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Symposium on
Interventional Echocardiography
and Decision-making in Structural Heart Disease

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# How Far to Push: Procedural Imaging for MitraClip Outside of A2/P2 and Beyond

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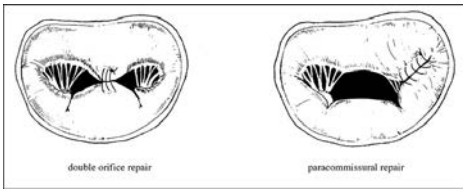
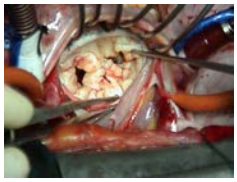
## DISCLOSURE

NONE

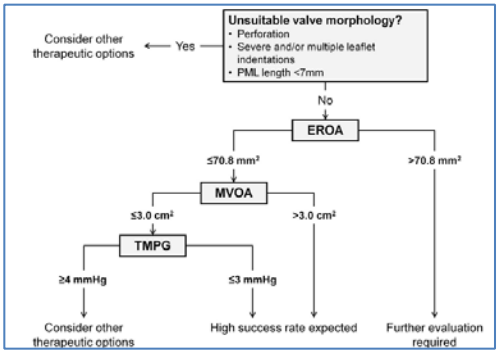
## THE EDGE-TO-EDGE TECHNIQUE FOR BARLOW'S DISEASE



Ottavio Alfieri et al. Department of Cardiac Surgery, San Raffaele University Hospital, Milan, Italy

# PATIENT SELECTION?



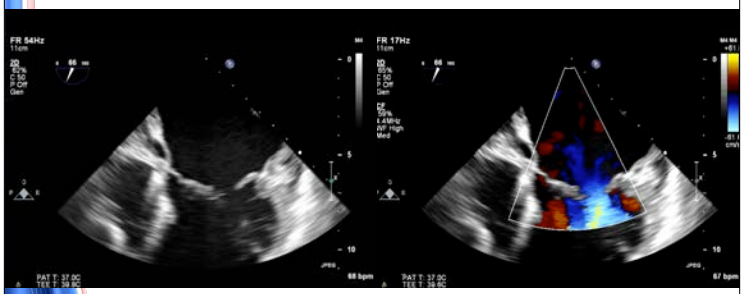

- 32/300 patients unsuccessfully treated

Lubos et al. JACC: Cardiovascular Interventions, 7, 4, 2014, 394 - 402

# LET'S REVIEW A FIRST CASE…

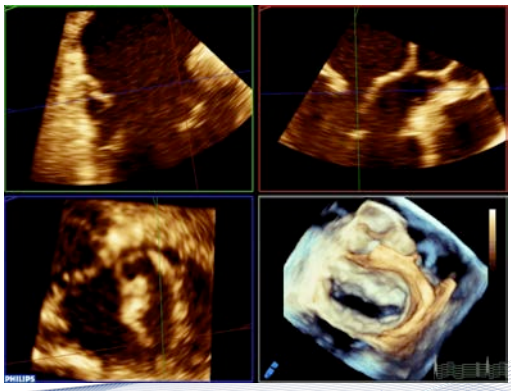
1. 79 yo F, tow truck driver & farmer presented with shortness of breath and symptoms of heart failure, on home oxygen
2. History was significant for breast cancer in remission from 2004-2014 after chemotherapy and radiation, now recurrent breast cancer, requiring repeated thoracocentesis for pleural effusion, started on experimental chemotherapy agent
3. Recently admitted for bacteremia and acute decompensated congestive heart failure (CHF), treated for endocarditis
4. Further workup revealed severe mitral regurgitation (MR) and patient was diagnosed with bileaflet prolapse and flail, scheduled for percutaneous mitral valve repair with the MitraClip®.

# PRE-PROCEDURE TEE IMAGING/VIDEO



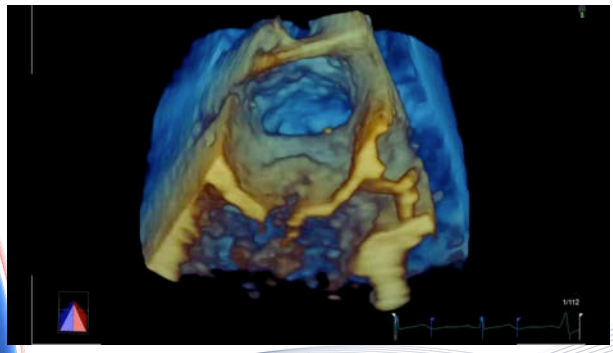
**ME mitral commissural view** **2D color ME mitral commissural view**

