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High values of NT-proBNP after re-surgery is related to decompensation of right ventricle and weakening of left ventricle in repaired patients with tetralogy of Fallot

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Background. On remote time after definitive repair of tetralogy of Fallot (TOF) patients were sometimes redone right ventricle outflow reconstruction (re-RVOTR) because of severe pulmonary valve regurgitation or severe stenosis of RVOT. Some patients were discharged with high NT-proBNP, though they seem to recover from intensive cardiac stress. We investigated what factors before re-RVOTR were connected with high NT-proBNP after re-surgery. Methods. The medical records of 26 TOF patients were reviewed who underwent re-RVOTR between 2010 and 2015. We performed cardiac catheterization before surgery to judge candidate for re-RVOTR. We defined high NT-proBNP as values of NT-proBNP on discharge after re-RVOTR 400 pg/ml or over (n=10) with which patients had potential to fall into heart failure (Japan heart failure society). Cardiac performances before surgery were compared between patients with or without high NT-proBNP. Results. There were no differences in RV volume between high NT-proBNP and non-high NT pro-BNP, such as on end-diastole (180 vs. 143 ml/m2) and on end-systole (118 vs. 76 ml/m2); no differences in RV pressure, such as on end-diastole (10 vs. 10 mmHg) and RV to LV pressure-ratio on end-systole (0.58 vs. 0.59). In contrast, ejection fraction of RV (RVEF) was significantly decreased in high NT-proBNP group (0.36 vs 0.48); particularly, the ratio of patients who had RVEF under 0.40 was higher in high NT-proBNP (70% vs. 12%, p=0.0085). As LV performances, volumes were significantly larger in high NT-proBNP group, such as on end-diastole (119 vs. 86 ml/m2) and on end-systole (58 vs. 38 ml/m2), although end-diastolic pressure and EF were almost equal between two groups. Clinically, the ratio of patients with having symptoms before re-RVOTR was not different between two groups. Discussion. Our study showed RVEF had declined substantially before re-RVOTR in repaired TOF patients, if patients discharged with high NT-proBNP after re-RVOTR. Likely, compensation of expanded RV had fallen in patients with reduced RVEF. Moreover, patients with high NT-proBNP had suffered LV expansion before re-RVOTR. Not all these degenerations improve on remote period after re-RVOTR. We should perform re-RVOTR before RVEF was reduced too much or LV started to transform with or without symptoms.