The autograft inclusion: An obligatory step to avoid late failure following the Ross procedure?

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One of the most important concerns regarding the Ross procedure is the fact that the pulmonary autograft (which means the valve and the proximal part of the pulmonary artery) is exposed to systemic pressure. In the past, a substantial number of surgical groups have reported a progressive dilation of the neo-aortic root with consecutive autograft insufficiency in the long term, leading to reoperation. In one of the largest meta-analyses, Takkenberg and colleagues¹ found that the failure rate was higher in children than in young adults, with pooled autograft deterioration linearized rates of 0.78% per year in adults and 1.38% per year in pediatric patients.

When debating about incidence and mode of autograft failure, we should not forget that the original description of the Ross procedure recommended suturing the autograft in a subcoronary position, which allows avoidance of long-term dilation but makes the surgery more challenging.

The report in this issue of the *Journal of Thoracic and Cardiovascular Surgery* by Skillington and colleagues² from the Royal Melbourne Hospital—although quite similar to the article already published in the *Annals of Thoracic Surgery* in September 2013³—is outstanding. It emphasizes that remarkable long-term outcomes after the Ross procedure can be obtained in the large majority of cases when the native aorta is used as autologous support for the pulmonary autograft and the aortic annulus and the sinotubular junction are “remodeled” during surgery to predetermined sizes. In that sense, this report adds significant knowledge about the outcome of the wrapped pulmonary autograft and the downsized native aortic annulus. The observational interval of as long as 15 years is long enough to be considered as representative, and Skillington and colleagues² report an impressive stability when the absolute diameters are considered.

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FIGURE 1. Technique of external autograft support with a prosthetic Valsalva graft (described in references 5 and 6). 2, Autograft; V, Vascutek Valsalva prosthetic graft (Vascutek Ltd, Inchinnan, UK); 3, homograft. (Property of the *Journal of Thoracic and Cardiovascular Surgery*).

Even though the results are convincing, it may appear surprising that Skillington and colleagues² recommend downsizing of the aortic annulus to a fixed diameter, independently of the diameter of the pulmonary valve annulus. Just consider, what happens to a 20-mm pulmonary artery autograft implanted in a 24-mm aortic annulus?

Another critical point of the autograft wrapping using native aorta is certainly the coronary artery reattachment to the autograft.

In addition, it would have been interesting to get some information about the quality (or the changes) of the aortic wall wrapped around the autograft at the time of reoperation. Were there several adhesions between the autograft and the aortic wall? Would a David procedure have been possible to rescue at least the neo-aortic valve, or not?

Finally, although not the principal topic of the report, the reader would expect minimal information about the performance of the right ventricle–pulmonary artery conduit and the availability of good quality, size-matched homografts.

In conclusion, the Ross procedure remains a complex operation for the majority of surgeons not accustomed to performing pediatric surgery or used to dealing with complex aortic root pathologies. To make external autograft support possible even in difficult situations, we and others have described a simple technique of implantation of the autograft within a prosthetic Valsalva prosthesis that does

not require additional time (Figure 1).⁴⁻⁶ This technique allows a support of the native aortic annulus as well because the proximal suture line connects the graft to the annulus itself. To date, the midterm follow-up as late as 8 years is very favorable.

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