WHEN TO CLOSE?
THE IDEAL TIMING IN PATIENTS WITH VSD AND SIGNS OF OVERLOAD

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- No Disclosure

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Ventricular septal defect (VSD) is the most common congenital heart disease. In patients with large VSD, left side chambers are subjected to volumen overload with subsequent chambers dilation , pulmonary hypertension and ventricular dysfunction. The effect of VSD closure on LV remodeling has been mainly asses in patients treated with surgery.

Since the first endovascular VSD closure in1988, percutaneous treatment of VSD has been shown to be an effective method with comparable succes rate and major complications to surgical closure, shorter hospital stay and better cosmetic results

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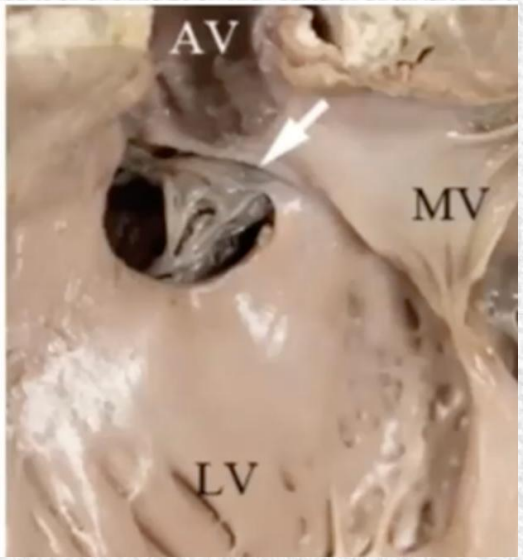
- Although arrythmia disturbance, new onset of aortic or tricuspid regurgitation, hemolysis and complete AVB continues ocurring, they are less frequent because of development of new devices
- Furthermore, the applicability of the endovascular closure in infants with heart failure is limited due to the higher proportion of failure and complications. The ideal device is still unavailable but there are different options for each anatomical varity

