

Redo -tricuspid valve replacement, technical consideration; valve in valve insertion

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Abstract:

With increasing life expectancy, as the general population ages, reoperation for valvular heart disease continues to increase. Structural failure of bioprosthesis and progression of native valve disease are leading causes of reoperation in tricuspid position (1). Reoperation is technically more difficult than primary operation and has been associated with higher mortality due to adhesion, the presence of more advanced cardiac pathology and the existence of more frequent co-morbidity. Peripheral cannulation, right thoracotomy and alternative surgical technique can be used to decrease mortality and morbidity.

Key words: tricuspid valve, reoperation, surgical technique

Introduction:

The prevalence of clinically significant tricuspid valve disease is far less than that of aortic and mitral valve disease. Also a variety of acquired and congenital heart diseases may involve tricuspid valve; the most common presentation is tricuspid valve regurgitation secondary to cardiac valvular pathology on the left side of the heart. The pathologic process of functional tricuspid regurgitation (TR) requires an understanding that the tricuspid annulus is a component of both tricuspid valve and right ventricle; the most frequently identified risk factors for TR progressions include older age, female gender, rheumatic etiology, atrial fibrillation, and the absence of a Maze operation. Functional TR is a progressive disease. Surgical treatment of left-sided valvular lesions are not always adequate to resolve or prevent progressive TR. This is particularly true when pulmonary hypertension persists. A progressive immunologic process in rheumatic valve disease can lead to severe TR years after successful percutaneous or surgical management of mitral valve. (3, 4)

The need for reoperative tricuspid valve

surgery occurs in high risk patients with most series reporting operative mortality ranging %20-%40. (4, 5)

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Case report:

A 20-year-old lady (weight 50 kg) was referred for redo pulmonary valve replacement (PVR) and tricuspid valve replacement (TVR). Patient had a medical history of ASD closure and PS repair using transannular patch, when she was six years old. 7 years later due to severe TR, she underwent TVR, using a 33 Carpentier-Edwards porcine valve. Control follow-up echocardiography showed severe TR-TS PI and cardiac MR confirming diagnosis. Patient scheduled for elective TVR and PVR.

Under general anesthesia and routine preparation for operation (we routinely use external defibrillator pad for redo surgery), right femoral artery was exposed, using a transverse inguinal incision. After sternotomy and bicaval cannulation, total CPB was established with moderate hypothermia (30°C), the aorta clamped ante



grade crystalloid cardioplegic solution infused. Right atrium and pulmonary artery opened. Pulmonary valve replaced with a23 ST.J (regent) valve, using continuous 2-0 proline suture. For TVR, the leaflets of porcine valve was removed, leaving whole valve stent intact, a29 ST. J HP valve inserted in it using continuous 2-0 proline suture. Right atrium and PA closed and rest of operation continued without complication (fig. 1).



Fig.1: Postoperative Chest X-Ray shows the shadow of new valve inserted into the older valve in the Tricuspid position

Patient was discharged ten days later on sinus rhythm with uncomplicated post operative course echocardiography before discharge and three months later showed EF=%55,trans-tricuspid valve gradient 3mmhg, trans-pulmonary valve gradient 14 mmhg .

Discussion:

Replacement of tricuspid valve is comparatively rare operation and regardless of the indication, historically has been associated with high mortality and morbidity. The need for re-replacement tricuspid valve most frequently occurs in high risk patients with advanced congestive right heart failure.

Risk factors for post operative mortality include, age greater than 50 years old, elevated pulmonary artery pressure, functional class 3-4, reoperation, urgent/emergent indication and hepatic dysfunction. (1, 3, 5, 6)

Because of adhesion around the heart with an associated risk of re-entry and existence of more frequent co-morbidity, alternative surgical technique can be used to decrease mortality. In selected case, patient with prior TV surgery, percutaneous valve replacement may be indicated.

Surrounding structures of surgical importance are the coronary sinus, the atrio-ventricular node and right coronary artery. To decrease the risk of post operative complete heart block, it is better to use interrupted pledgeted suture adjacent to septal leaflet on beating heart. When removal of the old sewing ring will result in sever annular disruption, the ring may be left in place and used as a neo-annulus for suturing. (1) The choice of prosthesis follow an algorithm similar to that used for valve replacement in other cardiac valve position. There is no clear superiority of one prosthesis over another, the decision should be individualized to the patient. Mechanical valve remain a valuable choice in patient with previous tricuspid valve replacement (7, 8, 9, 10, 11)

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