

IMAGES IN INTERVENTION

Chronic Total Coronary Occlusion With Bronchocoronary Collateral Circulation Failed to Visualize by Conventional Angiography



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We describe a case of chronic total occlusion of the right coronary artery (RCA) ostium (**Figure 1A**) in a 61-year-old man. Coronary angiography showed good collateral circulation from the left anterior descending artery via the Vieussens arterial ring to the proximal RCA and from the septal branch to the acute marginal branch, but it failed to visualize the complete course of the distal vessel segment of the RCA (**Figures 1B and 1C**). Computed tomography angiography clearly demonstrated a distal vessel segment of the RCA from the in-stent occlusion previously implanted (**Figures 1D to 1F**). In this patient, percutaneous coronary intervention was successfully performed, and 3 drug-eluting stents were implanted for the chronic total occlusion. Coronary angiography after stent implantation revealed the existence of a collateral connection to the bronchial artery (**Figures 2A and 2B**). This connection, known as “bronchocoronary collateral circulation,” was also confirmed by computed tomography angiography (**Figures 2C and 2D**).

Coronary collateral vessels can be divided into 2 major classes: anastomosis via extracardiac vessels;

and anastomosis via intercoronary branches. Among the known extracardiac vessels as a source of collateral circulations, one is the left internal thoracic artery for the left anterior descending artery, and the other is the bronchial artery for the RCA or the left circumflex artery. Fundamentally, the outside pericardium is supplied with blood from the left internal thoracic artery and the bronchial artery (1,2). Therefore, extracardiac anastomosis may develop when intercoronary anastomoses fail to supply blood to the peripheral coronary circulation. Computed tomography angiography is useful for the detection of this collateral circulation (3,4). We should be aware of the existence of extracardiac anastomosis when a conventional coronary angiography in the case of chronic total occlusion fails to visualize the complete course of coronary artery.

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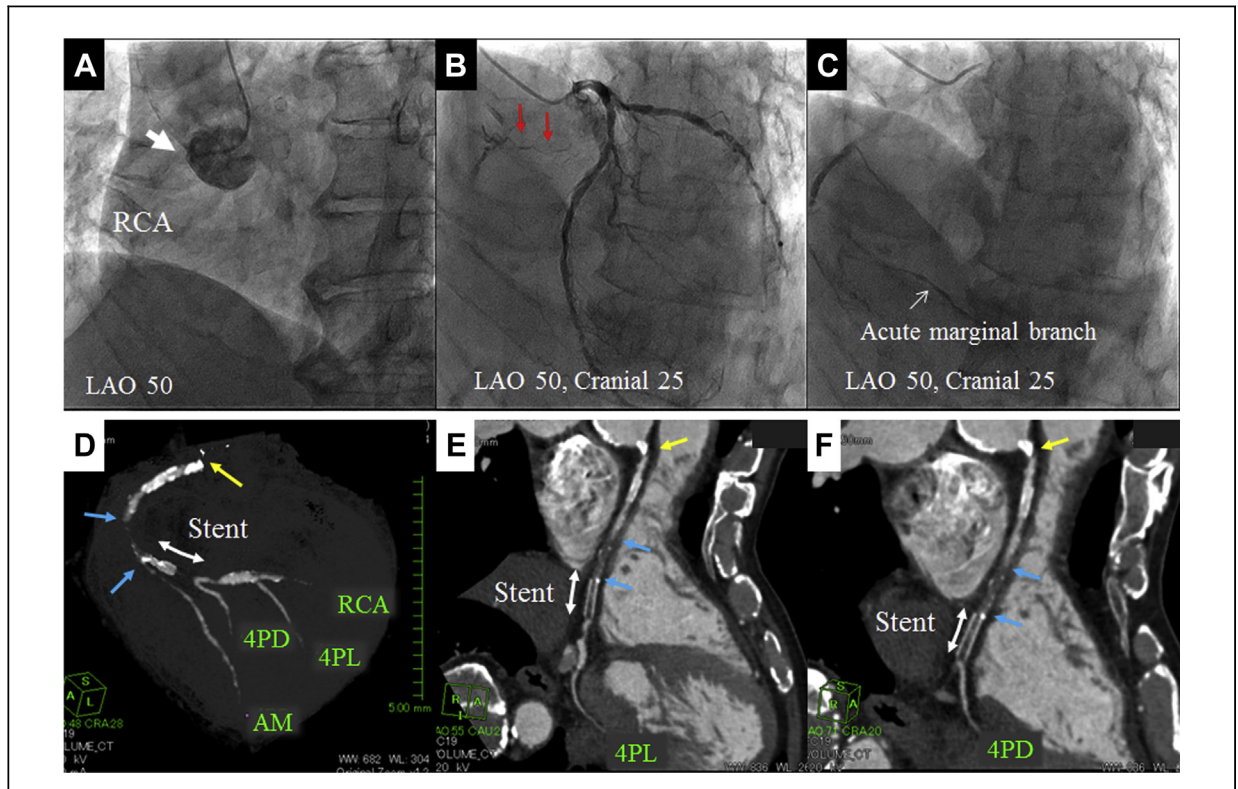


