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Maximal Beneficials Foreshows of Adopting De Vega Annuloplasy Technique Addressing Secondary Severe Tricuspid Regurgitation

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Abstract

Background: Persistence of significant secondary tricuspid regurgitation (TR) after its repair concomitant with a left-sided valve replacement contributes to increased mortality and morbidity in the immediate and late postoperative periods. Thus, attention is paid to trace risk factors that might affect the success of the repair. However, the knowledge of the exact underlying risk factors and relevant mechanisms contributing to progression of secondary TR is less.

Aim of Study: This study aims at identifying the effectiveness of adopting De Vega annuloplasty technique in dealing with cases of secondary severe TR in decreasing or abolishing it (over one year follow-up period) and evaluating the possible risk factors of failure of repair as well. As such, the purpose of addressing agents favoring the best accepted results of the nominated maneuver and planning the optimal surgical method of such secondary TR could be achieved.

Patients and Methods: This retrospective observational non-randomized study included 31 patients who had repair of the tricuspid valve (TV) by De Vega annuloplasty technique. They presented with either mitral valve disease and associated secondary severe TR (double valve disease) or combined mitral and aortic valves disease and associated secondary severe TR (triple valve disease). They had been operated upon be either mitral valve replacement (MVR) and De Vega annuloplasty for the TV or combined MVR and aortic valve replacement (AVR) i.e., double valve replacement (DVR) and De Vega annuloplasty for the TV. Postoperative mortality, morbidity outcomes, overall hospital complications, left ventricular ejection fraction (LVEF%), TR degree, functional clinical status, predictorsof failure of TV repair and overall one-year survival were evaluated.

Results: Mean age was 37.25±7.31 years. The overall hospital complication rate was 25.80%. No mortality happened during the follow-up period (overall one-year survival rate was 100%). The cumulative duration of the study was 3.167 years.

Significant improvement in the degree of TR, New Yok Heart Association (NYHA) classification and LVEF% was observed. Identified risk factors that were found to be statistically significant predictors of progression of the secondary TR after surgery by multivariable analysis were preoperative heart failure [OR: 14.245 (95% CI: 2.658-93.352); p= 0.002], prolonged period from onset of diagnosis to surgery [OR: 11.213 (95% CI: 2.234-86.584); p=0.006], atrial fibrillation (AF) [OR: 2.33 (95% CI: 1.088-5.068); p=0.018], enlarged left atrial diameter (LAD) [OR: 2.011 (95% CI: 0.981-9.375); p= 0.049] and dilated right ventricle (RV) [OR: 1.561 (95% CI: 1.115-2.389]; p<0.001).

Conclusion: Repair of the secondary TR at the setting of left-sided valve surgery is critical in achieving better results of preserving LVEF%, NYHA maneuver in dealing with severe secondary TR.

Predictors of progression of secondary TR and failure of repair include preoperative heart failure, prolonged period from onset of diagnosis to surgery, AF, enlarged LAD and dilated RV. Preoperative assessment of these risk factors is crucial in decision-making and determining the best surgical option. We recommend applying De Vega annuloplasty in patients with any of these risk factors in their preoperative profile.

Key Words: *De Vega annuloplasty technique – Severe tricuspid regurge – Secondary TV regurgitation.*

Introduction

SECONDARY tricuspid valve (TV) regurgitation is met commonly as functional to left-sided valve disease including both mitral and aortic **[1]**. Repair of the TV is done for both asymptomatic patients with severe regurge while concomitant left-sided valve surgery is triggered and of course symptomatic ones suffering from severe tricuspid regurge (TR) who received maximal medical treatment **[2]**. This class one surgical indication was agreed upon by The American College of Cardiology/American Heart Association (ACC/AHA) and the European Society Of Cardiology (ESC) as well **[3,4]**.

Repair of secondary severe degree of regurgitation of the TV is carried out by most cardiac surgeons. De Vega annuloplasty technique has been adopted by many of them for its simplicity, accept-

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able results, and being economic compared to other repair options. In this procedure, single continuous 3/0 poly-propylene double-armed suture extending from the anteroseptal commissure to the posteroseptal commissure extending to the right edge of the trigonum fibrosum to a point opposing the coronary sinus with teflon pledgets at each commissure is used to plicate the anteroposterior annulus of the TV **[5]**.

