Reviewer's report

Title: Evaluation Using a 4D Imaging Tool Before and After Pulmonary Valve Replacement in a Patient with Tetralogy of Fallot; What Is the Optimal Timing of Re-operation?

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Reviewer: Tatsuo Haraki

Reviewer's report:

Takigami et al. reported that the 4D MRI imaging can clearly evaluate pulmonary regurgitation, right ventricular (RV) volume and flow energy loss (FEL) in a patient with post-operative TOF. They conclude that 4D imaging was useful in the decision of re-operation in this patient. The 4D MRI imaging and evaluation for RV dysfunction is quite impressive, however, I have some questions.

1) What was the operation method of TOF in her two years old? VSD closure and RVOTR by RA incision?

2) What was this wide tachyarrhythmia? VT, rapid atrial fib or atrial flutter? Sinus rhythm was also CRBBB? How long was QRS duration in sinus rhythm? QRS duration was improved after re-operation?

3) Is there any possibility that RV dysfunction was caused by tachycardia-induced cardiomyopathy? Did she have impaired LV dysfunction?

4) The authors mentioned that RFCA for atrial flutter in this patient might have been effective to improve RV dysfunction. Did you have a choice of RFCA before PVR, or trans-catheter pulmonary valve replacement (TPVR)?

5) RV size and FEL had decreased remarkably, which contributed RV reverse remodeling (P10, L3).

The authors described the re-operation method in this patient was PVR, MAZE, and plication of RA. In contrast, some reports showed RV volume and dysfunction did not improve only PVR in patients with post-operative TOF. Is there any possibility that repeated tachyarrhythmia was mainly contributed RV remodeling in this patient? Or did she have any residual lesion, such as TR?

6) In evaluation of RV function and RV remodeling, what is the superiority of MRI imaging to echocardiography to decide the optimal timing of re-operation?

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