## PRE-PROCEDURE
## TEE IMAGING/VIDEO



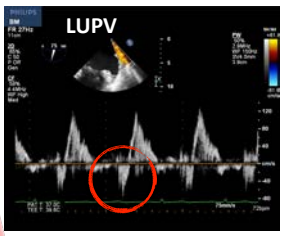
Multiplane view based on 3D image of mitral valve

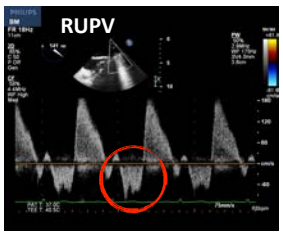
## PRE-PROCEDURE
## TEE IMAGING/VIDEO

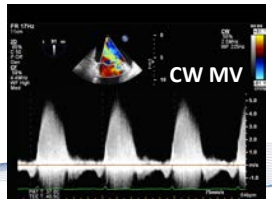


ME 3D 4CH

## PRE-PROCEDURE
## TEE IMAGING/VIDEO

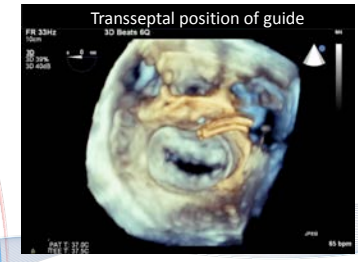


## PROCEDURE UPDATE

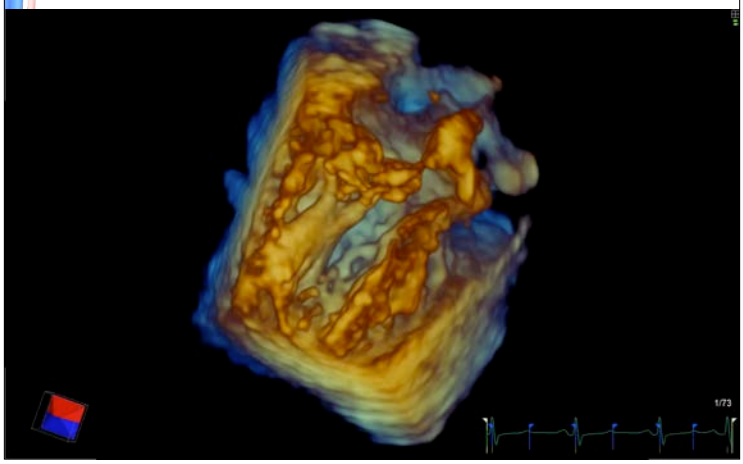
- Standard transeptal approach
- The overall procedural strategy was to enhance coaptation in in the anterolateral commissure (ALC).
- Given the extensive bileaflet prolapse, we opted to position the first MitraClip medial of the ACL



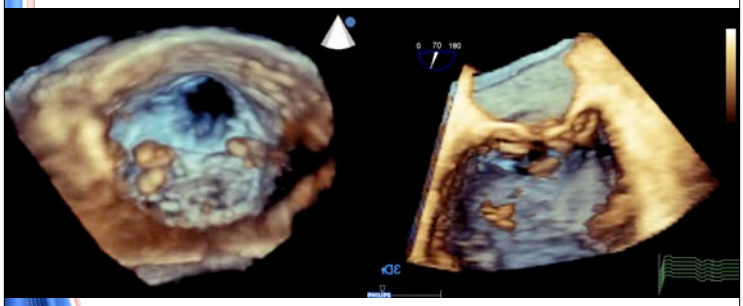

## CHALLENGES WITH MOVING THE MITRALCLIP INTO THE COMMISSURES

- Excessive mobility in degenerative MR
- Complexity of MV apparatus (chordal apparatus) leads to increase risk of injury
- Clip orientation (perpendicularity) - requires to adjust TEE imaging planes (multiplane)
- Reduced opportunity to move the MitraClip system
- Contact with myocardial wall (arrhythmia, injury)
- Mechanical forces might be very different compared to midline (A2/P2) position

