

P-174

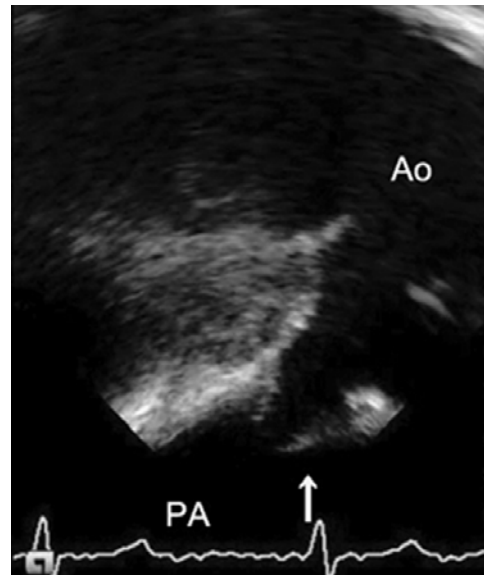
### **Intra-cardiac Echocardiography guided trans-catheter closure of Patent Ductus Arteriosus without contrast angiography**

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**Introduction:** Though contrast angiography is the standard guidance of trans-catheter closure of patent ductus arteriosus (TC-PDA), it is contra-indicated in patients with severe renal disease that often seen in senile patients. We have developed intra-cardiac echocardiography (ICE) guided TC-PDA (Cathet Cardiovasc Intervent 2015). We report sequential 6 cases that successfully underwent TC-PDA without contrast angiography.

**Methods:** Subjects were 6 patients with PDA and median age of 54.4 (35.4 - 66.1) years old. The median size of PDA was 4.0 (3.2 - 11.7) mm with median Qp/Qs of 1.8 (1.4 and 2.4), respectively. The oldest patient suffered from renal dysfunction and 2 patients had pulmonary hypertension. Prior to the TC-PDA, all patients underwent contrast X-ray computed tomography to clarify the anatomy. ICE catheter was inserted through 2<sup>nd</sup> sheath at femoral vein and placed at main or left pulmonary artery. During the TC-PDA, we primarily used ICE to guide the procedure.



**Results:** We could successfully place Amplatzer Duct Occluders in 5 and Amplatzer Septal Occluder in 1 without contrast angiography. ICE at main or left pulmonary artery has allowed us to determine the diameter and length of PDA, to monitor the device placement, and to determine the residual shunts. ICE did not increase the risk of complication except for transient arrhythmia, though new operator needs some learning time to understand orientation of ICE.

**Conclusions:** ICE-guided TC-PDA without contrast angiography is feasible and can be the standard treatment for adult patients, especially complicated by renal dysfunction.