Persistence of significant TR after its repair concomitant with a left-sided valve replacement contributes to increased mortality and morbidity in the immediate and late postoperative periods. Thus, attention is paid to trace risk factors that might affect the success of the repair **[6]**.

However, the knowledge of the exact underlying risk factors and relevant mechanisms contributing to progression of TR is less. Of these, the preoperative heart failure condition, the time lag from onset of diagnosis to surgery, atrial fibrillation (AF), enlarged left atrial diameter (LAD), dilated right ventricle (RV), and the persistence of pulmonary hypertension (PH) **[1]**.

This study aims at identifying the effectiveness of adopting De Vega annuloplasty technique in dealing with cases of secondary severe tricuspid regurgitation in decreasing or abolishing it (over one year follow-up period) and evaluating the possible risk factors of failure of repair as well. As such, the purpose of addressing agents favoring the best accepted results of the nominated maneuver and planning the optimal surgical method of such tricuspid regurge could be achieved.

Subjects and Methods

Study design:

This retrospective observational non–randomized study included 31 patients who had repair of the TV by De Vega annuloplasty technique. They presented with either mitral valve disease and associated secondary severe TR (double valve disease) or combined mitral and aortic valves disease and associated secondary severeTR(triple valve disease). They had been operated upon be either mitral valve replacement (MVR) and De Vega annuloplasty for the TV or combined MVR and aortic valve replacement (AVR) i.e., double valve replacement (DVR) and De Vega annuloplasty for the TV. All relevant data about the TV repair maneuver adopted in the whole study population were studied and thoroughly evaluated in the preoperative, intraoperative, and over one-year postoperative periods. Written informed consent of each and every patient was obtained preoperatively. All surgeries were carried out in Egypt (conducted in the operating theatre of the Department of Cardiothoracic Surgery, Faculty of Medicine, Cairo University) using standard open-heart surgical procedures. Data of the study was collected for the operated-upon patients in the period between September 2019 and November 2022. The data of the study population was collected from the cardiothoracic section computer database supplemented by a review of hospital records. Approvals of the Scientific Committee of the Department of Cardiothoracic Surgery, the Scientific Committee of the Faculty of Medicine, and the Ethical Committee of the Faculty of Medicine, Cairo University were all obtained. The study was approved by the Research Ethics Committee (REC) and its registration number is N-82-2023 on 04-03-2023.

Inclusion and exclusion criteria:

Included population were patients presented with mitral valve disease and associated secondary severe TR and patients presented with combined mitral and aortic valves disease and associated secondary severe TR. The excluded patients were those with echocardiographic evidence of organic TV disease requiring concomitant tricuspid valve replacement (TVR), patients with concomitant ischemic heart disease (IHD) requiring coronary artery bypass grafting (CABG) surgery and re-do cases. Extremes of age (less than 17 or more than 70 years) were not involved in the study.

Management regimen:

Preoperatively:

The assessed preoperative variables included age, sex, smoking, functional class according to the New Yok Heart Association (NYHA) classification, complete general and local cardiological clinical evaluation, estimated time from onset of diagnosis to surgery, hypertension, diabetes mellitus, chronic obstructive pulmonary disease (COPD), AF, rheumatic fever history, routine preoperative laboratory investigations [complete blood count (CBC), liver and renal function tests, coagulation profile, serum electrolytes (sodium and potassium), fasting blood glucose (FBG)], resting 12-lead electrocardiogram (ECG), plain chest X-ray, cardiac catheterization and preoperative baseline transthoracic echocardiography (TTE) addressing measures of LAD, right ventricular diameter (RVD), left ventricular ejection fraction per cent (LVEF%), tricuspid annular plane systolic excursion (TAPSE), pulmonary artery pressure (PAP) and TV morphological changes. Color Doppler was used to assess

the regurgitant jet into the right atrium (RA). Tricuspid regurgitation per cent (TR%) (demonstrating the degree of TR) was calculated by the ratio of the maximal regurgitant jet area to the RA area using planimetry [7]. The degree of TR was determined accordingly. Mild TR was identified when TR% is <20%, moderate TR with 20-34% and severe TR if >34% [8].

