Objective. Since the first intracardiac surgical Tetralogy of Fallot (TOF) repair was reported, the outcome of patients after corrective surgery has improved over the years. However we are now faced with an increasing number of patients who present with pulmonary valve regurgitation (PR) or right ventricular (RV) dysfunction, and these patients always have a risk for sudden death. The severity of PR and the RV end-diastolic volume were reported to show a positive correlation with the brain natriuretic peptide (BNP) level in patients with surgically repaired TOF, but this has been controversial. The purpose of this study was to evaluate the BNP levels, and to address the issue of optimal surgical timing in patients who underwent TOF repair.

Methods. We retrospectively reviewed 33 patients (20 males, 13 females) older than 10 years of age who underwent TOF repair at our institution.

Results. The median age at the initial repair was 13 months (range, 4-38 months). The median time that had passed since the original corrective surgery was 12 years (range, 10-20 years). Ten reinterventions were required in our patient group, including pulmonary valve replacement (PVR), pulmonary artery plasty, tricuspid valve repair, right ventricular outflow tract reconstruction (RVOTR) and ventricular septum defect (VSD) closure. In the patients who underwent PVR, the BNP levels before the procedure were significantly higher than those in the other patients (median 54.0 vs. 21.8 pg/ml, P<0.05). In the patients who did not have PVR, the BNP levels of the patients who had moderate or severe PR were significantly higher than those of patients who had trivial or mild PR in echocardiography (median, 26.0 vs. 17.0 pg/ml, P<0.05). After the PVR procedure, the PR was improved at all the patients and the BNP levels were significantly decreased (median, 54.0 vs. 32.7 pg/ml, P<0.05).

Conclusions. The severity of PR may have a relationship with the BNP level long after repair for TOF. The BNP level may contribute to defining the indication and timing of TVR for TOF late after the initial operation. PVR after TOF repair significantly improves the RV function, and may reduce the risk for sudden death.