Aortic root redo’s revisited; “new kids on the block” meaning more options to me.

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Aortic root redo’s revisited; “new kids on the block” meaning more options to me.

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Central Picture legend:
Valve/Ring - to coronary distance maintained after separate sinus remodeling

We read with keen interest the study from the Ehrlich group on CTA analysis following Composite valved conduit implantation in 64 consecutive patients[1]. Their findings indicate a decreased coronary height for left and right coronary arteries, to 8 mm and 11 mm, respectively. In addition, the virtual valve-coronary distance was significantly reduced by 4.0 and 4.5 mm for left and right coronaries, respectively. This puts 59% of these patients in jeopardy of coronary obstruction during valve-in-valve procedures, as a reduction to 4 mm is considered a critical value. Interestingly, 48.5% of cases were related to left coronary obstruction.

This reignites an ongoing discussion on the strategy of aortic valve substitute selection during root replacement with regard to redo-operation, and the feasibility of valve-in-valve interventions. This is illustrated by editorial letters in a recent journal discussing different variants of root replacement, namely stentless versus stented Bentall, within the context of data derived from the STS database [2,3]. The arguments in favor of bio-Bentall due to its valve-in-valve suitability should be taken with caution in light of Ehrlich’s results of diminished valve-coronary distance following a classical Bentall. One of the simplest solutions to effectively mitigate this risk is to lower the level of the implanted valve. However, in the context of root replacement, this may necessitate a separate sinus replacement, as it elevates the suturing line of the aortic root above the valve virtual plane, as proposed by Sievers [4]. Supporting this idea, a paper published by the Urbanski group demonstrates
the long-term feasibility of separate sinus replacement during root replacement-sparing operations on 669 patients over 18 years [5]. The variations in the number of sinuses replaced generally correlated with asymmetric root enlargement. Interestingly, the replacement of one, two, and three sinuses was distributed relatively equally and was performed in 209, 234, and 226 patients, respectively. Most of these were separate non-coronary sinus replacements, thus making the re-implantation of coronary buttons unnecessary. As an aside, replacement of the left coronary sinus was necessary in only 16 patients, which, when replaced, posed the greatest risk for obstruction. The potential benefits of separate sinus root replacement may stem from not only avoiding unnecessary sinus replacements and coronary re-implantation but may also be due to favourable anatomy, as shown in Fig 1. In bicuspid aortic valve-related aortopathy, this may present an attractive option, as shown by our “BAV working group” [6]. Due to the imminent risk of redo root operations, it is critical to reconsider all options beyond the classical Bentall during index root operations, as discussed in Elefteriades’ editorial [7]. There are a variety of new approaches, such as wrapped stentless conduit replacement, separate sinus remodeling, and the PEARs root concept, that address root dilatation while offering increased flexibility for root operations. Thus, flexibility in choosing the index procedure is crucial in the context of possible re-interventions.

Fig 1 Valve/Ring - to coronary distance after separate sinus remodeling