Intraoperatively:

The analyzed operative variables included intraoperative mortality, aortic cross-clamping (ischemic) time, cardiopulmonary bypass (CPB) time, and inotropic support demand.

Operative technique:

All the patients were routinely scrubbed and draped exposing the chest. After standard median sternotomy, pericardiotomy, and suspension of the pericardial edges, the ascending aorta was cannulated followed by bicaval cannulation for venous drainage with application of tapes around the superior (SVC) and inferior (IVC) vena cava (to be snared when the RA was opened later to guard against massive air embolism). A two-way cannula was inserted in the aortic root for venting. After institution of CPB, cooling started to achieve systemic core body temperature of 28-30°C. The ascending aorta is then cross-clamped and proper myocardial protection was achieved by intermittent antegrade infusion of cold crystalloid cardioplegia initially for 45 minutes then every 30 minutes for the subsequent doses. All the patients were submitted for MVR. Typically for all of them, it was done via left atriotomy in the Waterston Groove. In cases with triple valve disease, concomitant AVR was conducted via aortotmy incision.

After aortic declamping, de-airing maneuvers, re-warming and upon regaining cardiac activity, cavae were snared and oblique right atriotomy was done with applying right atrial retractor to expose the TV. De Vega annuloplasty was done on warm beating heart using single continuous 3/0 polypropylene double-armed suture extending from the anteroseptal commissure to the posteroseptal commissure of the TV extending to the right edge of the trigonum fibrosum to a point opposing the coronary sinus with teflon pledgets at each commissure. Reduction of the anteroposterior annulus was achieved by tightening the suture over a 27-29mm sizer such that the slightly diverged index and middle fingers were hardly admitted in the valve. Testing the competency of the repair was done to confirm absence of regurgitation prior to closing the right atriotomy [5].

Postoperatively:

The assessed postoperative variables included hemodynamic status in the intensive care unit (ICU), duration of mechanical ventilation, duration of inotropic support, total ICU stay, immediate postoperative mortality, morbidity, and adverse complications during hospital stay (the overall hospital complication rate was calculated on the basis of the number of patients with at least one hospital complication), total duration of hospital stay, routine prior-to-discharge TTE (stressing on assessment of replaced valve function, repaired TV status and LVEF%), postoperative one-year morbidity, mortality, complications, complete general and cardiological assessment with NYHA functional class, and one-year follow-up TTE (for assessment of replaced valve function, degree of TV regurgitation and measures of LAD, RVD, TAPSE, PAP and LVEF%).

Statistical analysis:

All patients' data were tabulated and processed using SPSS V 13.0 (SPSS Inc., Chicago, IL). Quantitative variables were expressed using mean and standard deviationand were compared using *t*-student test. Qualitative variables were compared using Chi-square test or Fischer's exact test when appropriate. Correlation between parameters was performed using Spearman's rank correlation coefficient. Analysis of risk factors predicting progression of TR were performed by multivariable logistic regression analysis. In all tests, *p*-value was considered significant when $p<0.05$, highly significant when $p<0.01$ and extremely significant when $p<0.001$.

Results

Preoperative data:

The study population were 18 (58.06%) males and 13 (41.93%) females whose ages ranged from 18 to 62 years with a mean age of 37.25±7.31 years. Smokers were 12 (38.71%). Hypertensives were 5 (16.12%). Chronic renal disease was found in 2 (6.45%) and the mean creatinine value was 0.9±0.45mg/dl. Diabetics were 3 (9.67%) and their mean FBG level prior to surgery was 150.22±11.5 mg/dl. 27 (87.09%) patients were in NYHA class III and the rest 4 (12.90%) were in NYHA class IV. Rheumatic fever history was 100% positive. The mean estimated time from onset of diagnosis to surgery was 10.12±2.21 months. Preoperative AF was diagnosed in 14 (45.16%). The mean LAD was 5.81±0.63 centimeter (cm). Mean RVD was 5.13±0.67cm with mean TAPSE of 1.7±0.18 cm. Mean LVEF% was 60.54±2.21 %. PH was diag-

nosed in 16 (51.61%) and the mean PAP was 53.18±8.14mmHg.