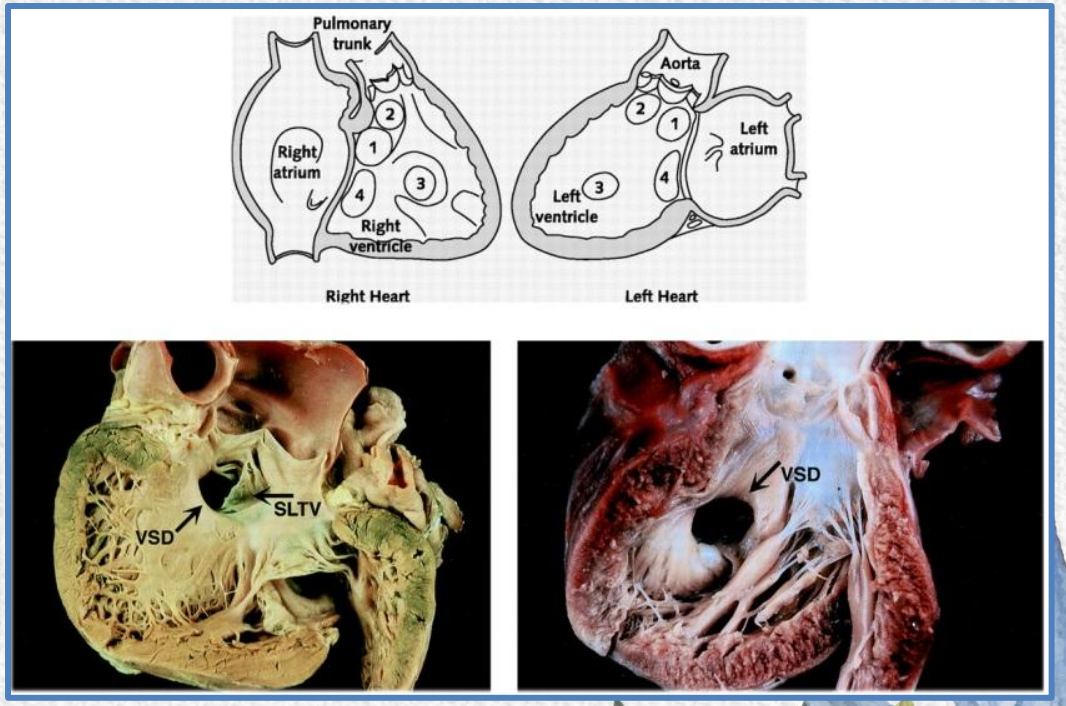
VSD ANATOMICAL VARIABILITY

Proximity to
Tricuspid valve

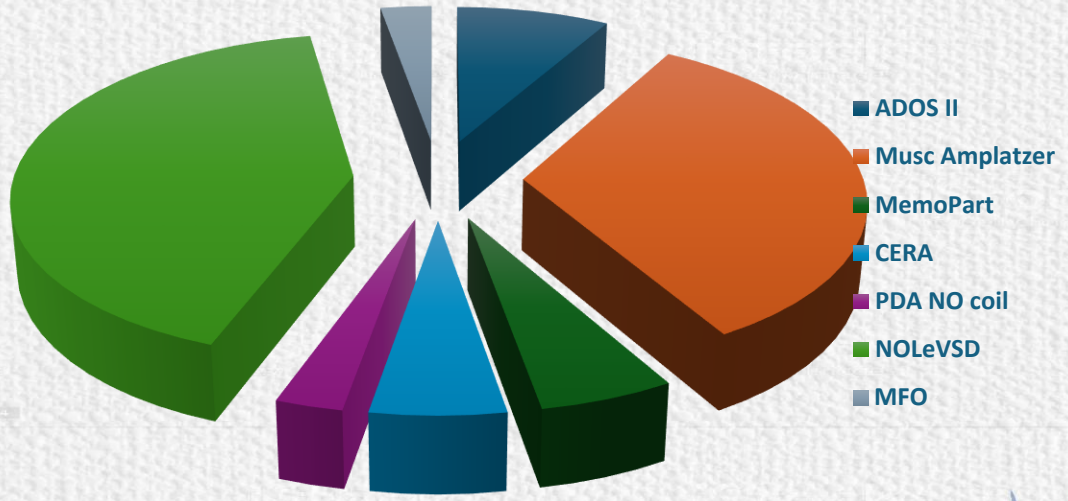
Aortic Valve cusps



Malalignement



VARITY DEVICES



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- **Transcatheter VSD closure indication:**

- 1)Heart failure symptoms, growth failure, recurrent respiratory tract infections
- 2) Significant left to right shunt (QP/QS >1,5:1)
- 3) Left heart enlargement on transthoracic echocardiography
- 4) Low to moderate PA elevation pressure with RVP < 6 -8 UW
- 5) No others cardiac defect requiring surgery

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➢VSD Closure under 10 kg

- 10-5 kg Antegrade approach (A-V asa / FO-LA-LV)
  Venous direct RV-LV approach
  Retrograde approach
- < 5kg Retrograde approach? Femoral artery punction?
  More arrythmogenic
  Aortic and Tricuspid Valve lesión
  Antegrade or perventricular approach

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> Pediatr Cardiol. 2023 Jun;44(5):1176-1182. doi: 10.1007/s00246-023-03100-5.
Epub 2023 Jan 25.

Transfemoral Perimembranous Ventricular Septal Defect Device Closure in Infants Weighing ≤ 10 kg

Dhafer Alshahrani [1 2], Niall Linnane [1], Brian McCrossan [1 3], Paul Oslizlok [1], Colin J McMahon [1], Kevin P Walsh [1], Damien P Kenny [4]

Affiliations + expand

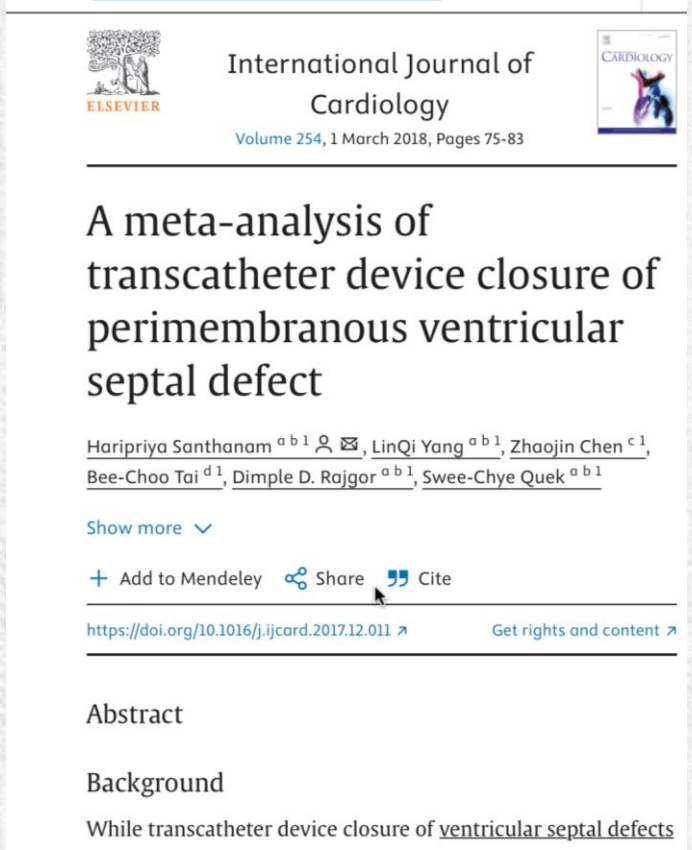
PMID: 36698044 PMCID: PMC10224829 DOI: 10.1007/s00246-023-03100-5

