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References

1. Temporary aortic valve tested. *JAMA*. 1966;198:53.
2. Berger RL, McCormick JR, Stetz JD, Klein MD, Ryan TJ, Carr J, et al. Successful use of a paracorporeal left ventricular assist device in man. *JAMA*. 1980;243:46-9.
3. Berger RL. Nazi science—the Dachau hypothermia experiments. *N Engl J Med*. 1990;322:1435.

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TECHNICAL CHANGES IN THE IMPLANT OF SUTURELESS AORTIC VALVES: THE SENSE OF BEING PIONEERS

To the Editor:

Although the Perceval sutureless aortic valve (LivaNova PLC, London, UK) is currently routinely used in many European cardiac surgery centers,¹ concerns remain regarding the need for postoperative permanent pacemaker implantation.² In this regard, we read with great interest the article by Yanagawa and colleagues,³ who presented a simple technical modification to lower the rate of pacemaker implantation in patients undergoing aortic valve replacement with the Perceval sutureless bioprosthesis.

From 2010 to date, we have implanted 380 Perceval valves, with 10% of patients requiring postoperative pacemaker implant up to August 2015. Since then, we have implemented several changes trying to refine the implant technique. In particular, attention to the appropriate depth of suture placement in relation to the annulus is critical to ensure adequate valve functioning without additional risks for the conduction system. These sutures are placed at the nadir or midpoint of the leaflet insertion line. Use of a semi-circular needle facilitates the placement of the guiding sutures, beginning no more than 2 mm below the annulus and exiting approximately 2 mm above the annulus. Passing these sutures from below to above the annulus was found to be helpful to control suture insertion depth. Inappropriately deeper placement of the guiding sutures into the left ventricular outflow tract carries the risk of damage to the

conduction system after valve placement. During valve deployment, special attention should be paid to the angle of the holder with regard to the seating of the valve in the noncoronary sinus. Inappropriate tension of the guiding sutures may cause the valve to be seated too deeply, particularly at the commissure between the right and noncoronary cusps, with potential for damage to the underlying conduction system.

With the adoption of these measures, since September 2015 only 1 additional patient (3.3%) has required pacemaker implantation postoperatively in our institution. Our comment is intended to help centers starting to implant the Perceval valve, showing that the unique position of being pioneers in the use of a new device should contribute to the standardization of the technique by accurate monitoring of the results.

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References

1. Fischlein T, Meuris B, Hakim-Meibodi K, Misfeld M, Carrel T, Zembala M, et al. The sutureless aortic valve at 1 year: a large multicenter cohort study. *J Thorac Cardiovasc Surg*. 2016;151:1617-26.
2. Vogt F, Pfeiffer S, Dell'Aquila AM, Fischlein T, Santarpino G. Sutureless aortic valve replacement with Perceval bioprosthesis: are there predicting factors for postoperative pacemaker implantation? *Interact Cardiovasc Thorac Surg*. 2016; 22:253-8.
3. Yanagawa B, Cruz J, Boisvert L, Bonneau D. A simple modification to lower incidence of heart block with sutureless valve implantation. *J Thorac Cardiovasc Surg*. March 10, 2016 [Epub ahead of print].

<http://dx.doi.org/10.1016/j.jtcvs.2016.03.035>

THE TIPPING POINT: WHEN SHOULD A MODIFICATION BECOME THE STANDARD TECHNIQUE?

