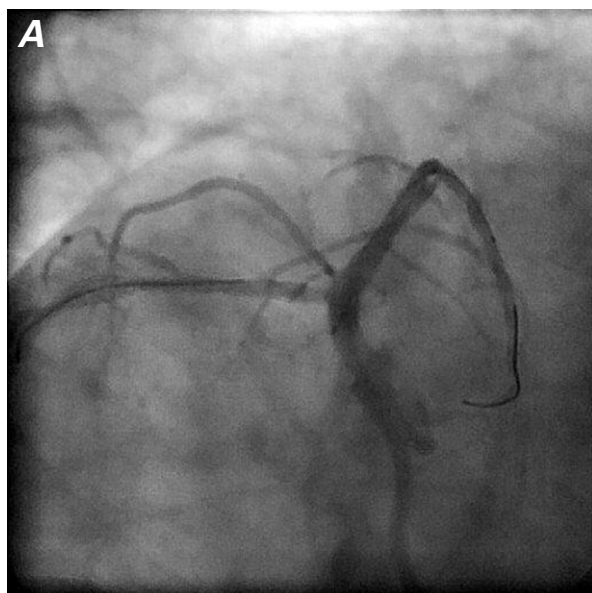


Fig. 5 Coronary angiograms in **A)** 60° right anterior oblique and **B)** 45° left anterior oblique views show the zotarolimus-eluting stent after its deployment (via a crossover technique) from the left main to the proximal left anterior descending coronary artery.

Left coronary angiography was performed with use of a 5F Judkins right (JR) 4 diagnostic catheter. The right coronary artery was engaged via counterclockwise rotation of that catheter at a left anterior oblique (LAO) angle of 45°. There was significant stenosis in the left main coronary artery (LMCA) ostium, with a lesion in the proximal left anterior descending coronary artery (LAD) (Fig. 3). There was no significant stenosis of the left circumflex or right coronary artery. A 6F Amplatz left 1 guiding catheter (Cordis, a Johnson & Johnson company; Miami Lakes, Fla) was used to engage the left coronary artery. Intravascular ultrasound (IVUS)

examination with use of an Atlantis® SR Pro imaging catheter (Boston Scientific Corporation; Natick, Mass) revealed diffuse calcified atherosclerotic disease from the LMCA to the proximal LAD (Fig. 4A). We performed percutaneous LM coronary intervention on the LMCA because the patient had refused surgery. A 3.5 × 24-mm Resolute Integrity zotarolimus-eluting stent (Medtronic, Inc.) was deployed from the LMCA to the proximal LAD by means of kissing-balloon angioplasty (Fig. 5). The final IVUS images showed relatively good stent apposition (Fig. 4B). The patient was well at the time of his 40-month clinical follow-up examination. In this case of a right-sided aortic arch, we successfully used transversely inverse image acquisition, counter-rotation of JR4 and Amplatz catheters, and IVUS to compensate for the limitations imposed by congenital anatomic variations.

Comment

Dextrocardia with situs inversus is a rare congenital defect in which the apex of the heart is on the right side of the body, as a result of a variation in cardiac development.¹ The prevalence of coronary artery disease in patients with dextrocardia is similar to that in the general population.² Successful percutaneous coronary interventions have been performed in patients with dextrocardia, but there have been no reports for LMCA disease.^{3,4} Because the positions of the coronary artery ostia in dextrocardia form a mirror image in relation both to the sinuses and to the aortic arch, the most important modifications to apply in performing coronary angiography are opposite-direction catheter rotations and mirror-image angiographic angles.

References

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