Abstract

Transcatheter closure of Perimembranous VSDs (PMVSD) remains challenging particularly in infants. The aim of this study is to evaluate the efficacy and safety of transfemoral PMVSD device closure in infants weighing ≤ 10 kg in a single centre. Retrospective review of departmental databases and medical charts to define patient cohort and collect demographic, procedural and follow-up data. Between July 2014 and March 2021, 16 patients underwent attempted transfemoral PMVSD device closure (12 retrograde) at a median age of 11 months (interquartile range [IQR] 9-

Retrospective review 16 pt <10 kg
LV dilation, heart failure or VSD associated valve aortic regurgitation
Median defect size was 6,8 mm
Median device waist size was 6 mm
Two patient developed aortic and tricúspide regurgitation , surgery treatment
No embolization neither femoral artery compromiso
No AV block at 40 month FU
Small residual shunt in 3 pt.

VSD CLOSURE: SAFETY AND EFFICACY



International Journal of Cardiology
Volume 254, 1 March 2018, Pages 75-83

A meta-analysis of transcatheter device closure of perimembranous ventricular septal defect

Haripriya Santhanam [a b 1], LinQi Yang [a b 1], Zhaojin Chen [c 1], Bee-Choo Tai [d 1], Dimple D. Rajgor [a b 1], Swee-Chye Quek [a b 1]

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Abstract

Background

While transcatheter device closure of ventricular septal defects

- 54 publications
- 6762 pt pmVSD
- Mean age 1.6 to 37,4 y
- Succesful device implantation 97,8% (95%CI 96,8 to 98,6)
- Residual shunt 15,9% (95% CI 10,9 to 21,5)
- Arrhythmias disturbances 10,3%
- Valvar defects 4,1%
- CAVB 1,1% (95% CI 0,5 to 1,9)

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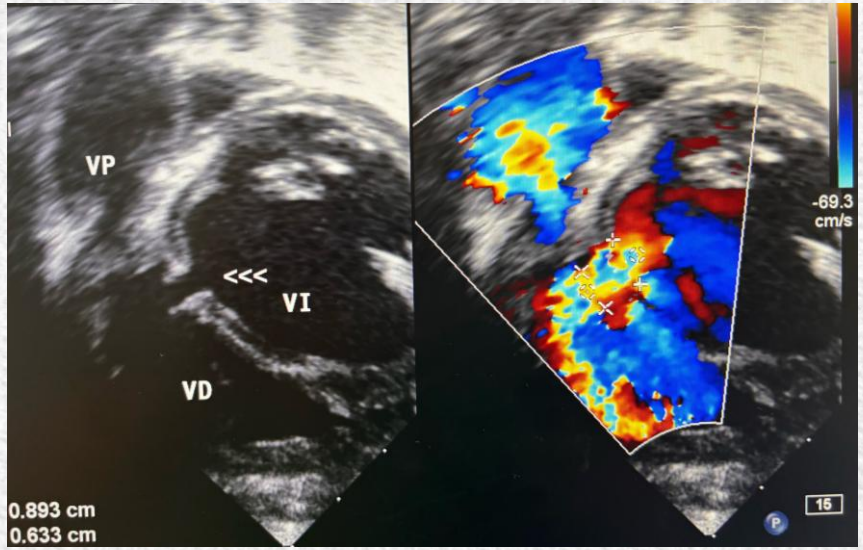
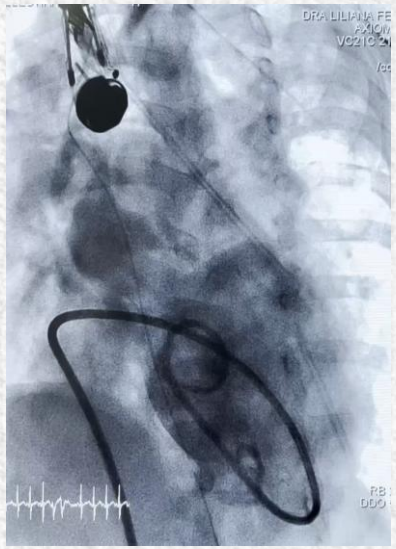
- Rapid left ventricular dimensión normalization following transcatheter ventricular septal defect closure in children