Operative data:

27 (87.09%) had MVR and TV De Vega annuloplasty and 4 (12.90%) had MVR, AVR and TV De Vega annuloplasty. No intraoperative mortality occurred. Mean total operative time was 189.18± 20.44min., mean total bypass time was 125.15± 19.02min. and mean total cross clamp time was 91.25±15.30min. All patients transferred to ICU on epinephrine infusion 5-10 microgram/kg/min. and norepinephrine 5-10 microgram/kg/min. was added to 13 (41.93%).

Postoperative data:

The mean period of the total ICU stay was 51.45±7.21 hours. The mean total duration of mechanical ventilation was 12.01±4.88 hours, mean duration of inotropic support was 21.33±2.05 hours and mean total blood loss was 732.21±220.32ml. No cerebro-embolic, deep surgical wound infection nor respiratory adverse events were faced. But hemorrhagic complication was faced with 2 (6.45%), superficial surgical wound infection was encountered in 6 (19.35%), transient renal dysfunction occurred to 1 (3.22%) while temporary heart block was faced in 4 (12.90%). The overall hospital complication rate was 8 (25.80%). No mortality happened in the ICU period or during the hospital stay period. Routine prior-to-discharge TTE confirmed functioning well-seated replaced prostheses and trivial residual TR in 9 (29.03%) (p<0.01) with a mean LVEF% 53.20±3.79%. The mean duration of the total hospital stay was 9.32±1.99 days.

The mean period for return to work was 61.35±8.01 days. No mortality happened during the follow-up period (overall one-year survival rate was 100%). Significant improvement in the degree of TR, NYHA clinical status and LVEF% was observed (Table 1). The cumulative duration of the study was 3.167 years. Multivariable analysis was done to identify the possible risk factors that could predict hindering complete success of the annuloplasty technique in abolishing or greatly diminishing the TR postoperatively and consequently-theoretically-they could cause progression of it in the non-repaired TV. Identified risk factors that were found to be statistically significant predictors of progression of the secondary TR after surgery by multivariable analysis were preoperative heart failure, prolonged period from onset of diagnosis to surgery, AF, enlarged LAD and dilated RV (Table 2).

Table (1): One-year follow-up postoperative TR degree, NYHA clinical status and TTE findings. Categorical variables are expressed as numbers and percentages and continuous variables as mean and SD.

Variable	Preoperative	One-year Postoperative	p-value
Functional Status:			
NYHA class I	0	26 (83.87%)	<0.001
NYHA class II	0	5 (16.12%)	<0.001
NYHA class III	27 (87.09%)	0	<0.001
NYHA class IV	4 (12.90%)	0	<0.001
TR degree:			
No or Trivial	0	2 (6.45%)	<0.001
Mild	0	24 (77.41%)	<0.001
Moderate	0	5 (16.12%)	<0.001
Severe	31 (100%)	0	<0.001
TTE Findings:			
EF (%)	60.54±2.21	64.20±2.87	0.05
LAD (cm)	5.81±0.63	5.23±0.12	0.05
RVD (cm)	5.13±0.67	4.12±0.34	<0.001
PAP (mmHg)	53.18±8.14	32.43±2.99	<0.01
TAPSE (cm)	1.7±0.18	1.6±0.79	0.05

NYHA : New York Heart Association.
TR : Tricuspid regurgitation.
EF : Ejection fraction.
LAD : Left atrial diameter.
RVD : Right ventricular diameter.
PAP : Pulmonary artery pressure.
TAPSE : Tricuspid annular plane systolic excursion.

Table (2): Risk factors of progression of TR by multivariable logistic regression analysis.

Risk factor	OR	p-value	95% CI
Preoperative heart failure	14.245	0.002	2.658-93.352
Prolonged period from onset of diagnosis to surgery	11.213	0.006	2.234-86.584
AF	2.33	0.018	1.088-5.068
Enlarged LAD	2.011	0.049	0.981-9.375
Dilated RV	1.561	<0.001	1.115-2.389

TR : Tricuspid regurgitation.
AF : Atrial fibrillation.
LAD: Left atrial diameter.
VD: Right ventricle.
OR: Odds ratio.
CI : Confidence interval.

