Commentary: Pulling back the curtain: Need for reoperation after valve-sparing aortic root replacement

John A. Elefteriades, MD

The authors are to be congratulated on a superb study that looks beyond the immediate postsurgical time frame in patients undergoing Dr David’s elegant valve-sparing aortic root procedure. Two leading centers have combined their experience, provided very safe valve-sparing surgery, and determined medium-term basic clinical follow-up.

The authors look at reoperations both on the aortic root segment and on more distal segments of the thoracic aorta. In this Commentary, we will focus only on the proximal reoperations, as need for operation on the more distal aorta will arise on occasion, regardless of the aortic root repair technique, representing progression of biologically triggered disease in distant aortic segments.

Of greatest importance in this study are reinterventions on the operated zone itself: the valve or the aortic root. The authors found a reintervention rate for aortic insufficiency or for recurrent aortic root disease of 8.3%, presenting at various times throughout the follow-up period.

This study is especially important because, from the patient’s point of view, need for early reoperation (at a mean of 1.6 years) can only be regarded as tragic—both emotionally and in terms of the substantial operative complexity, surgical risk, pain, and recovery. The authors are to be congratulated on performing the reoperations quite safely. Adding to the patient adversity, 13% of those undergoing a first reoperation required a second reoperation as well.

Besides the patients with full reoperative data at hand, an additional 2 patients are known to have undergone reoperation elsewhere. Given the disappointment of needing reoperation, it is possible that additional patients sought their reoperation elsewhere. So, the reported reoperation rates should probably be viewed as the lower limit of the true rates, which may be higher.

Another issue concerns not reoperation per se but recurrent aortic insufficiency. In this study, the authors did not routinely assess late aortic valve competency. One wonders whether, above and beyond the performed reoperations, there could be a reservoir of patients with significant aortic insufficiency out among the postoperative population who have not yet come to attention. Such patients may be progressively damaging their left ventricles over time without yet presenting for reoperation.

Follow-up in this study was medium term (mean 7 years). The ideal aim in aortic root surgery is for lifelong cure. One wonders if need for reoperation will continue to accrue in this patient cohort as follow-up lengthens.

Perhaps the greatest contribution of this study lies in informing the decision among aortic root replacement options, which include composite graft replacement and the...
Ross procedure (Figure 1). Even the PEARS procedure (personalized external aortic root support), ridiculed at first, is gaining respect, as high protection from subsequent aortic events has been demonstrated.2 Also, localized sinus replacement deserves consideration among alternative procedures for patients with isolated disease (of the more vulnerable noncoronary sinus).3,4

The remarkable operation developed by Dr David and reported in the authors’ study has achieved a position of prime importance among aortic root surgical alternatives. In terms of perspective vis-à-vis alternate procedures, a report at the same American Association for Thoracic Surgery meeting5 presented 30-year follow-up after traditional mechanical or biologic aortic root replacement. (Mechanical valves were generally chosen for patients younger than 60-65 years of age and biological valves above that criterion.) That traditional root replacement study found minimal rates of late bleeding or thromboembolism, only a 1.9% rate of root reoperation over the entire 30-year term, and ultra-long-term survival equal to an age- and sex-matched population (Table 1). Another alternative, the Ross operation, is undergoing a resurgence, as routine wrapping of the autograft with Dacron promises to prevent or eliminate the late root dilatation that has previously plagued this complex alternative.

The authors of the paper reviewed in this Commentary have provided important data that surgeons can use to put valve-sparing aortic root surgery in perspective vis-à-vis other root alternatives, including traditional root-replacement procedures and the Ross operation. We congratulate the authors for their superb clinical results and for this important contribution to the aortic root literature.

References


### Table 1. Comparison of outcomes after valve-sparing surgery and traditional aortic root replacement in two studies reported at the 93rd Annual Meeting of The American Association for Thoracic Surgery

<table>
<thead>
<tr>
<th>Paper</th>
<th>Number of patients</th>
<th>Mean age</th>
<th>Surgical mortality</th>
<th>Late bleeding</th>
<th>Late TE</th>
<th>Root reoperation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valve-sparing (Singh et al1)</td>
<td>781 (2 institutions)</td>
<td>50 y</td>
<td>1.5%</td>
<td>NA</td>
<td>NA</td>
<td>8.3%</td>
</tr>
<tr>
<td>Root replacement (Jeoffrey et al5)</td>
<td>595 (single surgeon)</td>
<td>56 y</td>
<td>1.9% (nondissection patients)</td>
<td>2.9% (over entire study duration)</td>
<td>1.2% (over entire study duration)</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

TE, Thromboembolism; NA, not available.