injury to the conduction system [4]. Spherical remodeling of the overloaded right ventricle may cause the septum-parialdiotemal dimension to preferentially increase, similar to what happens to the left ventricle with cardiomyopathy. The very reasons why many surgeons do prefer rigid mitral rings in that setting could therefore apply to tricuspid valve pathology as well.

Our study aimed to evaluate the application to the tricuspid valve of a flexible prosthetic band originally devised for mitral valve repair [6, 7]. Patients studied had moderate or severe TR associated with mitral valve disease, though cases with mild TR were similarly treated in the presence of significant dilatation of right heart chambers. The severity of this dilatation was confirmed at surgery by inspection of the heart and visual exploration of the tricuspid valve following right atriotomy. We are well aware this subjective evaluation is the main drawback of the study. However, subjective as it may be, assessment of right atrial and ventricular volumes, right atrial free wall thickness, caval size and tricuspid ostium may indirectly indicate a significant degree of volume overload no less reliably than a single episodic measurement of the regurgitant jet flow. Also, the preoperative right atrial maximum end-systolic area index >10 cm²/m² retrospectively confirmed the severe degree of right atrial dilatation, supporting the surgeon’s visual inspection and evaluation.

Our results support an aggressive surgical approach to significant tricuspid regurgitation as defined above. In-hospital mortality compared favorably with predicted estimates. Only one patient died during follow-up. No deaths could be imputed to the tricuspid annuloplasty band. Significant decrease of NYHA class and systolic pulmonary artery pressure confirmed good surgical treatment of the left-sided cardiac valves pathology. Correction of mitral regurgitation accounted for mild and non-significant decrease of left ventricular ejection fraction after surgery.

In conclusion, the Koehler band proved easy to implant, effective and durable. The systematic downsizing of the prosthetic ring should be performed for correction of functional TR due to left-sided valves disease. We suggest, ideally, annular remodeling with tricuspid annuloplasty to correct increased circularity and planarity, and restore the normal bimodal – elliptical shape of the tricuspid annulus to reduce leaflet tethering and stress [2]. This may be achieved by using prosthetic remodeling annuloplasty (i.e. flexible band and remodeling ring), especially in patients with significant TR and right-sided cardiac chambers dilatation, with history of right heart failure. We have a large experience in surgical treatment of significant TR due to left-sided valves disease. We suggest, that tricuspid valve prosthetic annuloplasty with remodeling flexible ring should be performed for correction of functional TR in patients with:

- significant TR (3+ or 4+) and/or significant tricuspid annulodilatation
- significant right ventricle enlargement and/or high pulmonary hypertension
- systolic dysfunction in one or both heart ventricles
- tricuspid leaflets tethering

In addition, we perform downsized ring annuloplasty. The systematic down-sizing of the prosthetic ring has played an important role in decreasing the incidence of significant residual or recurrent TR, or both, after repair.

References


eComment: Tricuspid valve prosthetic annuloplasty

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We thank the authors for this very interesting information [1]. It is known that with functional tricuspid regurgitation (TR) the annulus becomes larger, more planar, and circular. We support, ideally, annular remodeling with tricuspid annuloplasty to correct increased circularity and planarity, and restore the normal bimodal – elliptical shape of the tricuspid annulus to reduce leaflet tethering and stress [2]. This may be achieved by using prosthetic remodeling annuloplasty (i.e. flexible band and remodeling ring), especially in patients with significant TR and right-sided cardiac chambers dilatation, with history of right heart failure. We have a large experience in surgical treatment of significant TR due to left-sided valves disease. We suggest, that tricuspid valve prosthetic annuloplasty with remodeling flexible ring should be performed for correction of functional TR in patients with:

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References


eComment: Should stitch annuloplasty really be abandoned for developed flexible prosthetic band or ring in functional tricuspid regurgitation?

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I read with great interest the recent article by Gatti and colleagues [1] in the ICVTS. They report satisfactory short-term clinical and echocardiographic results of tricuspid valve annuloplasty with a flexible prosthetic band (Koehler band) in 53 patients with significant tricuspid regurgitation and dilatation of the right-sided cardiac chambers. I would like to add some comments to this topic.

In cardiovascular practice, various repair techniques have been advocated in patients with functional tricuspid regurgitation secondary to left-sided valve disease, those of which include the use of flexible and rigid prosthetic rings or three-dimensional rings, flexible prosthetic bands, use of artificial chordae with polytetrafluoroethylene sutures for anterior and septal tricuspid leaflet pathology, stitch annuloplasty such as semicircular (De Vega repair) or simple lateral annuloplasty (Kay), and novel techniques such as edge-to-edge technique [2] or cover technique [3].

Selecting of the annuloplasty type is mostly a matter of surgeon choice, and the underlying valve pathology. Although the literature contains little information concerning the late results of tricuspid valve repair, I also believe that tricuspid annuloplasty preserves the geometry and function of the right ventricle and avoids complications inherent in prosthetic valve surgery. Tricuspid valve repair does not add morbidity or mortality to a left-sided valve surgery.

Currently, the most common surgical procedure performed for repairing tricuspid annular dilatation is undersized tricuspid annuloplasty resulting in increased tricuspid leaflet coaptation and decreased tricuspid regurgitation.

The subject of leaflet tethering, which results from apical and lateral displacement of the papillary muscles secondary to progressive right ventricular dilation, may not completely be solved by tricuspid annuloplasty alone and may cause late recurrence of tricuspid regurgitation. Castedo and colleagues reported that an approach including the tricuspid bicuspidalization achieved by posterior leaflet plication, a double valve orifice obtained by approximation of the free edges of the septal, and the newly created antero-posterior leaflets were very effective in patients with severe tethering effect and great annulus diameter in which DeVege’s annuloplasty was previously performed.

In our clinic, in patients with very dilated tricuspid annulus and/or severe tricuspid regurgitation, we have performed ring annuloplasty techniques, but the stitch annuloplasty has been used as well for surgical correction of less pronounced enlargement of the tricuspid annulus.

In their experience compared to ring annuloplasty with a mean follow-up time of 3 years, Ganth and colleagues [4] suggested that bicuspidization annuloplasty was a reliable method for tricuspid annuloplasty and should be given consideration when approaching every patient with functional tricuspid regurgitation undergoing aortic or mitral valve surgery. They conclude that there is not a significant difference between two annuloplasty techniques.

Additionally, as reported in the authors’ article, it makes satisfactory short-term results difficult to put in perspective for a long-term period. Therefore, I agree with the authors that longer-term evaluations are required to determine the stability of tricuspid valve repair using Koehler band.

As a conclusion, instead of implanting a prosthetic ring or band, I think that stitch annuloplasty may still be useful for the correction of moderate functional tricuspid regurgitation in patients undergoing left-sided valve surgery because of a simpler, inexpensive, and less time-consuming procedure with few complications.

References


