

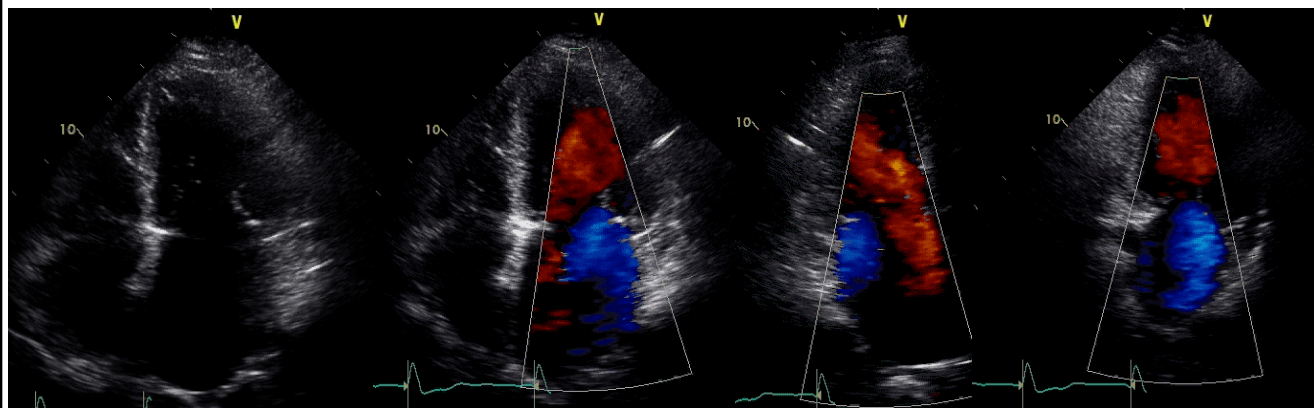
Sitting in with the heart valve team: Mitral and tricuspid cases

Echo Hawaii 2020

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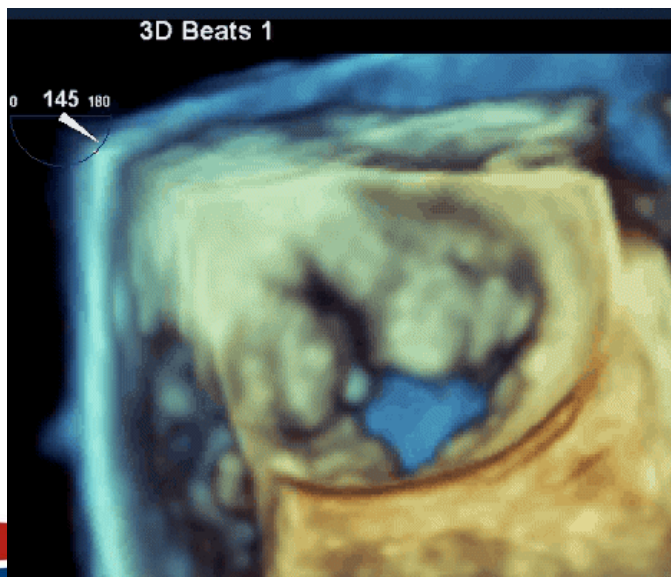
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Severe FMR



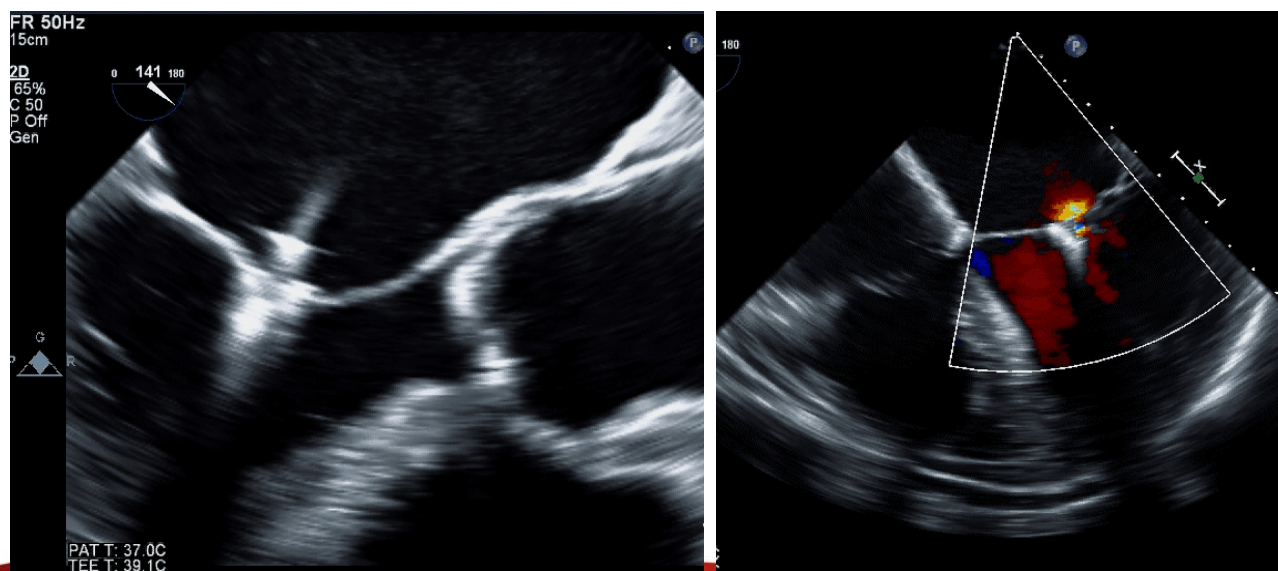
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Severe FMR



3

Successful clip x 1



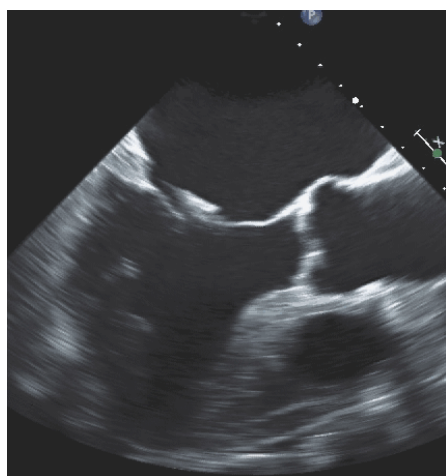
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Day 1



