

Mitral Regurgitation Cases

Federico M Asch, MD

@FedericoAsch

Director, CV Core Labs
Director, Cardiac Imaging Research
MedStar Health Research Institute
MedStar Washington Hospital Center
and
Georgetown University

www.EchoCoreLab.org



1

Disclosures

- Academic Echo Core Lab
 - Edwards
 - Abbott / SJM
 - Medtronic
 - Sorin/Livanova
 - Boston Scientific
 - GDS/Ancora
 - Mitralign
 - Neovasc
 - Caisson

www.EchoCoreLab.org

Thanks to Dr S. Goldstein for sharing slides and cases



2

1

Echo for MV Disease

- Mitral valve anatomy/pathology
[Mechanism(s) of MV disease]
- Determination of treatment timing
and options

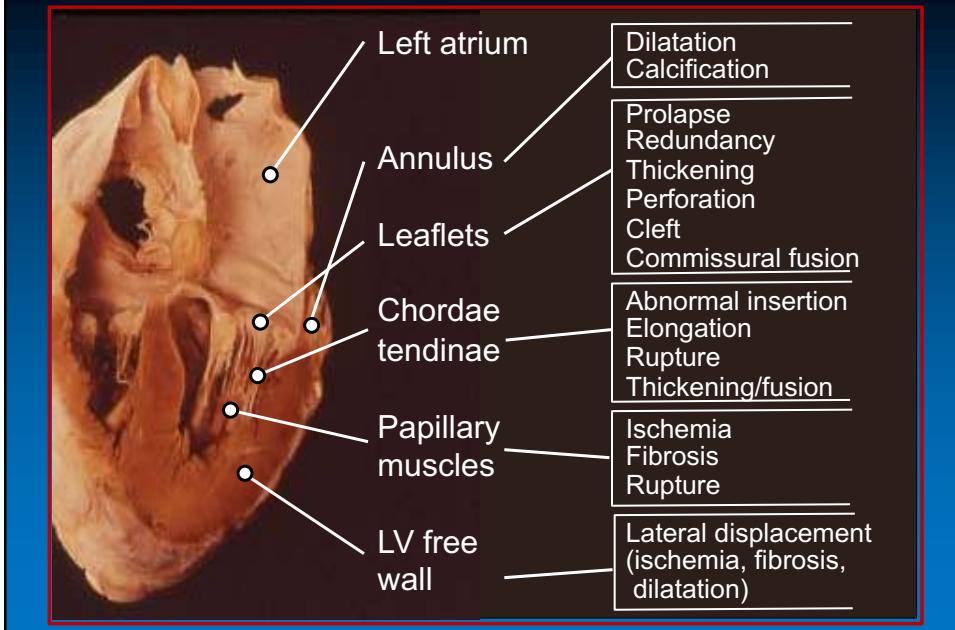
3

MV anatomy/pathology

5

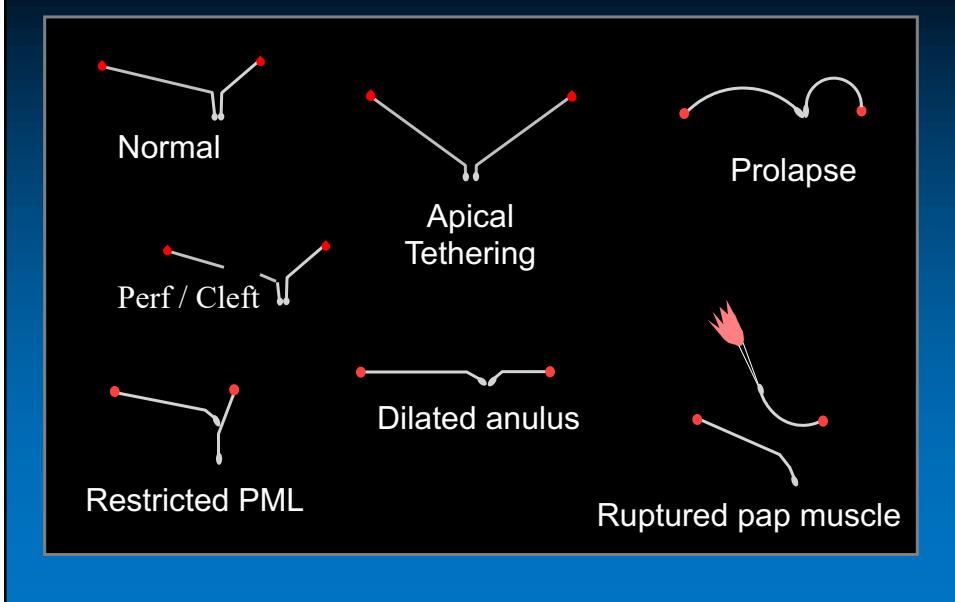
2

Complexity of Mitral Valve Apparatus

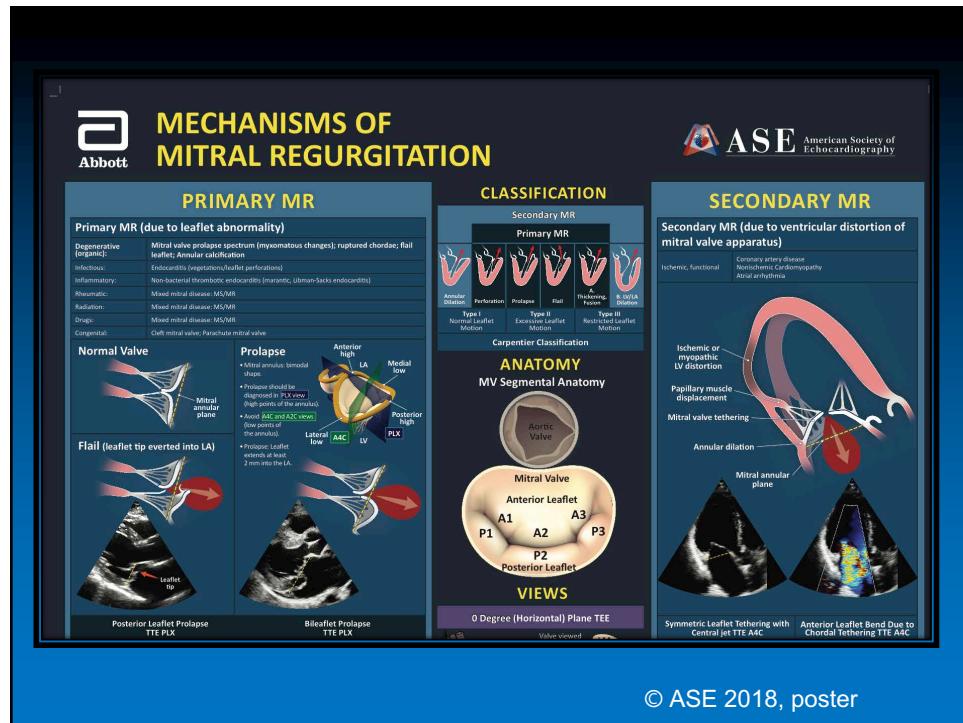


