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Research Article

Surgical Correction of Tricuspid Component of Patients with Multi-Vessel Heartdefect.

Abdumadjidov Kh[1*], Buranov H.J[1], Isomitdinov B.Sh[2].

[1]Republican Specialized Center of Surgery named after academician V. Vahidova.

[2]Bukhara State medical institute after named Abu Ali ibn Sina

Corresponding Author Abdumadjidov, professor of the department surgical disease and reanimation, Bukhara State Medical institute

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Abstract:

The analysis of results of surgical correction of 326 (8%) patients with tricuspid pathology in rheumatic multi-valve heart defects. The age of our patients ranged from 12 to 74 years (mean 36.7 + 9.4). Women were 220 (67.5%), while men - 106 (32.5%). According to the degree of circulatory disorders, patients were divided according to the classification of chronic heart failure (CHF) in NYHA, where in functional class III were assigned 24 (7.4%), and to IY functional class NYHA - 302 (92.6%) patients. The clinic is the most commonly used plastic fibrous ring by De Vega. Of the 262 (80.5%) operated by the method of De Vega, at 26.9% after correction of regurgitation on tricuspid valve (TC) virtually disappeared, at 62.8% - regurgitation decreased from a low of 1 degree, and the remaining 10.3% were operated last was reduced to 2 (moderate) degree. In 8 (2.46%) cases of infective endocarditis was made "open" correction - prosthetics TC biological prosthesis. Known methods of creating a bicuspid tricuspid valve - Kay Reed Kay Boyd used in 13.4% of cases, but in recent years because of the low efficiency of data communication techniques greater preference for annuloplasty by De Vega.

Keywords: tricuspid component; multi-vessel heartdefect**;** tricuspid pathology

Introduction

The study showed: when hemodynamically insignificant defects from TC correction can be avoided. When regurgitation grade 2-3 (combination of stenosis and insufficiency) seemed tricuspid component defect correction. Due to the possibility of complication ventricular insufficiency in cases with highpulmonary hypertension hyper corrections unacceptable.

According to statistics, the cause of the combined heart disease is often a rheumatism, approximately 60-65% of cases, in the development of multi-valve heart defects also reveal rheumatoid history. Based on data from the statistics - a year in our country is in need of surgical correction of acquired heart diseases, about 14-15 thou. patients, of whom half are diagnosed multivalve heart defects [2; 4; 6, 7].

Progress cardiac science of recent decades confirms the possibility of correction of multi-valve heart defects with a fairly good result. This is facilitated by the improvement of methods of diagnostics and surgical tactics, the development of different ways of reconstructive operations, the improvement of anesthesia and improved methods to protect the myocardium and postoperative management of this difficult group of patients. In patients with multi-valve heart disease is difficult to resolve the issue - whether correcting accompanying Moderate malformation of the tricuspid valve (TV)? Conservative tactics, as experience shows, is justified only when hemodynamically insignificant lesions of the tricuspid heart valve [1, 3, 5]. Thus, the defect correction of tricuspid (DCT), as well as correction of the other components of a complex multi-valve rheumatic heart disease is important in achieving good immediate and late results of operations.

Material and methods

The Department of Reconstructive Surgery of acquired heart defects JSC RSCS named after academician V. Vahidov over the past 12 years operated 4077 patients under extracorporeal circulation (EC) with cardioplegia (CP) and 326 (8%) cases of them performed tricuspid surgical correction. The age of our patients ranged from 12 to 74 years (mean 36.7 + 9.4). Women were 220 (67.5%), while men - 106 (32.5%). According to the degree of circulatory disorders, patients were divided according to the classification of chronic heart failure (CHF) in NYHA, where in functional class III were assigned 24 (7.4%), and to the IV NYHA functional class - 302 (92.6%) patients. Surgical correction in our patients was performed under extracorporeal circulation (EC) and cardioplegia (CP). The nature of the corrections made multi-valve, with tricuspid component is presented below.

