

Early Postoperative Low Cardiac Output Syndrome Due to Restrictive Right Ventricle Physiology After Surgical Repair of Tetralogy Fallot

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Objectives: The restrictive right ventricle physiology (rRVF) after surgical repair of tetralogy of Fallot (TOF) is common. Clinically significant rRVF leading to high morbidity and mortality is seen due to low cardiac output syndrome (LCOS) in early postoperative period. We investigated the role of echocardiography to determine the risk of clinically significant rRVF after surgical repair of TOF.

Methods: 46 patients who had surgical repair of TOF between May 2014 and June 2017 were taken to this study. Group 1 (n=10, median age 14,0±2,3 months) was found echocardiographic evidence of RVF with LCOS; group 2 (n=12, median age 8,1±3,0 months) was found rRVF without LCOS; while group 3 (n=24 patients, median age 9,6±2,9 months) showed neither LCOS nor rRVF. Presence of end diastolic antegrade forward flow greater than 30 cm/sec during atrial systole using pulse wave Doppler measurements of at least three different consecutive cycles was accepted as echocardiographic evidence of rRVF. The right ventricle and left ventricle diastolic functions were also assessed by analyzing mitral and tricuspid inflow patterns and Doppler tissue imaging (DTI). Right ventricle myocardial performance index (RVMPI), and left ventricle myocardial performance index (LVMPI) values were evaluated.

Results: The end diastolic antegrade pulmonary flow velocity was significantly higher in group 1 (p<0.001). RVMPI in group 1 was higher compared to group 3 (p<0.001). The concurrent use of end diastolic antegrade pulmonary flow velocity (cut-off value>99 cm/sec) and DTI values showed 100% sensitivity and 90% specificity.

Conclusion: In patients who had surgical repair of TOF, the LCOS development risk can be determined by using DTI and end diastolic antegrade pulmonary flow velocity measurements in the early postoperative period.