

VSD closure

Intra-procedural Guidance

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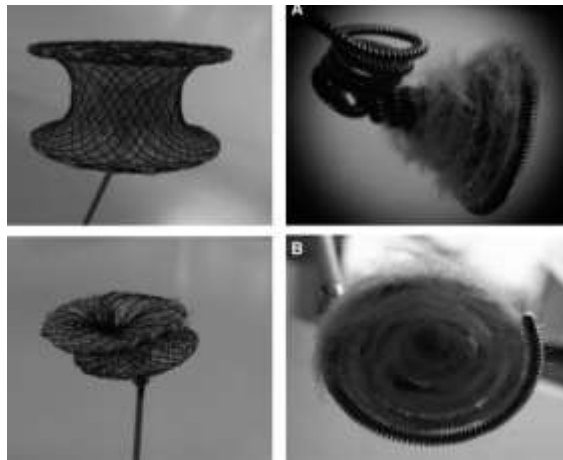
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CardioEgypt 2018

VSD

- The most frequent types of congenital malformations
- A **VSD** is the most frequent of the various types of CHD (25%-30% of all CHD).
- Approximately one **infant** in 500 will be born with a **VSD**

- Standard treatment for VSD is open surgery, which is widely performed with minimal operative mortality but still carries risks, such as
 - complete atrioventricular block (cAVB),
 - residual shunt,
 - post pericardiotomy syndrome,
 - wound infection,



The inclusion criteria

- (i) congenital VSD as shown by echocardiography
 - (ii) body weight >10 kg and age >2 years
 - (iii) maximum VSD diameter <20 mm by TTE
 - (iv) a distance of >1 mm from the pmVSD to the aortic valve
 - (v) left-to-right shunt
 - (vi) calculated pulmonary vascular resistance <8 Wood units.
-
- X severe aortic regurgitation
 - X severe aortic valve prolapse

Intra-procedural guidance:

- **Aim:**
- Anticipation and avoidance of complication
- Ensure safety of the patient
- Choice of the best device type and size for the intended defect

Intra-procedural guidance:

- Guidance can be done intra-procedural :
 - Electrically by the ECG,
 - Hemodynamically by the pressure waves tracing and Oxygen saturation
 - Imaging (TTE, TEE ,3 D or ICE)

Echocardiography guidance

- TTE
- TEE under general anesthesia to define
 - number,
 - location
 - relation to adjoining structures (chordae, papillary muscles & AV valves)

JACC: CARDIOVASCULAR IMAGING
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IMAGING VIGNETTE

3D Echocardiography for Planning and Guidance of Interventional Closure of VSD

Marietta Charakida, MD, PhD, Shakeel Qureshi, MD, John M. Simpson, MD

Three D

echocardiography permits projection of an en face view of the VSD from which accurate sizing can be performed irrespective of the shape or location of the defect and independent of pre-defined angles of insonation. VSDs may often have unusual or irregular shapes and the 3D technique has the ability to display such morphology and assist in selection of suitable device

Procedure – LV angiogram

- Perimembranous defects:
- the long axial oblique (LAO 60 degrees/15 degrees cranial) view is the best to profile such defects
- Size of aneurysm
- No of fenestrations [largest hole, most central hole]
- Distance from aortic valve

Procedure – LV angiogram

- Muscular defects
- Perimembranous ventricular septal defects

- The **femoral vein** access is helpful in anterior and Perimembranous VSD
- The **right internal jugular** access is especially helpful in patients with a mid, posterior and muscular VSD.



Eur Heart J. 2010 September; 31(18): 2238-2245.

PMCID: PMC2938468

Published online 2010 August 27. doi: [10.1093/eurheartj/ehq240](https://doi.org/10.1093/eurheartj/ehq240)

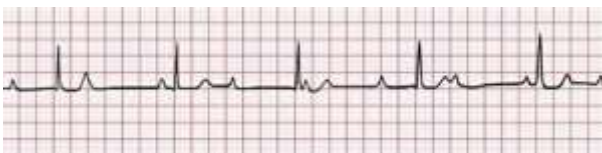
Transcatheter device closure of perimembranous ventricular septal defects: mid-term outcomes

[Jian Yang](#),^{1,†} [Lifang Yang](#),^{2,†} [Yi Wan](#),^{3,†} [Jian Zuo](#),^{1,†} [Jun Zhang](#),^{4,†} [Wensheng Chen](#),^{1,†} [Jun Li](#),⁴ [Lijun Sun](#),⁵ [Shiqiang Yu](#),¹ [Jincheng Liu](#),¹ [Tao Chen](#),¹ [Weixun Duan](#),¹ [Lize Xiong](#),^{2,*} and [Dinghua Yi](#)^{1,*}

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- The most common complications associated with transcatheter pmVSD closure were heart rhythm disturbances (58 of 103)

AV blocks



Percutaneous Transcatheter Closure of Perimembranous Ventricular Septal Defects in One Working group, Long-Term Follow up

Abstract

Our goal in this work was to evaluate the safety and efficacy of percutaneous transcatheter closure of ventricular septal defects (VSD), mostly perimembranous types (VSDpm) and long-term results. The VSD is the most common congenital heart disease. Transcatheter percutaneous closure have been a novel technique.