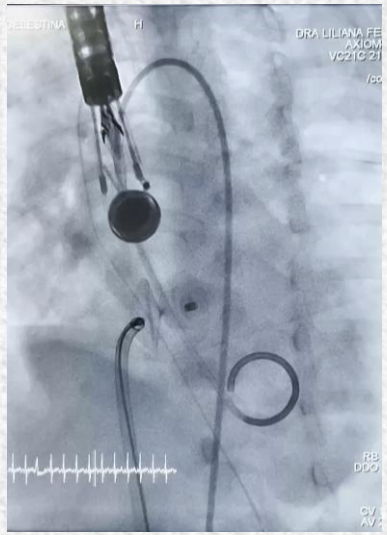
  Hui Yuan, Wenjing Zhu, Jianli Lv

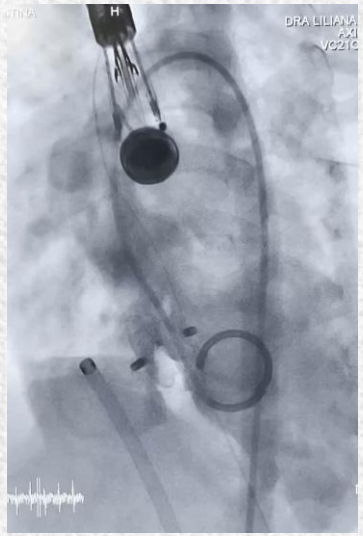
- 124 pts (mean age 3,5+-3y)
- VSD size 5,7mm
- LVEDD Z-scores decreased, 87,1% normalization at 1 month
- Showed inverse association between age and diamter normalization , and proportional with the size of the defect