## EXCESSIVE MOBILITY IN PRIMARY MR

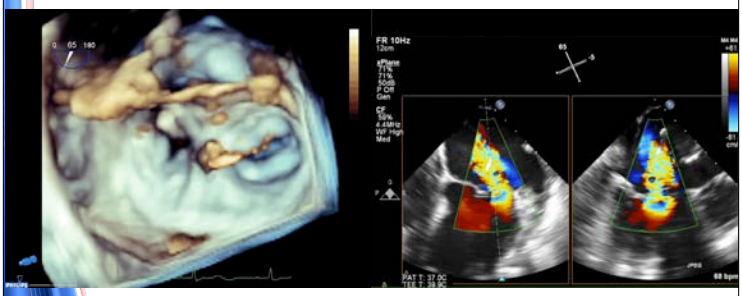


## COMPLEXITY OF MV APPARATUS



Mitral valve apparatus from LV

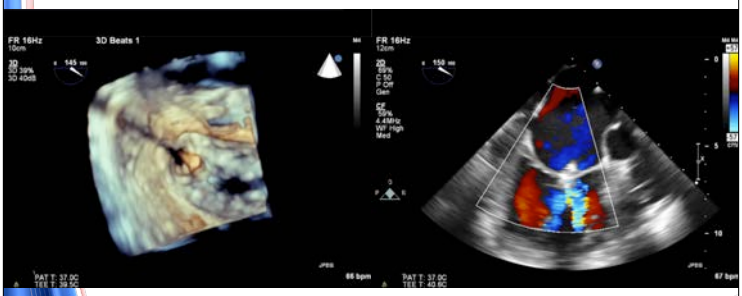
## PROCEDURAL TEE: INITIAL GRASP



3D enface view of MV
Initial grasp

2D color ME mitral commissural view shows unchanged MR, 1st clip likely too medial

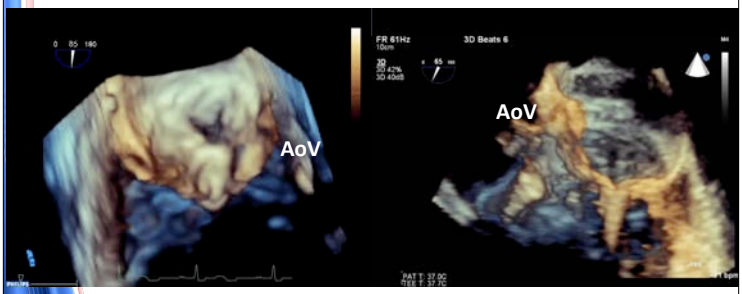
## PROCEDURAL TEE: 2ND GRASP



3D enface view of MV
2nd grasp, 1st clip, more lateral

2D color ME mitral commissural view shows MR changed but still significant

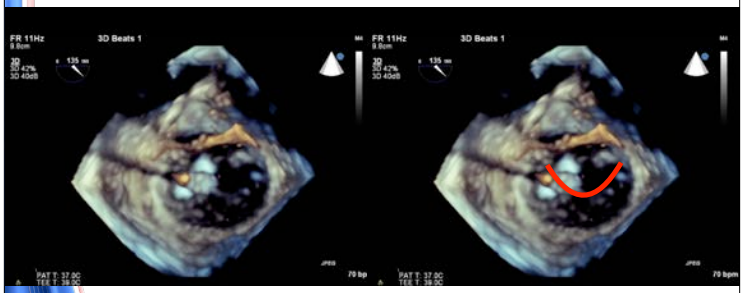
## PROCEDURAL TEE: 1ST CLIP DEPLOYED: UTILITY OF CROPPING TOOLS




3D image of MV cropped from medially showing 1st clip and A1/P1 prolapse

3D image of MV cropped from lateral showing A1/P1 prolapse and 1st clip behind

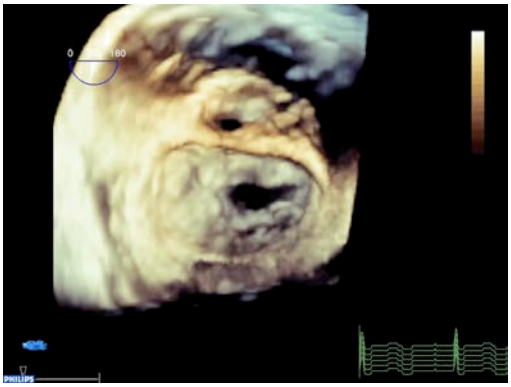
## PROCEDURAL TEE: 2ND CLIP MOVING INTO THE ALC



Approach for 2nd clip (lateral to 1st clip) - lowered gain to appreciate MitraClip orientation in LV

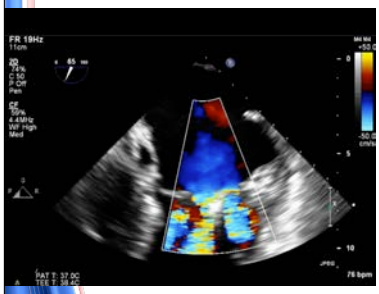
MitraClip rotated to align perpendicular to MV leaflets

## PROCEDURAL TEE: 2ND CLIP

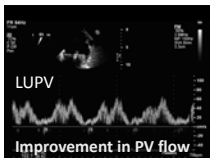


3D enface view after 2 clips

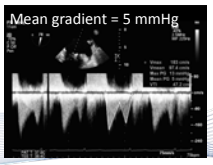
## PROCEDURAL TEE IMAGING/VIDEO



2D color suggest further reduction in MR but still moderate severity, consider 3rd clip in AL commissure.