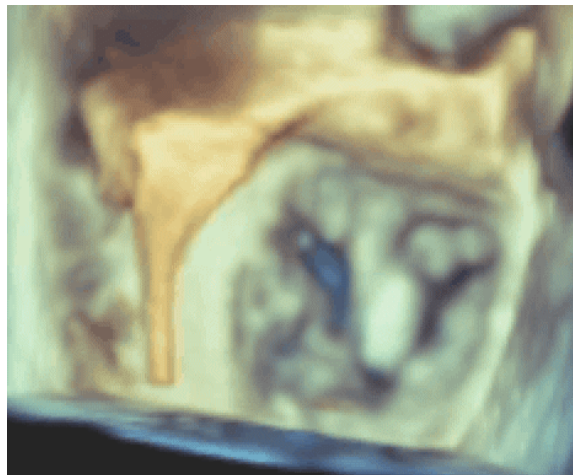
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Post clip x 1



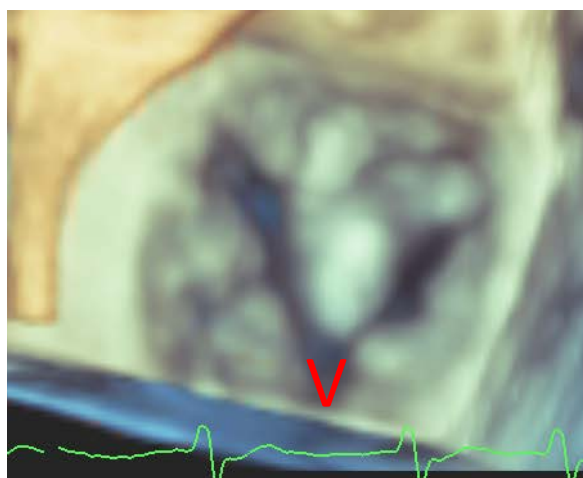
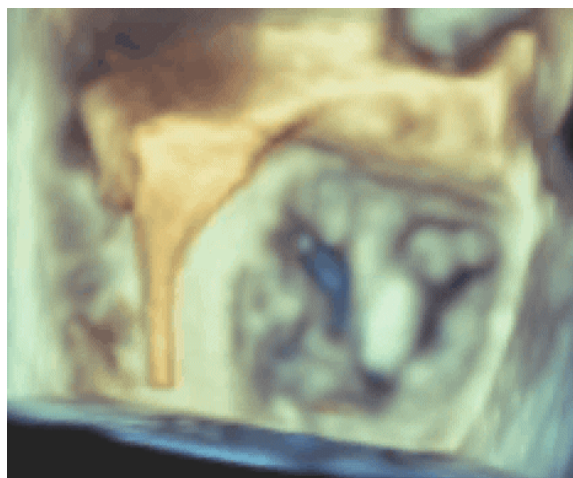
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Procedure 2



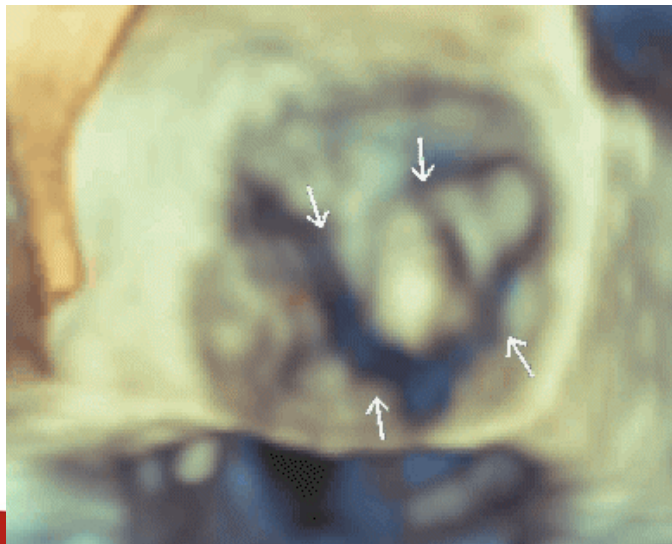
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Mitralvalvulosis



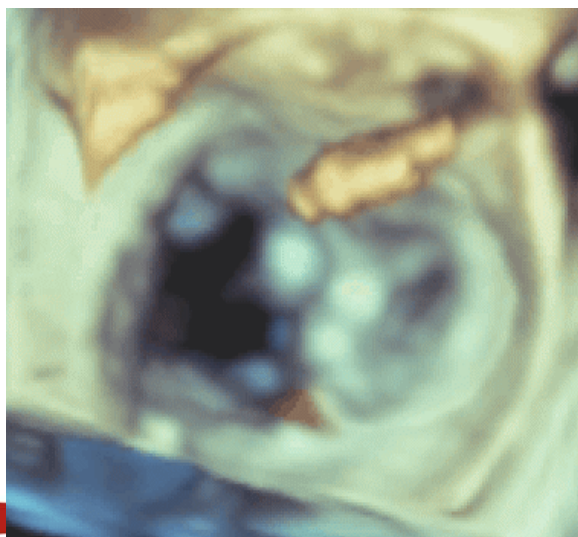
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Procedure 2



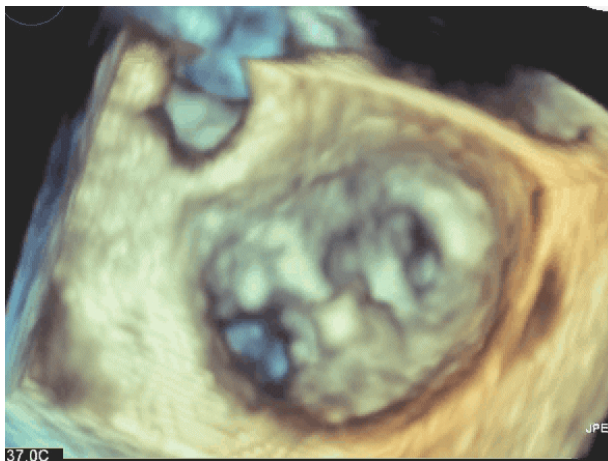
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Procedure 2



