colleagues² reported an operative mortality of 3.4%, and overall survivals were 92% at 5 years and 80% at 10 years. Taken together, these data indicate that our findings are unlikely to be attributable to a selection bias in favor of the repair group.

Could our findings be due to a selection bias in disfavor of the replacement group? Charitos and Takkenberg clearly suggest that this might be the case, because according to their analysis survival in the replacement group was much lower than in previous reports. The main reference they quote to back up their statement is an article by Kvidal and colleagues³ that seemingly shows better outcome after AV replacement than in our population. Careful inspection of Figure 6 in the article of Kvidal and colleagues,³ however, shows that their results were in fact quite similar to ours. Indeed, in their analysis of long-term survival, Kvidal and colleagues³ excluded operative mortality (which we did not) and only reported on relative survival, the ratio of observed to expected survival rate, the latter being calculated from life tables compiled from the total population of Sweden stratified by sex and age. Figure 2 shows the same analysis with our data. One can clearly see that survival of patients undergoing repair was close to 100% (which means a similar survival to the age- and sex-matched Belgian population) and that by contrast 9-year survival in the replacement group was significantly reduced to 73% at 9 years, a value not very different from the 76% found at 9 years by Kvidal and colleagues.³ Our results are also aligned with those of Klodas and associates,⁴ for whom 10-year survival was 65%, and those from the Veterans Affairs randomized trial,⁵ in which 10-year mortality after mechanical AV replacement was 40%. It would thus appear that our findings after AV replacement for aortic regurgitation are also unlikely to be due to a selection bias in disfavor of the replacement group.

Is this the end of the story? Certainly not; as we stated in our article, we cannot agree more on the need for a large-scale randomized trial to establish definitively the superiority of valve repair over valve replacement.

*Christophe de Meester, MS
Jean-Louis Vanoverschelde, MD, PhD
Université Catholique de Louvain
Brussels, Belgium*

References

1. Sharma V, Suri RM, Dearani JA, Burkhart HM, Park SJ, Joyce LD, et al. Expanding relevance of aortic valve repair—is earlier operation indicated? *J Thorac Cardiovasc Surg.* 2014;147:100-8.
2. Aicher D, Fries R, Rodioncheva S, Schmidt K, Langer F, Schäfers HJ. Aortic valve repair leads to a low incidence of valve-related complications. *Eur J Cardiothorac Surg.* 2010;37:127-32.
3. Kvidal P, Bergström R, Hörte LG, Ståhle E. Observed and relative survival after aortic valve replacement. *J Am Coll Cardiol.* 2000;35:747-56.
4. Klodas E, Enriquez-Sarano M, Tajik AJ, Mullany CJ, Bailey KR, Seward JB. Aortic regurgitation complicated by extreme left ventricular dilation: long-term outcome after surgical correction. *J Am Coll Cardiol.* 1996;27:670-7.
5. Hammermeister K, Sethi GK, Henderson WG, Grover FL, Oprian C, Rahimtoola SH. Outcomes 15 years after valve replacement with a mechanical versus a bioprosthetic valve: final report of the Veterans Affairs randomized trial. *J Am Coll Cardiol.* 2000;36:1152-8.

<http://dx.doi.org/10.1016/j.jtcvs.2014.08.013>

ARRHYTHMIA PREVALENCE AFTER EXTRA CARDIAC CONDUIT FONTAN: A VIEWPOINT

To the Editor:

I read with much interest the article by Balaji and colleagues,¹ “An International Multicenter Study Comparing Arrhythmia Prevalence Between the Intracardiac Lateral Tunnel and the Extracardiac Conduit type of Fontan Operations,” which concluded that there was an increased chance of early sinus node dysfunction but no significant difference in late arrhythmia prevalence for extracardiac conduits (ECCs) relative to

intracardiac lateral tunnels (ILTs). These conclusions carry much relevance considering an overall worldwide preference toward ECCs from an arrhythmia perspective and the potential difficulties for transvenous pacing and transcatheter arrhythmia ablations after ECC use. I would, however, like to bring up 2 important points in this context.

First, Balaji and colleagues¹ mentioned a higher number of patients with heterotaxy in the ECC group (n = 70) than in the ILT group (n = 30), and there is published evidence² that the incidence of arrhythmias after the Fontan operation is much higher in patients with heterotaxy. I believe that this difference may well have influenced the results of the study, and a subgroup analysis excluding the patients with heterotaxy would therefore be of much interest.

Second, apart from this large study, 2 other studies^{3,4} have also pointed out the possibility of increased incidence of sinus node dysfunction after ECC relative to ILT, and the cause remains unexplained in the literature. An important possible contributing factor to this occurrence is the reoperative dissection to separate the right pulmonary artery from the left atrial roof during ECC completion after a bidirectional Glenn shunt; this may possibly damage blood supply to the sinus node, which arises from the circumflex artery in as many as 40% of cases. This dissection is not needed during an ILT completion after a hemi-Fontan operation, avoiding the potential for this occurrence postoperatively. More careful dissection in this area during ECC completion thus could possibly reduce the incidence of sinus node dysfunction.