6

Mechanisms of Mitral Regurgitation

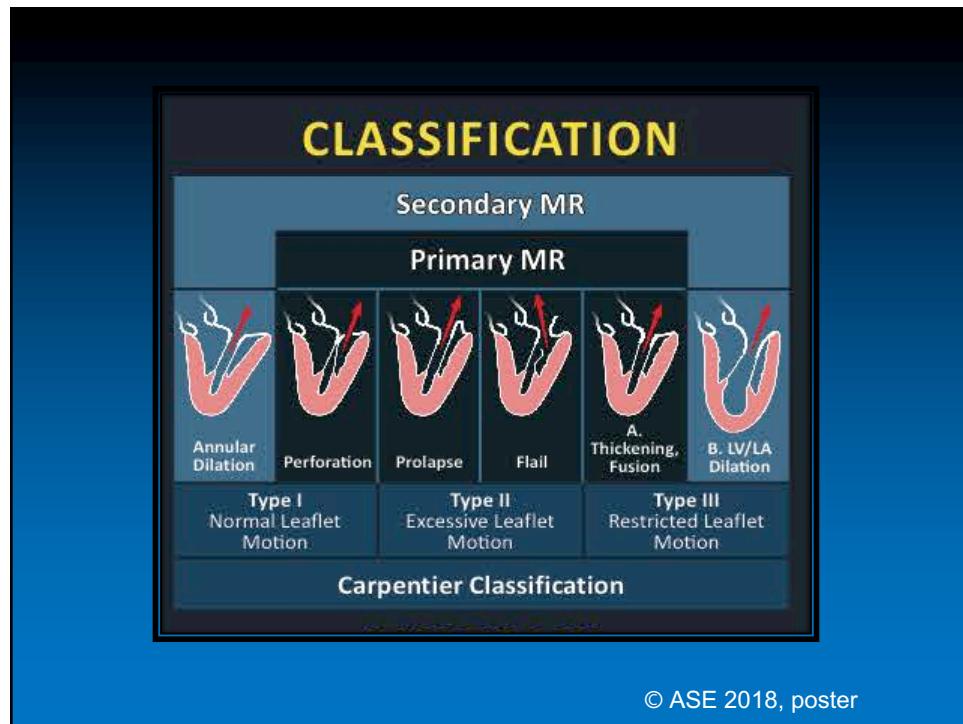


11



© ASE 2018, poster

13



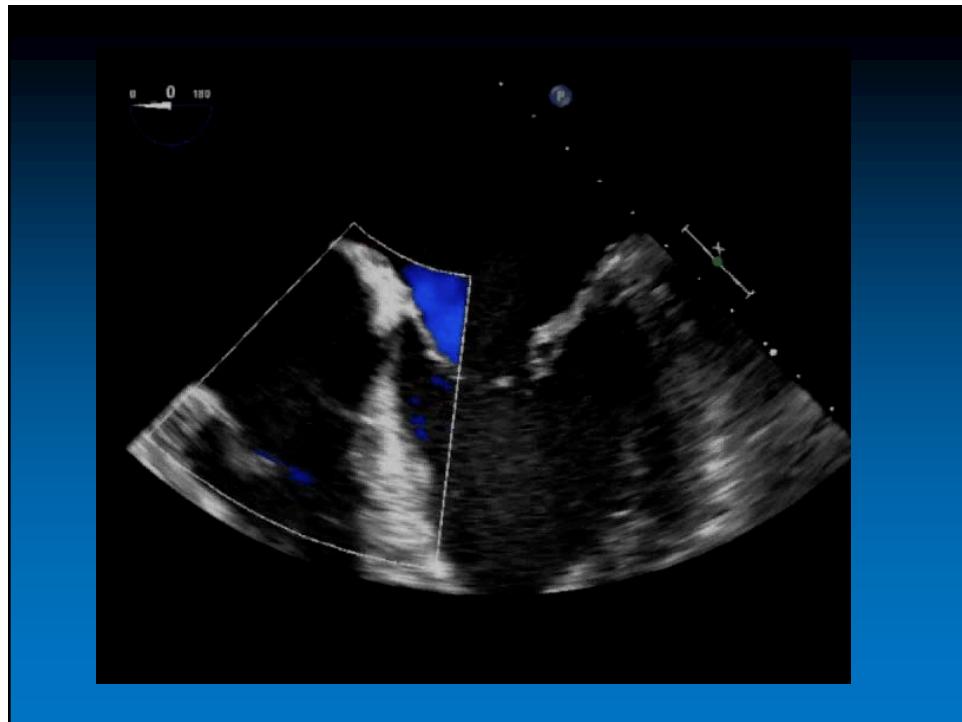
© ASE 2018, poster

16

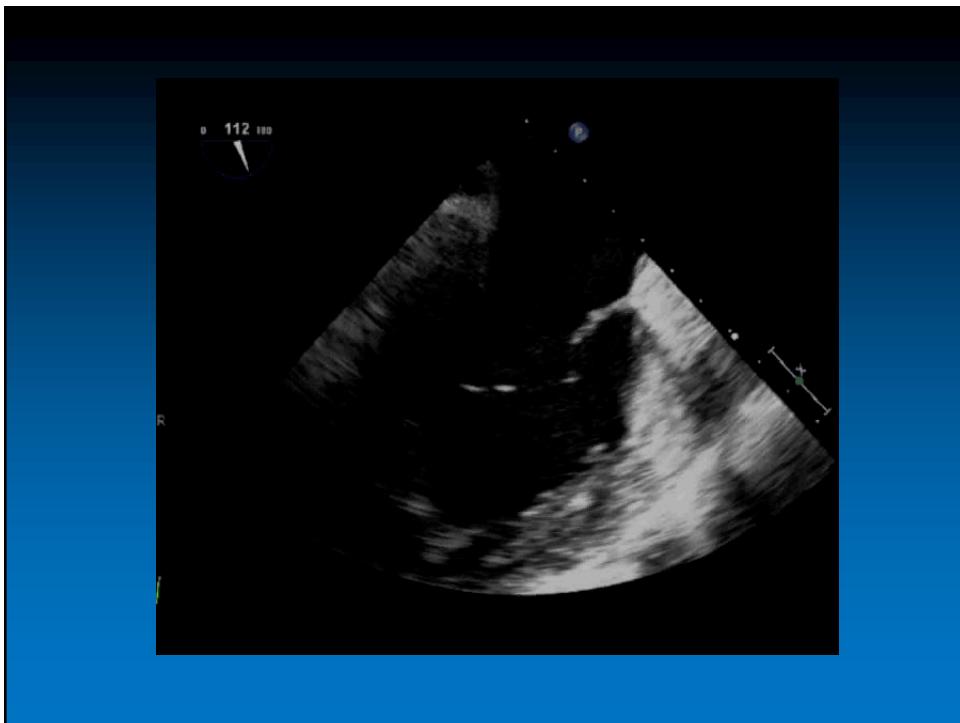
Case 1

Ruptured chords P2

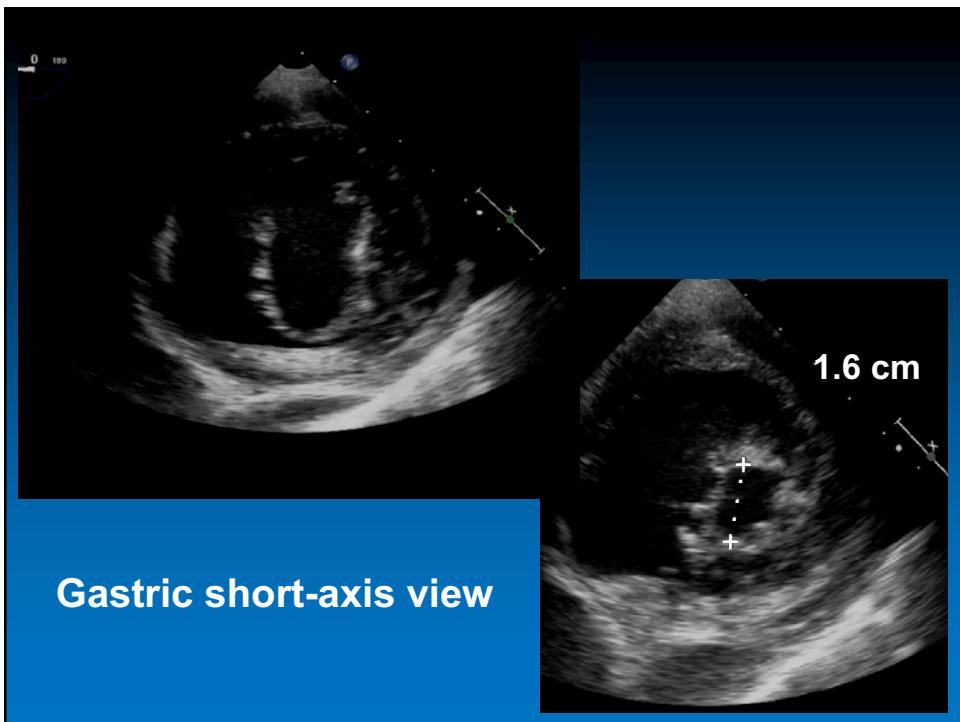
19



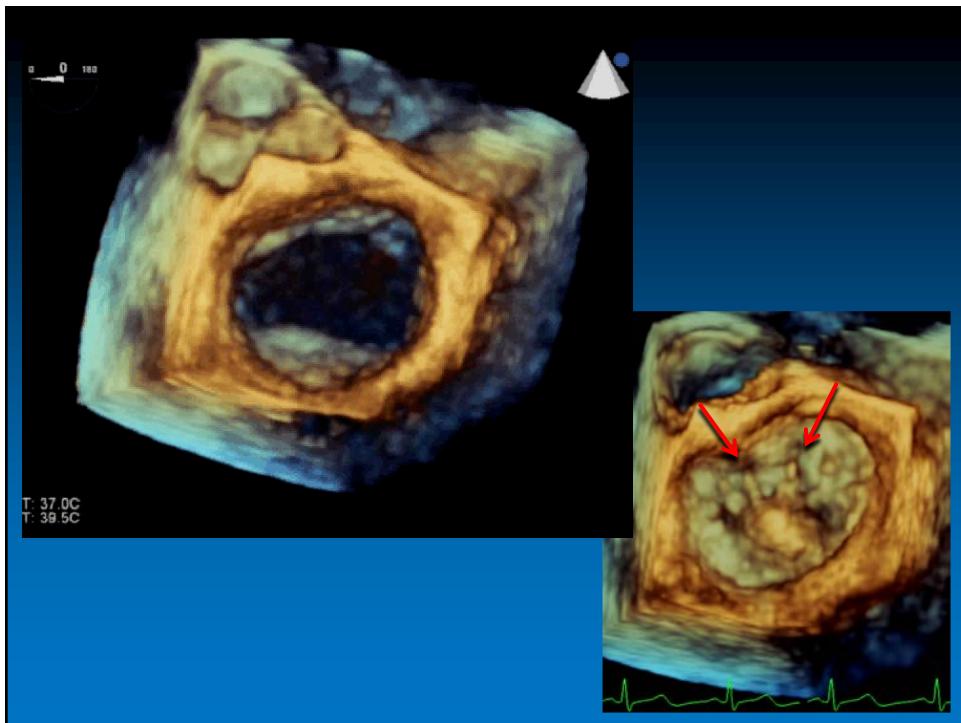
20



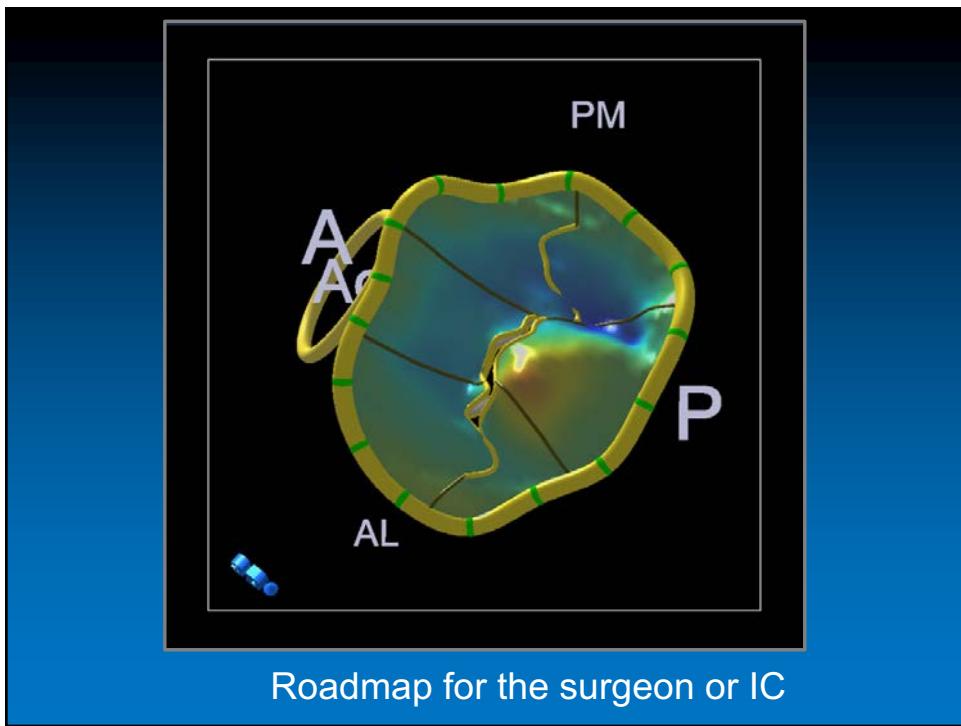
21



22