Improvement in PV flow

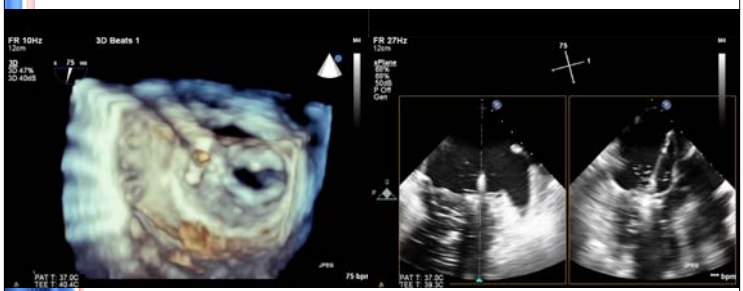




## CASE DISCUSSION - AUDIENCE

After the placement of 2 MitraClips, the severity of MR has been reduced significantly.

A) 3rd Mitraclip will increase the gradient even further
B) Attempting to maneuver a clip into the ALC is too risky and should not be attempted.
C) MitraClip therapy is all about reducing the severity of MR, which has already been achieved.
D) Although technically challenging, adding a 3rd MitraClip to the ALC might completely "exclude" the ACL and result in further reduction of MR

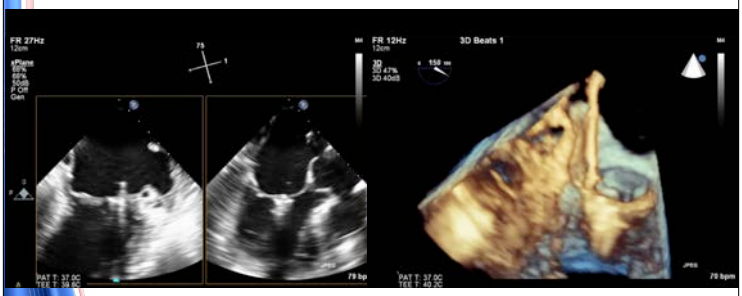
## PROCEDURAL TEE: 3RD CLIP



3D enface showing approach for 3rd clip

Using adenosine to reduce heart rate to permit capture of dynamic bileaflet prolapse and flail

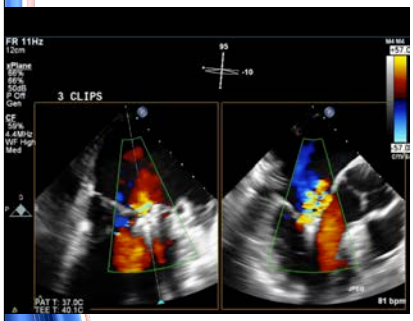
# PROCEDURAL TEE: 3RD CLIP



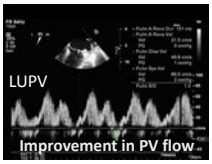
Stable clip position
Simultaneous biplane view

Stable clip position on 3D
as seen from AL commissure

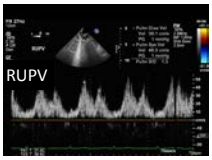
# PROCEDURAL TEE: FINAL ASSESSMENT

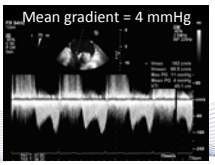



ME 2D color mitral
commissural view after 3rd clip

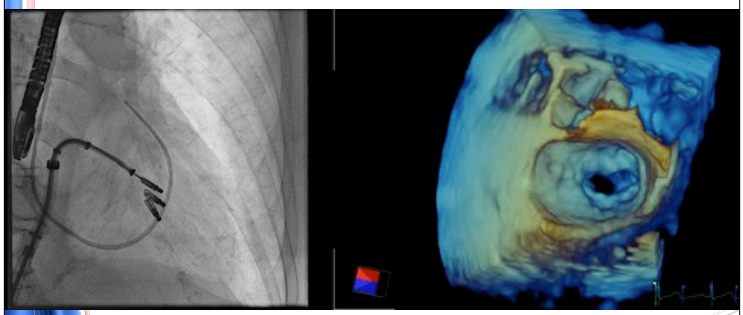



Improvement in PV flow




# FINAL RESULT: "NEO" MITRAL VALVE



Fluoroscopy after 3rd clip

3D enface of the MV after the
placement of 3 MitraClips.