Tricuspid surgical corrections by gender and classification

	Tricuspid surgical corrections – 292 cases (100%)			
	Men	Women	Functional class III by NYHA	Functional class IV by NYHA
Percentage	32.5%	67.5%	7.2%	92.8%
Quantity of patients	106	220	23	302

The nature of the corrections made multivalvewith tricuspid component.

Title operations	Quantity	Percent
PMAV with Pl.TV	165	50.61%
Pl.TV with Pl.MV and Pl.AV	58	17.79%
PMV with Pl.TV and Pl.AV	46	14.11%
PMV with Pl.TV	18	5.52%
PAV with Pl.TV and Pl.AV	15	4.6%
PMAV with OTC	9	2.76%
PMV to PTV	4	1.23%
PMV to PTV, and PAV	3	0.92%
Other Operations	8	2.46%
Total operations	**326**	**100%**

***** PMAV- prosthetics of mitral and aortic valves,

Pl.TV –plasty of tricuspid valve,

Pl.MV - plasty of mitral valve,

Pl.AV - plasty of aortic valve,

PMV - prosthetics of mitral valve,

PMV - prosthetics of mitral valve,

PAV – prosthetics aortic valve,

PTV - prosthetics of tricuspid valve,

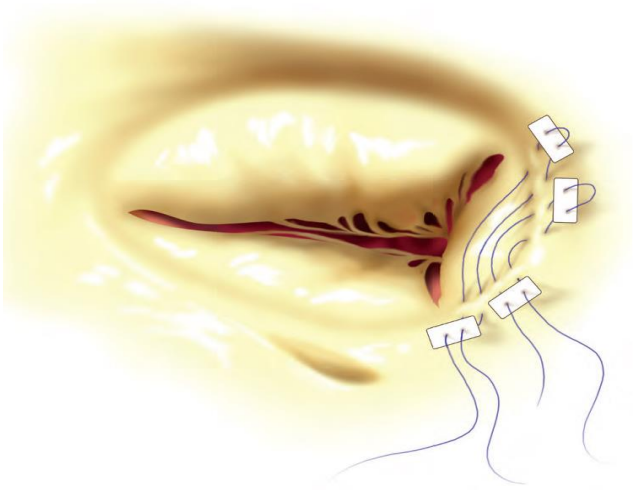
OTC - open tricuspid commissurotomy.

In the diagnosis of multi-valve of acquired heart disease in addition to general clinical research methods, used highly informative, invasive, non-invasive methods of diagnosis: electrocardiography, transthoracic and transesophageal echocardiography (TEE) with Doppler, radioscopy of the chest, computed tomography (CT), coronaroventriculography (CVG) with aortography (AG), if necessary, and angiocardiography (ACS). By the nature of the corrections made to the multi-valve tricuspid component, it can be said that performed prosthetic valves: prosthetics of mitral and aortic valves (PMAV), aortic valve replacement (AVR), mitral valve (PLA), and tricuspid valve prosthesis (PTC). Recent combined with mitral plasty (Pl.MK), aortic (Pl.AK) and tricuspid valves

Results and Discussion

According to the analysis of clinical material and the results of the executed corrections can show the following: predominantly TP heart combined with mitral disease (MD) when the congestion of the pulmonary circulation (PC) is enhanced, and partly as a compensatory mechanism of the body to progressive pulmonary hypertension (PH), there is tricuspid insufficiency (TI) varying degrees. Isolated tricuspid valve damage occurs, as we know, rarely. Therefore, the decision to issue the surgical correction of the combined TA solved more often as an additional component of the multi-valve heart disease.