Discussion

Secondary TV regurgitation is a commonly encountered surgical entity met with rheumatic left-sided cardiac valve pathology in a ratio of 1:3 patients **[9]**. However, its lines of management face everlasting contradictory reports. While it's generally believed that it might regress spontaneously gradually after successful surgical correction of the left-sided valve lesion, its progression is reported. Even late significant postoperative TR is reported in 16-37% of patients who hadn't received any TV surgical intervention in some studies **[6,10]** with resultant higher mortality and morbidity rates **[1]**.

The ACC/AHA and the ESC guidelines recommend concomitant surgical intervention of less than severe degree of secondary TR (at the setting of left-sided valve surgery) when there is TV annular dilatation >40mm **[11]**. These are aided by several recent reports confirming worsening of both early and late postoperative outcomes if significant secondary TR hadn't been corrected. They attribute it to progression of TR and right-sided heart failure **[12]**. Therefore, surgical correction of secondary TR at the time of left-sided valve surgery is crucial.

Of these reports the one by Frater et al. **[13]** who strongly recommend repair of the apparent intraoperative mild secondary TR. They claim that the moderate or even the severe secondary TR may appear only in mild fashion intraoperatively because the secondary TR is dynamic. Moreover, several studies demonstrate freedom from moderate or severe TR in >85% of patients who had undergone TV annuloplasty at 10-years follow-up in comparison to <50% of those who hadn't **[14]**.

Our study adopted De Vega annuloplasty technique to repair the secondary severely regurgitant TV at the setting of MVR in 27 (87.09%) patients and DVR (MVR and AVR) in 4 (12.9%) patients; a similar cohort to others **[1,15]**. However, our cohort' sages ranged from 18 to 62 years with a mean age of 37.25±7.31 years; younger than others which was 49.70±15.80 (range: 32-70) years in the study conducted by Wang et al. **[1]** and 45.40± 6.71 years in the study by Abdelmohty et al. **[15]**. Our cohort's preoperative demographic data and NYHA classification resembled other studies **[1,15]** and Choi et al. **[16]**. The mean preoperative LVEF% in our cohort was 60.54±2.21%; a preserved left ventricle (LV) in a cohort that doesn't include associated pathologies impairing it. Other studies showed higher LVEF% **[15]** while others showed lower ones **[1]**.

The TV repair was always done on a beating heart after declamping the ascending aorta, so our cohort's mean total cross clamp time was 91.25± 15.30min. and the mean total bypass time was 125.15±19.02min.; significantly shorter than what was reported by Choi et al. **[16]** but longer than what Abdelmohty et al., reported **[15]**. Our study population showed no mortality in the intraoperative, immediate postoperative and through hospital stay course. The overall hospital complication rate was 8 (25.80%). Our results were like Wang et al. **[1]**, Abdelmohty et al. **[15]**, Nardi et al. **[16]**, Hoe et al. **[17]** and Pradhan et al. **[18]**.

Over one-year follow-up, we had no mortality and statistically significant improvement in the degree of TR, NYHA clinical status and LVEF% was observed. In our study, which had cumulative duration of 3.167 years, no postoperative severe TR was encountered. 26 (83.87%) showed regression of the preoperative severe secondary TR to no or trivial -to- mild TR and 5 (16.12%) regressed to moderate TR. Wang et al. **[1]** in their series reported 4/31 (12.90%) having postoperative more than moderate TR and the remaining 27/31 (87.09%) having mild TR in their long-term follow-up study (mean 5.2±2.9 [range: 3-16] years after surgery). Also, Choi et al. **[16]** reported 9/174 (5.17%) had postoperative moderate or severe TR while the rest 165/174 (94.83%) had mild TR. Abdelmohty et al. **[15]** reported a rate of 75.75% freedom of the preoperative severe secondary TR at their 6-months follow-up study and so did Smid et al. **[20]** who reported 77.40-100% freedom rate in their 3-79 months follow-up study. Again, Kara et al. **[21]** reported 77.10-100% freedom of the preoperative severe secondary TR in their 3-64.8 months follow-up series.