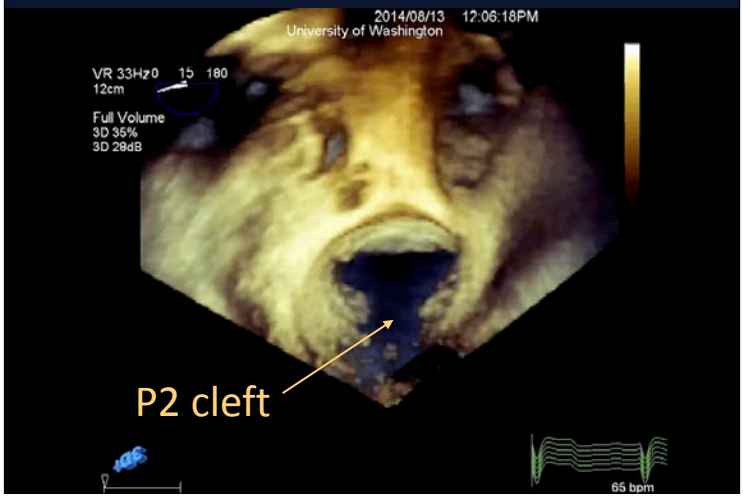
## TEACHABLE POINTS FOR FIRST CASE

1. Complex percutaneous repair of mitral valve with bileaflet prolapse in anterolateral commissure
2. 3D helped in delineating complex anatomy
3. Slowing the heart rate can assist with difficult MitraClip placement

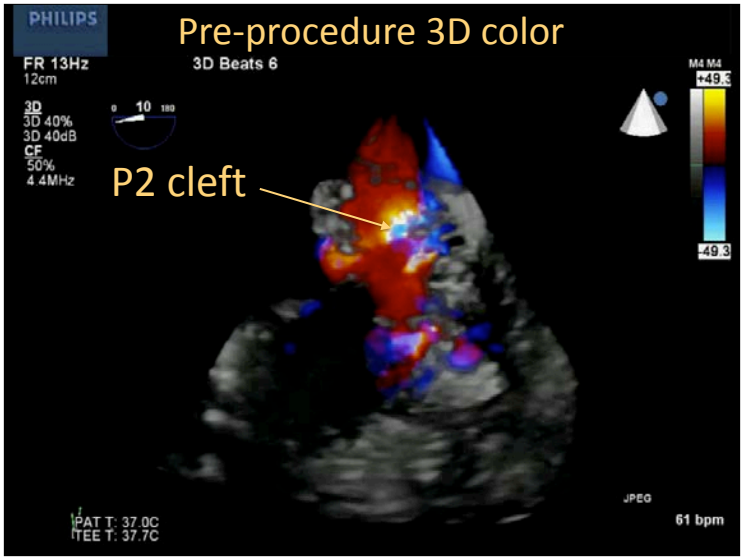
## CASE#2: ADULT CONGENITAL PATIENT

- 54-year-old gentleman born with complex congenital heart disease including transposition of the great vessels with VSD and pulmonary stenosis
- Palliation: left Blalock-Taussig shunt at 1 year of age
- Complete repair using the Rastelli procedure in 1979 including 25 mm composite RVOT conduit
- Progressive and ultimately severe bioprosthetic PV regurgitation, he underwent successful Melody valve implantation UW Washington in 2012
- Longstanding history of severe MV regurgitation

