Aortic valve replacement via right anterior thoracotomy with sutureless valves: The way to go!

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In their article in this issue of the *Journal*, Murzi and colleagues¹ have retrospectively evaluated the outcomes of 300 consecutive patients (aged 76 ± 6 years) after aortic valve replacement (AVR) through a right minithoracotomy with a sutureless aortic valve prosthesis between 2011 and 2015. Learning curve was analyzed by dividing the study populations into 3 tertiles of 100 patients each. The overall mortality was 0.7%. They observed no significant differences in mortality and complications among the 3 tertiles.

Murzi and colleagues¹ conclude that sutureless AVR through a right minithoracotomy can be performed safely without a significant learning curve. They also conclude that with adequate training and supervision, the procedure can be spread to all the surgical staff.

Changing population demographic profiles have resulted in the increasing age of the patients presenting for AVR. The situation is similar in other industrialized countries. New techniques avoiding long extracorporeal circulation and cardiac ischemic times, as well as minimally invasive surgical access, should therefore be helpful to optimize the challenge of this changing patient cohort.

Several studies have shown that patients undergoing minimally invasive AVR have a shorter hospital stay, less pain, shorter duration of ventilation, less blood loss, and less blood transfusion than do patients undergoing conventional full sternotomy.² Postoperatively, the patients can be mobilized earlier and the respiratory function may also be better. Limited exposure of the operative field is a disadvantage for the surgeon, and this is reflected in a longer operative time in minimally invasive cases compared with operations conducted through a full sternotomy. Furthermore, minimally invasive AVR is technically even more difficult in patients with small and calcified aortic roots. This could be one of the reasons that minimally invasive AVR is not yet being universally performed.

In the past few years, transcatheter aortic valve implantation has been proposed for elderly patients and others at

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Central Message

A sutureless aortic valve prosthesis is the “ideal” biologic prosthesis for aortic valve replacement through a right minithoracotomy, even in patients with calcified or small aortic roots.

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high risk who would not qualify for conventional aortic valve operations.³ Transcatheter aortic valve implantation is still being reserved, however, for patients who either are at very high risk or are not considered suitable candidates for classic surgery.

In the study of Murzi and colleagues,¹ a self-anchoring aortic valve was implanted through a right minithoracotomy. The proposed advantages of self-anchoring prostheses are as follows:

1. Absence of the need for anchoring sutures potentially reduces the cardiac ischemic (crossclamp) time and consequently extracorporeal circulation time.
2. Self-anchoring valve designs eliminate the need for suturing ring present in conventional prostheses, resulting in increased functional valvular diameter.
3. Absence of the need for sutures makes minimally invasive access technically easier and thus also more reproducible.

In this study, Murzi and colleagues¹ indeed observed that limited exposure in minimally invasive access not a disadvantage. Conversion to full sternotomy was rarely required. Nevertheless, one of their conclusions, that “sutureless AVR via a right minithoracotomy can be performed without a significant learning curve,” must be

qualified. Murzi and colleagues¹ state that they were already performing AVR through a right minithoracotomy with conventional valves. The chief surgeon already had a large experience in AVR through a right minithoracotomy. Only 3 surgeons had not personally performed AVR through a right minithoracotomy, and they had certainly assisted in such cases.⁴ Obviously, changing to a sutureless valve prosthesis made the valve implantation “technically easier” and may have contributed to the absence of the learning curve. As Murzi and colleagues¹ point out, it is mandatory that the surgical training be structured and closely monitored. The surgeons need to be trained separately in AVR through a right minithoracotomy and in sutureless AVR. My own institution’s experience with sutureless valves, starting from the “first in human” implantation in April 2007, has been similar.⁵⁻⁷

In summary, this study highlights the advantages of the Perceval S sutureless valve (LivaNova PLC, London, UK). It is a technically simple and “ideal” biologic prosthesis for AVR through a right minithoracotomy, even in patients with calcified or small aortic roots. In this respect, Murzi

and colleagues¹ are to be congratulated for this interesting article and will help in enabling broader application of minimally invasive AVR.

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