23

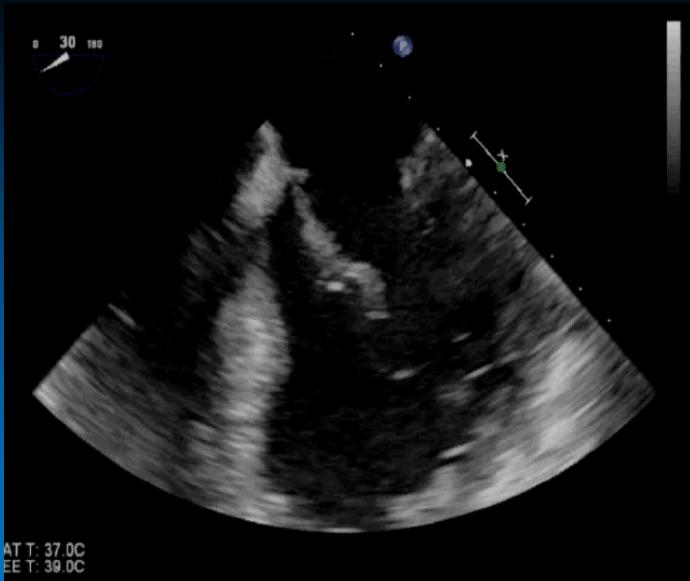


24

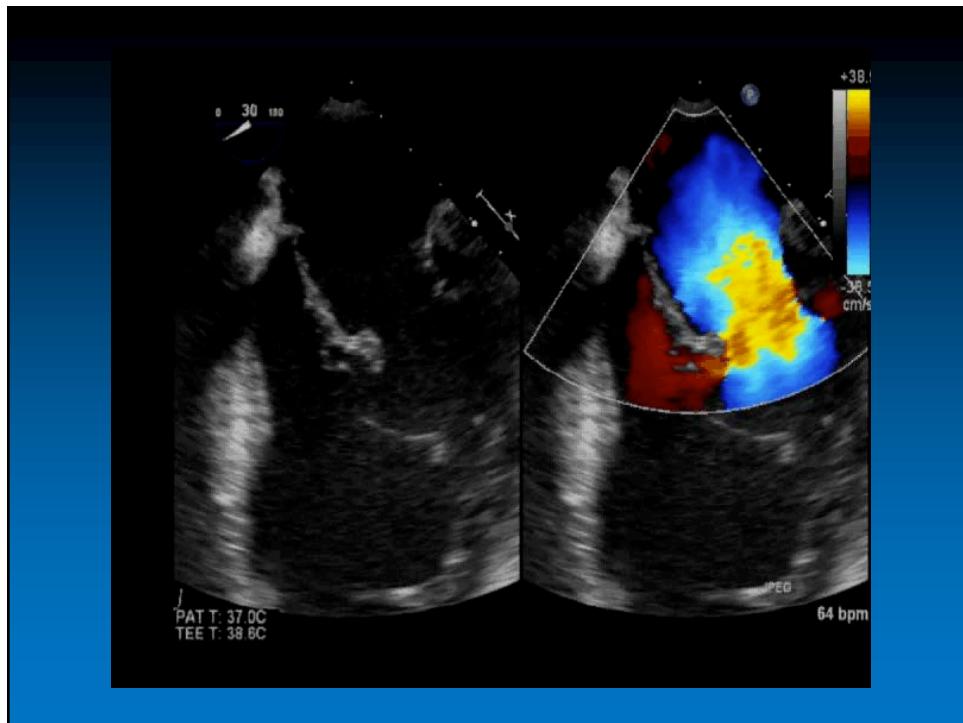
Case 3

Ruptured cords A2 and A3

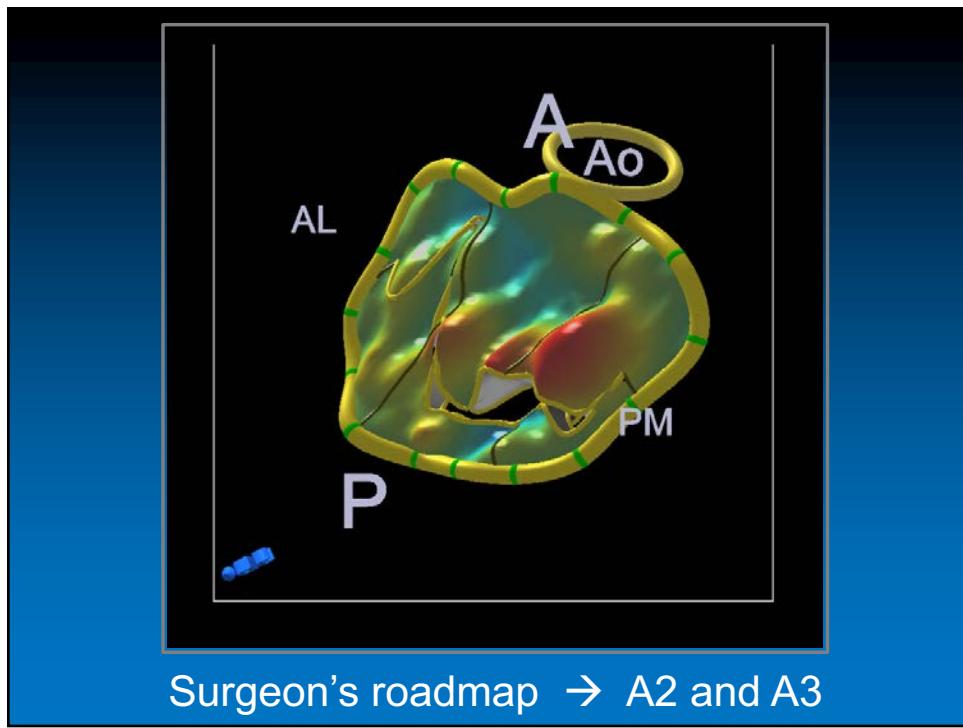
28



29



30

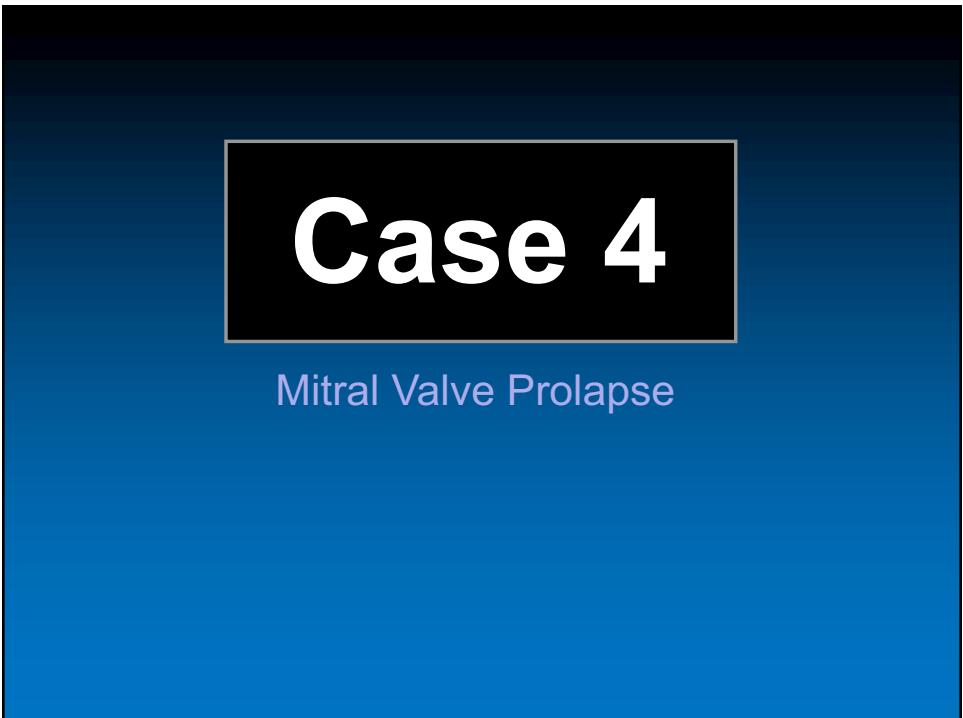


31



MVP

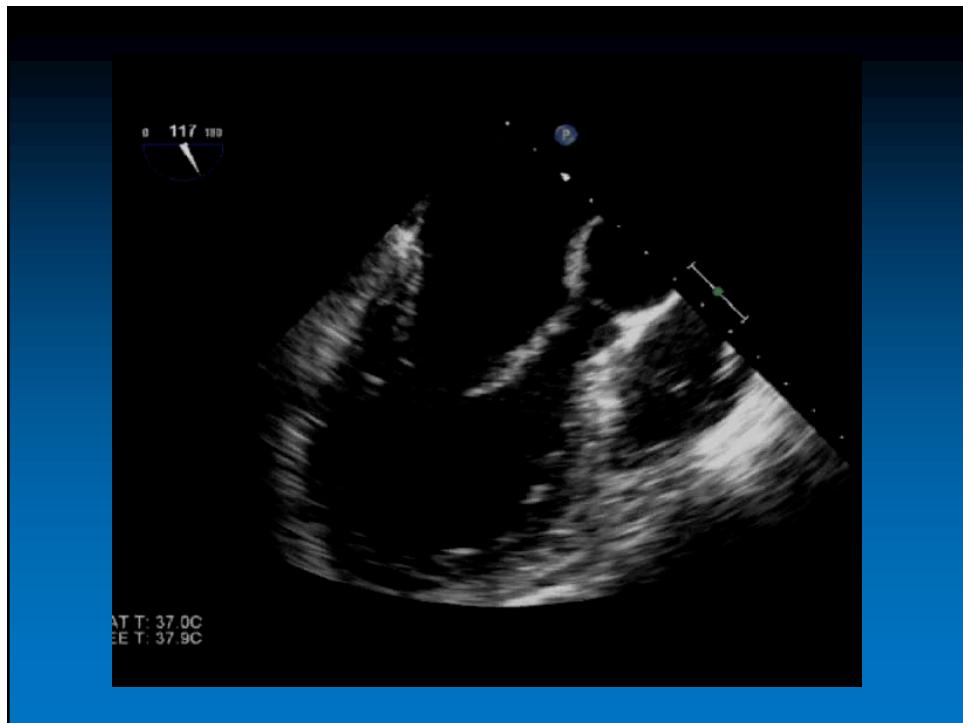
32



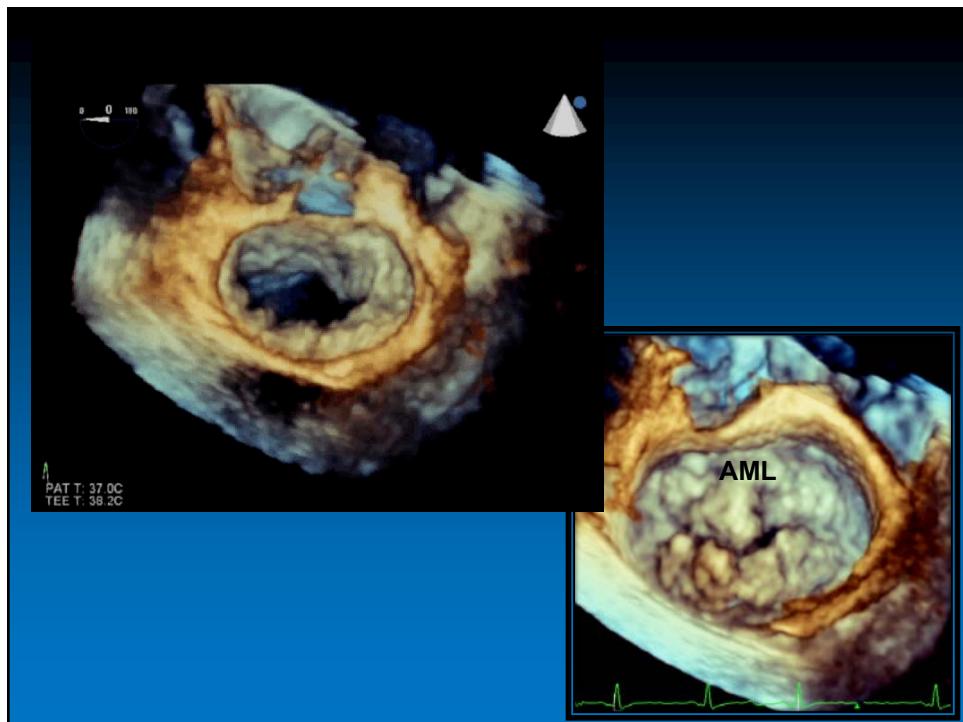
Case 4

Mitral Valve Prolapse

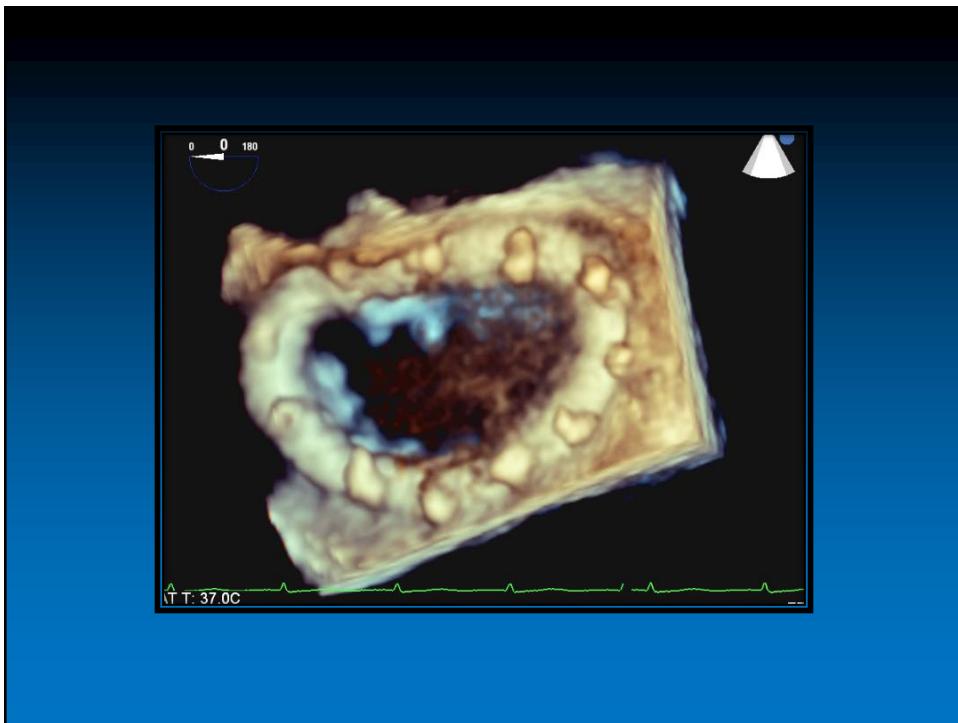
34



