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Key Words: tricuspid annulus, annuloplasty, strain

Discussion

Dr Song Wan *(Hong Kong, China)*. Congratulations, Dr Malinowski, for this excellent presentation, and I think this elegantly designed and carefully conducted study definitely will enhance our understanding about tricuspid valve geometry and dynamics.

My first question to you: Because your studies were all performed in healthy normal animals, one may assume the normal saddle shape of the tricuspid valve is well maintained before surgery. So it's a little bit surprising to see after flexible band annuloplasty basically it has completely flattened the tricuspid valve. And this is actually in contrast to our previous many experimental and clinical observations on the mitral valve, where the flexible band can maintain the saddle shape. So can you enlighten us a little bit on this aspect?

Dr Marcin Malinowski *(Grand Rapids, Mich)*. Thank you so much for the question. Let me first address your first comment. Of course, this kind of a study had a certain limitation. It was done on healthy animals without previous annular dilation or previous functional tricuspid regurgitation. So bearing it in mind, of course, we have to have limited extrapolation to the clinic. But, of course, as you correctly pointed out, that's what we saw, that implantation of that flexible band flattened the annulus. And we were surprised by that based on the decades of previous experiments on the mitral valve when, as you mentioned, the flexible rings maintained the saddle shape.

I think that there may be a 2-fold explanation for this. First of all, we are on the right side, so we have completely different compliance of the right ventricle in comparison to the left side. And second, usually with this kind of study done previously on animals on the mitral side, we usually implanted the ring—the full ring—and here on the tricuspid side we used a band. So that may be another possible explanation.

But of course this is a very interesting finding and we would like to explore it more in the future.

Dr Wan. Okay. My second question—and, really, I appreciate you sharing your manuscript a few days early so that I can look into many details—you said you measured annular height to commissural width ratio at the maximal valve area time. If I understand correctly, that's the end-diastolic phase.

Dr Malinowski. That's around end-diastolic, because it differs animal to animal and not precisely at that time. But it was within the boundaries of the end-diastolic, that's correct.

Dr Wan. But the point is what we are really interested in is the end-systolic phase. We want to know the annular height to commissural width ratio at the end-systolic phase. That actually, again based on the mitral research, really matters.

Dr Malinowski. We have the data, so we will be glad to provide the data on any time point, basically.

Dr Wan. Excellent. Finally, a very short question. Any animal after weaning from cardiopulmonary bypass needed pacing, especially in the Contour 3D (Medtronic, Minneapolis, Minn) group?

Dr Malinowski. I think among 10 of them, 2 required pacing because of the way they are implanted, so that they cover most part of the septal leaflet, and in fact 2 required pacing, that's correct.

Dr Wan. I am not familiar with the animal conduction system anatomy, but based on our clinical experience, the TriAd Adams ring (Medtronic) can significantly avoid injury to the conduction system.

Dr Malinowski. The construction of the TriAd Adams ring is completely different. It's wide open, so that was the idea behind this design, to make it open to avoid this kind of conflict with the conduction system. And that's correct; we didn't see any conduction system interference with the other groups in contrast to the Contour 3D ring.

Dr Wan. Thank you, and once again, thanks for the honor of discussing this.