Material and methods: Between December 2004 and December 2013, 300 patients with medical record of VSD were admitted to our study, previously admitted to the cath lab at our center for percutaneous treatment of their VSD with various types of devices. All patients were followed until December 2013, 1 to 109 months. VSD type treated: perimembranous (VSDpm) 93.85 % and muscular (VSDM) 6.14%. The VSD measures before the procedure by echocardiography or at cardiac cath ventriculography were 2 - 18 mm. Successful implantation of the device was 91.4 % in all attempted cases.

The type of device used was Amplatzer 73.30 % and the Nit Occlud Coil 26.69 %. Complications were mostly minor, major complications were 2.49% including the late follow-up. They were complete AV block in 2 cases, 0.99 %; 2 cases need late surgery in the follow up secondary to the VSD closure procedure, 0.99 % and 1 case that required removal of the device in surgery because of Hemolysis 0.5 %.

Conclusions: Percutaneous closure of VSD in experienced hands can be performed safely and successfully with low morbidity and mortality. Long-term results are good: percutaneous closure of VSD is less invasive and could be taken as a reasonable proven alternative in the treatment of perimembranous ventricular septal defects as well.

Research Article

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Federico Borges^{1*}, Angelo Sparano¹, Yudith Robles¹, Ernesto Urbano¹, Manfred Hermann¹, Carlos Garcia¹, Rosa Zabala¹, Guillermo Villoria¹, Manuel Acuña¹, Hugo Castro¹, Roshech Bravo¹, Ericson Ramirez¹ and Carlos Troconis¹

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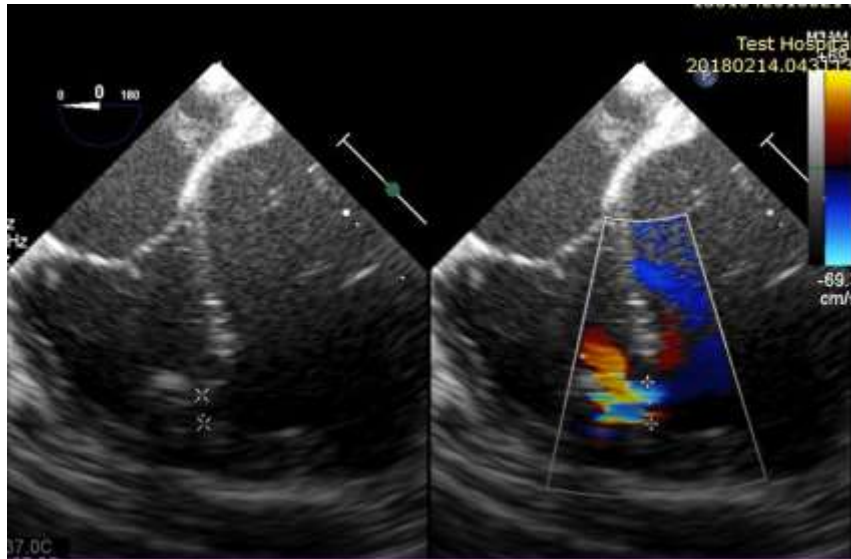
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- A 30 month old girl
- Under weight
- Easy fatigability



Circulation

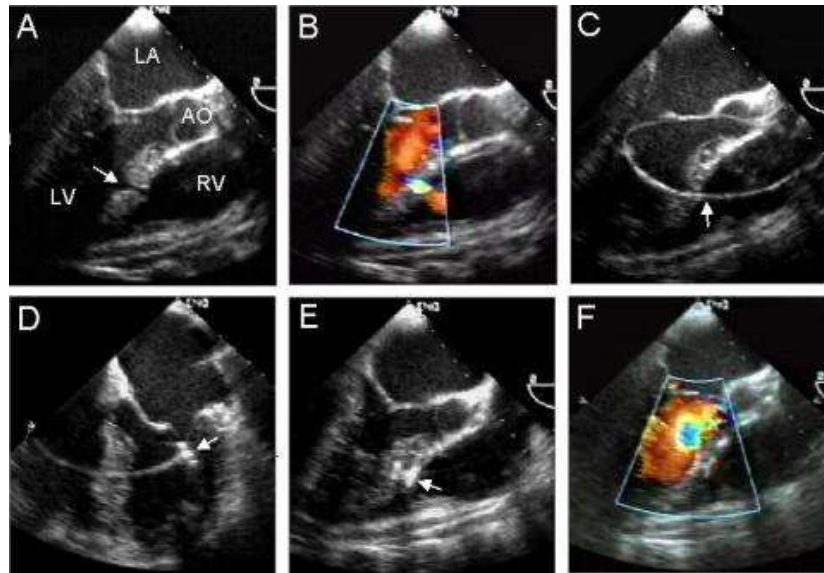
CONTEMPORARY REVIEWS IN CARDIOVASCULAR MEDICINE

Intracardiac Echocardiography During Interventional and Electrophysiological Cardiac Catheterization

Ziyad M. Hijazi, Kalyanam Shivkumar, David J. Sahn

However, we believe that it is crucial to review prior echocardiographic imaging and other diagnostic studies for their adequacy and completeness

Intra cardiac echocardiography



Take home message

- Take your time before you start
- Rhythm monitoring is mandatory
- Echo (by its modalities) guidance is the secret of successful procedures .
- The formation of a loop is a crucial part of the procedure.

Thank you