35



36



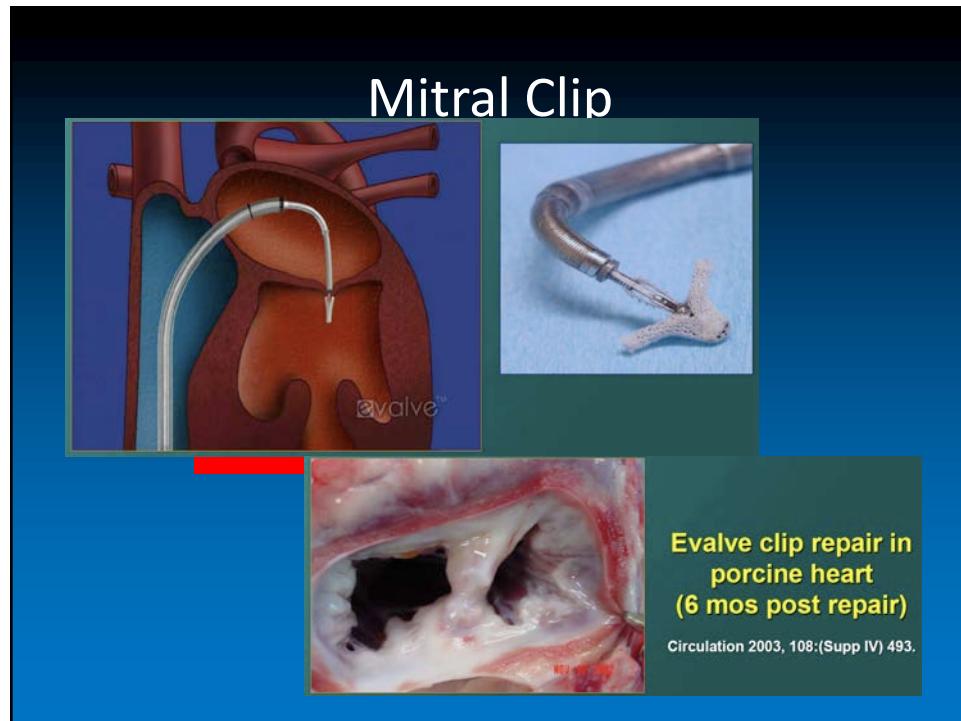
37

Percutaneous options for Degenerative MR

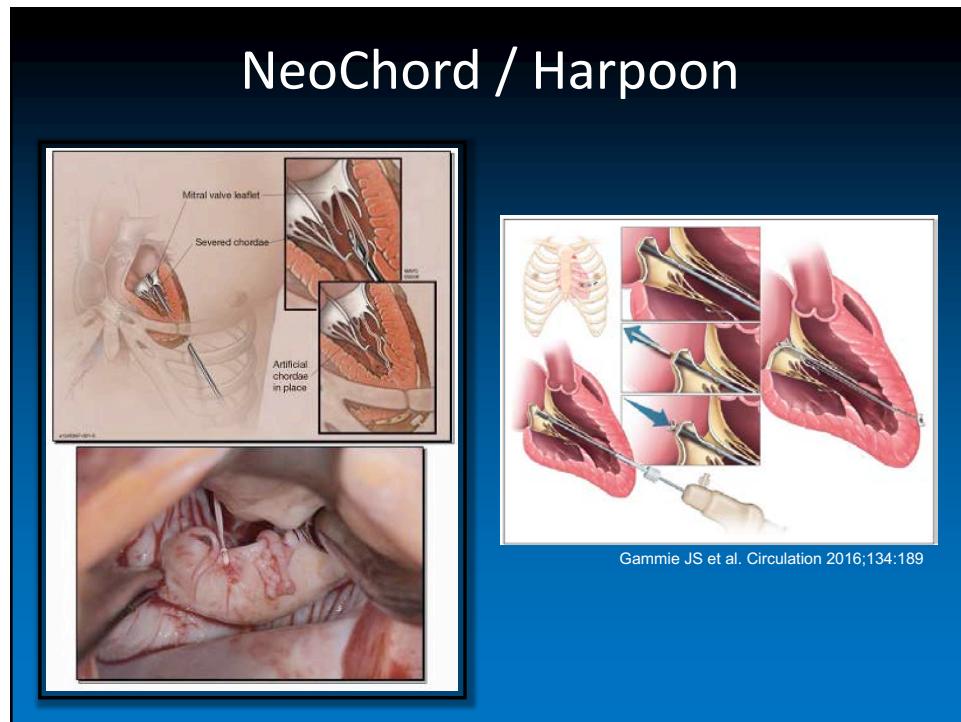
Investigational devices (except for mitral clip)

- Leaflet Plication
 - Mitral Clip, Mobius
- Chordal implantation
- Prosthetic valves

38



39

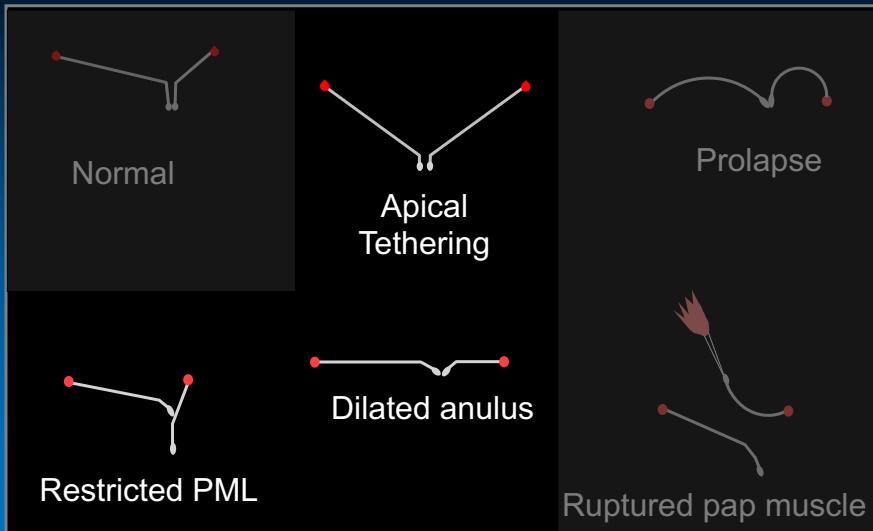


40

Functional MR

41

Functional Mitral Regurgitation