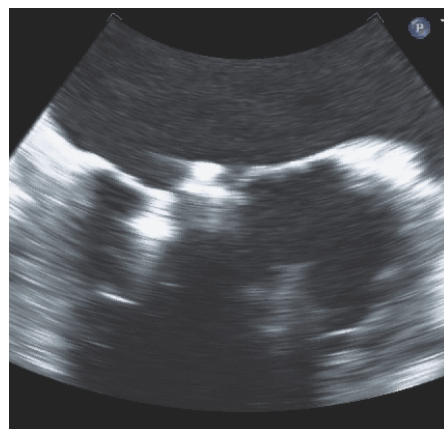
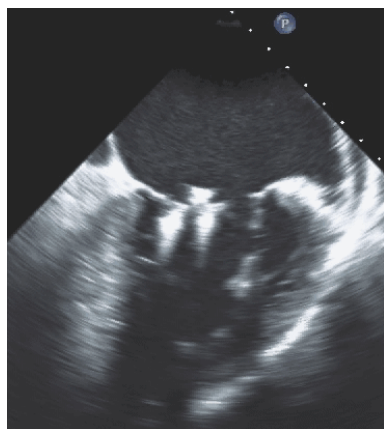
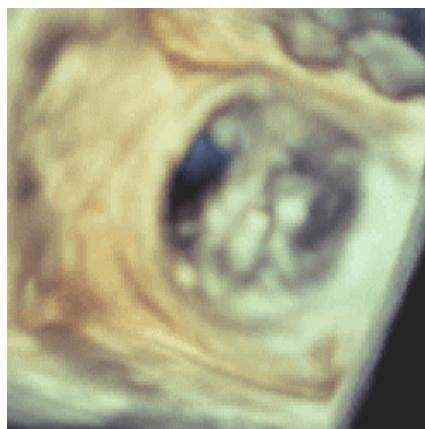
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Procedure 2



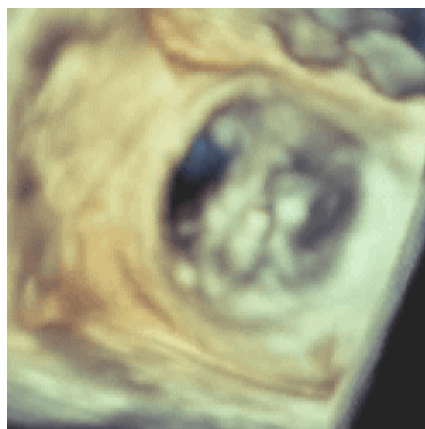
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Post Procedure 2



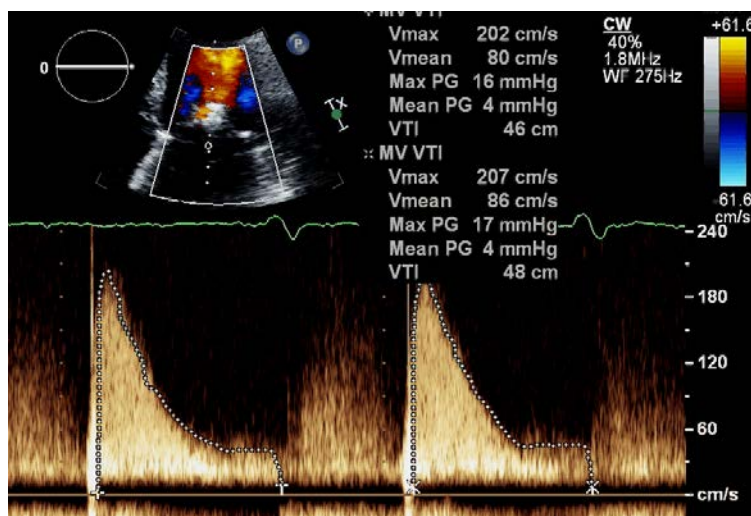
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Post Procedure 2



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Post Procedure 2



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Case 2



- **79 y/o male, 3x median sternotomies**
 - AVR xenograft 2003
 - Re-do mechanical AVR and CABG 2010. Dual chamber pacemaker.
 - MV repair 2017 with 30mm Carpentier-Edwards Physio 2 semi-rigid annuloplasty ring for severe primary MR

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Case



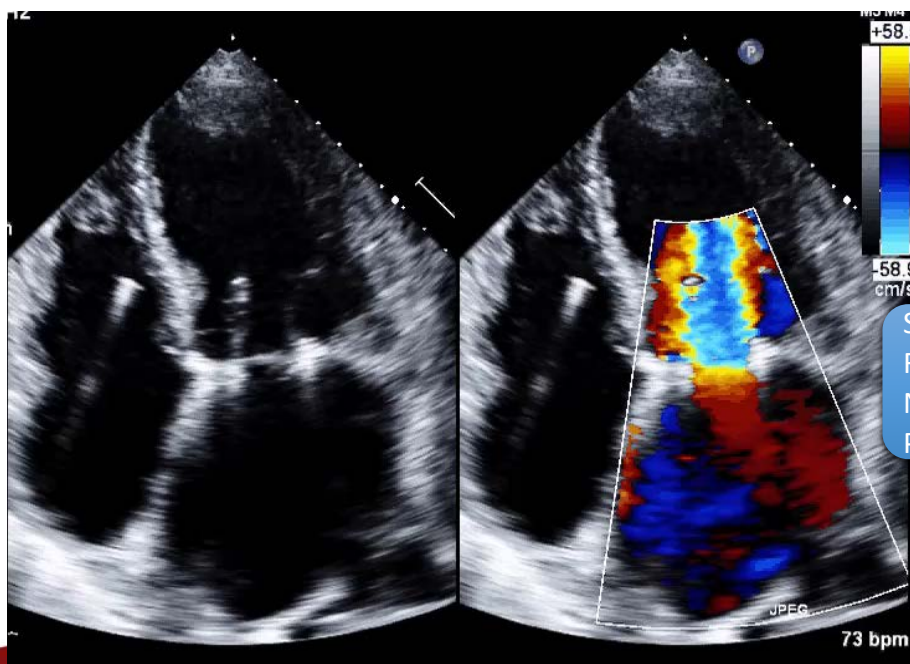
- **79 y/o male, 3x median sternotomies**
 - Re-presents 3 months post-op #3 with NYHA Class IV dyspnoea
 - Hospitalised with edema and pulmonary congestion
 - Afebrile, normotensive, mild tachycardia, elevated JVP, moderate edema, very loud murmur
 - Anemic, high reticulocyte count, low haptoglobin and high LDH
 - Inflammatory parameters and blood cultures benign

