

Percutaneous Bicaval Balloon Occlusion In Minimally Invasive Right-sided Heart Surgery: Our Initial Experience

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OBJECTIVES

Right-sided heart surgeries—such as tricuspid valve repair or replacement, atrial septal defect (ASD) repair, and correction of partial anomalous pulmonary venous return (PAPVR)—pose technical challenges due to the need for manipulation of the superior and inferior vena cava (SVC and IVC), especially in redo operations complicated by pericardial adhesions. To streamline the approach to bicaval occlusion and minimize surgical dissection, we adopted a percutaneous technique utilizing CODA balloons (Cook Incorporated, Bloomington, IN).

METHODS

Cardiopulmonary bypass is established via femoral artery and venous cannulation through femoral and right jugular veins. Initially, we used 3/8-3/8-3/8 Y-connector for CODA balloon insertion into both venous lines. This approach was later refined to directly insert a CODA balloon into 12 Fr sheaths in the right jugular vein (via a secondary access) and contralateral femoral vein. Balloon placement in the SVC and IVC was guided by transesophageal echocardiography and inflated prior to right atriotomy to ensure complete occlusion. This technique avoided the surgical dissection of the IVC and SVC.

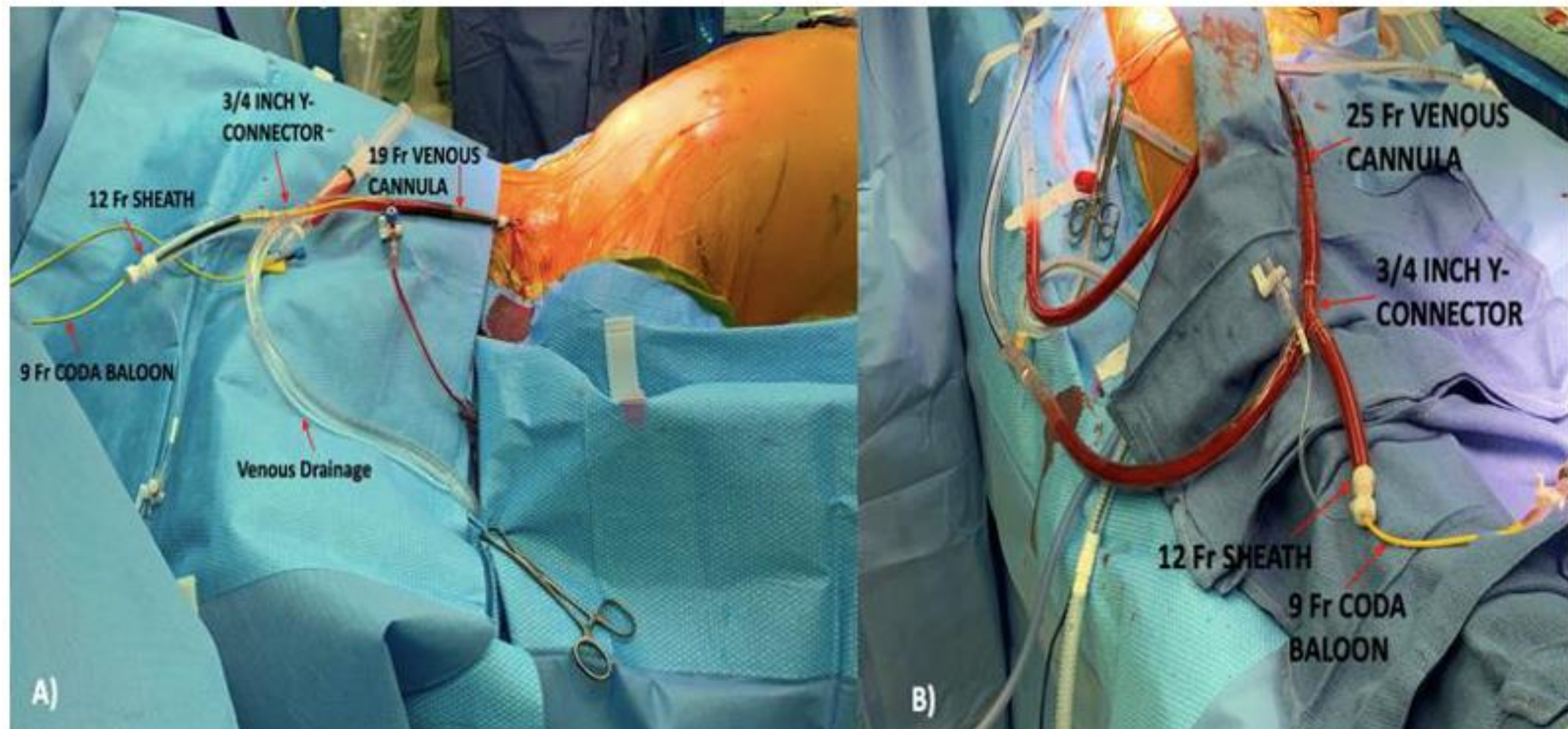
RESULTS

No	Patients	Diagnosis	Procedure
1	74 M	TR	Sternotomy TV repair (Tri-Ad 32 mm)
2	65 M	TR	MIS -> Sternotomy TVR (Perimount 29 mm)
3	72 M	TR	REDO MIS on-pump beating TVR (Perimount 31 mm)
4	65 M	TR	MIS on-pump beating TV repair (Tri-Ad 28 mm)
5	68 M	TR	MIS on-pump beating TVR (Perimount 33 mm)
6	83 F	TR	REDO MIS on-pump beating TVR (Epic 33 mm)
7	43 F	PAPVR	MIS PAPVR repair (Baffle reconstruction)
8	36 M	ASD	MIS ASD repair

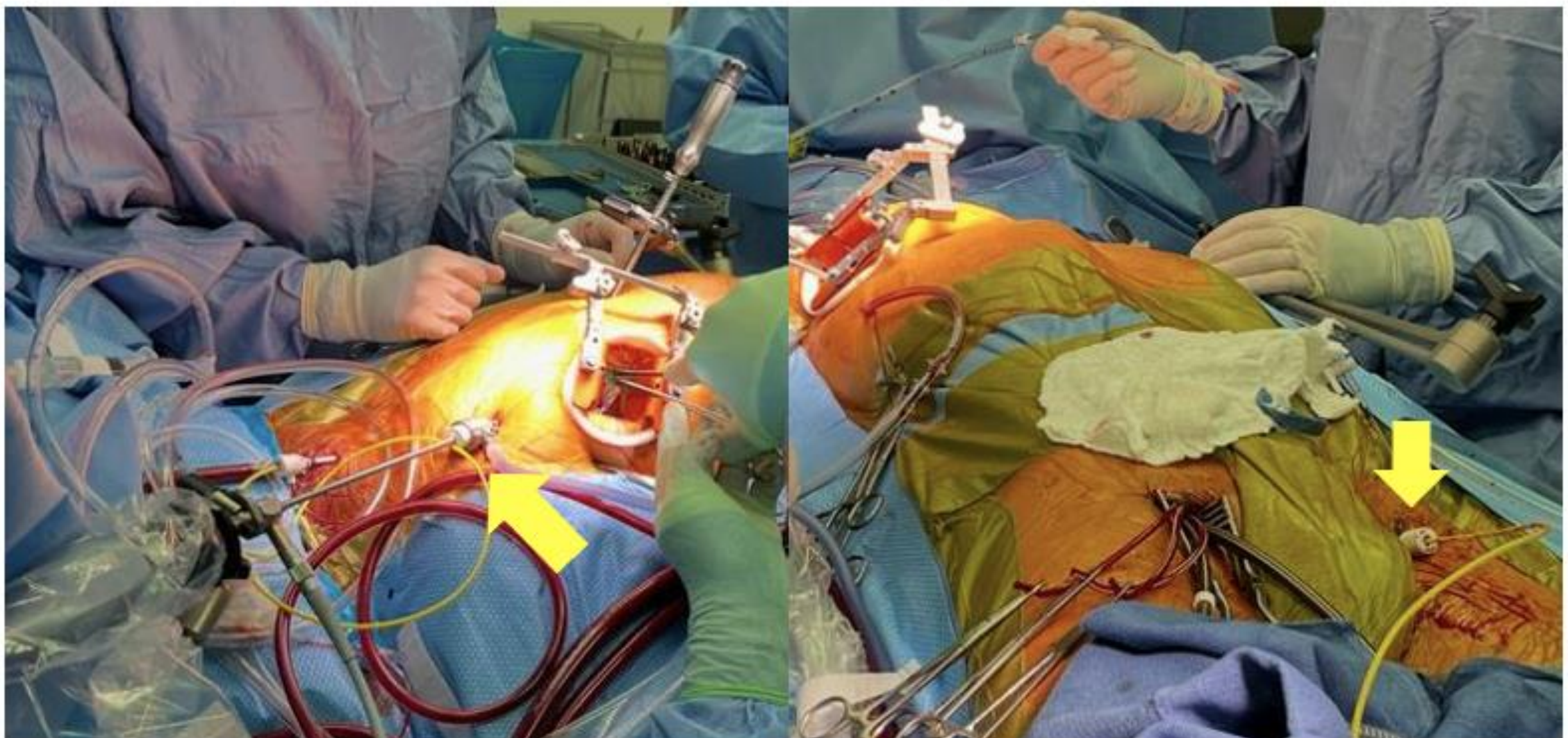
CONCLUSIONS

Our preliminary experience indicates that percutaneous bicaval balloon occlusion with CODA balloons is a feasible and safe alternative to conventional techniques in minimally invasive right-sided heart surgery. This method appears especially beneficial in redo procedures, where adhesions pose significant challenges to standard surgical dissection. Further clinical application and evaluation are needed to validate the broader applicability and long-term outcomes of this technique.