Reply to the Editor:

We appreciate the commentary by Fischlein et al¹ from one of the largest single-center experiences with the Perceval valve (LivaNova, Milano, Italy) and the authors of several important publications, including a recent large multicenter cohort study.² Similar to our experience, they also found that deeper placement of the guiding sutures into the left

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ventricular outflow tract risks damage to the conduction system. By placing their guiding sutures no more than 2 mm below the nadir of the annulus and by angling the valve to prevent deeper implantation at the right noncommissure, they found a 3-fold reduction in their pacemaker rate from 10% to 3.3%. Because theirs is a much larger experience than ours, corroboration by the Nuremberg group goes a long way to support the generalizability of our findings.³

In our center, the Perceval valve has become a helpful tool for multiple concomitant procedures for those who we believe would gain benefit from a shorter crossclamp time. In select cases, such as reoperative aortic valve replacement for a failed Toronto Stentless Porcine Valve (St Jude Medical Inc, St Paul, Minn), adhesions between the stentless valve and the native aortic root often require a complex root replacement.⁴ Here, the Perceval valve has been invaluable in allowing us to perform a rather simple implantation. However, in our jurisdictions where health-care budgets are scrutinized closely, without this modification, we simply could not justify the use of the Perceval valve with double-digit pacemaker rates.

Parenthetically, since the publication of our article, we had a single case of Perceval implantation with complete heart block immediately postoperatively. The patient had a low-lying right coronary ostia with a prominent calcium bar extending from the annulus to the ostia. We thought that implantation with our modification risked coronary obstruction; thus, the guiding sutures were placed 3 mm below the aortic annulus. By intraoperative transesophageal echocardiography, the distance from the annulus to the lower aspect of the valve was 6 mm. This case further supported the association between low implantation and conduction disturbance in our hands.

Any modification to an established technique should be performed with caution. As the authors correctly state, it is critical to document all changes and monitor outcomes closely. However, if enough surgeons from multiple centers perform similar modifications with lower resultant rates of pacemaker implantation without paravalvular leak, valve dislodgement, or other unintended consequences, then the modification should become the standard technique.

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References

1. Fischlein T, Dell'Aquila AM, Santarpino G. Technical changes in the implant of the Perceval sutureless aortic valve: the sense of being pioneers. *J Thorac Cardiovasc Surg.* 2016;152:288.
2. Fischlein T, Meuris B, Hakim-Meibodi K, Misfeld M, Carrel T, Zembala M, et al. The sutureless aortic valve at 1 year: a large multicenter cohort study. *J Thorac Cardiovasc Surg.* 2016;151:1617-26.e4.
3. Borger MA, Prasongsukarn K, Armstrong S, Feindel CM, David TE. Stentless aortic valve reoperations: a surgical challenge. *Ann Thorac Surg.* 2007;84:737-43.
4. Yanagawa B, Cruz J, Boisvert L, Bonneau D. A simple modification to lower incidence of heart block with sutureless valve implantation. *J Thorac Cardiovasc Surg.* March 10, 2016 [Epub ahead of print].

<http://dx.doi.org/10.1016/j.jtcvs.2016.03.061>

OCCULT BLEEDING IN LEFT VENTRICULAR ASSIST DEVICE RECIPIENTS: IT IS THE PATIENT RATHER THAN THE PUMP

To the Editor:

It was with great interest that we read the article by Grosman-Rimon and colleagues.¹ This is indeed a significant contribution to understanding mechanisms of occult bleeding in continuous-flow left ventricular assist device recipients. It is our opinion, however, that current research in this field focuses far too much on biochemical pathways and overlooks patient-related comorbidities at the time of the procedure. Real-life data from the Interagency Registry for Mechanically Assisted Circulatory Support registry² indicate that 1-year freedom from gastrointestinal bleeding is strongly associated with preoperative state (Interagency Registry for Mechanically Assisted Circulatory Support level, New York Heart Association functional class, age, need for dialysis, concomitant procedures, history of coronary artery bypass grafting), irrespective of pulsatile-flow or continuous-flow device operation. In addition, coagulation disorders predisposing toward bleeding after left ventricular assist device implantation, especially the loss of high-molecular weight von Willebrand factor multimers, seem to be detectable already before the procedure in patients with end-stage heart failure.³ In the light of these findings, it is important to identify patients at risk. It is our belief that we should focus on preimplantation patient profiles rather than on the pump.

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