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TTE

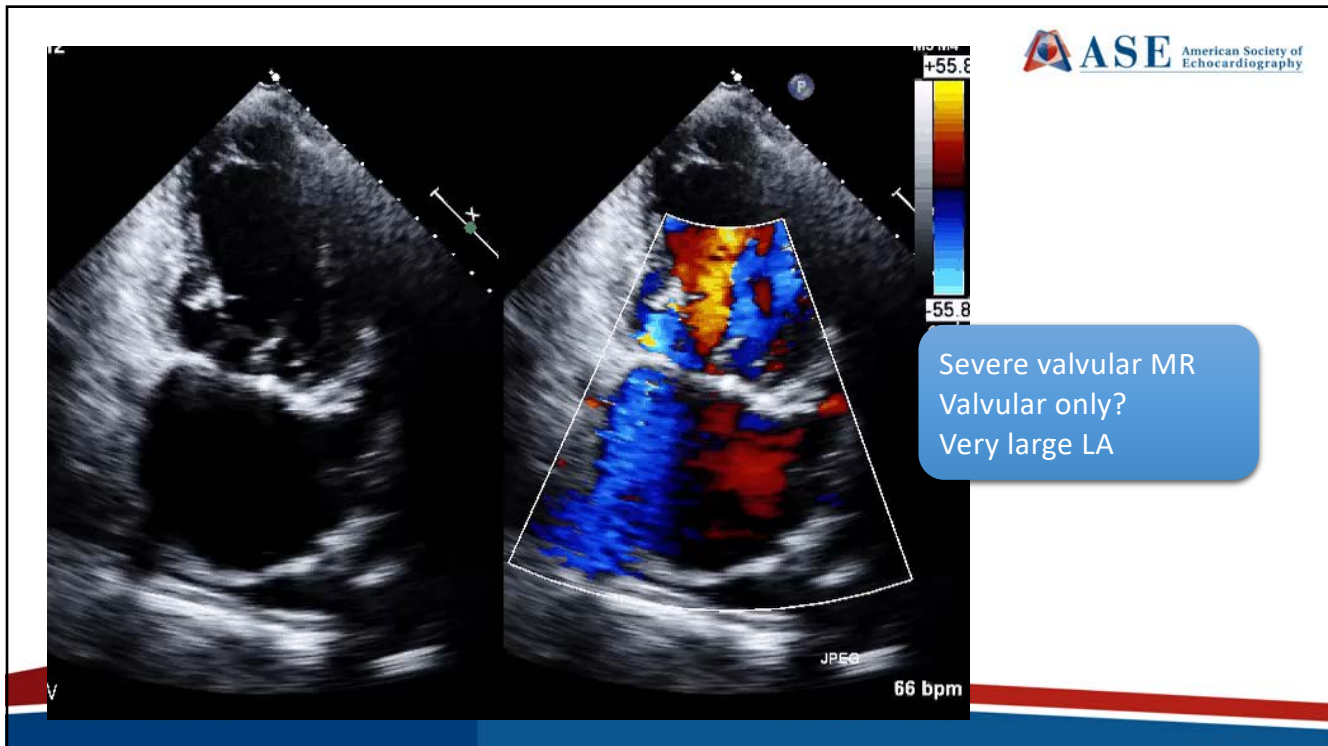
 ASE American Society of Echocardiography


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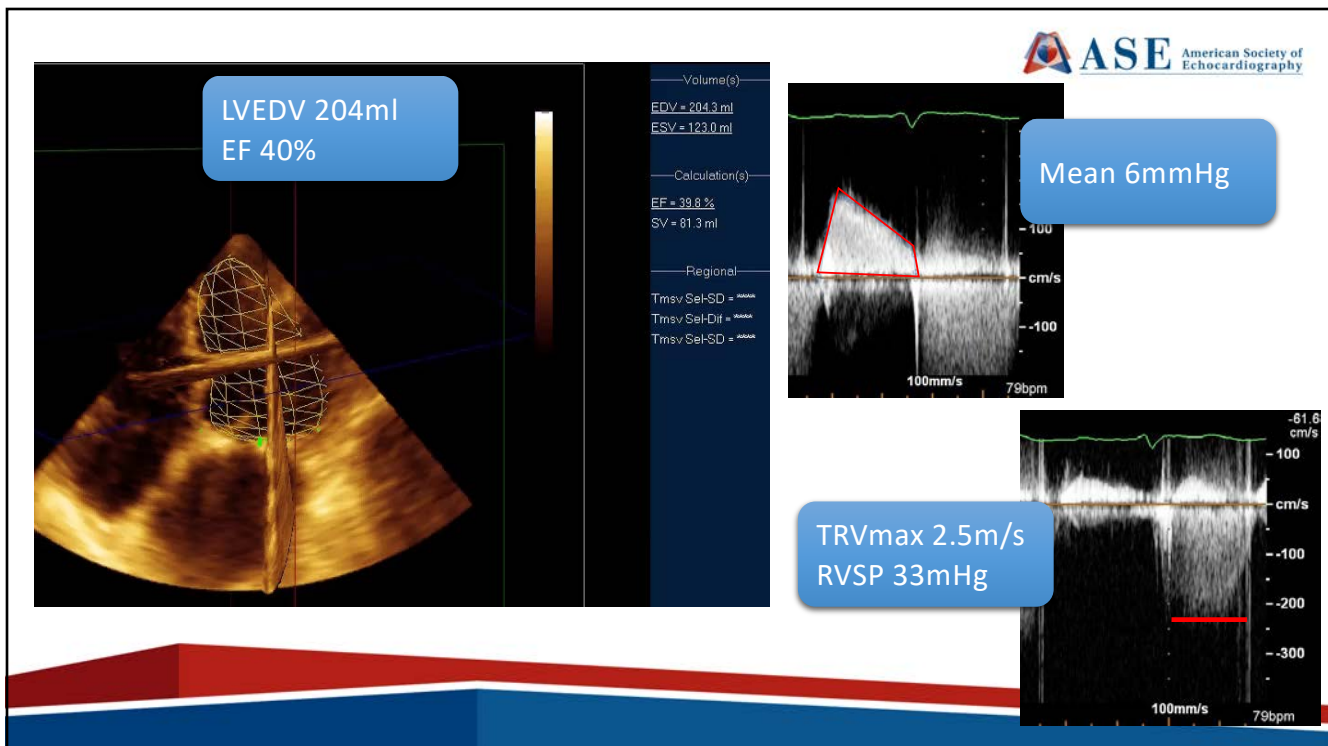

 ASE American Society of Echocardiography

Severe Valvular MR
Ring Stable
No Flail material
PPM

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What is going on?