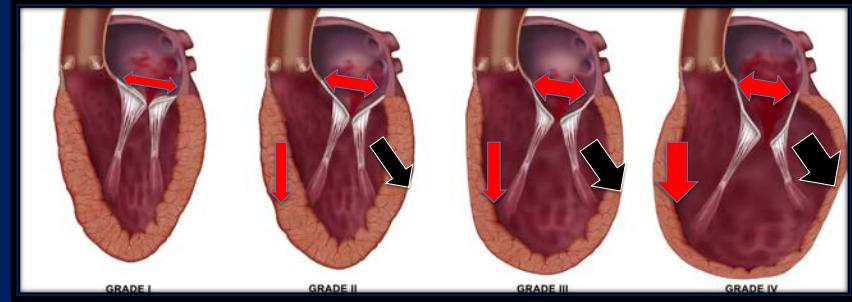


42

14

Functional (Secondary) MR

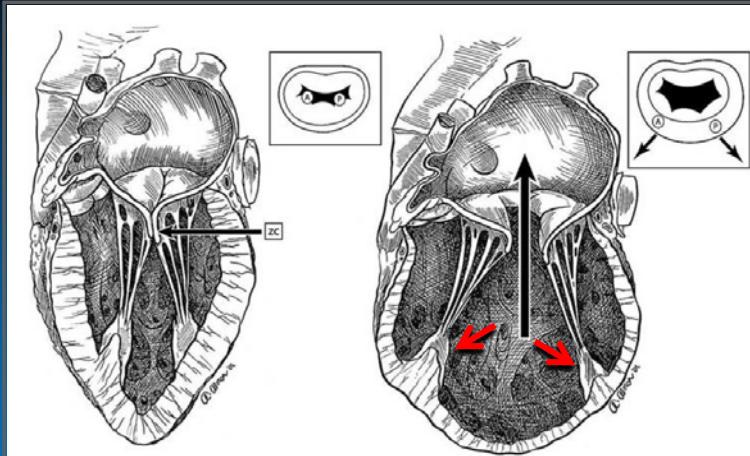
- SMR is a consequence of leaflet tethering and incomplete leaflet coaptation.



Badhwar V et al. J Thorac Cardiovasc Surg 2019

43

Morphologic Changes in Heart Failure



Papillary muscles displaced apically and laterally

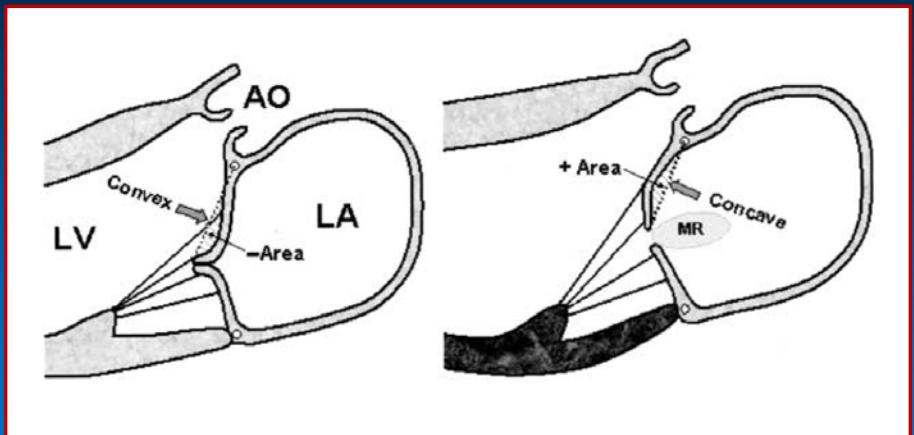
Bolling J Heart Valve Dis 11:S28(2002)

