Letters to the Editor

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- Include no more than 500 words of text, three authors, and five references
- Type with double-spacing
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Inappropriate surgical technique or prosthesis malfunctioning?

To the Editors:

The Jude Medical (SJM) Regent valve (St Jude Medical, Inc, St Paul, Minn) represents the ultimate step in bileaflet valve engineering aiming to overcome prosthesis-patient mismatch. Compared with the SJM Hemodynamic Plus model, also the carbon rim is supra-annular. The new configuration offers a greater orifice area for a given annulus diameter.¹

Øvrum and Tangen² reported 3 cases of intraoperative rereplacement of the SJM Regent aortic valve. Several issues raised by the article are questionable and misleading, and careful attention must be paid before “re-engineering” daily practice according to erroneous concepts.

First, claiming an acute arrest is intrinsically imprecise, since “leaflet arrest” implies a sudden opening discontinuance in a previously correctly functioning valve. In this case, the alleged arrest was actually the absence of leaflet motility and housing rotation during intraoperative testing on the arrested heart. Subvalvular tissue was entrapped into the motion mechanism. Acute arrest is a threatening definition evocative of malfunction, rather than technical difficulties, possibly related to the modality of the implant. In fact, as authors claim, “after explantation there were no signs of mechanical dysfunction.”

Second, the authors refer to a previous article³ reporting 2 similar cases in which the SJM Standard valve was used. The only common element between the articles is inappropriate definition of the episode as leaflet arrest. In fact, in Grattan and Thulin’s article, no tissue entrapment was evidenced intraoperatively: leaflet motionlessness was reproduced onto the explanted prosthesis, compressing the sewing cuff with a clamp and then, in vitro, by a push-rod device applying a variable axial force, suggesting an intraoperative oversizing.

Third, the authors report that in 2 cases the SJM Regent valve was replaced with a CarboMedics (CM) valve (Sulzer Carbo-

medics Inc, Austin, Tex) of similar size. This statement is incorrect because similar label size does not imply equal diameter, the size 27 CM valve being smaller than the size 27 Regent valve. This supports an oversizing due to inappropriate prosthesis selection as a causative factor. At our institution, we routinely proceed with valve sizing only after positioning the annular sutures to avoid an incorrect estimation of the sutures’ intra-annular encumbrance.

We believe that the main issue of Øvrum and Tangen’s experience is *how* subvalvular tissue could get entrapped in the valve’s hinges. In the SJM Regent valve the pivot mechanism is placed below the annulus.² Therefore, we usually adopt some shrewdnesses during the implant. After valve seating, we secure the suture cuff to the annulus by 3 tourniquets fastened onto the commissures. An additional tourniquet might be placed below the noncoronary sinus, representing an intraprocedural “blind window.” Only after testing the correct opening of the valve, held by tourniquets in what will be its definitive position, do we tie the sutures. The tourniquets also guarantee that cuff’s anchorage is uniformly perpendicular to the aortic wall, with no leaning; they avoid, during tying, an inappropriate sliding of the intra-annular portion of the valve below the aortic annulus, resulting in a dangerous proximity to the subvalvular tissue.

Adopting this cautiousness, we did not encounter any need to rereplace a Regent valve or any other mechanical valve implanted in the aortic position.

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References

1. Bottio T, Caprili L, Casarotto D, Gerosa G. Small aortic annulus: the hydrodynamic performances of 5 commercially available bileaflet mechanical valves. *J Thorac Cardiovasc Surg*. 2004;128:457-62.

2. Øvrum E, Tangen G. Acute leaflet arrest in St Jude Medical Regent aortic valve. *J Thorac Cardiovasc Surg.* 2005;129:1446.
3. Grattan MT, Thulin LI. Leaflet arrest in St Jude Medical and Carbomedics valves: an experimental study. *Eur J Cardiothorac Surg.* 2004;25:953-7.
doi:10.1016/j.jtcvs.2005.08.004

Reply to the Editor:

We appreciate the remarks forwarded by Dr Gerosa. However, we believe that their comments strengthened the concerns we pointed out in our brief communication.¹ For implantation of the St Jude Medical (SJM) Regent aortic valve (St Jude Medical, Inc, St Paul, Minn), they describe a modified technique, using tourniquets to pull down the valve before tiding. This kind of maneuver is normally not necessary when inserting supra-annular prostheses provided by other manufactures.

The main message of our report was that, being presented with a new modification of the SJM valve, we encountered technical problems in routine valve replacement operations, using standard, widely recognized suture techniques. In the cases presented, the leaflets were unmovable and rotation was impossible due to entrapment of the subvalvular tissue into the hinge. Whether or not the

term “acute leaflet arrest” is correct remains a minor issue; the situation was unexpected and very unpleasant. The operations were performed by senior cardiac surgeons who had implanted a large number of several types of aortic valve prostheses during more than 25 years. Further, since publishing our negative results, other colleagues have confidentially reported anecdotal cases similar to ours.

In contrast to other prostheses that can be implanted entirely above the ring, the hinges of the SJM Regent valve are still placed below the annulus. Consequently, this valve cannot be regarded as a true supra-annular valve. Therefore, we find the statement in the first line of Gerosa’s letter, claiming that the SJM Regent valve “represents the ultimate step in bileaflet valve engineering,” difficult to accept.

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Reference

1. Øvrum E, Tangen G. Acute leaflet arrest in St. Jude Medical Regent aortic valve *J Thorac Cardiovasc Surg.* 2005;129:1446.
doi:10.1016/j.jtcvs.2005.08.026

St Jude Medical Regent valve To the Editor:

The recent publication by Øvrum and Tangen¹ describes acute leaflet arrest with implantation of the St Jude Medical Regent valve (St Jude Medical, Inc, St Paul, Minn), specifically accumulation of subvalvular tissue into the leaflet and hinge mechanism. Several issues need to be raised with this brief report.

The St Jude Medical Regent valve, as noted, is implanted in the supra-annular position; only the pivot guards are intra-annular (Figure 1). My colleagues and I have described our technique for implanting all St Jude Medical valves utilizing everting mattress sutures and have used this technique in more than 5000 patients monitored for up to 25 years.^{2,3} We have not had issues of annular tissue impingement preventing the opening of the valve with any of the St Jude Medical models. Although leaflet opening has been impeded rarely by hypertrophic septa, turning the valve has provided relief. Utilizing ventricular-to-aortic suture (noneverting), particularly if the depth of the bite into aortic annulus is too great or the valve is not seated properly, can force annular tissue into the lumen of the prosthetic valve.

Figure 1. The St. Jude Medical HP valve (left) is seated intra-annular, while the Regent sewing ring supra-annular. **Note:** The sewing ring of the HP model diameter is equal to the pivot diameter, while the sewing ring of the Regent model is off-set 0.5 mm. The pivot guard on the Regent must be positioned properly intra-annularly.