Put a ring on it?

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Central Message

Patients with tetralogy of Fallot undergoing pulmonary valve replacement should receive a tricuspid valve ring if they have more than moderate tricuspid regurgitation.

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As our understanding of the indications for pulmonary valve replacement in patients with tetralogy of Fallot and pulmonary valve insufficiency becomes clearer, we also need to clarify the indications for simultaneous tricuspid valve repair. The current literature contains mixed messages, with in some instances nearly diametrically opposed opinions regarding the management of associated tricuspid valve insufficiency.^{1,2} In this issue of the *Journal*, Roubertie and colleagues³ from Bordeaux, France, have truly helped to clarify this clinical conundrum. The conclusion of their review is that patients with *severe* tricuspid valve insufficiency should undergo placement of a tricuspid ring at the time of pulmonary valve insertion. In contrast, if the patient has *moderate* tricuspid valve insufficiency, then there is no obvious benefit to tricuspid valve repair because such patients all improved as the right ventricle remodeled. This study may lead to a change in practice pattern for some surgeons. In some cases, this will eliminate an unnecessary operation previously thought to be beneficial; in others, it will lead to performing a much-needed operation that will improve the patient's quality of life.

Of course, there is some risk to addressing the tricuspid valve at the time of pulmonary valve replacement. The complexity of the operation is increased, necessitating more extensive dissection, bicaval venous cannulation, caval snares, and a longer crossclamp time. An improperly performed tricuspid valve repair can potentially cause tricuspid valve stenosis or injury to the atrioventricular node. These complications were avoided by the surgeons from Bordeaux.³ On the other side of that spectrum are the patients who do not have their tricuspid valve addressed and end up requiring a reoperation for tricuspid valve replacement. In the experience of Roubertie and colleagues³ and others, tricuspid valve *reoperations* with a replacement are associated with high mortality and poor long-term outcomes.

A finding interesting to me in the review of Roubertie and colleagues³ was the annular diameter of the tricuspid valve. In the patients with no or mild tricuspid regurgitation, the annular diameter was 29.4 mm. In those with

moderate tricuspid valve insufficiency, the diameter was 33.2 mm. Finally, in those with severe tricuspid valve insufficiency, the diameter was 36.9 mm. Further studies with more patients may possibly provide a cutoff for recommending tricuspid valve repair in addition to the echocardiographic assessment of severity. Tricuspid annular diameter has been considered a factor when determining indications for tricuspid ring placement in adult patients undergoing mitral valve surgery.⁵ One other note is that patients with tetralogy of Fallot and pulmonary valve insufficiency are known in some cases to have supraventricular tachycardia. These patients should all be carefully evaluated by an electrophysiologist before the operative intervention. Should the patient have evidence of right-sided arrhythmias that are not amenable to transcatheter ablation, strong consideration should be given to performing a right-sided maze procedure at the time of the pulmonary valve replacement (with or without tricuspid valve repair).⁴

In summary, the surgical group from Bordeaux³ has helped to clarify the indications for tricuspid valve repair in patients requiring pulmonary valve replacement after tetralogy of Fallot repair. Their outcomes with a group of more than 100 patients undergoing pulmonary valve replacement strongly suggest that the indications for tricuspid valve repair at the time of pulmonary valve replacement are clear. If the patient has more than moderate tricuspid valve insufficiency, the surgeon should put a ring on it!

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