A novel composite coronary bypass graft strategy using the saphenous vein bridge: could the venous valves induce worse patency results?

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We have read carefully and with great interest the pilot study by Tremblay et al. [1]. In this study, an original technique of coronary artery bypass grafting (CABG) is shown using a direct anastomosis of the left internal mammary artery (LIMA) to a saphenous vein component placed as a bridge from the left anterior descending artery (LAD) to other anterolateral coronary arteries. First of all, we would like to congratulate the authors on the way the study was presented. It showed a simple technique as well as a didactic method.

In the past 20 years, we have been dedicated to the study of CABG without extracorporeal circulation and without manipulation of the aorta. From the beginning, we have preferred composite grafts of the LIMA and of the great saphenous vein (GSV) without valves, particularly when bypassing the left coronary artery system.

We have published the reasons that led us to use valveless segments of the GSV in the composition of the graft [2]. Regarding the study by Tremblay, we have considered the venous segments that were used. As the arterial circulatory system is pressured, competitive, and potentially bidirectional since it is valve free, it has been thought that the venous grafts placed in the arterial circulation should obey this anatomical physiological principle. In our experience with the GSV, these segments without valves are found without technical difficulties, especially the little ones used to graft the diagonal artery and the ramus diagonalis.

We support the belief of some authors that a venous segment containing a valve when used to bypass an artery with an overestimated stenotic lesion is more likely to occlude. That happens because the physiologically competitive flow in the grafted site could lead to stasis of blood, and subsequent thrombosis, especially at rest, and possibly precociously [3]. Based on what was said above and analyzing the results presented by the authors, we see that the patency of the vein graft to the LAD was 100%, while the patency of the vein graft to the diagonal artery was 85%, being exactly the venous segment potentially having a valve. On the other hand, it has been reported that the sites of valves are primary locations of development of atheromatous plaques [4,5].

We have attentively read the trial protocol by Drouin et al. published to expand this study [6]. Nevertheless, we suggest an analysis of the results of venous segments without valves in a group of patients, if possible, as we believe this could enrich the study.

We would like to remark that the matter of the pilot study is of great importance in our field, and that this innovative and reproducible technique could represent a great improvement in the quality of life of those suffering from coronary disease, especially the elderly, the ones with anatomical complexity and those with severe disease.

Conflict of interest: none declared.

REFERENCES


LETTERS TO THE EDITOR

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We would like to thank professor Lobo Filho et al. [1] for the interest in our manuscript [2] presenting an alternative to conventional coronary artery bypass grafting (CABG) involving a composite-sequential graft to bypass the anterolateral coronary artery territory. Current practice guidelines strongly recommend using the left internal mammary artery (LIMA) to bypass the left anterior descending artery (LAD). The use of composite grafts allows reducing the need for aortic manipulations and associated stroke risk while still providing complete revascularization. In this context, we developed a new strategy using the LIMA for blood inflow and a saphenous vein bridge (SVB) (LIMA-SVB) to distribute the LIMA blood almost directly to the LAD but also to other anterolateral coronary targets such as diagonals, ramus inter-mediis or high first obtuse marginal branches. In this technique, a short saphenous vein graft (SVG) is anastomosed to the LAD and the other anterolateral coronary arteries, and the LIMA is connected to the roof of the SVG just above the SVG-LAD anastomosis. This simple strategy is useful in several patients as it is associated with numerous advantages: easy-going off-pump CABG, limiting the length of the SVG required, ease of performing a direct SVG anastomosis to the LAD, increased blood flow in the LIMA pedicle, and favourable clinical and radiological outcomes [2]. As mentioned by Lobo Filho et al. [3], we also believe that the use of an SVG in combination with the LIMA could improve the long-term patency of the SVG.

As suggested [3, 4], we believe that the use of a valveless SVG may improve the patency of the conduit. Since the instauration of the LIMA-SVG technique...
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The left and right internal thoracic arteries may not have equivalent histological structures

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I commend Kinoshita and his colleagues for their effort in producing information on the histomorphometry of the right and left internal thoracic arteries (ITAs) [1]. While histological structure of the left ITA (LITA) has been adequately studied, the right ITA (RITA) has remained relatively overlooked with scarce information. Undoubtedly, the excellent results with the use of the LITA in coronary artery bypass grafting are due to, to a great extent, its histological structure.

However, part of Kinoshita’s paper conclusion may be misleading and does not represent the real picture. The statement that the right and left ITAs have equivalent histological and morphometric properties is not endorsed by the method employed in this work. For comparing both ITAs, only the redundant distal portion has been trimmed off and sent to the laboratory for morphometric analysis. Extrapolation of findings from these small fragments to the whole artery extension is uncertain and precarious, and the heterogeneity of the LITA histological structure along its downstream course is fairly well known [2].

We studied histomorphometrically both ITAs and compared sequentially their entire extension, and our findings revealed subtle but considerable differences. In relation to the size, the RITA proximal segments presented significantly larger diameters in comparison with LITA. Also, slight differences between the ITAs were noted in the thickness of the tunica media and the tunica intima. But most notably, regarding the number of elastic layers, a statistically significant difference was found among both ITA segments. In the LITA, the amount of elastic layers was concentrated in the intermediate segments and relatively reduced in the proximal and distal segments. In the RITA, a more regular wall histological structure throughout its length, with a relatively steady amount of elastic layers and a virtual uniformity in the distribution of elastic layers, was observed among its segments [3].

These data positively correlate and reinforce the findings of the previous anatomical studies [4, 5]. In part, the explanation could be attributed to the embryological origin. The left subclavian artery arises from the left seventh intersegmental artery, while the right subclavian artery originates from a multiple embryological origin: proximally to distally arises from the fourth aortic arch, the right dorsal aorta (between the fourth and the seventh intersegmental arteries), and from the right seventh intersegmental artery. Even among specimens of ITA distal segments a great histological variability exists. A study on the structure of the ITA distal segment in 100 patients found a large variation in the composition of the tunica media. The media could be classified into three different types: muscular, hybrid and elastic type. In 52%, the elastic type dominated in the distal part, while hybrid and muscular patterns were found in 22 and 26%, respectively [6].

In summary, despite suggested structural differences between the right and left ITAs, the authors’ clinical data are comfortably reassuring on the excellent patency rates of both ITA grafts, thus strengthening the recommendation for their enhanced clinical use.

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