



**Spitalul Monza**  
Centru Cardiovascular



## SUCCESSFUL PARTIAL CLOSURE OF A MODERATE TO LARGE SECUNDUM ATRIAL SEPTAL DEFECT WITH SEVERE PULMONARY HYPERTENSION USING A FENESTRATED OCCLUTECH FIGULLA® FLEX II ASD DEVICE. CASE REPORT.

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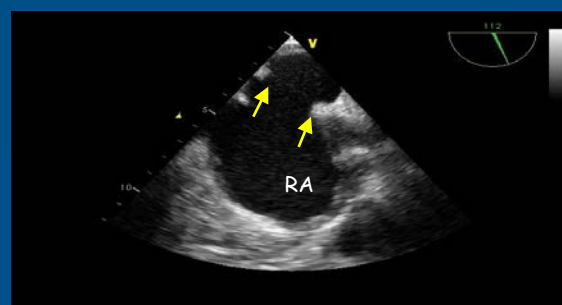
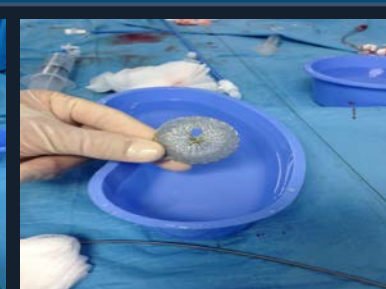
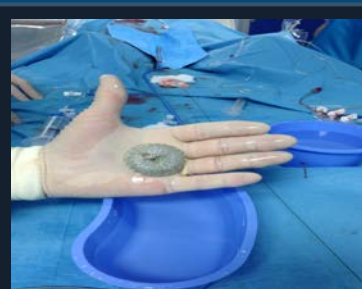
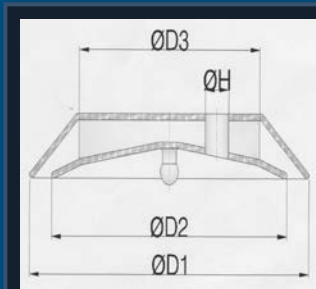
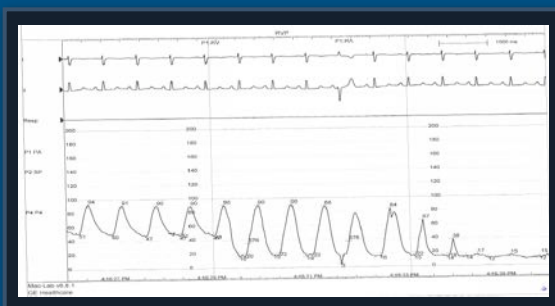
**Background:** Atrial Septal Defect (ASD) is the commonest adult congenital heart defect. 15 % of these patients will eventually develop pulmonary hypertension (PHTN) if left untreated. Moreover, some cases will present when PHTN has ensued or has even become systemic, reducing their chances for succesful closure. Partial ASD closure has been reported in the elderly and in cases of severe PHTN, with variable results. In this report we describe our experience with closing of a moderate-to-large symptomatic secundum ASD associated with severe PHTN in a 52-year-old male in New York Heart Association classification (NYHA) class II-III with no other clinically meaningful treatment alternatives.

**Methods:** Clinical examination revealed a wide fixed splitting of 2nd heart sound and an ejection systolic murmur on the pulmonary area. Chest X-ray showed cardiomegaly, right atrial and vesntricular enlargement, dilated main pulmonary artery and pulmonary congestion. Transthoracic echocardiography (TTE) confirmed a centrally located secundum ASD measuring 26 mm with critical right chambers volume overload; septal defect rims were all well represented but the supero-anterior one. Full hemodynamic study first at room air and thereafter at 10 L/min 100% oxygen for 10 minutes was performed that revealed: bidirectional shunt, predominatly left-to-right shunt (QP/QS: 1.7), severe pulmonary artery hypertension (90 mmHg), normal systolic aortic pressure (120 mmHg), pulmonary vascular resistance 7.84 Wood Units with a ratio between total pulmonary resistance to total systemic resistance of 0.54. Diagnostic coronary angiography was done and revealed normal coronary anatomy and flow pattern. The patient was labeled as high risk for closure and was refused for surgical correction. The transcatheter closure procedure was performed under general anesthesia and transesophageal echocardiography (TEE) guidance. The defect was partially closed using a manufacturer made fenestrated Occlutech Figulla® Flex II ASD 27 mm device. This occluder consists of a Nitinol-wire mesh with "shape-memory" properties. A flexible waist connects the two retention discs, and conforms completely to the atrial septum once deployed. The left atrial disc measured 42 mm, the right atrial disc 38 mm with a connecting waist of 27 mm. A perfectly round para-central custom made fenestration of 6 mm was created; the patch cut and the sewing around the fenestration was designed accordingly. This special ASD occluder turned to be very flexible and fitted the defect perfectly. A regular 14 Fr Mullins delivery sheath was required. The patient received heparin 100 IU/kg during the procedure followed by dual oral antiplatelet therapy (aspirin and clopidogrel) for 6 months. Antimicrobial prophylaxis against infective endocarditis was also recommended.

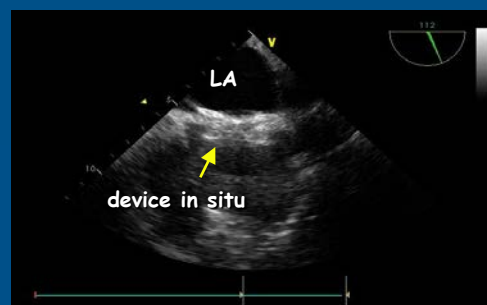
**Results:** The implantation procedure was successful without any complication. Post-procedure and 1 month TTE confirmed that the fenestration is still patent and estimated systolic pulmonary artery pressure dropped from 90 mmHg to 35 mmHg, right ventricular diastolic dimensions slightly decreasing. Immediate marked symptomatic improvement was obtained. No device malfunction, atrial arrhythmias or thrombus formation was detected so far.

Pre- procedure PA-RV-RA pressure measurements

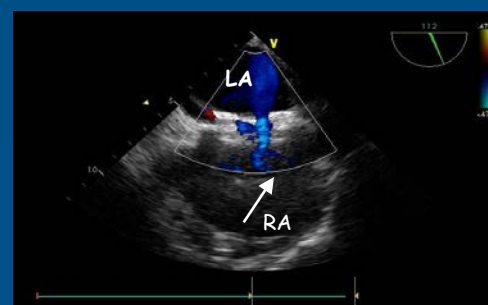
Fenestrated Occlutech Figulla® Flex II ASD 27 mm Device



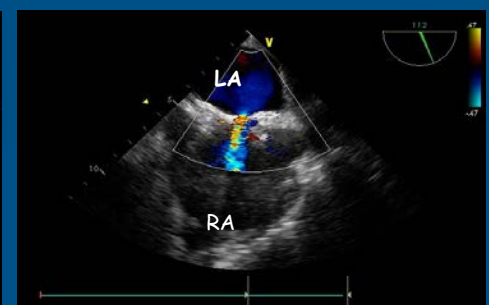
Pre-op TTE bicaval view



Intraoperative TEE : device deployed



Intraoperative TEE : patency of fenestration



1 month post-op Echo color Doppler

**Conclusions:** Management of secundum ASD and severe PHTN has proven to be challenging. Partial closure is a safe and feasible treatment option to reduce the magnitude of the shunt and the right ventricle volume overload; it may represent a bridge to complete closure when using a custom made fenestrated device. Long term follow up is imperative to plan second stage closure of the fenestration in the nearest future.