Flail repair?

Ring stable?

LV Failure/
reserve?

Severe mitral
regurgitation
With
Clinical heart
failure

AVR working?

Infection?

Hemolysis?

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TEE



Dehiscence?

Very large LA
Ring rocking?
Flail material?

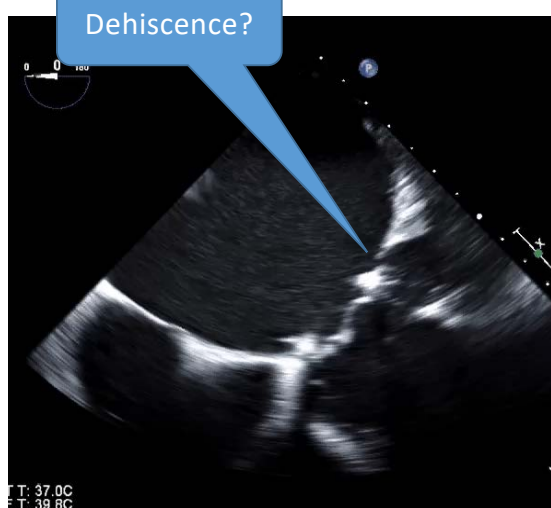
T: 37.0C
E: 39.0C

JPEG

52 bpm

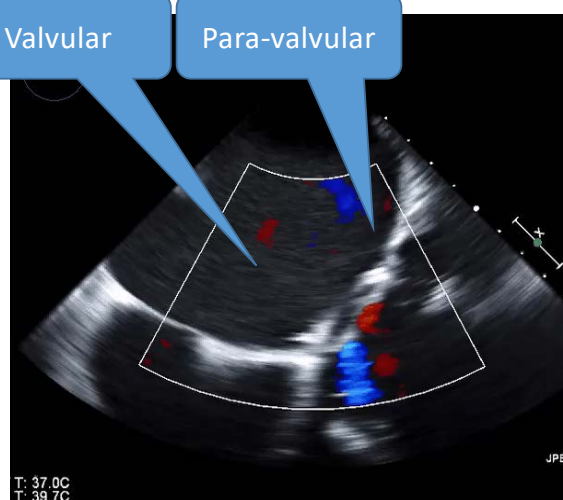
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TEE



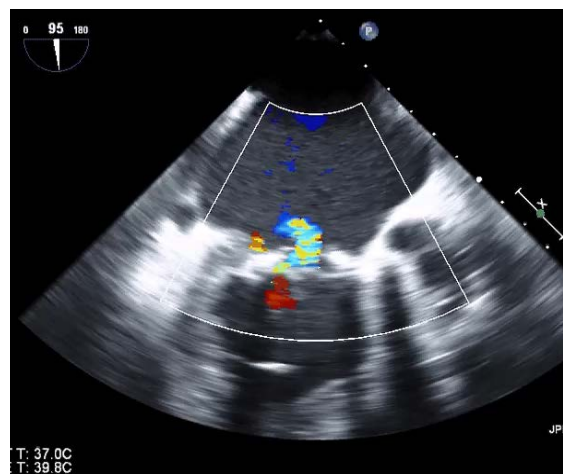
Valvular

Para-valvular



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TEE



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TEE

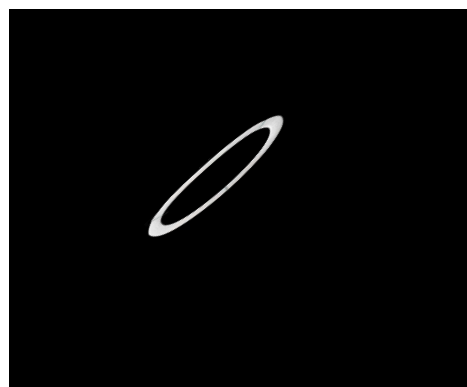
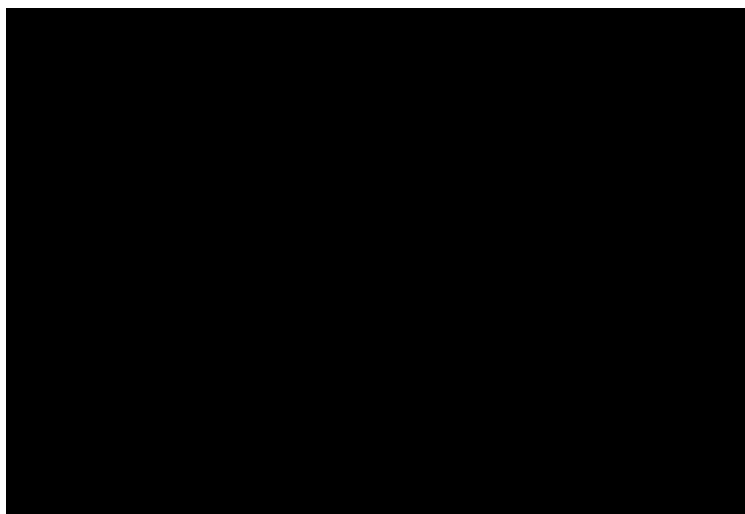
Para-valvular



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Complex MR



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Case Summary



- **79 y/o male, 3x median sternotomy**
 - moderate left ventricular dysfunction
 - permanent atrial fibrillation
 - dual-chamber pacemaker
 - Severe MR valvular and paravalvular from lateral ring dehiscence
 - Hemolysis
- **STS-PROM 13.7%**

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Options?



4th sternotomy?

Re-repair?

MVR?

AVR revision?

Severe MR
Ring dehiscence
Hemolysis

Mitraclip?

Valve in ring?

Paravalvular MR?

palliate

verb [pal-ee-eyt]

to relieve or lessen
without curing; mitigate.

