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# Commentary: "Details make perfection, and perfection is not a detail" (Leonardo da Vinci)

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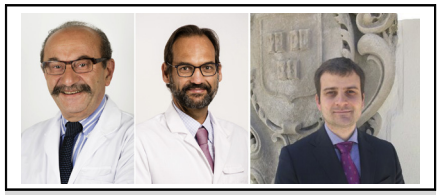

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**CENTRAL MESSAGE**

Aortic valve reimplantation provides a comprehensive treatment of aortic root dilatation and aortic regurgitation and has shown excellent long-term results.

In 1995, I (G.E.K.) had the chance to visit during some months Professor Carpentier in Paris and Professor David in Toronto. Both events marked undoubtfully my further professional career; nonetheless, the months spent in Toronto decided my main field of development in cardiac surgery. While reading the last report by David and colleagues[1] on the reimplantation of the aortic valve (AV), published in the current issue of the *Journal*, I reflected on the evolution of valve-sparing procedures during these last 25 years, in particular on what is widely known as the David procedure. Also, I could not help but thinking about the development of mitral valve repair during the same time span. David and colleagues have unequivocally shown that reimplantation of the AV is associated with an excellent survival that is not matched by the best-available valve prosthesis, a low risk of recurrence of severe aortic regurgitation over time, an even lower risk of valve stenosis and, overall, a very low risk of valve reoperation. Further, although initially valve reimplantation was applied to tricuspid AV with little regurgitation, nowadays this procedure is implemented also in bicuspid AV and valves with severe insufficiency. So, although we've come a long way in the last 20 years, why this procedure is still not as widely spread as mitral valve repair? Mitral regurgitation due to dilatation of the annulus (type I) can be simply and effectively treated with annuloplasty. *Mutatis mutandis*, dilatation of the aortic

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root can be fixed with aortic annuloplasty that, however, is not that simple due to the peculiar multiplanar configuration of the functional aortic annulus. Moreover, as the authors point out, a too-small vascular graft can induce aortic regurgitation that was not present preoperatively. The situation becomes even more challenging when the dilatation of the aortic root is associated with cusp prolapse (type I plus type II aortic regurgitation) and when the AV is bicuspid (or unicuspid or quadricuspid). A prolapse of the posterior mitral leaflet is usually treated with resection or neochordae and annuloplasty. In AV, similarly, a prolapse of the right coronary cusp can be treated with a central plication. However, the very limited amount of tissue and the extremely precise geometric configuration between the cusps make the AV "unforgiveable," and a few millimeters of tissue plication can make a big difference. Excessive correction can indeed result in regurgitation due to restricted cusp mobility. Nonetheless, the series from David and colleagues shows that patients presenting for valve-sparing surgery are a young cohort, with a median age of 46 years. In these patients, given the results of reimplantation presented here and those after prosthetic valve replacement,[2] it is worth all efforts to preserve or repair the valve. Root remodeling (the Yacoub operation) can also treat root aneurysm, but it is also clear that it needs some kind of additional annuloplasty to stabilize the valve function. We believe instead that valve reimplantation offers a comprehensive approach to valve stability, and for this reason it is our technique of choice. Moreover, the supposed disadvantages of reimplantation of the valve into a straight graft have not been proven. Valve reimplantation is currently standardized and highly reproducible, as shown in this series and in our own experience.[3] Therefore, valve-sparing surgery should become integral part of the cardiac surgeon's arsenal within the large shelf of aortic root surgery. Further, as pointed out by the authors, quality of the cusp tissue is a more important element than root size or degree of aortic regurgitation. Although the reparability of the valve is a matter of experience, valves with severe regurgitation, bicuspid valves, and also those with non-calcific cusp disease can be successfully preserved with reimplantation. Not least, valve reimplantation has been employed also to treat late failure after the Ross procedure, extending the benefits of the autograft.[4] Therefore, with the solid experience of the last 30 years and the current results, we should not fear to broaden the use of the reimplantation technique, particularly in young patients. In the era of transcatheter valve replacement when the valve-in-valve seems to be the easy solution, we like to remember that "we choose to go to the moon in this decade and do the other things, not because they are easy…"[5] We should not seek the easiest solution but the best one for the patient. Valve-sparing surgery offers consistent and durable results.

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