44

15

Leaflet Configuration in Long-Axis View

Tethering of Mitral leaflets Expressed by Concavity



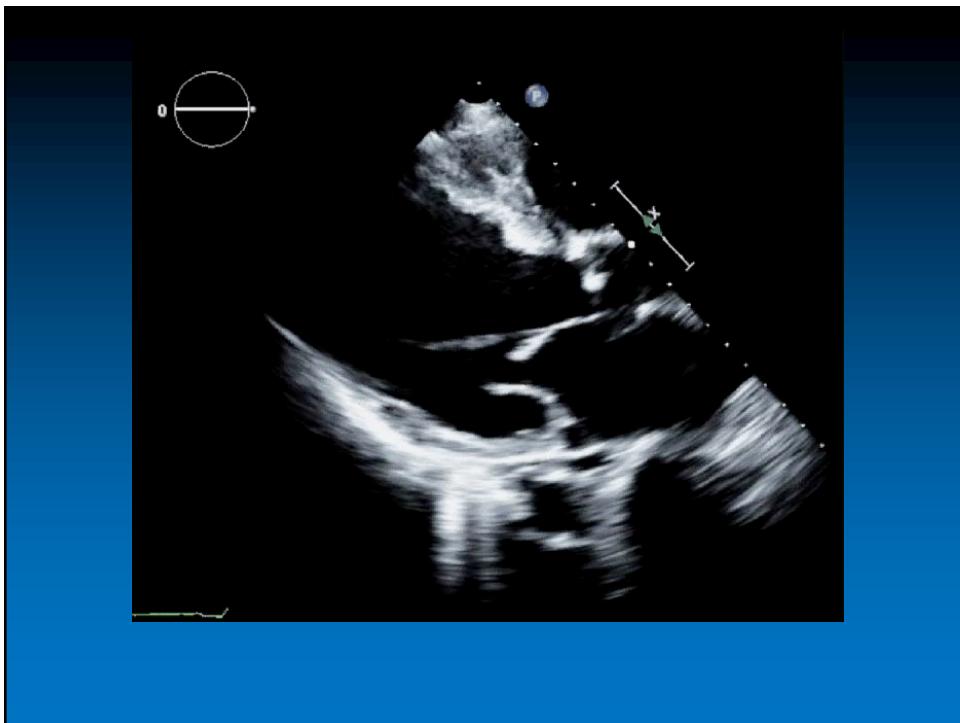
Nesta . J Am Soc Echocardiogr 2003;16(12):1301-8