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30mm Carpentier-Edwards Physio 2 semi-rigid annuloplasty ring

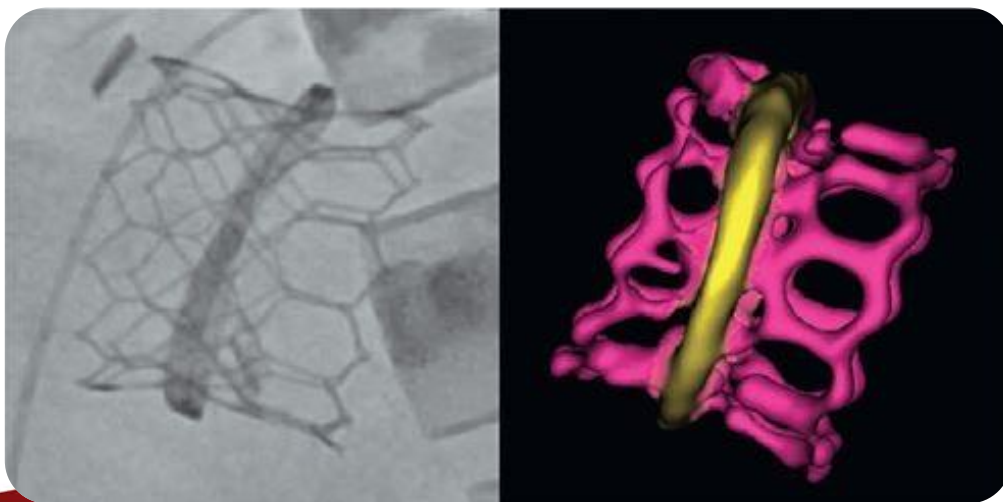


The Carpentier-Edwards Physio ring

- composed of Elgiloy bands, a cobalt-chromium alloy
- Alloy bands separated by polyester film bands
- Anterior section of this ring is rigid,
- Posterior section is flexible, allowing transverse but not longitudinal deformation
- It has been previously described that these rings become rounded after the TMViR

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30mm Carpentier-Edwards Physio 2 semi-rigid annuloplasty ring



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Valve-in-a-ring: Edwards Sapien™ transcatheter valve within Edwards Physio™ annuloplasty ring in sheep.



European Journal of Cardio-thoracic Surgery 35 (2009) 965–969

EUROPEAN JOURNAL OF
CARDIO-THORACIC
SURGERY

www.elsevier.com/locate/ejcts

Minimally invasive off-pump valve-in-a-ring implantation: the atrial transcatheter approach for re-operative mitral valve replacement after failed repair^{☆,☆☆}

Joerg Kempfert^{a,*}, Johannes Blumenstein, Michael W.A. Chu, Patrick Pritzwald-Stegmann, Tobias Kobilke, Volkmar Falk, Friedrich W. Mohr, Thomas Walther

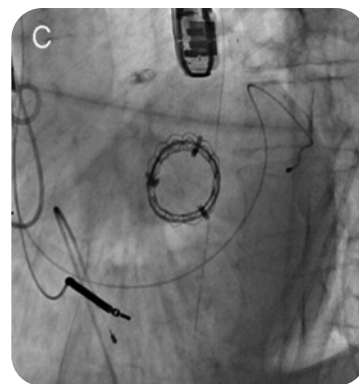
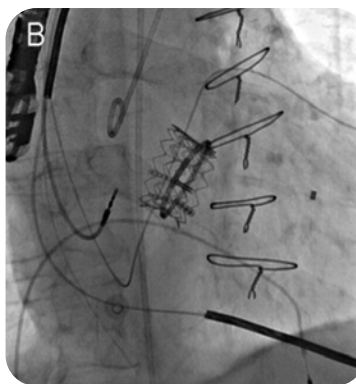
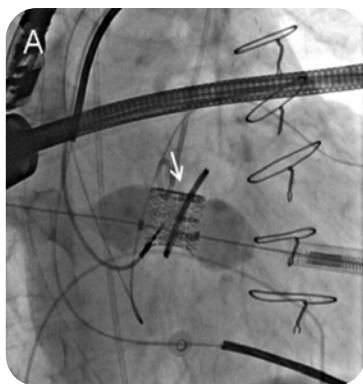
^aDepartment of Cardiac Surgery, Heartcenter, University of Leipzig, Leipzig, Germany

Received 8 September 2008; received in revised form 18 January 2009; accepted 2 February 2009; Available online 26 March 2009

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Apical trans-catheter mitral valve-in-ring implantation



European Journal of Cardio-thoracic Surgery 39 (2011) 1054–1056

EUROPEAN JOURNAL OF
CARDIO-THORACIC
SURGERY

www.elsevier.com/locate/ejcts

Case report

First-in-man implantation of a trans-catheter aortic valve in a mitral annuloplasty ring: novel treatment modality for failed mitral valve repair[☆]

Arend de Weger^{a,*}, See H. Ewe^b, Victoria Delgado^b, Jeroen J. Bax^b

^aDepartment of Cardio-Thoracic Surgery, Leids Universitair Medisch Centrum, Albinusdreef 2, 2300 RC, Leiden, The Netherlands

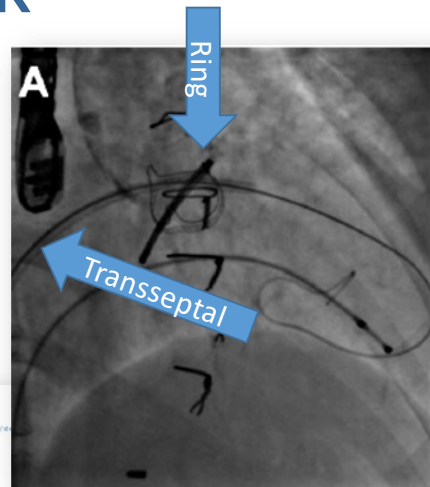
^bDepartment of Cardiology, Leids Universitair Medisch Centrum, Albinusdreef 2, 2300 RC, Leiden, The Netherlands

Received 1 September 2010; received in revised form 9 September 2010; accepted 12 September 2010

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Trans-femoral ViR



JACC: CARDIOVASCULAR INTERVENTIONS
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Transfemoral Implantation of Transcatheter Heart Valves After Deterioration of Mitral Bioprosthesis or Previous Ring Annuloplasty

Claire Boulet, MD, PhD,* Amir-Ali Fassa, MD,* Dominique Himbert, MD,* Eric Brochet, MD,* Gregory Dacrocq, MD,* Mohammed Nejari, MD,* Walid Ghodhane, MD, Jean-Pol Depoix, MD, Patrick Nataf, MD, Alec Vahanian, MD*

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Mitral ViR - Four considerations

1. Characteristics of the annuloplasty – Bands vs Rings,

- Bands incomplete or complete depending on whether they are sutured only to the posterior annulus or to the posterior and anterior annulus, respectively.
- Mitral rings tend to be complete - rigid or semi-rigid