6 mo 3,5 kg muscular VSD direct antegrade approach





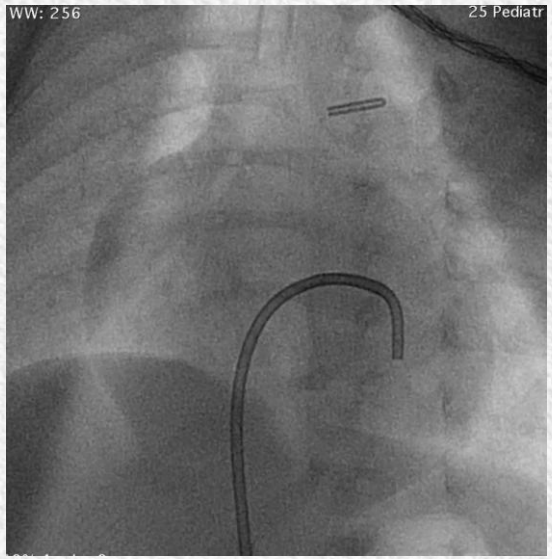


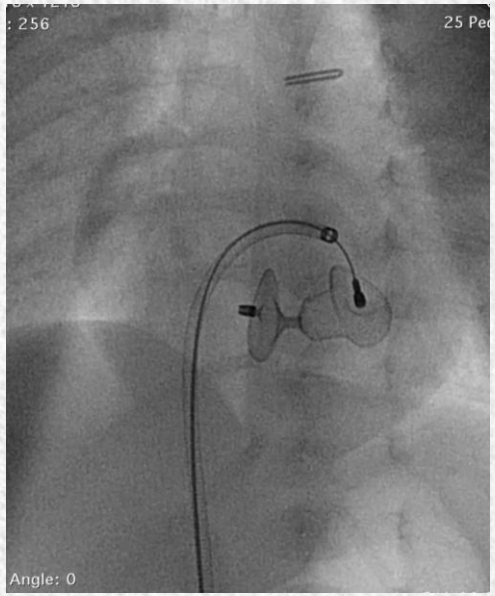


VSD 8,5 mm MFO 10-8

Neonate 3 kg Heart defect association

VSD 7,5 mm MFO 10-8

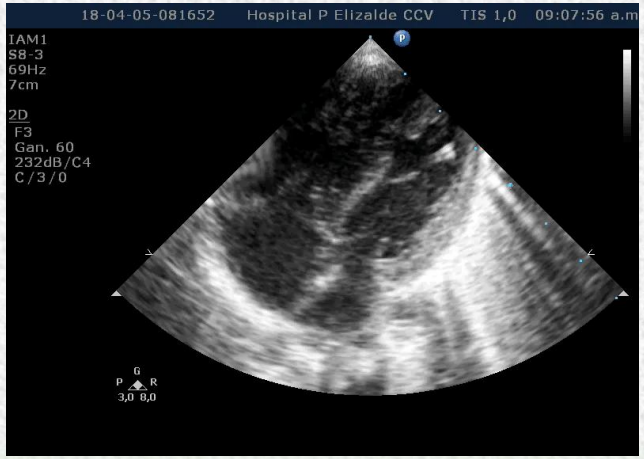


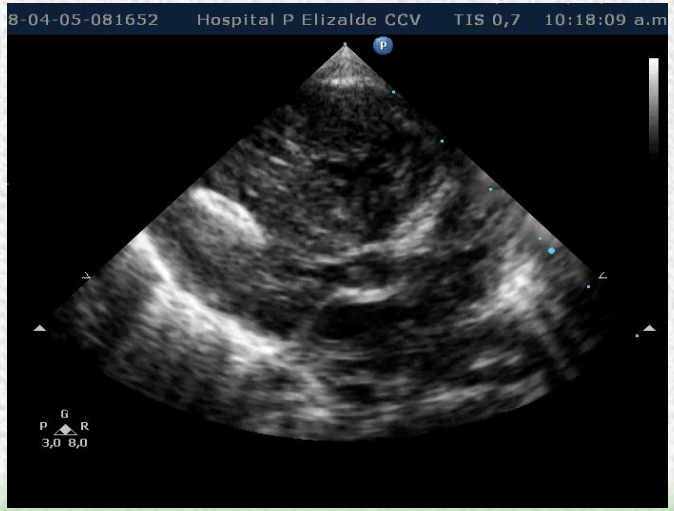


Ao Stenosis
Aortic Coarctation

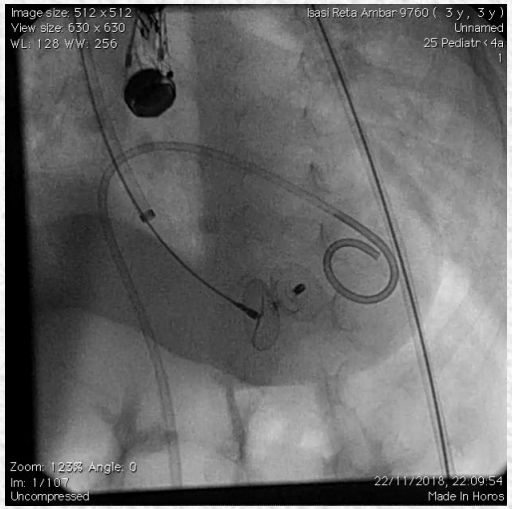
Antegrade approach
Veno-venous loop

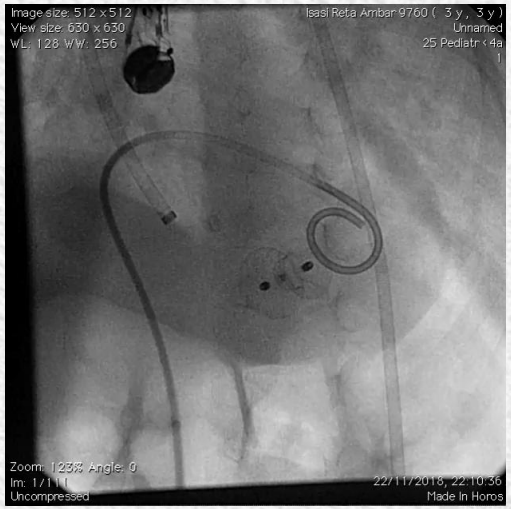