45

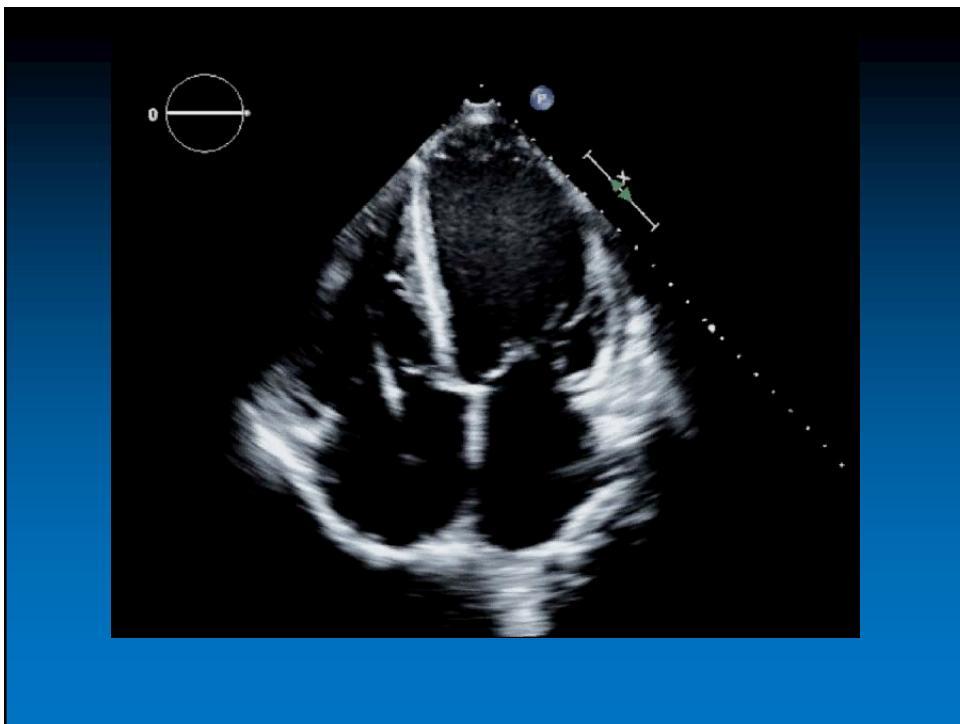
Carpentier IIIb

Restricted posterior leaflet

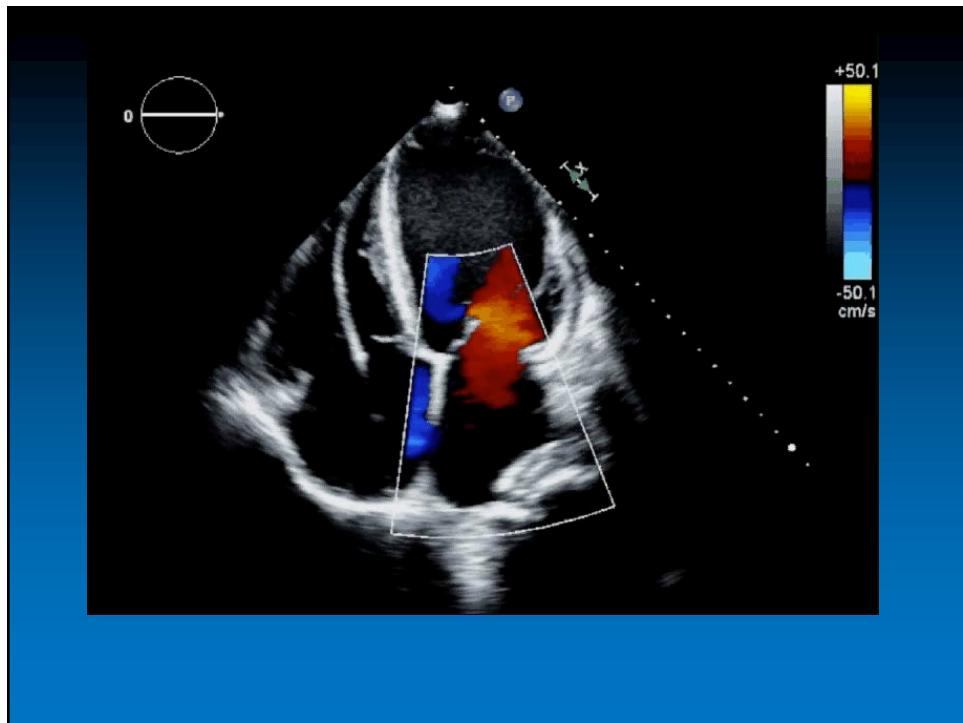
46



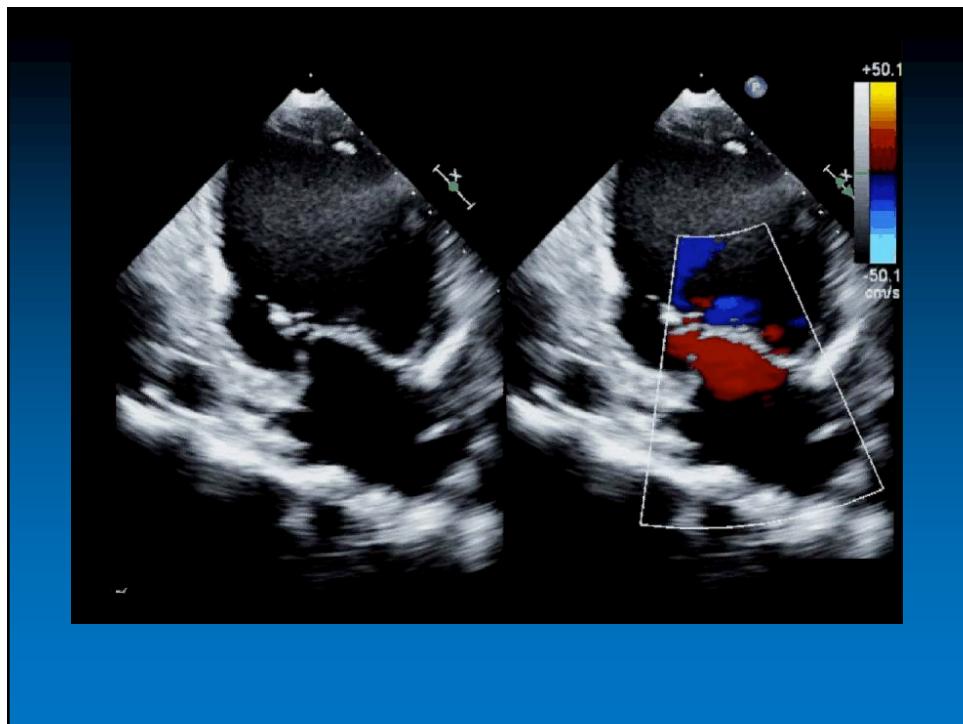
47



48



49



50

Functional Mitral Regurgitation

- Global LV dysfunction
- Regional LV dysfunction
- Sphericity of LV
- Excessive pap muscle displacement
- Decreased overlap of leaflets
- LA enlargement
- Loss of systolic mitral annular contraction
- Increased “tenting” area
- Delayed activation of P-M pap muscle (dyssynchrony)

51

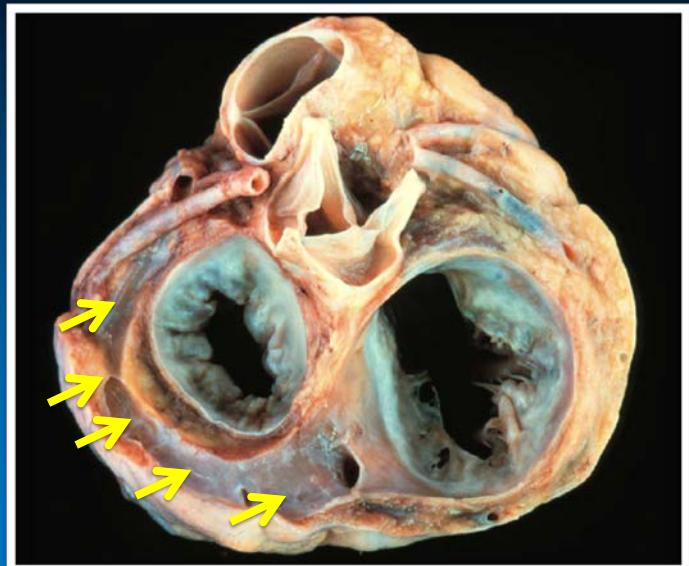
Percutaneous options for Functional MR

All are investigational devices

- Annuloplasty
 - Direct
 - Mitralign
 - Guided Delivery System (GDS) - AccuCinch
 - Rings: Transcath (Cardioband) or Hybrid (RF, mechanical)
 - Indirect
 - Coronary sinus devices (Evolution, Monarc, Carillon)
- Leaflet Plication
 - Mitral Clip
- Prosthetic valves

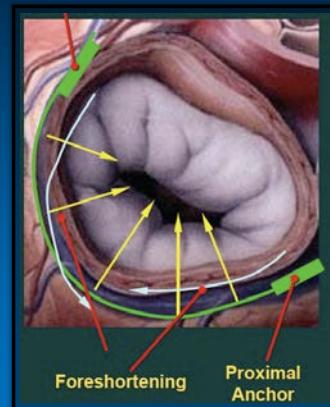
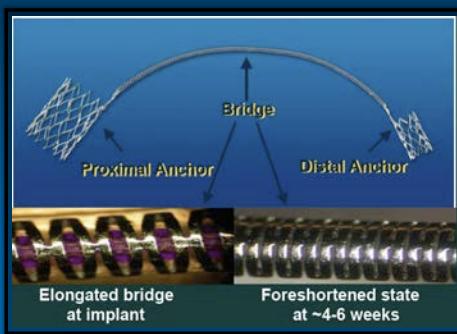
52

Indirect Annuloplasty – Coronary Sinus



53

Indirect Annuloplasty: Monarc Carillion

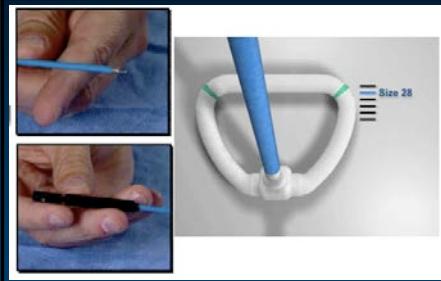


54

Mitral rings



Cardioband – GDS - Millipede



Adjustable ring

55

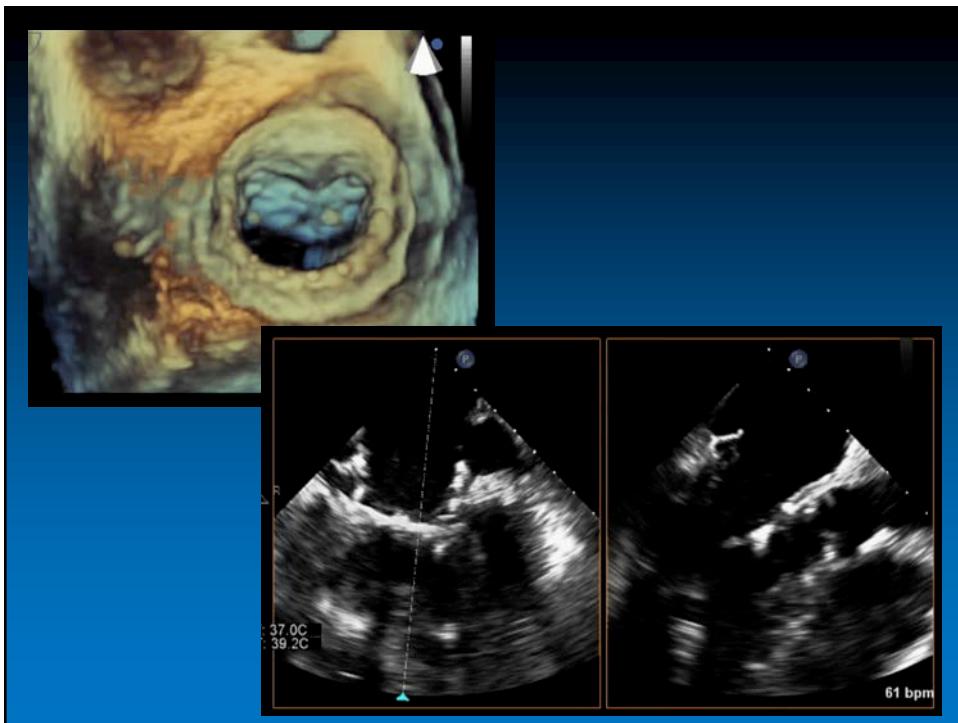
TMVR – Valve replacement



- Early investigational stages
- Anchoring is more challenging than TAVR
 - Less Calcium
 - Highly mobile annulus
 - Irregular plane: Saddle shape
 - D-shaped annulus
- Paravalvular leak: hemolysis?
- Thrombosis?



56



57

Conclusion

Understanding MV anatomy and the mechanism of MR in detail, will allow deciding the best therapeutic approach for any given patient.

59



60