Letter to the Editor

Does the clover technique fit the annular physiology?

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We have read the study of Lapenna et al. with great interest [1]. We think that these techniques are not compatible with the co-aptation physiology. Our concerns are as follows.

If we apply the clover technique to a normal (without regurgitation) tricuspid valve, would this create an insufficiency? Yes, it would. This is because the free edges of the leaflets could not adapt to changes in filling and stroke volumes and ejection fractions after the clover technique. In the changing volume system, do not the leaflet edges change their locations at the annular plane? What kind of strategies did the authors use to prevent this?

The tricuspid annulus shrinks from diastole to systole, thus decreasing its area and contributing to co-aptation. Flexible rings change the annular shape and decrease the annular area. (Can the flexible rings you used decrease their circumference?) These changes occur through bulging internally or externally and inferiorly or superiorly. Would not these changes disrupt the co-aptation mechanism?

In the de-Vega annuloplasty technique, we could not be sure of co-aptation. This is because we leave the initiative to annular movement and regurgitating volume regarding what part of the annulus would shrink.

In rupture of chordae, why did the authors not think to treat this situation without formation of a new chordae?

Reference


Reply to Kestelli et al.

Reply to the Letter to the Editor

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We would like to thank Dr Mert Kestelli et al. for their interest in the clover technique and for the issues they addressed in this letter [1]. Certainly, the clover technique changes the morphology of the tricuspid valve as it does the edge-to-edge technique with the mitral valve. However, it has been clearly demonstrated that the hemodynamic behaviour of a double-orifice mitral valve does not differ from that of a physiological valve of same total area [2]. Our echocardiographic and clinical data show that this concept applies to a clover-shaped tricuspid valve as well. Therefore, no stenosis or restricted filling occurs, even during exercise, unless the total area of the three orifices is excessively decreased, which is usually not the case. If we apply the clover technique to a normal tricuspid valve, this would not create an insufficiency unless the leaflets are distorted by a wrongly positioned central stitch. Moreover, since the stitch is only centrally located, the remaining portions of the free edges of the leaflets still preserve their ability, although partially reduced, to adapt their location according to changes in filling and stroke volume. As a matter of fact, none of the clover-repaired tricuspid valves in our series did show different behaviour or intermittent—recurrent regurgitation, depending on the degree of filling of the right ventricle. Even during exercise echocardiography, this finding was never observed. Some of the rings we used were flexible. Those rings can certainly change (to a certain extent) their size and shape and therefore preserve annular movement. However, in our experience, regardless of the type of annuloplasty performed, rupture of the suture has not been an issue, which is not of much concern.

Finally, conventional techniques, including the use of artificial chordae, have been adopted in the past in our Institution to treat complex forms of tricuspid regurgitation as those described in our article [3]. Unfortunately, the early and mid-term results have not been satisfactory as those we have been able to achieve so far with the clover technique.

Reference