Courtesy Dr. DAMSKY BARBO

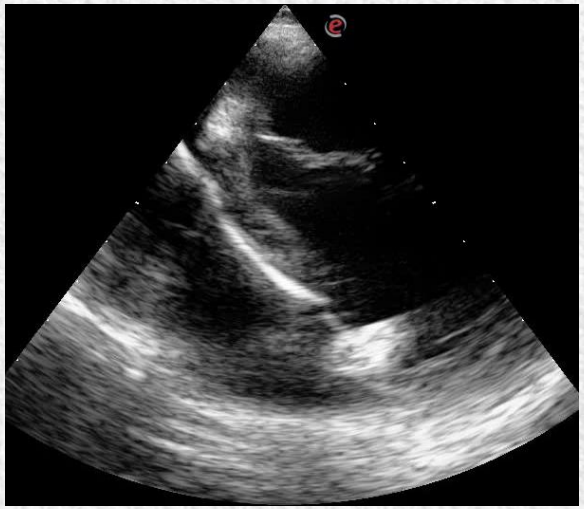




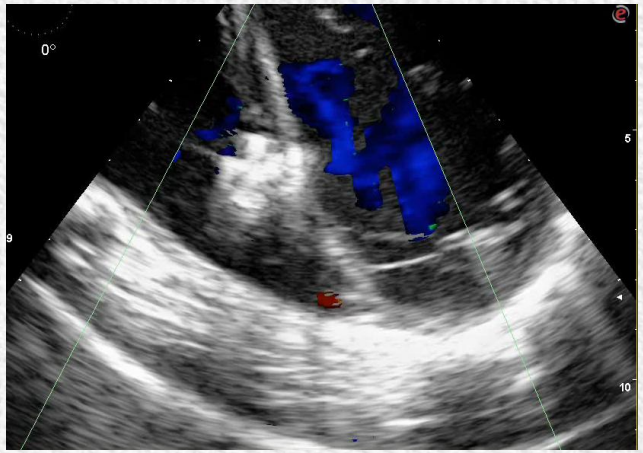
1,5 y 10 kg - Muscular VSD in DORV with PS





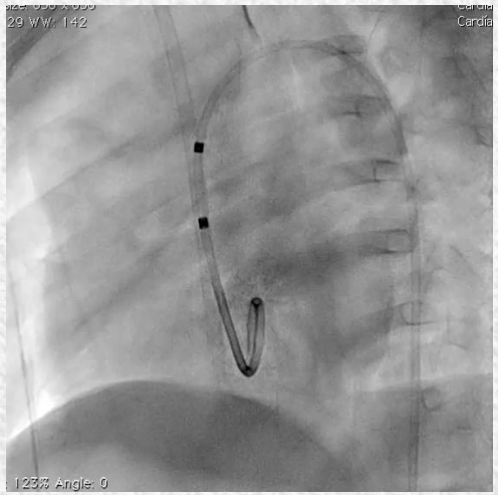


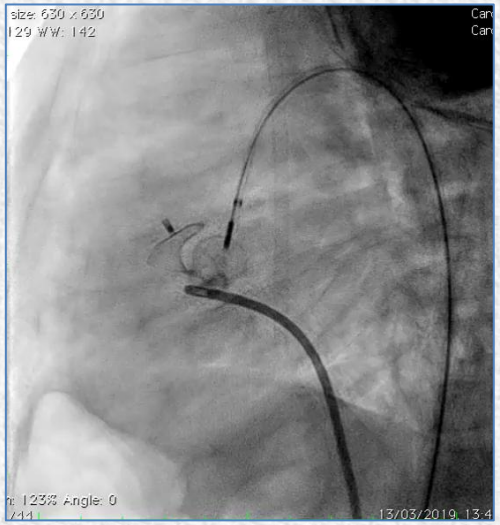
Antegrade approach



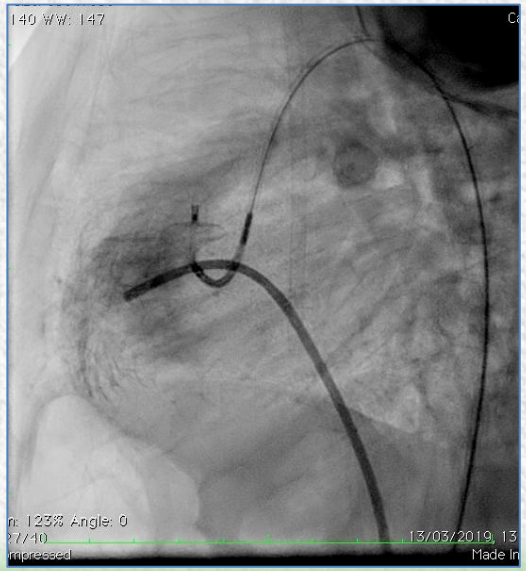
Dr Damsky Barboza courtesy

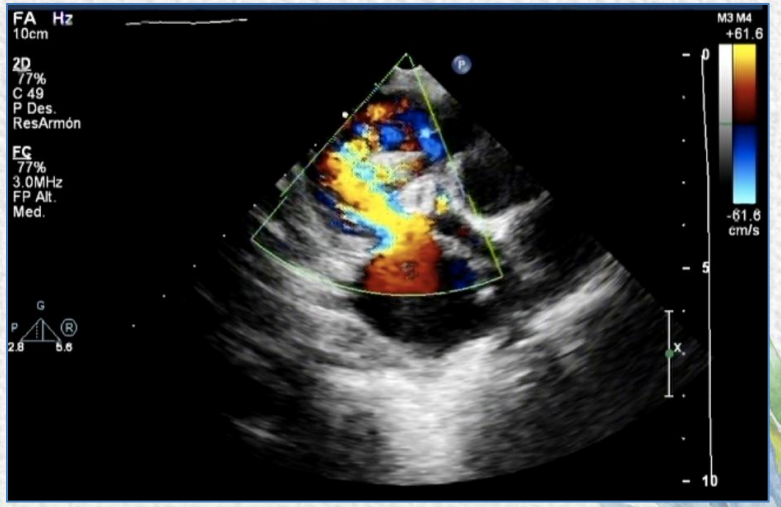
6m- 4,5 kg RV OT VSD
Retrograde approache



