A rescue option procedure post-transapical transcatheter aortic-valve implantation†

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I have read with great interest the article by Kempfert et al. [1] ‘A second prosthesis as a procedural rescue option in transapical aortic valve implantation’. In this article, the authors present the results of a cohort of patients undergoing a second placement of SAPIEN™ valve affirming that it is a valuable ‘bailout’ technique in case of VSD, dysfunctional leaflets or too low placement of the first prosthesis.

The authors report that approximately 40% of dysfunctional valves is due to ‘malfunctional leaflets’. They state that the VinV only works if the leaflets of the first valve are fully covered by the stent of the second valve. Nevertheless in fig. 2 the valves are not completely covered by a second valve. Moreover, they state that the low positioning was attempted in all cases due to low insertion of the coronary arteries. But a second SAPIEN™ prosthesis was successfully implanted in all seven patients in a slightly higher position (in the direction of the ascending aorta).

How could the authors explain that? Is it correct to define these leaflets as ‘malfunctioning’?

The second valve with the same size would then overextend the first one increasing at the same time the radial forces and thus eliminating much of the ‘recoil’ effect. Do not the authors think that it would be better reballoonig the first valve implanted avoiding the rupture of the leaflets?

Finally, I would like to know whether the authors have a pacing problem during the first procedure and whether there was a correct axis between the valve plane and prosthesis during valve displacement with transapical implant.

REFERENCE

We read with great interest the recent article by Park et al. [1] regarding outcomes in patients who underwent isolated aortic valve replacement (AVR) in a redo setting with a patent internal thoracic artery (ITA). They further analysed the impact of ITA control on patient outcome, concluding that not impeding ITA blood flow and allowing thus myocardial perfusion was associated with improved outcomes.

Myocardial territories at the borders of ITA distribution are traditionally considered prone to ischaemic changes due to an incomplete cardioplegic effect. Although ITA control aims at preventing cardioplegia ‘washout’ to achieve adequate cardioplegic arrest, this was early associated with a substantial risk of graft injury and associated mortality.

A number of approaches have been developed to address myocardial protection in this anatomically complex group, including various on-pump beating heart approaches. These incorporate pure retrograde perfusion of normothermic oxygenated blood [2, 3] as well as simultaneous retrograde and antegrade blood perfusion, according to individual patient anatomy [4]. Furthermore, if previous revascularization provides sufficient perfusion of all myocardial territories, retrograde and/or antegrade blood perfusion may be avoided entirely with safety [2, 5]. We have described a case of AVR in the presence of bilateral patent ITAs with the cross-clamp fibrillation [6]. Perfusion temperature ranged from 32°C to normothermia in these series.

The authors used cold blood cardioplegia in all patients [1]. Retrograde and/or antegrade perfusion with oxygenated blood appears to provide myocardial protection and optimal conditions for performing conventional AVR in selected patients.

From the technical standpoint, potential washout from the coronary ostia is easily manageable with simple measures, as already described in the literature. Appreciating the limitations of a retrospective study in this complex entity, we would like to enquire if the authors have modified their approach in recent years in regard to achieving myocardial protection.

We commend the authors on their outstanding results.

REFERENCES

LETTER TO THE EDITOR RESPONSE

Reply to Dimarakis and Anderson

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We appreciate the comments of Dr Dimarakis and Mr Anderson [1]. We agree that this is a complex problem as reflected by the multiple approaches that they highlight. Whenever there are so many techniques, it is evidence that none is ideal. With regard to modification of our approach in recent years to achieving myocardial protection in this particular group of patients, we believe that it would be fair to say that, although the practice at Mayo Clinic remains relatively heterogeneous according to surgeon preference, increasingly the surgical staff is comfortable with leaving the patent ITA open [2]. The senior author’s (T.M.S.) practice has certainly evolved that direction. Although initially insistent upon control of the ITA to achieve absolute electromechanical silence and uniform cooling as trained in the early 1990s, the outcomes achieved by senior colleagues such as Dr Charles Mullany encouraged the adoption of this more parsimonious approach with excellent outcomes. By the end of his surgical career at Mayo, Dr Mullany preferentially performed the procedure without attempting control of ITA flow, the senior author strove to emulate this master-surgeon’s practice. Today, the senior author cools only mildly (32–34°C) and administers cold cardioplegia retrograde every 20 min. It seems to work.