Reply to Letter to the Editor

Reply to Kariya et al.

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Keywords: Congenital heart disease; Fontan; Tricuspid valve; Unguarded tricuspid orifice

We thank the Editor for giving us the opportunity to reply to the 'Letter to the Editor' describing the unguarded tricuspid orifice with pulmonary atresia [1]. We congratulate Kariya et al. for successful surgical treatment using a total right ventricular exclusion and total cavo-pulmonary connection (TCPC). Because of the high mortality of this rare anomaly, there are only a few successful reports on the surgical strategy and procedure for treating this condition.

The main morphological feature of this anomaly is the lack of any guarding valvular tissue at the tricuspid annulus. In addition, this anomaly is associated with a high incidence of pulmonary valvular disease. The morphology of the right-heart system in Kariya’s report would be very similar to that of our case. Haemodynamically, poor right ventricular contractility resulted in the failure of the biventricular repair and caused Fontan circulation in both cases.

The clinical course of these two cases is quite different. The most important turning point would be the difference in surgical strategy during childhood. We selected the univentricular repair (extracardiac TCPC) at 6 years of age following a Blalock–Tausig shunt and a bidirectional Glenn’s operation. In contrast, the biventricular repair (right ventricular outflow-tract repair) had been conducted at 5 years of age following a Blalock–Tausig shunt. The biventricular repair for the case with poor right ventricular function such as Kariya’s case would lead to an enlarged right atrium and ventricle, resulting in congestive right-heart failure with refractory arrhythmia. Then, total right ventricular exclusion and Fontan circulation in both cases.

We had previously reported a total right ventricular exclusion for arrhythmogenic right ventricular cardiomyopathy and Ebstein’s anomaly [2]. This procedure improves cardiac output and reduces supraventricular/ventricular arrhythmia by removing arrhythmogenic tissue from both the right atrium and the right ventricle [3]. Thus, this procedure would be very beneficial for the patient with right ventricular failure and refractory arrhythmia by its action of converting the biventricular heart into a univentricular heart (Fontan circulation). The surgical strategy in Kariya’s report appears to be appropriate for these reasons.

Although the surgical strategy for unguarded tricuspid orifice with pulmonary atresia is different in both the cases, Fontan circulation was successfully established in both cases during childhood and adulthood. An accurate diagnosis in the neonatal period, infancy and childhood is important to consider the surgical strategy in the early period of life. Where this anomaly has not been diagnosed until adulthood, total right ventricular exclusion and TCPC conversion would be one of the surgical options for such patients.

References


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Letter to the Editor

Spontaneous right ventricular rupture in re-operative cardiac surgery

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I read with interest the article ‘Spontaneous right ventricular rupture after sternal dehiscence following coronary artery bypass grafting’ by Elsayed and colleagues in Images in Cardiothoracic Surgery [1]. I believe that the rupture was an induced perforation of the right ventricle, rather than it being spontaneous. It caused a steady, slow bleeding forming substernal and pleural collections and not exsanguination of right ventricular (RV) rupture. This reminded me of an actual spontaneous RV rupture that occurred within a few seconds of successful completion of a sternal split in a re-operation for the mitral valve in an elderly woman. The right ventricle was intact upon entry, and it started to tear apart without spreading the sternal edges, thus causing exsanguination and shock. Immediate mobilisation of the sternum, control of the bleeding by Foley’s catheter and rapid institution of femoro-femoral cardiopulmonary bypass helped in stabilising the patient, who eventually recovered well. A retrospective analysis of the case and echocardiography revealed extreme thinning of the right ventricle and dilatation caused by long-standing pulmonary hypertension. The case presented by Elsayed
emphasises the concept of a proper sternal closure, especially in the elderly, following a coronary bypass where some patients may need reinforced sternal closure to avoid some of the dreadful, preventable complications of cardiac surgery caused by the sternal wound [2,3].

References


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Reply to the Letter to the Editor

Reply to Al-Ebrahim

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We thank Dr Al-Ebrahim [1] for his interest in our article ‘Spontaneous right ventricular rupture after sternal dehiscence following coronary artery bypass grafting’ [2]. Dr Al-Ebrahim mentions that he thinks that this injury is induced rather than spontaneous. We disagree with that statement because although the injury did not present with the typical picture of exsanguination and shock similar to the patient Dr Al-Ebrahim mentioned in his letter, the injury of the right ventricle in our case was also spontaneous.

The patient had a coronary artery bypass grafting (CABG) and had a difficult respiratory wean owing to poor preoperative pulmonary function tests. On day 4, it was found that the patient’s sternum was unstable, but without any evidence of deep mediastinitis. On day 8, it was noticed that he had signs of hypovolaemia with decreasing haemoglobin. An echocardiogram and computed tomography (CT) scan was done to rule out any collection. This revealed that, in fact, one of the sternal wires was broken and was pointing posteriorly, causing a ‘spontaneous’ rupture of the right ventricle with a consequent retro-sternal haematoma and a haemorrhagic collection in the left pleura, which was opened earlier during the initial surgery. The patient was taken to the operation theatre and a ‘spontaneous’ perforation was found in the right ventricle, which was then successfully repaired. As we can see, the initial injury was not induced in any way but was mainly due to broken sternal wires. Unfortunately, the patient died 4 days later, succumbing to multi-organ failure.

We agree with Dr Al-Ebrahim that proper sternal closure in the elderly is crucial post cardiac surgery to avoid lethal complications that can be caused by sternal wounds. We do occasionally use sternal reinforcement in high-risk, obese, diabetic patients. We hope this case emphasises the role of the CT scan in the early detection of potentially fatal complications of sternal dehiscence.

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Letter to the Editor

Are we allowed to declare radial artery graft with a ‘string sign’ for a patent conduit?

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Keywords: Angiographic graft patency; String sign

We read with great interest the manuscript by Buxton and colleagues [1] that has recently been published. In addition to an excellent review of the role and the fate of currently used conduits for coronary artery bypass grafting, the authors have pointed out the question of radial artery (RA) patency that have been presented so far in prospective, randomised trials (PRTs). We strongly support their observation that the radial artery patency study (RAPS) did not confirm better angiographic RA graft patency compared with saphenous vein (SV) graft patency. The basic results from the RAPS study have been reported few years ago by Desai and associates [2]. Although that study has demonstrated significantly better angiographic RA graft patency compared with saphenous vein (SV) graft patency. The basic results from the RAPS study have been reported few years ago by Desai and associates [2].

We agree that the issue of string sign is still pending. Although the study of Desai and associates [2] have pointed out the question of radial artery (RA) patency that have been presented so far in prospective, randomised trials (PRTs). We strongly support their observation that the radial artery patency study (RAPS) did not confirm better angiographic RA graft patency compared with saphenous vein (SV) graft patency. The basic results from the RAPS study have been reported few years ago by Desai and associates [2]. Although that study has demonstrated significantly better angiographic RA graft patency compared with saphenous vein (SV) graft patency. The basic results from the RAPS study have been reported few years ago by Desai and associates [2].

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