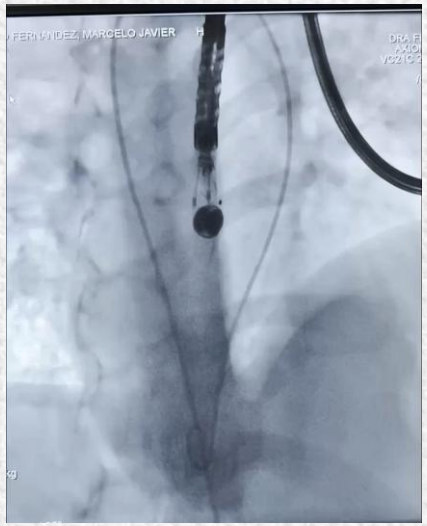
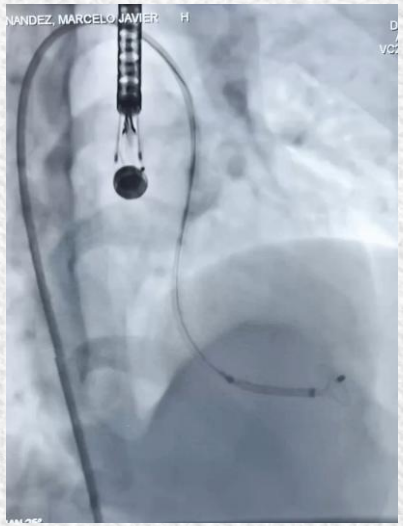
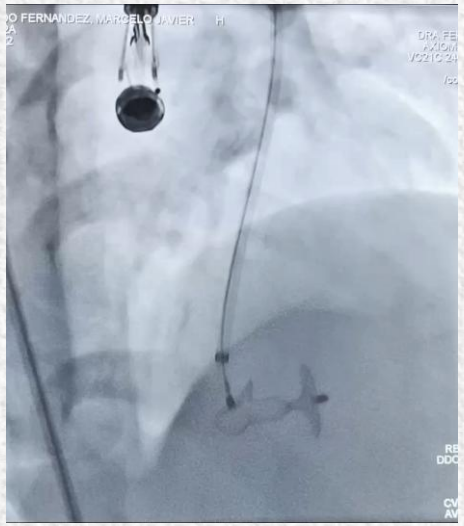
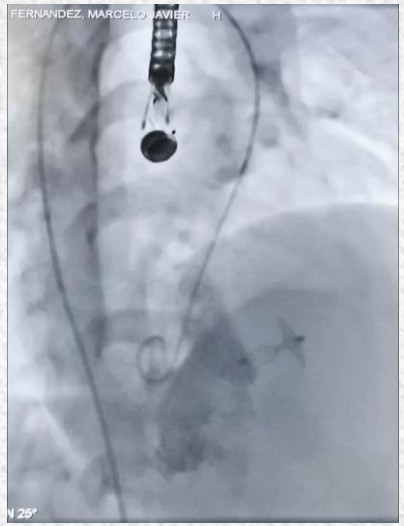


