The evaluation of diagnostic and interventional cardiac catheterization procedures of patients under extracorporeal membrane oxygenation support

Guzeltas A., Kasar T., Tanidir I.C., Ozturk E., Odemis E.
Department of Paediatric Cardiology, Istanbul Mehmet Akif Ersoy, Thoracic and Cardiovascular Surgery Center and Research Hospital, Istanbul, Turkey

Introduction:
The extracorporeal membrane oxygenation (ECMO) support has been using increasingly after cardiopulmonary arrest or postoperatively in cardiac surgery. ECMO is an useful method in patients that cannot be weaned from cardiopulmonary bypass and to adapt to the recent hemodynamic alterations in early postoperative period. Cardiac catheterization might be indicated for clarification of the underlying pathology or for treatment of these patients supported by ECMO.

Methods:
Between 2010 and 2014, 1420 patients with congenital heart disease underwent cardiac surgery and 71 of these patients (5%) needed ECMO support after surgery. Diagnostic or interventional cardiac catheterization was performed in 6 (8.45%) of these 71 patients.

Results:
The diagnostic catheterization was performed in 2 of the patients while invasive procedures were performed in 4 of the patients. In patients with antegrade flow, ECMO cannulas were clipped before the injections for higher quality. Left pulmonary arterial stenting was performed in 3 of the patients and balloon angioplasty of both pulmonary arteries was performed in one of the four patients during interventional catheterization procedure. BT shunt recanalization was performed simultaneously with left pulmonary artery stenting in one of these patients. There were no complications recorded during transportation to the catheterization laboratory or during catheterization. One of the two patients after the diagnostic catheterization was referred to surgery for pulmonary artery reconstruction and the other one for correction of supravalvular aortic stenosis and left main coronary artery stenosis. Four patients were successfully weaned from ECMO after the procedures but 2 patients died under ECMO support during the ICU stay.

Conclusions:
ECMO can be life saving as a solution of hemodynamic problems after congenital heart surgery. If the patients cannot be weaned from ECMO support due to hemodynamic problems, catheter angiography should be performed urgently. Suitable transportation conditions, extensive logistic support together with experienced staff, diagnostic and invasive cardiac catheterization can be performed with minimal risk in these patients. We think that for better and high quality views in patients with antegrade flow, who cannot be weaned from ECMO support, ECMO cannulas can be clipped just before the injections.