NYHA classification of our cohort showed dramatic improvement at one-year follow-up where no candidate remained in NYHA class III or IV while most of the cohort expressed as 26 (83.87%) became in NYHA class I and the other 5 (16.12%) became in NYHA class II. Again, our results come comparably consistent with the results reported by other investigators **[1,9,15,16,20,21]**. This obvious observation of improvement of NYHA clinical status may be thus explained based on improved TR degree and right-sided heart failure stigmata. This provides a clear proof of the association between the decline in the degree of TR and the upturn in the NYHA class documenting the fact of this inverse relationship. This observation was reported by other researchers **[1,9,16,20,21]**. Opposing to our conclusion what was stated by Abdelmohty et al. **[15]**. Whilst they reported better improvement of NYHA class in their subgroup of patients who had undergone TV annuloplasty repair but there was no statistical difference compared to the subgroup who had left-sided valve surgery only, they reported that despite they had high rate of failed repair among their cohort, victims of postoperative moderate to severe TR could tolerate it well and showed minimal heart failure symptoms. They, thus, "couldn't accurately co-relate" the degree of postoperative recurrent TR and the right-sided heart failure symptoms to NYHA class.

Multivariable analysis was done to identify the possible risk factors that could predict hindering

complete success of the annuloplasty technique in abolishing or greatly diminishing the secondary TR postoperatively and consequently-theoretically-they could cause progression of it in the non-repaired TV. We could identify preoperative heart failure, prolonged period from onset of diagnosis to surgery, AF, enlarged LAD and dilated RV as statistically significant predictors. Our findings are like other authors' reported findings **[1,15,22,23]**.

Prolonged period of rheumatic affection of the heart (which was 100% in our cohort) causes progressive pathological changes including left-sided valve lesions, myocarditis with myocardial metabolic disorder impairing ventricular performance, myocardial hypertrophy and eventually atrial and ventricular dilatation with possible PH. These pathomorphological changes cause secondary TR (regardless of rheumatic affection of the TV). Corrected left-sided valve lesions might solve this problem but as the initiative pathology is a continuous progressive one, secondary TR may not regress and unfortunately it may even progress. Thus, the long periods of time from the onset of diagnosis and accordingly the prolonged attacks of heart failure and impaired NYHA class resemble independent predictors of failure of the attempted repair maneuver. This conclusion agrees with other researchers **[1,15,22,23]**.

The vicious circle of AF and LA dilatation plays an important role in the progression of secondary TR and predicts failure of its repair. AF impairs LA contractility as does its enlargement for any other reason. This leads to increased RV after load, RV dysfunction, RVD and TV annular dilatation with resultant secondary TR. One the other hand, enlarged LA is an independent risk factor for AF according to Framingham and Strong Heart studies **[24,25]**. Thus, persistence of AF postoperatively causes further remodeling of even both atria electrically and mechanically leading to more LA enlargement. Dilatation of the RA with progressive TV annular dilatation may contribute to progression of the secondary TR as reported by Vaturi et al. **[26]**. Other authors **[1,10,15,22,23]** agree to our results.

Dilated RV and progressive RV dysfunction with resultant everlasting never-spontaneously regressing TV annular dilatation were found to be critically important predictors of progression of secondary TR. This reflects the importance of three issues. First, properly performed annuloplasty is highly mandatory to help regression of the annular dilatation. Second, this finding explains the high rate of progression of secondary TR in patients who would undergo only left-sided valve surgery without any surgical intervention to the TV. Third, this reflects the importance of TAPSE in the preoperative evaluation stage. Although we found its comparable pre and postoperative results of statistically significant value (p=0.05), it wasn't found a predictor for failure of repair by the multivariable analysis. Porter et al. **[6]** in their work expressed the importance of TV annular dilatation in evaluating the progression of secondary TR and even they recommended it as an important indication for TV repair regardless the degree of severity of regurgitation claiming that it's associated with poor prognosis if left untouched. Again, other researchers agree with our results **[1,6,10,22,23]**.

PH may be responsible for RV after load, RVD, annular dilatation and progression of TR. However, there are contradictory reports about it as a predictor of failure of repair and progression of postoperative TR **[6,10]**. In our cohort, PH was diagnosed in 16 (51.61%) and the mean preoperative PAP was 53.18±8.14mmHg and the mean one-year follow-up PAP was 32.43±2.99mmHg with high statistically significant value (p<0.01). However, it wasn't found to be a predictor for failure of repair by the multivariable analysis. This may be explained by the postoperative drop of PAP and decreased incidence of persistent PH postoperatively. Similar results were reported by other authors **[1,6,10,17,19]**.