VSD 4mm
MFO 8-6

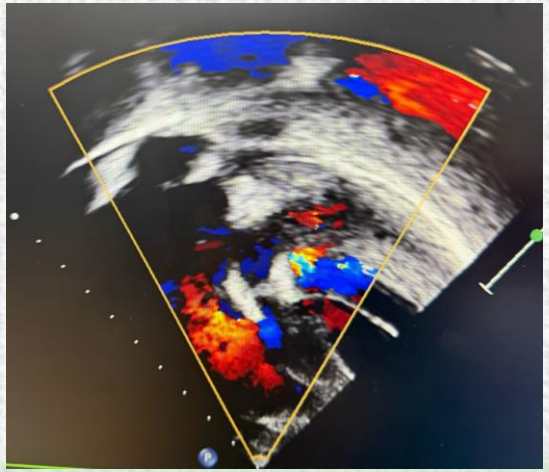




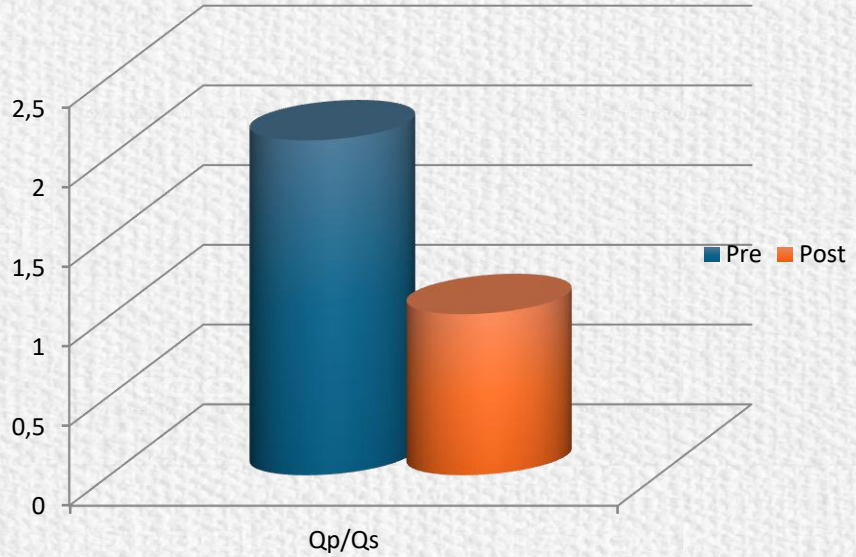
6 yo VSD in Situs Inversus
Retrograde approach VSD 5 mm MFO 9-7

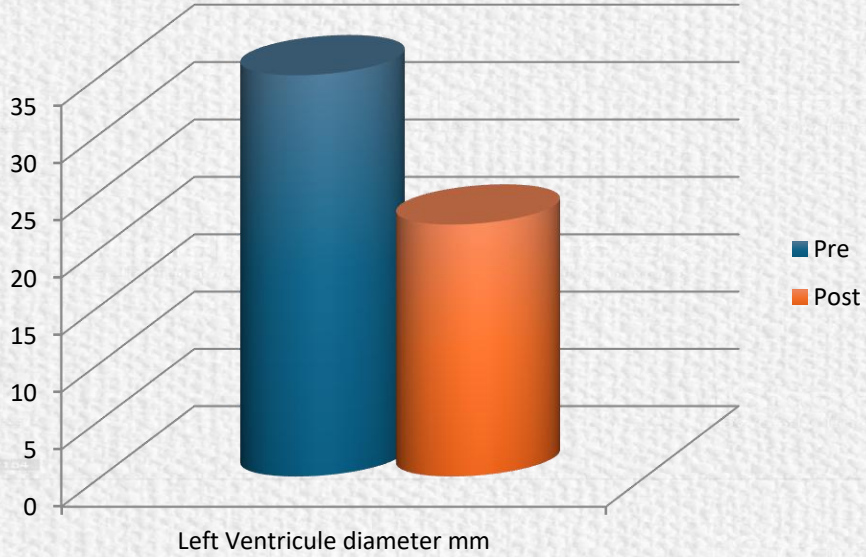





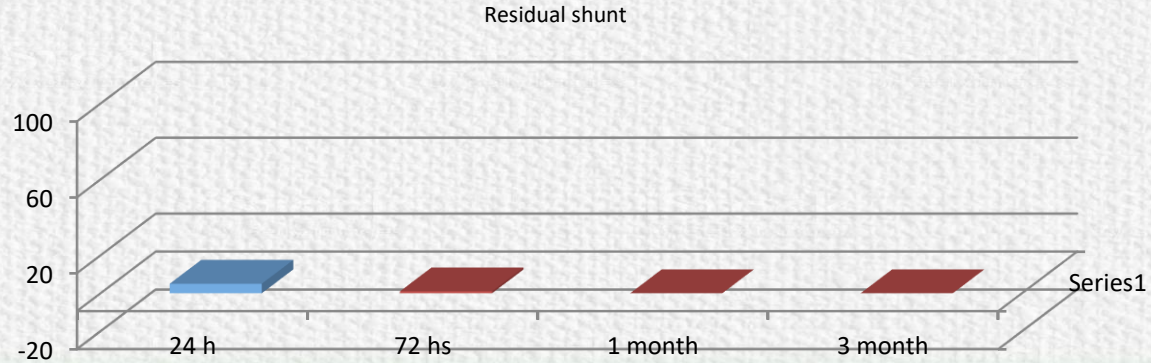
VSD: 6,5 mm
MFO 9-7

114 Pts 6 month follow up showed normal QP/QS values and lLV normal diameter







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- The benefits of the procedure be higher than the risk
- Transcatheter VSD closure is a technically challenging procedure
- Is essential to be performed by experienced operators in centers with adequates resources and support services
- The procedure is safe and effective with favorable outcome even in heart failure infants and patients pulmonary hypertension
- Percutaneous VSD closure is asociated with improvement of various LV parameters with favorable LV remodeling and function