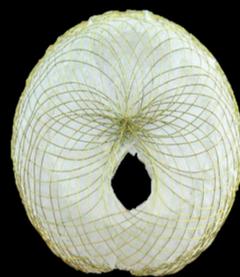
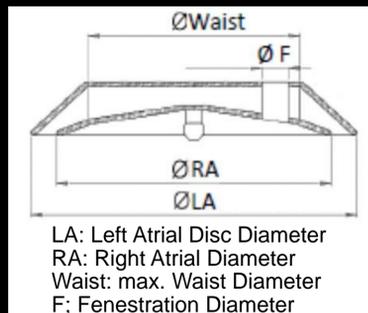


# Helping to control pulmonary hypertension in a trisomy 21 infant with a fenestrated atrial septal defect device

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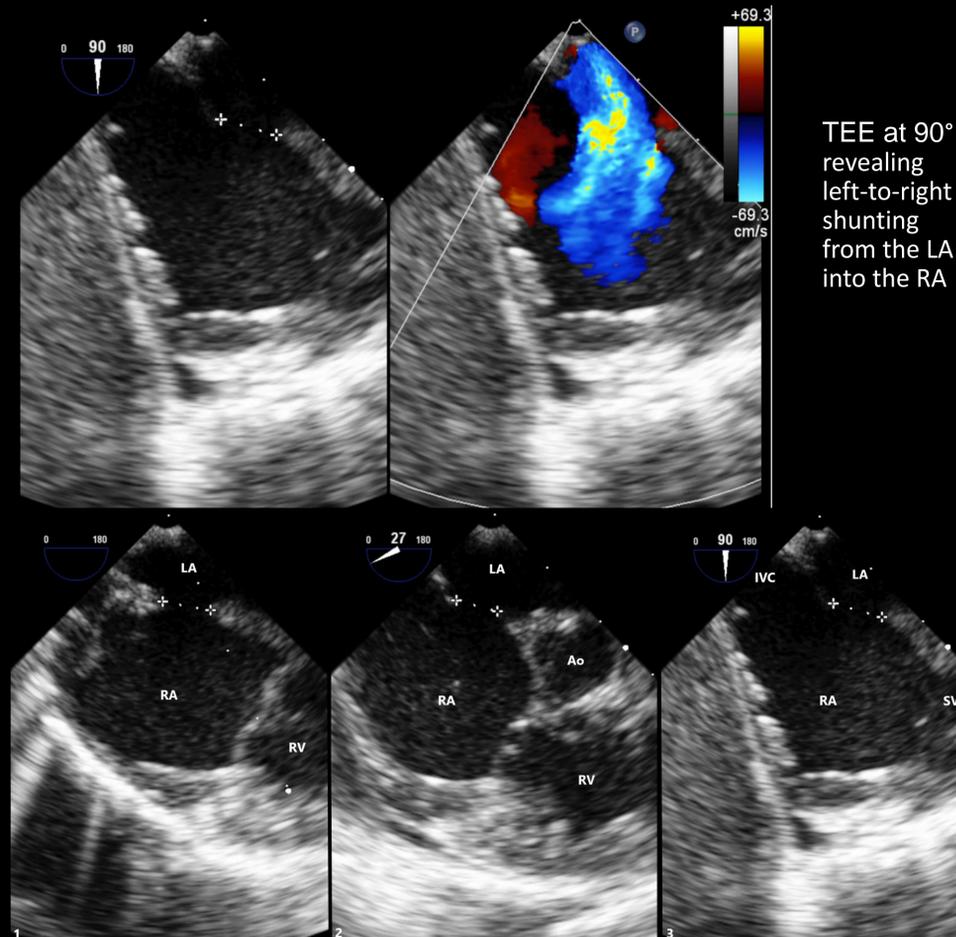
## Introduction/Device

- Transcatheter closure of ASD reduces progression of R sided heart dilation and failure, arrhythmias, and pulmonary arterial hypertension (PAH) secondary to excessive pulmonary flow
- complete closure of the defect could have fatal consequences (ie lack of systemic blood flow) in patients with an ASD and coexisting conditions such as: Left ventricular (LV) dysfunction, Right ventricular (RV) dysfunction, Pulmonary hypertension
- There are well-described methods for creating handmade fenestrations in commercially available ASD occluder devices, such as creating balloon-dilated holes before implantation
- Drawbacks to these methods include limited control over the size of the fenestration and difficulty in maintaining patency
- The Occlutech FASD occluder provides a manufactured alternative with demonstrated safety and clinical benefits