FIGURE 1 Coronary Angiography and Computed Tomography Angiography

Coronary angiography showed chronic total occlusion (white arrow) of the right coronary artery (RCA) ostium (A) and good collateral circulation from the left anterior descending artery via the Vieussens arterial ring (red arrows) to the proximal RCA and from the septal branch to the acute marginal branch, but it failed to visualize the complete course of distal vessel segment of the RCA (B, C). (C) Delayed image of B. Computed tomography clearly demonstrated a vessel segment of the RCA distally from the in-stent occlusion previously implanted (D to F). The white double-headed arrow indicates the location of a stent previously implanted. The yellow arrow indicates total occlusion of the RCA ostium and the proximal RCA occlusion is represented between the blue arrows. AM = acute marginal; LAO = left anterior oblique; PD = postero-descending; PL = postero-lateral.

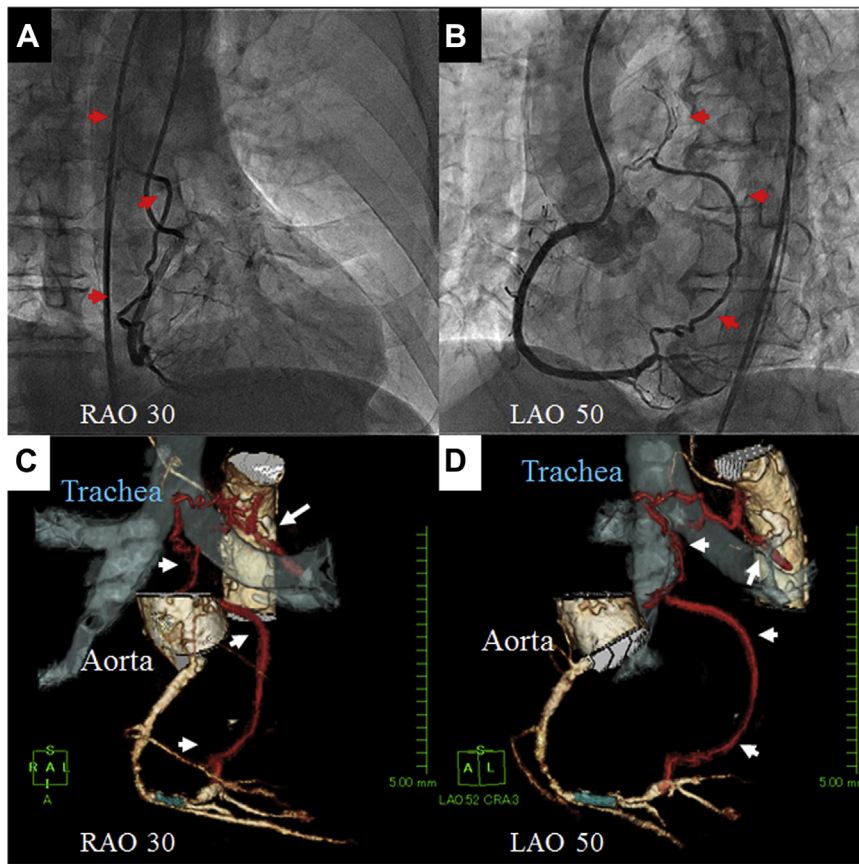


FIGURE 2 Bronchocoronary Collateral Circulation

(A, B) Coronary angiography after stent implantation. It revealed the existence of a collateral (red arrows) connection to the bronchial artery. (C, D) Bronchocoronary collateral circulation (white arrows) on the computed tomography angiography before percutaneous coronary intervention. LAO = left anterior oblique; RAO = right anterior oblique.

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