By etiological causes are rheumatic TC defeat as a result of infective endocarditis, degenerative valve changes, specific and traumatic. In our practice, the most frequent causes of TP were rheumatism, infective endocarditis. Based on the above diagnostic methods, in 326 cases (8%) identified multivalve heart defects that have been performed on indications one or other "open" correction of tricuspid pathologies, combined and other corrections. In this category of patients, a variety of options for the surgical correction of the TA were performed, starting from the open tricuspid commissurotomy (OTC) with chondroplasty, ending the incompetent tricuspid valve prosthesis. The nature and amount of the executed "open" multi-valve defects correction with tricuspid component results in table №1. As we have seen, we carried the heavy volume correction of the three valves, of which the most frequently performed mitral and aortic valve replacement with plastic TK. But more fulfilled valve saves reconstructive plastic surgery in this group of patients in recent years. As we know, TC pathology develops special scenario: if the expansion of the fibrous ring (FC), TCs develops in the direction of the front and rear flaps intact remains mostly septal flap. The defeat of infective endocarditis is also developing in this direction. This creates the need to reinforce said portions FC unlike the mitral valve. In addition, the development failure, TK plays an important role development of pulmonary hypertension (PH), a high degree. As practice shows, and our observations, the need for a high degree of regurgitation TC correction specifies mandatory monitoring of regression of PH. If necessary, it is better to leave a small degree of regurgitation in the TC based regression of PH, as early postoperative overcorrection TK leads to the development of right heart failure. In view of this, we tend to choose a correction in the form of annuloplasty FC TC, sometimes in combination with an open tricuspid commissurotomy with chondroplasty. According to the literature analyzing the results to date are known several types of annuloplasty FC and TC plastics: Kay Reed, Kay Boyd, also De Vega methods (pic.1,2,3,4).



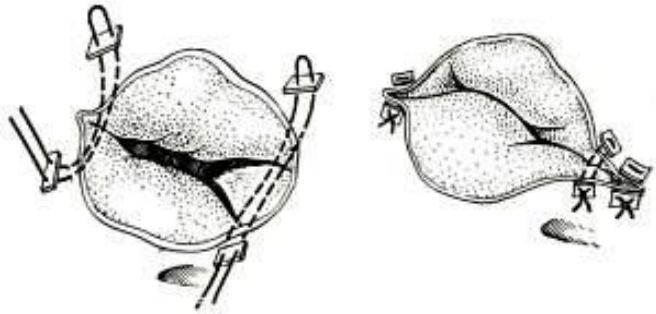


FIG 1: Plastic TC for Kay Reed FIG2: Plastic TV by Kay Boyd

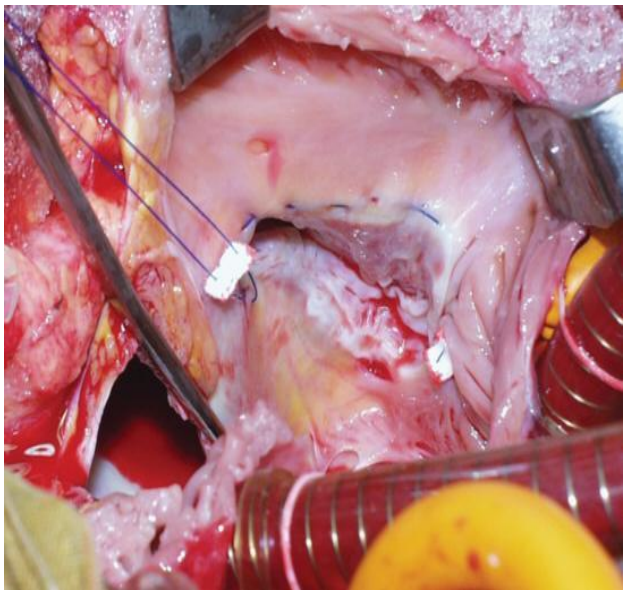
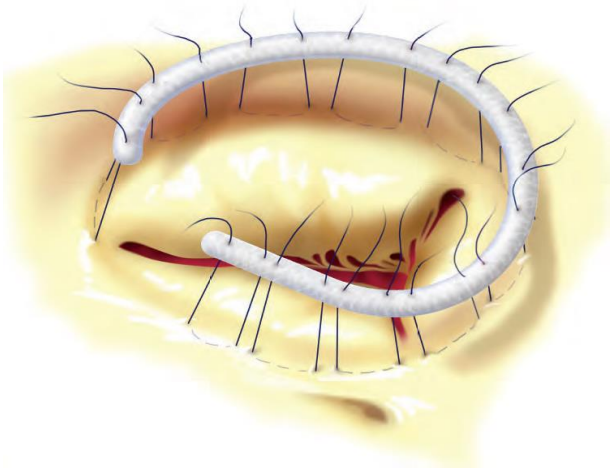
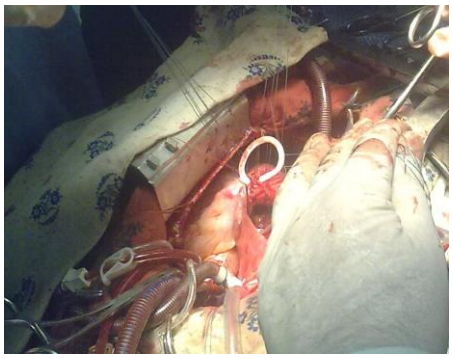