Conclusion:

Repair of the secondary TR at the setting of left-sided valve surgery is critical in achieving better results of preserving LVEF%, NYHA functional classification and regression of secondary TR. De Vega annuloplasty technique proved to be successful maneuver in dealing with severe secondary TR. Predictors of progression of the secondary TR and failure of repair include preoperative heart failure, prolonged period from onset of diagnosis to surgery, AF, enlarged LAD and dilated RV. Preoperative assessment of these risk factors is crucial in decision-making and determining the best surgical option. We recommend applying De Vega annuloplasty in patients with any of these risk factors in their preoperative profile.

Study limitations:

This study is a retrospective one, with relatively small number of cases, done by a single surgeon. Duration of follow-up and survival rate estimation was for one year, thus, longer follow-up periods are recommended to establish the results.

Conflict of interest:

None.

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المتنبئات بالمزايا القصوى لاعتماد تقنية دى فيجا الحلقية لإصلاح الارتجاع الثانوى شديد الدرجة فى الصمام ثلاثى الشرفات

يسهم استمرار الارتجاع الثانوى الشديد الدرجة فى الصمام ثلاثى الشرفات بعد اصلاحه أثناء جراحة استبدال صمامات القلب على الجهة اليسرى منه فى زيادة المضاعفات ومعدل الوفيات بعد الجراحة مباشرة وعلى المدى البعيد، ولذا زاد الاهتمام بدراسة المتنبئات بنجاح عملية الاصلاح. ولكن المعارف المتاحة لمعرفتها وطريقة تأثيرها لا تزال قليلة.

أجريت هذه الدراسة بهدف تقييم أثر تنفيذ تقنية دى فيجا الحلقية لعلاج حالات الارتجاع الثانوى الشديد الدرجة فى الصمام ثلاثى الشرفات فى تقليل أو التخلص من الارتجاع وأيضاً تقييم العوامل التى تتسبب فى فشل الإصلاح، وبالتالى التعرف على المتنبئات بنجاح عملية الإصلاح واختيار الوسيلة الجراحية المثلى.

تم تنفيذ هذه التقنية على إحدى وثلاثين مريضاً ومتابعتهم على مدار عام بعد إجراء الجراحة. وأظهرت الدراسة عدم حدوث وفيات أثناء أو بعد الجراحة لمدة عام المتابعة كما أظهرت نتائج مقبولة لما بعد الجراحة وتحسناً ملحوظاً ذو دلالة إحصائية فى وظيفة البطين الأيسر للقلب والحالة الصحية للمرضى وكذلك درجة الارتجاع فى الصمام ثلاثى الشرفات. كما تم التعرف على متنبئات نجاح عملية الإصلاح وهى حالة القلب قبل الجراحة وطول الفترة الزمنية منذ التشخيص وحتى الجراحة والرفرفة الاذينية وتضخم الاذين الأيسر والبطين الأيمن.

وهكذا يمكن استنتاج أن تنفيذ هذه التقنية الجراحية ليم تؤثر سلباً أثناء الجراحة بل وينبغى إصلاح الارتجاع الثانوى فى الصمام ثلاثى الشرفات أثناء جراحة استبدال صما مات القلب على الجهة اليسرى منه لتحقيق التحسن فى وظيفة البطين الأيسر للقلب والحالة الصحية للمرضى و كذلك درجة الارتجاع فى الصمام ثلاثى الشرفات. كما نستنتج نجاح التقنية فى علاج حالات الارتجاع الثانوى الشديد الدرجة فى الصمام ثلاثى الشرفات بتقليلة أو التخلص من الارتجاع تما ماً، وينبغى الوضع فى الاعتبار تقييم متنبئات نجاح عملية الإصلاح أثناء تقييم المريض قبل الجراحة لاختيار الطريقة الجراحية المناسبة للمريض، وأخيراً نوصى باستخدام هذه التقنية لأى مريض عنده أى من متنبئات نجاحها.