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Pathophysiology of saphenous vein valves in coronary artery bypass with composite arteriovenous grafts

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We read with interest the editorial by Hwang *et al.* (1). Initially, we would like to congratulate the authors for the manuscript, and for the continuous interest in improving the use of composite grafts with the saphenous vein (SV), a surgical technique that we have also used for more than 20 years and which, in selected cases, we believe is a safe and effective approach in coronary artery bypass graft surgery (CABG) (2).

The success of any medical treatment involves a profound understanding of the anatomical, physiological and pathological concepts that involve the disease. In CABG this is not different, and the favourable clinical results obtained over the last 50 years with this procedure are due to the obedience to these principles.

Advantages of arterial grafts over venous grafts in CABG are currently described. However, except for the considerable evidence on the benefits obtained with the left internal thoracic artery, there is still uncertainty about total arterial myocardial revascularization, mainly due to the morbidity resulting from the harvesting of arterial grafts (1,3).

We emphasize that following the anatomo-physiological precepts, each anatomical structure has a defined physiological function. Harvesting of an artery implies some degree of functional damage to its supplied territory, a situation possibly minimized by collateral circulation, but that does not occur uniformly in all individuals. SV harvesting results in a minimal functional impairment, with low morbidity in short, medium- and long-term, making this conduit still be used in about 70% of all CABG (1,4).

There are considerable differences between venous and arterial grafts. One of the most relevant is the existence of valves, fundamental elements in the venous system of the lower limbs. As the arterial system, from the physiological point of view, is closed, pressured, competitive, and with potentially bidirectional flow, the presence of a valve in the arterialized venous segment may be incompatible with the graft's new function (2,4,5). Thus, it is necessary that the venous graft is preferably valveless, since it will perform the function of an artery.

Defence of this point of view is based on three aspects: (I) a coronary venous graft, especially when revascularizing arteries with non-critical obstructive lesions, is subject to flow competition, especially during rest. Thus, the presence of valves may favor blood stagnation, with subsequent thrombosis and early graft obstruction, a fact that may help to explain the failure rate of the SV in the first 30 days; (II) in composite grafts, the venous segment is of shorter length than in aortocoronary grafts, favoring the selection of valveless segments; and (III) from the anatomopathological point of view, it has long been reported that the valve in the coronary graft of SV is a site with propensity to formation of atheromatous plaques (1,2,5).

In addition to the technical aspects illustrated by the authors (1), we defend the importance of valveless SV segments in arteriovenous composite grafts in CABG, in order to respect the physiopathological principles and to possibly obtain better results with this approach.

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None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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References

1. Hwang HY, Kim KB. Saphenous vein as a composite graft from the internal thoracic artery. Ann Cardiothorac Surg 2018;7:686-9.
2. Filho JG, Leitão MC, Forte AJ, et al. Flow analysis of left internal thoracic artery in myocardial revascularization surgery using y graft. Tex Heart Inst J 2006;33:430-6.
3. Tatoulis J. Total arterial coronary revascularization-patient selection, stenoses, conduits, targets. Ann Cardiothorac Surg 2013;2:499-506.
4. D'Agostino RS, Jacobs JP, Badhwar V, et al. The Society of Thoracic Surgeons Adult Cardiac Surgery Database: 2018 Update on Outcomes and Quality. Ann Thorac Surg 2018;105:15-23.
5. Mills NL, Everson CT. Vein graft failure. Curr Opin Cardiol 1995;10:562-8.

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