2. Characteristics of the THV including the delivery system,

3. Probability of LVOTO

4. Possibility of delayed embolization.

Flexible Incomplete



Semi-rigid complete



Rigid complete



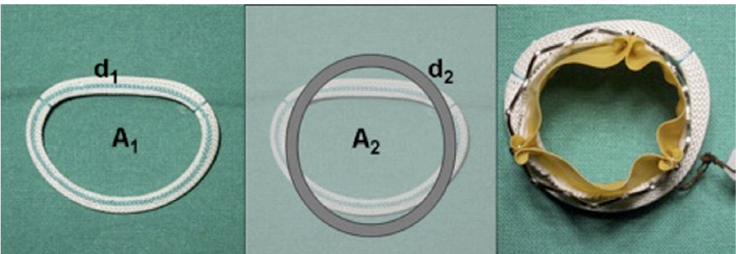
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Acquired Cardiovascular Disease Wilbring et al

Pushing the limits—further evolutions of transcatheter valve procedures in the mitral position, including valve-in-valve, valve-in-ring, and valve-in-native-ring

Manuel Wilbring, MD,^a Konstantin Alexiou, MD,^a Sems Malte Tugtekin, MD,^a Sebastian Arzt, MD,^a Karim Ibrahim, MD,^b Klaus Matschke, MD,^a and Utz Kappert, MD^a

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Assumption:
 $A_1 = A_2$ and $d_1 = d_2$

Circle formula:
 $A = \pi \times (d \times \frac{1}{2})^2$

Conversion:
 $d = 2 \times \sqrt{A/\pi}$

Example:
Carpentier-Edwards Physio Annuloplasty Ring 30 mm

Labeled Size:	30.0 mm
Internal diameter given by the manufacturer:	28.9 mm
Orifice area (A_1) given by the manufacturer:	440 mm ²
Calculated diameter after circularization:	23.7 mm

The Journal of Thoracic and Cardiovascular Surgery • January 2014

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Approach in this case

- **General anaesthesia with fluoroscopic and TEE guidance in hybrid OR**
- **Left anterior mini-thoracotomy**
- **Trans-apical VIR to be performed first**
 - May reduce para-ring leak
 - PVL closure device may encroach upon MV repair

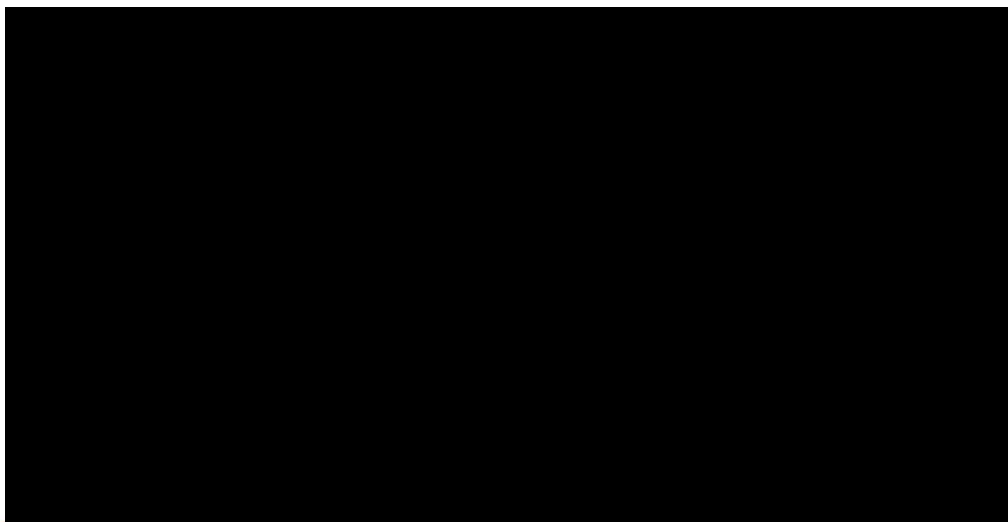
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26mm Edwards Sapien 3



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Post TMVI – Valve in Ring



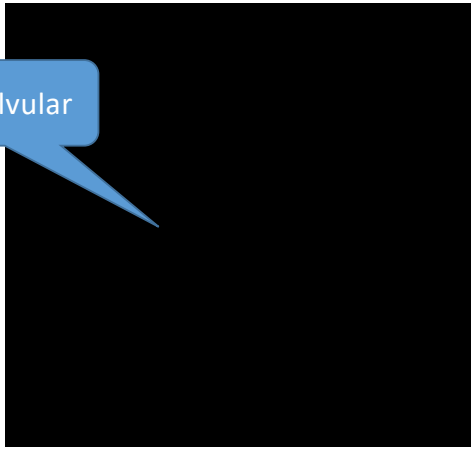
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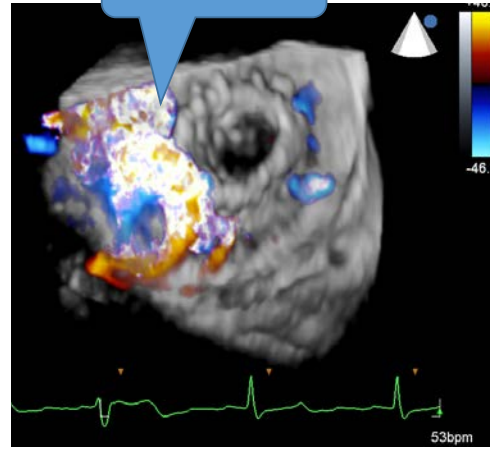
Post TMVI – Valve in Ring



Para-valvular



Para-valvular



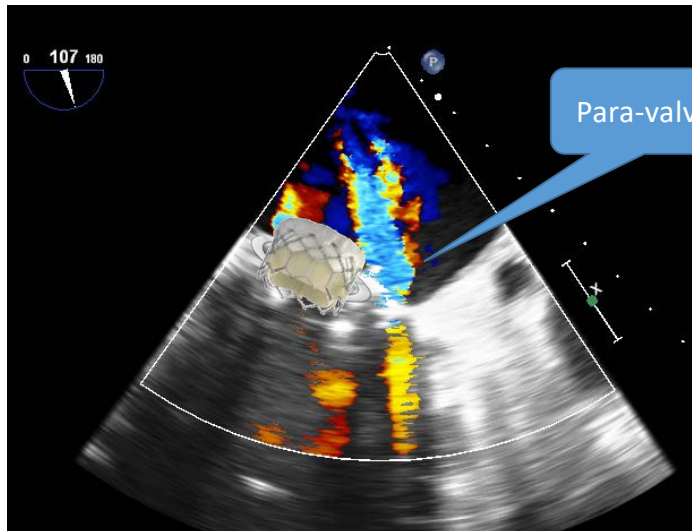
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Post TMVI – residual PVL

