

Image in cardiology

Volumetric quantification of coronary steal in a giant coronary fistula

Cuantificación volumétrica del robo coronario en una fístula coronaria gigante

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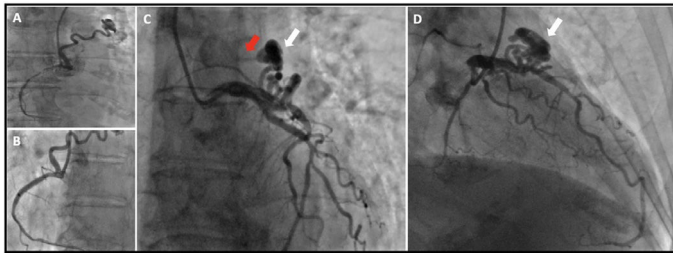


Figure 1.

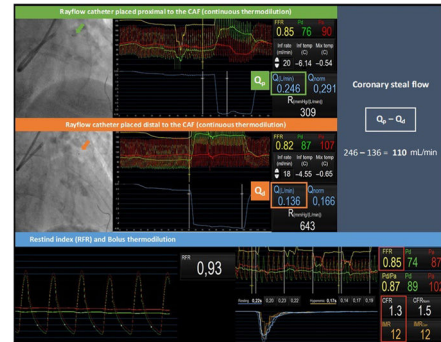


Figure 2.

A giant coronary artery fistula (CAF) with multiple tracts flowing from the proximal left descending (LAD) artery to the pulmonary artery was incidentally found in a 75-year-old woman during non-ST-elevation acute myocardial infarction angioplasty in the right coronary artery (figure 1). An informed consent form was obtained from the patient.

A comprehensive invasive physiological assessment of the LAD territory was performed by a pressure-temperature sensor-equipped wire. A normal resting full-cycle ratio (RFR) (0.93) and fractional flow reserve (0.85) were obtained. Then, the index of microvascular resistance (12) and coronary flow reserve (1.2) were also determined by intracoronary bolus thermodilution inducing hyperemia with regadenoson.

Eventually, the intracoronary continuous thermodilution technique was performed. This technique allows invasive measurement of absolute coronary flow (Q , in mL/min) and absolute microvascular resistance (R_{μ} , in mmHg/mL/min) in a standardized fashion.

Absolute coronary flow diverted to the fistula was quantified (110 mL/min) by subtracting the absolute flow distal to the fistula (136 mL/min) to the absolute flow proximal to it (246 mL/min); therefore 44% of the total coronary flow from the LAD territory was driven to the pulmonary artery through the CAF (figure 2).

Previous reports have proven the feasibility of the bolus thermodilution technique to assess functional evaluation of CAF. Nevertheless, this is the first reported case evaluating the functional significance of a CAF by continuous thermodilution, thus quantifying the volumetric steal phenomenon in mL/min.

Unlike bolus thermodilution, continuous thermodilution is an adenosine-free and operator-independent technique, permitting a direct measurement of coronary flow in mL/min and not a surrogate estimate like bolus.

The clinical value of this technique in CAF evaluation remains to be further elucidated.

Based on fractional flow reserve and RFR determination and considering that the patient had a symptom-free period before the non-ST-elevation acute myocardial infarction, a conservative approach was adopted, despite finding a remarkable volume of flow diverted to the fistula.

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AUTHORS' CONTRIBUTIONS

All authors contributed significantly to the manuscript development, participating in the conception, design, analysis and interpretation of data. Furthermore, all of them have reviewed the manuscript critically and approved it.

CONFLICTS OF INTEREST

None

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