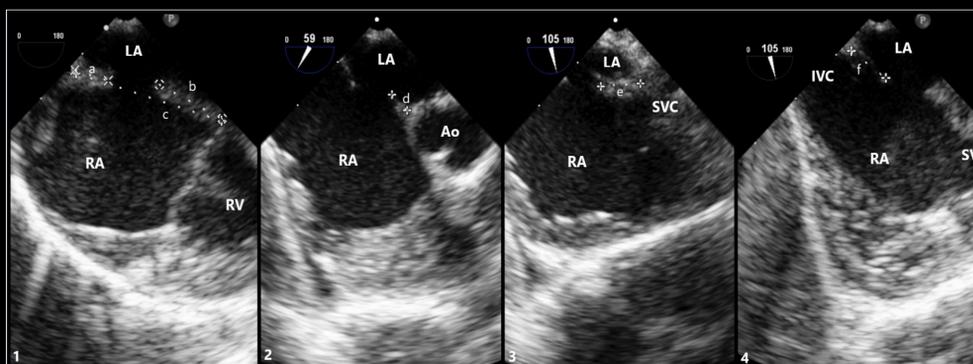


## Case Report

- 11-month-old female with Trisomy 21; 9.1 kg
- History of ostium secundum ASD, L atrial HTN secondary to LV diastolic dysfunction, and PAH
- Started on diuretic tx with Furosemide
- Diagnostic cardiac catheterization measurements:  
PA pressure: 27mmHg  
LA pressure: 12 mmHg  
PVR 3.91 indexed WU  
Qp:Qs 1.7:1
- ASD measured 5.3 x 8.5mm by echocardiography



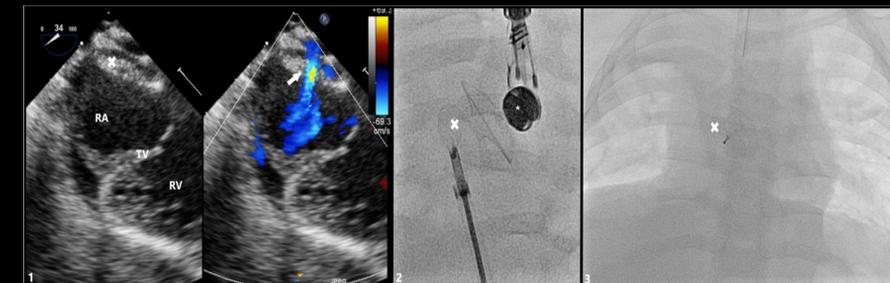
(1) TEE at 0° with defect measuring 6.7mm. (2) TEE at 27° with defect measuring 5.7mm. (3) TEE at 90° with defect measuring 6.9mm.  
LA: left atrium, RA: right atrium, RV: right ventricle, Ao: aortic root, IVC: inferior vena cava, SVC: superior vena cava



(1) TEE at 0° showing superior rim measuring 5.9mm(a), inferior rim measuring 12.0mm(b), and total septal length measuring 25.9mm(c). (2) TEE at 59° showing aortic rim measuring 3.8mm(d). (3) TEE at 105° showing SVC rim measuring 7.4mm(e). (4) TEE at 105° showing IVC rim measuring 7.4mm(f).  
LA: left atrium, RA: right atrium, RV: right ventricle, Ao: aortic root, IVC: inferior vena cava, SVC: superior vena cava

## Follow up

- 3-weeks post: normalize heart size, well seated device, expected left to right shunt
- 8-month post: no atrial level shunt, fenestration closed, normal RA & RV size and function



(1) TEE probe at 34° with color compare showing device in appropriate position fully covering secundum ASD with residual left-to-right shunt through fenestration (arrow). (2) Angiogram demonstrating appropriate placement of fenestrated ASD closure device just prior to release from delivery sheath and cable. (3) Post-procedure posterior-to-anterior chest x-ray image of appropriate device placement

## Discussion

- Patients with DS have higher rates of pulmonary HTN than non-downs patients
- The Occlutech® fenestrated ASD occluder allows for a set size fenestration with no excess stent material in the left atrium
- Vettukattil et al. (2019) demonstrated the use of a fenestrated ASD device in pediatric patients with PH and a large ASD; smallest patient was 5 years old
- The patient's fenestration did close after 8 months, which is a longer period of time than previously reported with handmade fenestrations

## Conclusions

- The Occlutech® fenestrated ASD occluder is a safe device when implanted in small children requiring ASD closure with residual atrial communication
- The device minimizes the degree of atrial shunting and pulmonary over-circulation but maintains the possibility of a right-to-left shunt in settings of high pulmonary arterial pressure