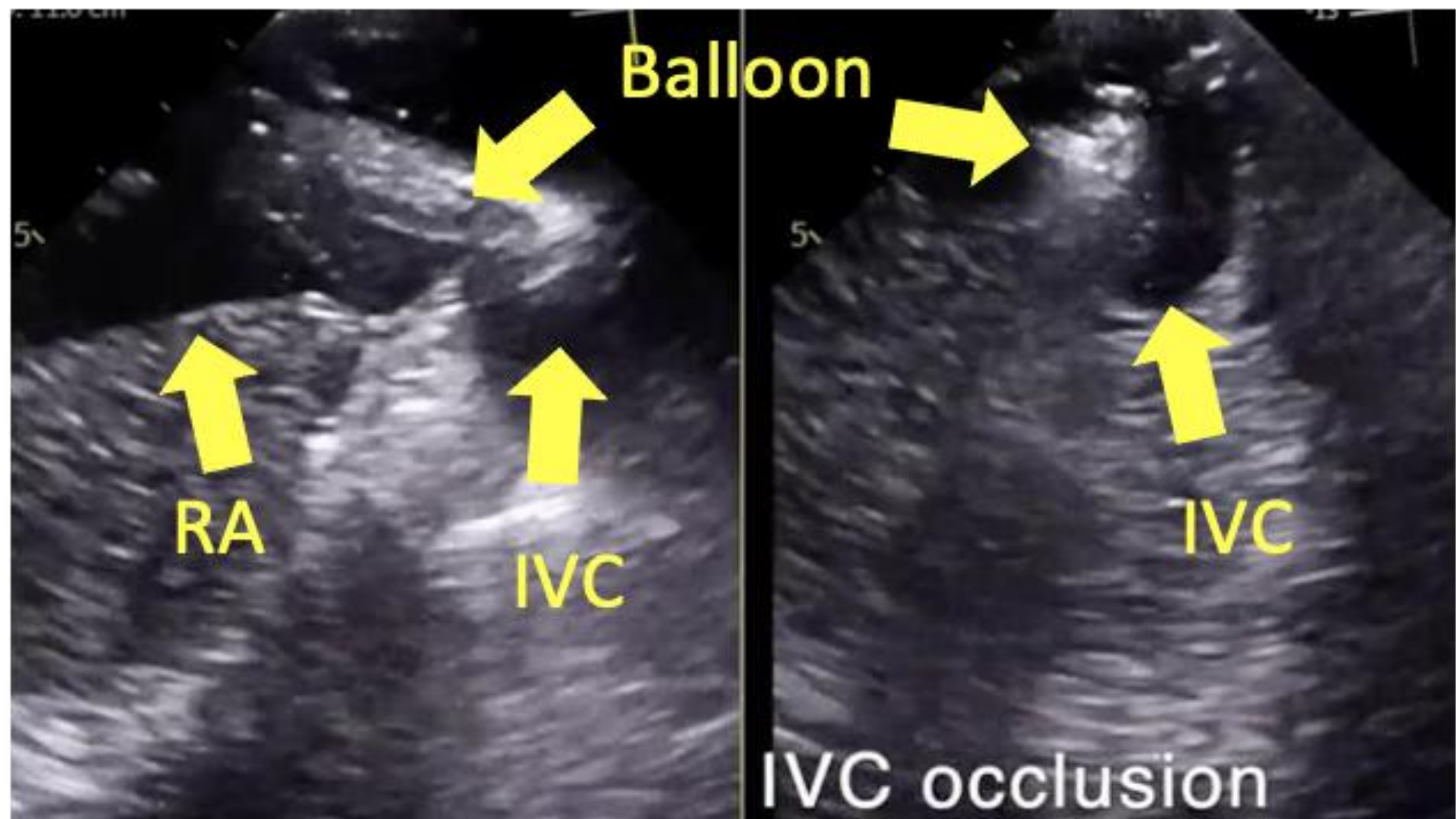
Initial configuration



Current configuration



TEE guided positioning of the CODA balloon



Excellent visualization of the right-size structure