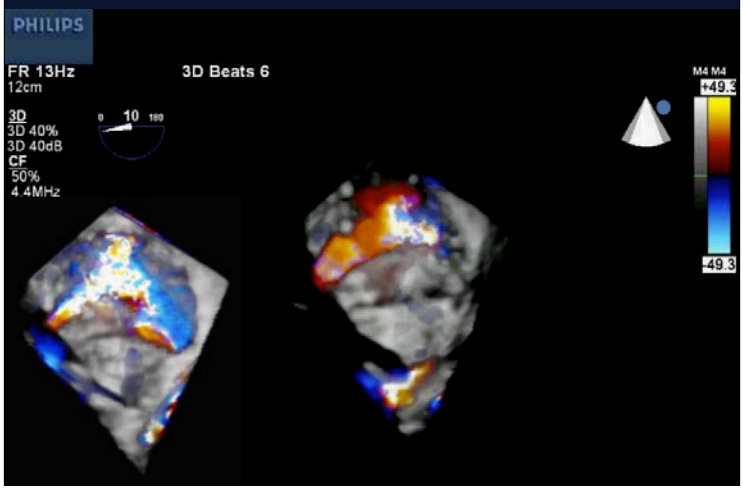
## Pre-procedure TEE



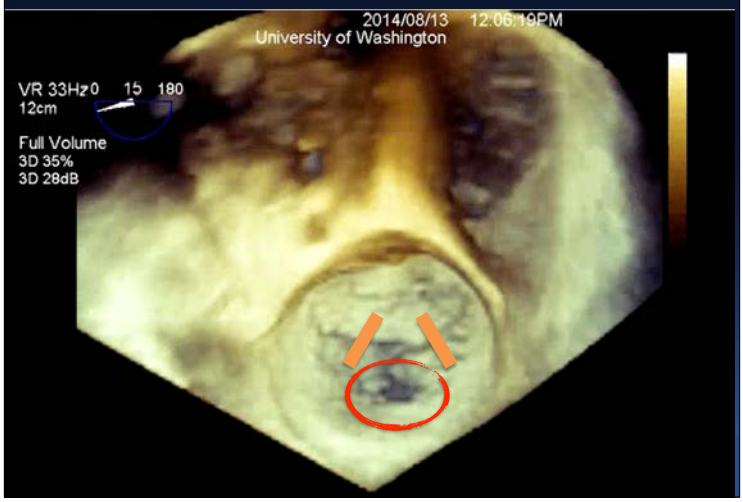
## Pre-procedure 3D color



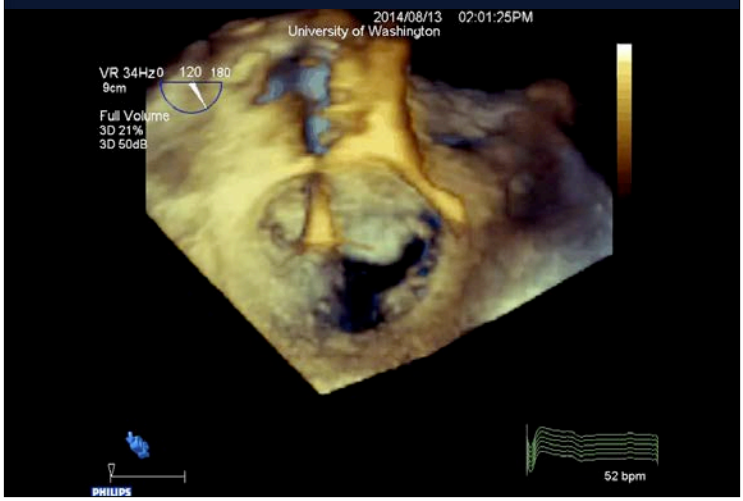

## Pre-procedure 3D color



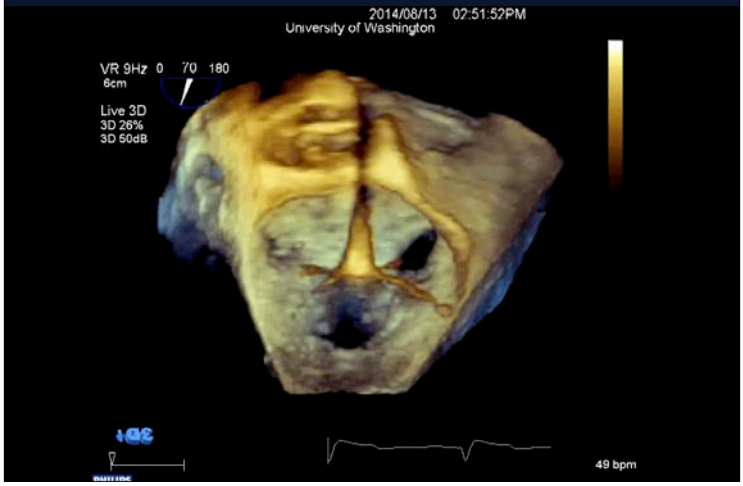

## Procedural strategy - 2 clip case



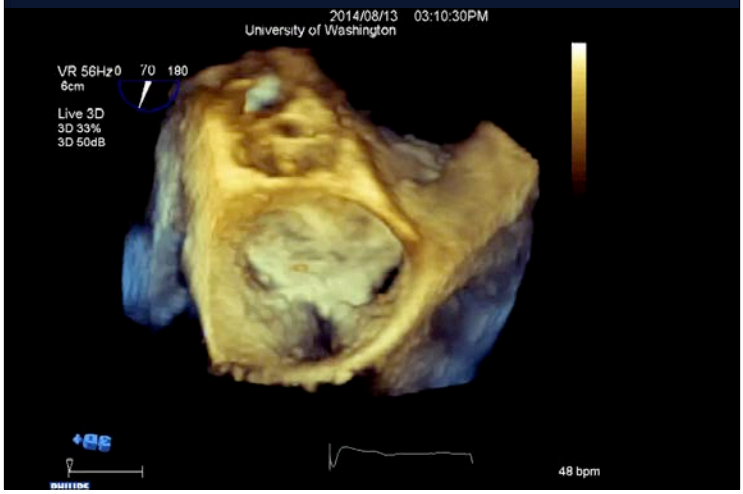
## Procedural TEE: 1st clip



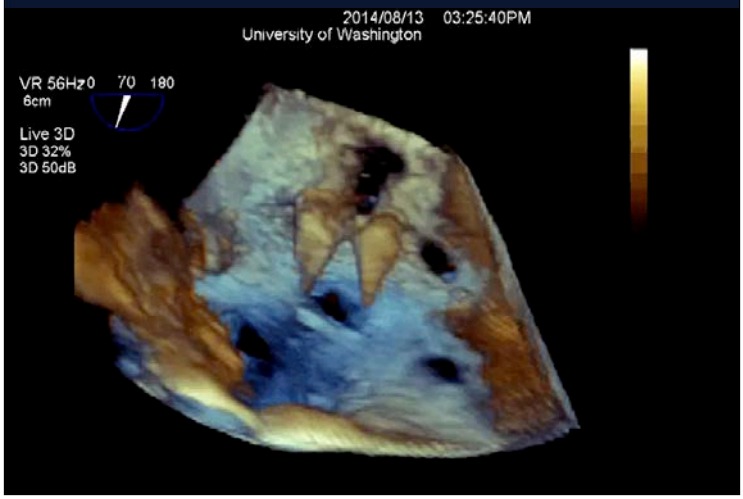

## Procedural TEE: 2nd clip



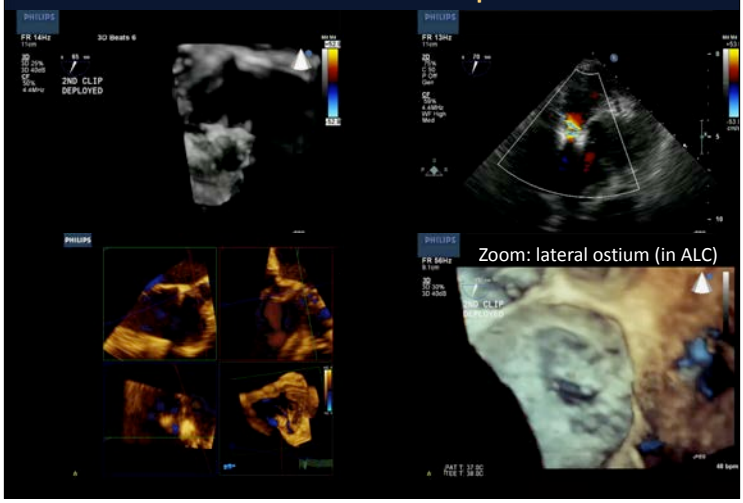

## Pre-procedure TEE: 2nd clip released



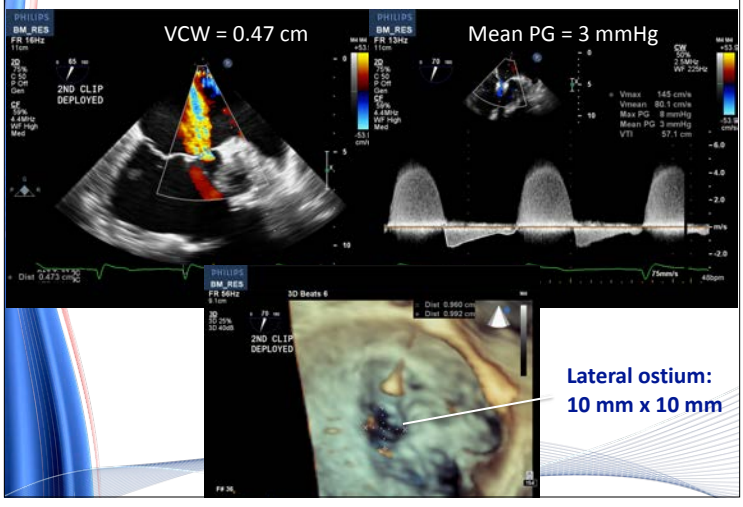
