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EDITORIAL COMMENT

''*Unsuitable for PCI...*'' Multivessel primary PCI. But for whom?☆

''*Unsuitable for PCI...*'' ICP multivaso no enfarte agudo do miocárdio com elevação de ST. Mas para que doentes?

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Following the recent publication of the PRAMI trial,[1] the appearance of the article entitled ''Multivessel approach in ST-elevation myocardial infarction: Impact on in-hospital morbidity and mortality'' by Santos et al. in this issue of the *Journal* could not be more timely.

The study analyzed a population of patients with ST-elevation myocardial infarction (STEMI) included in the Portuguese Registry of Acute Coronary Syndromes who underwent primary percutaneous coronary angioplasty (PCI), comparing patients treated by PCI of the culprit vessel only (n=180) with those who underwent PCI of vessels other than the infarct-related artery (n=77).

Patients undergoing multivessel PCI were more often medicated with glycoprotein IIb/IIIa inhibitors (73.7% vs. 38.8%) and had more stents implanted (1.4 vs. 1.1 stents per lesion), more of which were drug-eluting stents (73.7% vs. 40.8%). In-hospital mortality and the incidence of complications (defined as major bleeding, need for transfusion, invasive ventilation, heart failure and reinfarction) were lower in the multivessel PCI group (2.6% vs. 7.8% and 23.4% vs. 32.8%, respectively). None of these differences reached statistical significance, probably due to the small sample size. Multivariate analysis identified renal failure, left ventricular dysfunction and major bleeding as independent predictors of in-hospital mortality.

Besides the limitations pointed out by the authors, they do not state how many patients underwent complete revascularization by multivessel PCI, or the functional significance of the treated lesions. Perhaps the most important limitation of this study, as well as others on the same subject, is that the criteria used by the operators to decide on the therapeutic approach are unknown.

It is worth examining the results of the recently published PRAMI trial,[1] which compared multivessel primary PCI with PCI of the culprit vessel only.

The authors reported a statistically significant reduction in the incidence of the primary outcome of death from cardiac causes, nonfatal myocardial infarction, or refractory angina (from 23% to 9%, p<0.001) in the multivessel PCI group. An equally favorable and significant reduction was seen when the analysis was limited to cardiac death and nonfatal myocardial infarction (from 11.6% to 4.7%, p=0.004).

These results are impressive, to an extent rarely seen in cardiological studies.

Of the 2428 patients with STEMI screened for eligibility, 1306 (53%) had multivessel disease; of these, 841 (64%) were excluded, some for objective reasons (meeting clearly defined exclusion criteria), but in 329 (39%) of these no objective reasons were given, simply that they had lesions in a non-infarct artery that were ''unsuitable for PCI''.

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The exclusion of patients in complex clinical situations on the basis of subjective and poorly defined criteria is a common problem in clinical trials that limits their application in day-to-day clinical practice. In the PRAMI trial, it is not stated which lesions and which patients were excluded on the basis that multivessel PCI was not a valid option.

Santos et al.'s results are in line with those of other publications on this subject,[1–6] but the fact that there are studies showing that primary multivessel PCI can have unfavorable outcomes[7–9] demonstrates the complexity of the question, which is still surrounded by controversy.

There are several reasons for this. The particular circumstances of primary PCI – the patient's clinical instability, the urgent need for revascularization, and in many cases the difficulties caused by emergencies outside normal working hours, limiting the feasibility of complex procedures – make adequate advance planning of the procedure difficult if not impossible.

At the same time, there are obvious complexities that are inherent to multivessel PCI, including patient variables such as diabetes, renal failure, left ventricular dysfunction and clinical instability, as well as factors related to the lesions (thrombi, chronic total occlusions, calcification, lesion length, tortuosity, bifurcations, myocardial viability, and functional significance).

According to Widimsky et al.,[10] there are around 60 possible scenarios for multivessel disease in STEMI patients. Given such complexity, it would clearly be difficult, or even impossible, to obtain conclusive evidence of the validity of the hundreds of possible therapeutic strategies for all these scenarios by means of randomized clinical trials.

For multivessel revascularization, not necessarily in the context of STEMI, the evidence indicates certain principles that improve prognosis: only lesions with documented functional significance should be revascularized[11]; surgical revascularization is the most appropriate strategy in some cases[12]; and multivessel revascularization should be preceded by a multidisciplinary discussion by the heart team.[11,13] Any decision to perform multivessel PCI should take these principles into account.

At all events, the available evidence, including the article by Santos et al. and the PRAMI study, indicates that multivessel primary PCI can have a significant favorable impact on prognosis, especially in selected patients.

Implementation of this strategy will of course make interventions more complicated and more demanding in terms of operator skill and experience.

Questions remain, including whether complete revascularization should be performed in a single procedure or staged; which patients will benefit from simultaneous or staged complete revascularization, and what is the appropriate timing for the latter; and the role of functional assessment by fractional flow reserve in STEMI.

We appear to be witnessing the gradual disappearance of another taboo in PCI – multivessel revascularization in primary PCI of patients with STEMI.

Conflicts of interest

The author has no conflicts of interest to declare.

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