

# Life saving collaterals: Right-to-left and left-to-right

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## Abstract

Coronary collaterals are anastomotic connections between portions of the coronary arteries. The coronary collateral circulation as an alternative source of blood supply has shown benefits such as limited infarct size, left ventricular remodelling and preserved left ventricular systolic functions.

**Keywords:** Coronary artery disease, collateral circulation, prevention.

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## Case

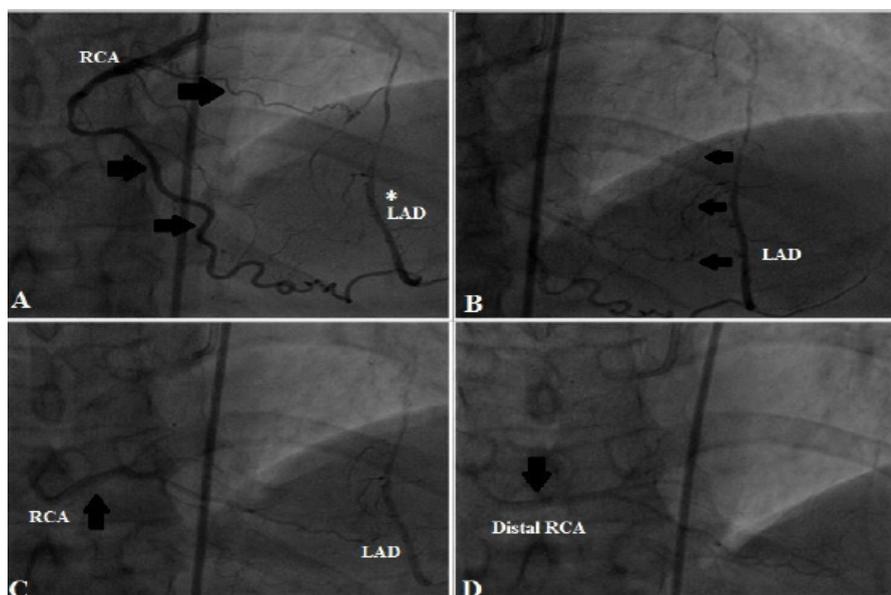
A 48 year-old male patient referred to cardiology clinic with typical anginal symptoms. There was not any remarkable disease in the patient's previous medical history. The 12-lead electrocardiogram showed ischemic changes. Transthoracic echocardiography showed mild hypokinesia in inferior wall, left ventricular ejection fraction was preserved and calculated 50% with Simpson method. Coronary angiography revealed chronic total occlusion of right coronary artery (RCA) and left-anterior descending (LAD) artery both. Interestingly, coronary collaterals originate from proximal part of RCA were retrogradely filling the total occluded LAD and supplies enough flow to the LAD area at risk for infarction (**Panel A, black arrows and asterisk**). Following retrograde filling of LAD, septal collaterals which originated from the retrogradely filled LAD were seen to fill distal RCA retrogradely again and supplies enough flow to the RCA area at risk for infarction (**Panel B-D, black arrows**). Those united collaterals were suc-

cessful at providing the blood supply, although with the chronic total occlusion of both RCA and LAD, a large area of myocardial ischemia was under at risk. The patient underwent coronary artery bypass graft surgery.

## Discussion

Patients with coronary artery disease, coronary collateral circulation is associated with a reduction in infarct size, left ventricular dysfunction and cardiovascular events, which translates into a relevant improvement in survival.<sup>(1)</sup> Well-developed coronary collaterals may help protect the myocardium from infarction during episodes of ischemia and may extend the limited number of valuable "golden hours" from the onset of an acute myocardial infarct to successful coronary reperfusion.<sup>(2)</sup>

In our case, myocardial salvage by extent collateral circulation is very likely in the presence of preserved left ventricular ejection fraction and protect heart from myocardial infarction despite the total occlusion of RCA and LAD.



### Figure legends:

**Panel A-D:** Collateral circulation originating from chronic total occluded right coronary artery (RCA) is retrogradely filling chronic total occluded left-anterior descending artery (LAD) (**Panel A, black arrows and asterisk**), septal collaterals developed from retrogradely filled LAD, supplying blood flow to the distal part of chronic total occluded RCA (**Panel B, black arrows**), distal RCA filling by septal collaterals originated from retrogradely filled LAD again (**Panel C-D, black arrows**).

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Conflicts of interest were not reported.

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