## Procedural TEE: 2nd clip released



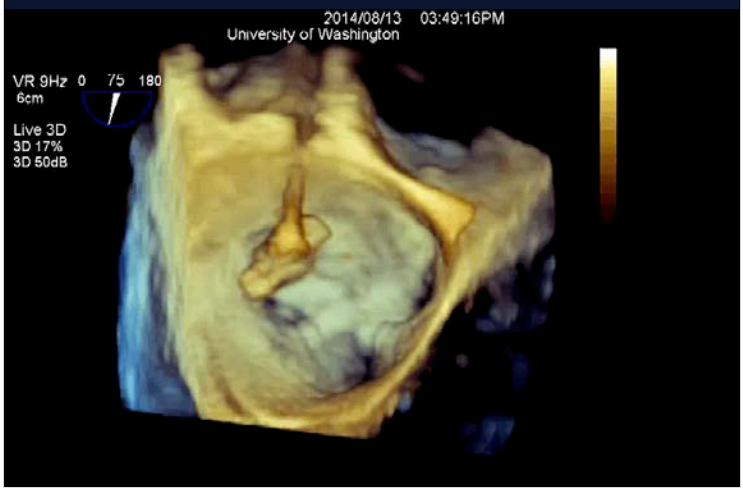

## Procedural TEE: 2nd clip released



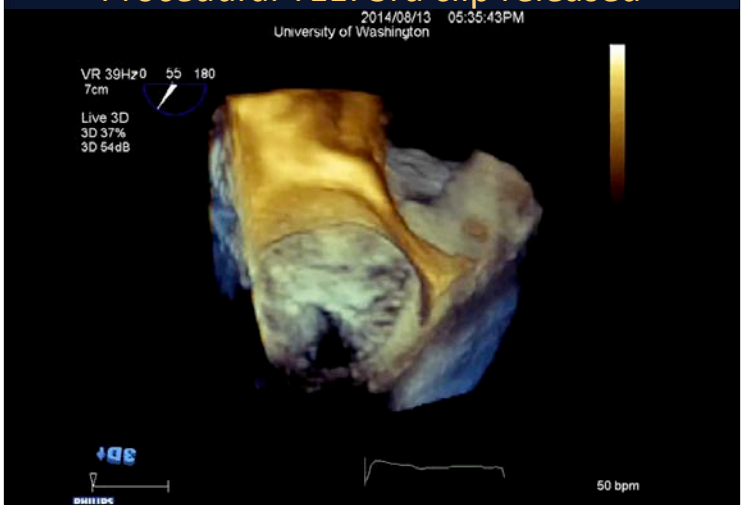

## AFTER 2ND CLIP - PUSHING FURTHER..



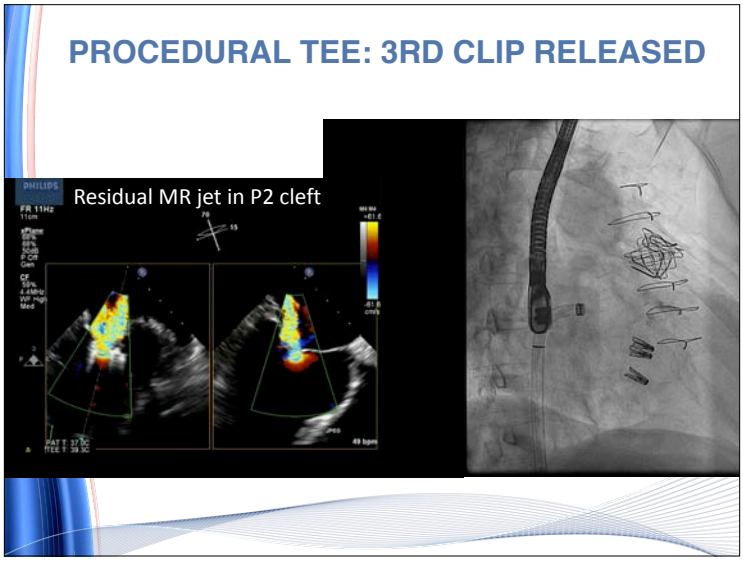
## Clip #3 approaching




## Procedural TEE: 3rd clip released



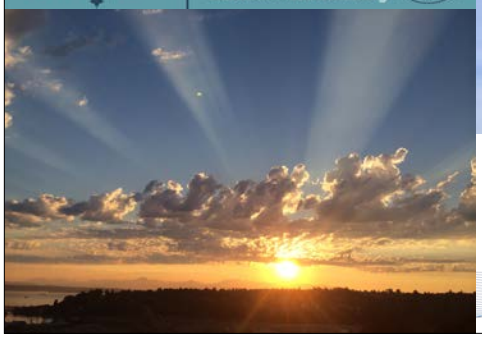

## PROCEDURAL TEE: 3RD CLIP RELEASED



## HOW FAR TO "PUSH IT" IN COMPLEX MITRACLIP CASES?

- Follow the INDICATION FOR USE (significant symptomatic mitral regurgitation (MR ≥ 3+) due to primary abnormality of the mitral apparatus [degenerative MR] in patients who have been determined to be at prohibitive risk for MV surgery by a heart valve team….
- Depends on your team's skill & comfort level
- Real-time 3D navigation of anatomical and functional challenges for device delivery is essential
- Team communication is key
- Consider backup plan

Thank you and see you in Seattle at ASE Scientific Sessions 2016

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