FIG 3: *Plastic by FC De Vega* *FIG 4: Plastic by FC De Vega (photo)*





a) **b)**

FIG.5 *a, b: Performing annuloplasty TC support rings*

Used and annuloplasty FC TC by means of support rings (usually ring Carpentier - Edwards, 5b). Among these operations, methods, most commonly performed types of valves save corrections tricuspid heart disease. In our clinic, the most commonly used plastic for TC FC De Vega (pic.3,4). Such corrections were in 262 (80.5%) cases. From these 262 patients who was received valve save correction by method De Vega showed the 26.9% - regurgitation practically disappeared, in 62.8% - regurgitation is decreased from minimum to 1 degree and the remaining 10.3% were operated last was reduced to 2 (average) degree. Imposing double pure string in the fibrous ring TC performed with using of Ethibond 2/0 or Prolene 2 / 0-3 / 0 (pic.3,4). Monitoring the adequacy of plastics need to carry out with the help of an obturator with a diameter of 35mm (for women), and up to 40mm (for men). Sometimes applied finger adequacy of control method narrowing FC TC. The result is visually monitored and water sample. In 9 (2.76%) cases, the combined TA (i.e., stenosis and insufficiency), the latter supplemented by open commissuretomy and tricuspid chordoplastic. When TC failure due to annulodilatation annuloplasty was performed FC on a support ring, only 4 (1.23%) were applied Carpentier-Edwards ring (5b). Previously widely used and the method of creating a bicuspid TC method Kay Boyd and Kay Reed. The latter technique was performed in 13.4% cases. This applied "U" shaped seam on both sides with FC (pic. №1,2) on the pads with bring closer ends, unable to create the last creating a bicuspid and reduce regurgitation. Unfortunately, in recent years, this technique is also used less frequently in mind the low efficiency of the method compared to the method of De Vega. To prevent the development of some postoperative complications, you need to navigate the surgical anatomy of the anterior-septal commissure, where the bundle of His, with the development of a full A-B block. Also in the art, lying sulcus coronaries extends right coronary artery trunk in the front flap zone (3-4mm from FK) and commissures in the area of the side. The process of stitching on the fibrous ring of plastic is made with strict regard to the anatomy of the conduction system and the right coronary artery.

Multivalve correction of acquired heart disease usually require long-term of EC and occlusion of the aorta, and the use of methods of surgical correction of the TA under EC condition on a beating heart aortic occlusion reduces time and improves multi-valve heart defects results in the "open" heart. In our clinic we used this technique in patients with isolated and combined TP heart. In 15 cases out of 326, we have applied this method TP correction. In 12 cases - performed plastic FC with reconstruction, and in 3 cases - dentures TC biological prosthesis. In these cases, after the phase correction of mitral and / or aortic valves, atrial septal produce sealing. After the prevention of air embolism and rewarming the patient to 36-37 degrees, removed the clip from the aorta. After the restoration of cardiac function, corrects tricuspid blemish on a beating heart. After checking the adequacy of the correction of the tricuspid valve, continued operation of the standard protocol (FIG6). TC Total prosthetics in our practice was performed in 7 (2.38%) patients. All patients were operated on for infectious endocarditis TC.

