

Cardiac Imaging

Giant Right Atrium Late After Left-Sided Heart-Valve Replacement: Re-Do Cardiac Surgery for Severe Tricuspid Regurgitation

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Key words:

Tricuspid regurgitation, aortic and mitral valve replacement, cardiac surgery

Manuscript received:

February 15, 2014;

Accepted:

June 4, 2014.

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Tricuspid regurgitation (TR) is not a benign disease. Functional or secondary TR typically occurs secondary to left-sided heart disease, or pulmonary hypertensive disease, in the absence of organic lesions of the tricuspid valve.¹ The optimal management of patients with functional TR at the time of left-sided heart-valve surgery continues to evolve.²⁻⁴

We describe the case of a 68-year-old woman with a history of aortic and mitral valve replacement, with mechanical prosthetic valves, as well as tricuspid annuloplasty (De Vega) for rheumatic valvulopathy four years previously. Before that operation she had suffered from infective endocarditis of the mitral valve, complicated by cerebrovascular embolisation in the left hemisphere. The patient had also been in atrial fibrillation for more than 10 years. She now presented with progressive dyspnoea on exertion, ankle oedema, abdominal distension and cachexia.

On physical examination, the patient had clinical evidence of congestive heart failure. Her blood pressure was 105/60 mmHg, the jugular veins were prominent, and the respiratory rate reached 20 breaths per minute. Abdominal examination revealed that the liver was palpable 10 cm below the costal margin. Free ascitic fluid was noted. The chest X-ray depict-

ed significant cardiomegaly, with a giant right atrium, presented as a marked bulging of the right heart border (Figure 1). The ECG demonstrated atrial fibrillation, complete right bundle branch block and left anterior fascicular block. Transoesophageal echocardiography revealed severe tricuspid insufficiency, massive dilatation of the right atrium (Figure 2) and right ventricle (44 mm RV diameter), as well as hepatic congestion. Left ventricular ejection fraction was not impaired (65%) and the two prosthetic valves in the mitral and aortic positions showed no significant dysfunction, beyond a possible central leak from the mitral prosthetic valve. There was no evidence of any organic lesion of the tricuspid valve, while its annulus diameter was measured at 67 mm. Pulmonary hypertension was present, with a pulmonary artery systolic pressure of 40 mmHg. Cardiac catheterisation showed normal coronary arteries. CT scan of the abdomen demonstrated significant liver enlargement, increased spleen size, significantly increased diameter of the inferior *vena cava*, and mild to moderate ascitic fluid accumulation.

The patient was operated on urgently, because of the rapid progression of cardiac dysfunction and haemodynamic compromise. Full cardiopulmonary bypass was



Figure 1. Chest X-ray, showing significant cardiomegaly. White arrows indicate the right atrial border.



Figure 2. Transoesophageal echocardiography, four-chamber view, demonstrating the volume of the right atrium.

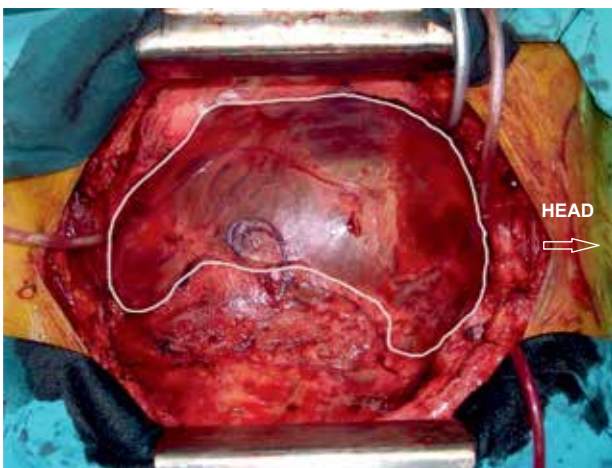


Figure 3. Intraoperative view. The white line encircles the right atrium, which covers most of the frontal aspect of the heart.

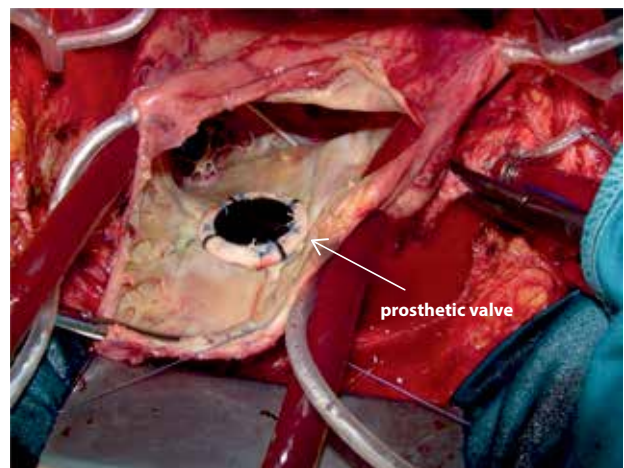


Figure 4. Intraoperative view. Right atriotomy. The mechanical prosthetic valve is implanted. Note the size of the right atrium.

established through a median re-sternotomy, with cannulation of the ascending aorta, as well as bicaval cannulation for venous drainage. The huge right atrium proved to cover most of the frontal aspect of the heart (Figure 3). The patient was cooled down to 27°C, the aorta was cross-clamped, and cold (4°C) crystalloid cardioplegia (Custodiol®) was given. This technique obtained a bloodless operative field. The tricuspid valve was excised via a right atriotomy and replaced with a mechanical prosthetic valve (Figure 4). The patient tolerated the procedure well and was weaned off cardiopulmonary bypass easily, with minimal inotropic support. She was discharged 7 days after surgery and is back to her daily activities, six months after operation. A postoperative chest X-ray showed significant heart size regression (Figure 5).

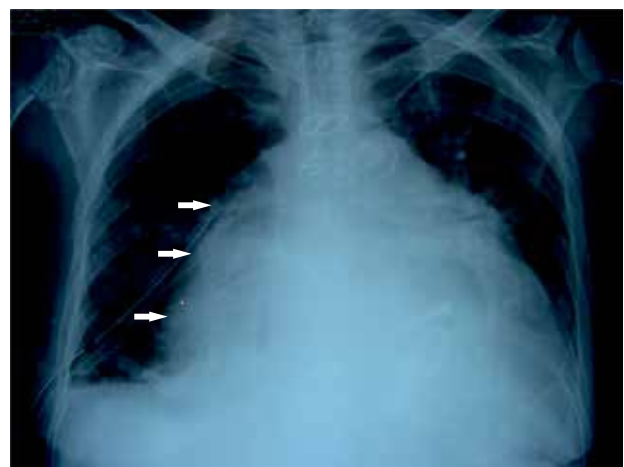


Figure 5. Postoperative chest X-ray. White arrows indicate the right atrial border.

The management of TR remains complex and the prognosis is not so favourable.^{4,5} The rationale for surgical correction of functional TR at the time of concomitant cardiac surgery stems from the observation that TR negatively impacts functional class and survival.^{3,4} Current tricuspid repair techniques have variable durability, as “ring” annuloplasty provides superior results compared with the “non-ring” techniques.⁶ Given the disappointing result of the tricuspid “suture” annuloplasty (De Vega technique) four years ago, this time our patient underwent tricuspid valve replacement, which was offered as an *ultima ratio*. The patient tolerated the procedure well, showing functional class improvement, six months after operation.

Aggressive treatment of moderate to severe TR during left-sided heart-valve surgery is undoubtedly recommended.²⁻⁶ The appropriate operative technique remains at the surgeon’s discretion.

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