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Three dimensional rotational angiography imaging in diagnosis and treatment of complex congenital heart diseases. A single-centre experience.

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INTRODUCTION: Three dimensional rotational angiography (3DRA) is a relatively recent but rising imaging technique used in paediatric and adult catheterization laboratories. Fusion of 3-dimensional (3D) image data with fluoroscopy can potentially overcome limitations of 2-dimensional (2D) angiography for visualizing complex cardiovascular structures and facilitating accurate diagnoses as well as drive interventional procedures. 3D images in real time can be useful both for diagnostic purposes and as a roadmap to guide interventions, especially in complex congenital heart diseases (CHD). We want to evaluate the impact of 3DRA in CHD catheterization management. **METHODS:** A database of all patients catheterized between March and December 2015 at our Hospital, were examined. Among all treated patients, 59 cases of complex CHD were approached with 3DRA. About considered population mean age and main weight were respectively 18.7 ± 12 yrs (range 2 months - 61 years of age) and 47.2 ± 23.8 Kg (range 2.5 - 90 Kg), including 28/59 paediatric patients (47.4%). Procedure types and trend were analysed. **RESULTS:** 3DRA was used respectively in 11 diagnostic procedure and 48 interventional catheterization. Diagnostic procedures consisted in n=3 pulmonary atresia with VSD and MAPCAs, n=5 TOF after surgical repair, n=1 discontinuous pulmonary artery, n=1 single ventricle after cavo-pulmonary connection, n=1 aortic coarctation after stenting. Interventional catheterizations involved n=18 percutaneous pulmonary valve implantations, n=18 percutaneous treatments of aortic coarctation (15 stent implantation, 3 stent re-dilatation), n=12 percutaneous treatment of pulmonary branch stenosis (10 stent implantation, 2 balloon angioplasty). In total investigations median dose-area product (DAP) was 8687.53 μGym^2 (range 146.32 - 48397 μGym^2), median fluoroscopy time was 30.6 min (range 3.29 - 186.22 min) and median contrast dose was 355.33 ml (range 50 - 999 ml). Separately in diagnostic investigations and in interventional procedures, DAP, fluoroscopy time and contrast dose were respectively: 2220.6 vs 9791.6 μGym^2 , 11.37 vs 35.2 min, 156 vs 403.9 ml. **CONCLUSIONS:** 3DRA used in diagnostic procedures and interventional catheterizations, especially for complex CHD, provides significant additional information as compared to bi-planed angiography, without need to do multiple injections and with a real reduction of X-ray exposure.