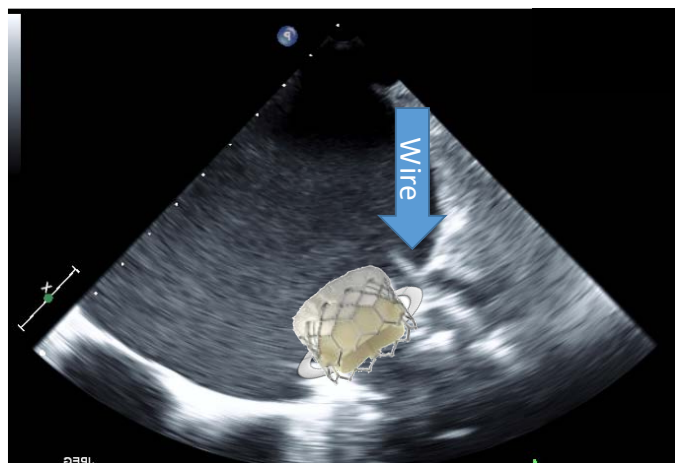


Para-valvular



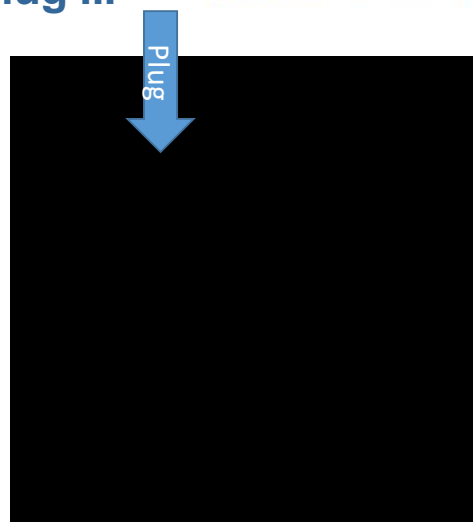
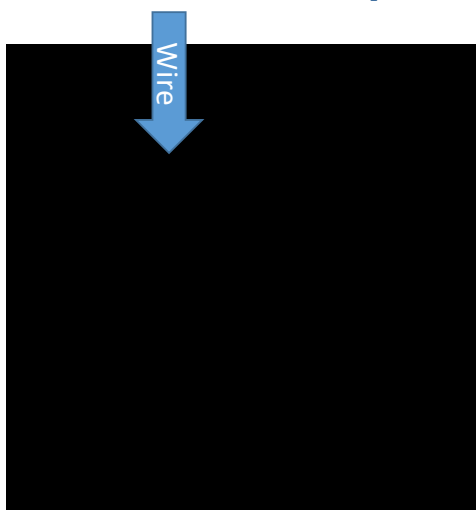
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Post TMVI – Wire across PVL



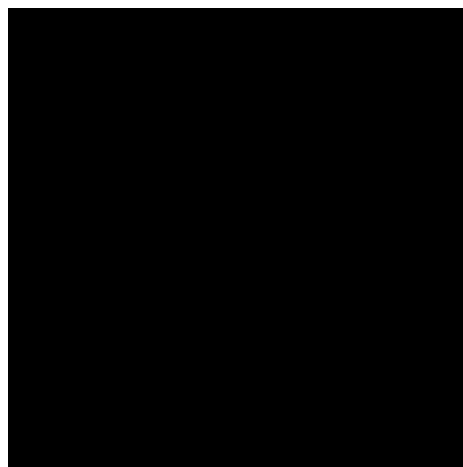
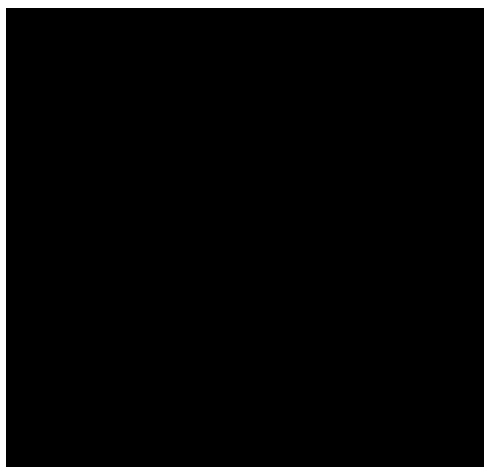
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14 x 5mm Amplatzer Vascular Plug III



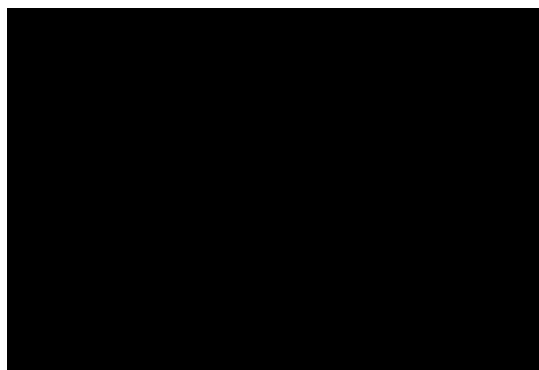
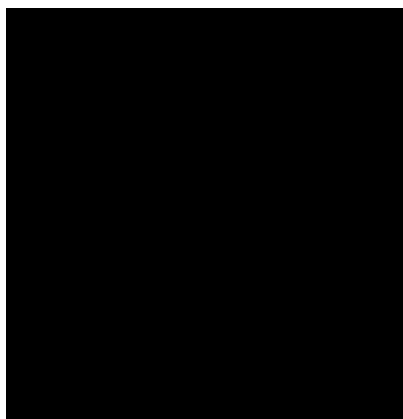
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AVP III positioning/tug test



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Final result



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Summary



- **Recurrent MR after MV repair may be complex**
 - Prepare to treat both trans-ring and para-ring MR
- **TF and TA access are feasible**
- **ViR TMVI is more challenging than ViV**
- **Consider regurgitant volumes of each jet**
- **Consider TMVI prior to PVL closure if treating both**