*Balram Babu Rajanbabu, MCh
Department of Cardiothoracic
Surgery
Apollo Hospitals
Bangalore, India*

References

1. Balaji S, Daga A, Bradley DJ, Etheridge SP, Law IH, Batra AS, et al. An international multicenter study comparing arrhythmia prevalence between the intracardiac lateral tunnel and the extracardiac conduit type of Fontan operations. *J Thorac Cardiovasc Surg.* 2014;148:576-81.
2. Bartz PJ, Driscoll DJ, Dearani JA, Puga FJ, Danielson GK, O'Leary PW, et al. Early and late results of the modified Fontan operation for heterotaxy syndrome 30 years of experience in 142 patients. *J Am Coll Cardiol.* 2006;48:2301-5.
3. Dilawar M, Bradley SM, Saul JP, Stroud MR, Balaji S. Sinus node dysfunction after intraatrial lateral tunnel and extracardiac conduit Fontan procedures. *Pediatr Cardiol.* 2003;24:284-8.
4. Kumar SP, Rubinstein CS, Simsic JM, Taylor AB, Saul JP, Bradley SM. Lateral tunnel versus extracardiac conduit Fontan procedure: a concurrent comparison. *Ann Thorac Surg.* 2003;76:1389-96; discussion 1396-7.

<http://dx.doi.org/10.1016/j.jtcvs.2014.08.013>

LACK OF INFLUENCE OF HETEROTAXY ON ARRHYTHMIA PREVALENCE AFTER INTRACARDIAC VERSUS EXTRACARDIAC FONTAN OPERATIONS

Reply to the Editor:

We thank Dr Rajanbabu for his comments. In response to these comments, we reanalyzed our cohort after removing the heterotaxy patients from both groups and the statistical results were the same. We therefore believe that the difference in the number of heterotaxy patients in the 2 groups did not influence our results.

We do, however, agree with his comment that transvenous pacing and transcatheter ablation are harder to perform after an extracardiac conduit operation. In light of our study results, the intracardiac tunnel may be the better operation from that point of view. Yet we caution that the follow-up in the 2 groups (particularly the extracardiac conduit cohort) in our study was short and that it may be wise to wait for longer follow-up before making definitive recommendations.

Seshadri Balaji, PhD, MBBS,
MRCP(UK)^a

Maully Shah, MBBS^b

^aOregon Health & Science University
Portland, Ore

^bChildren's Hospital of Philadelphia
Philadelphia, Pa

<http://dx.doi.org/10.1016/j.jtcvs.2014.12.044>

A RECOMMENDATION FOR MODIFICATION OF THE HOURGLASS-SHAPED RESECTION TECHNIQUE FOR REPAIR OF TALL MITRAL VALVE POSTERIOR PROLAPSE

To the Editor:

We have read the article entitled "Hourglass-shaped resection technique for repair of tall mitral valve posterior prolapse" by Sawazaki and colleagues¹ with great interest. They have well described their novel method for repairing a high posterior leaflet of the mitral valve. They have adopted triangular resection for a posterior leaflet of normal height, and an hourglass resection for an excessively high posterior leaflet without annular plication. This simple and reproducible method may indeed improve outcomes of folding plasty and avoid the sacrifice of large amounts of useful leaflet tissue during annular plication.^{2,3} Short-term results of this reproducible technique seem promising.¹

However, when the technical details for this novel method are examined more closely, some questions may arise. For instance, if points B and E, which represent the midpoints of a posterior leaflet, were sutured to the annulus, as shown in Figure 1, such an approach has important drawbacks. We think that this maneuver may pull the annulus and cause narrowing of the leaflet width, resulting in a final shape that impedes formation of a new, normal-sized, and deeply coapted posterior scallop. Thus, we suggest that some refining modifications to improve this technique may aid in achievement of more

satisfactory outcomes and decrease postoperative morbidity and complications.

Gökhan İlhan, MD^a
Mert Kestelli, MD^b
Berkay Özpak, MD^b
Sahin Bozok, MD^a

^aDepartment of Cardiovascular
Surgery
Recep Tayyip Erdogan University
School of Medicine
Rize, Turkey

^bDepartment of Cardiovascular
Surgery
Ataturk Training and Research
Hospital
Izmir, Turkey

References

1. Sawazaki M, Tomari S, Izawa N, Ueda Y. Hourglass-shaped resection technique for repair of tall mitral valve posterior leaflet prolapse. *J Thorac Cardiovasc Surg.* 2013;146:275-7.
2. Perier P, Clausnizer B, Mistarz K, Carpentier "sliding leaflet" technique for repair of the mitral valve: early results. *Ann Thorac Surg.* 1994;57:383-6.
3. Schwartz CF, Grossi EA, Ribakove GH, Ursomanno P, Mirabella M, Crooke GA, et al. Ten-year results of folding plasty in mitral valve repair. *Ann Thorac Surg.* 2010;89:488-9.

<http://dx.doi.org/10.1016/j.jtcvs.2014.10.095>

ABOUT LEMONS AND LEMONADE

To the Editor:

We read with great interest the article on lung volume reduction surgery (LVRS) published by Decker and coworkers,¹ even though we found the results somewhat disappointing.

On one hand, the study provides a previously unknown nationwide overview on the early outcome achieved with LVRS, taking into account the Society of Thoracic Surgeons database data; Decker and coworkers¹ underline that LVRS continues to be reportedly underused despite its proven efficacy and highlight the need to invest in future analyses to identify determinants of adjusted