Regurgitation	Percentage
Practically disappeared	26.9%
Decrease from minimum to 1 degree	62.8%
Reduced to 2 (average) degree	10.3%

Table 2: *Percentage of postoperative regurgitation changes.*

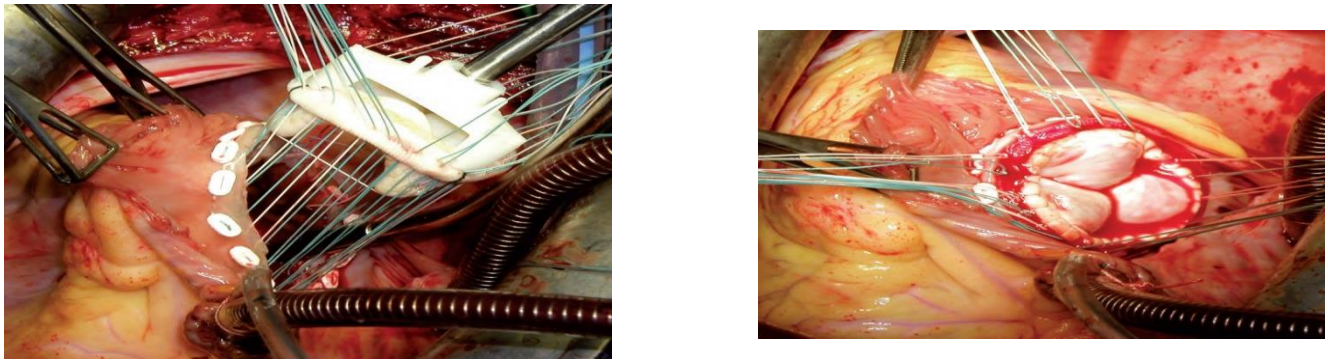


FIG 6: *Stages prosthesis TC biological prosthesis by St.Jude method*

Along with the general clinical research methods, to assess the results of surgical correction of pathologies multivalve correction tricuspid component contact transthoracic echocardiography is widely used in the early and late periods. In a performance, you can also define the positive dynamics of virtually all hemodynamic parameters (table №2).

Indicator	Before the operation	After the operation	P
End-diastolic size (mm.)	75,5±2,7	62,9±2,3	<0,01
End-systolic size (mm.)	57,1±2,2	47,6±1,9	<0,05
End-diastolic volume (ml.)	240,3±24,5	180,3±20,5	>0,05
End –systolic volume (ml.)	122,5±12,2	95,1±10,2	>0,05
Stroke volume (ml.)	120,5±12,3	85,4±10,2	>0,05
Ejection of Fraction (%)	58,1±2,3	48,4±1,9	>0,05
Pressure of right ventricle (mmHg.)	65,5±2,7	45,9±2,3	>0,05
Left atrium (mm.)	67,1±2,2	47,6±1,9	>0,05

Table 3: *The dynamics of echocardiographic parameters in patients with multi-valve heart defects aftercorrectionoftricuspidinsufficiency***.**

Thus, the choice of tactics of surgical correction of the TP is defined on the basis of the established degree of disease (stenosis or in combination) of the valve, the morphological status of the valves, subvalvular structures valve apparatus and the presence of LH.

Conclusion.

1. When the relative valve insufficiency with regurgitation before the 1st. correction of tricuspid defect can be avoided.

2. The presence of regurgitation grade 2-3 TC considered indications for surgical correction of the latter.

3. If you have a high LH should refrain from overcorrection of TP, since small residual regurgitation TC in the early postoperative period is essential for preventing the development of right ventricular failure.

4. Adequately performed correction of tricuspid component with multi-valve heart defects, and improves results of surgical treatment in the immediate and in the long periods of observation.

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