Ισχαιμική Μιτροειδική Ανεπάρκεια

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Θεσσαλονική

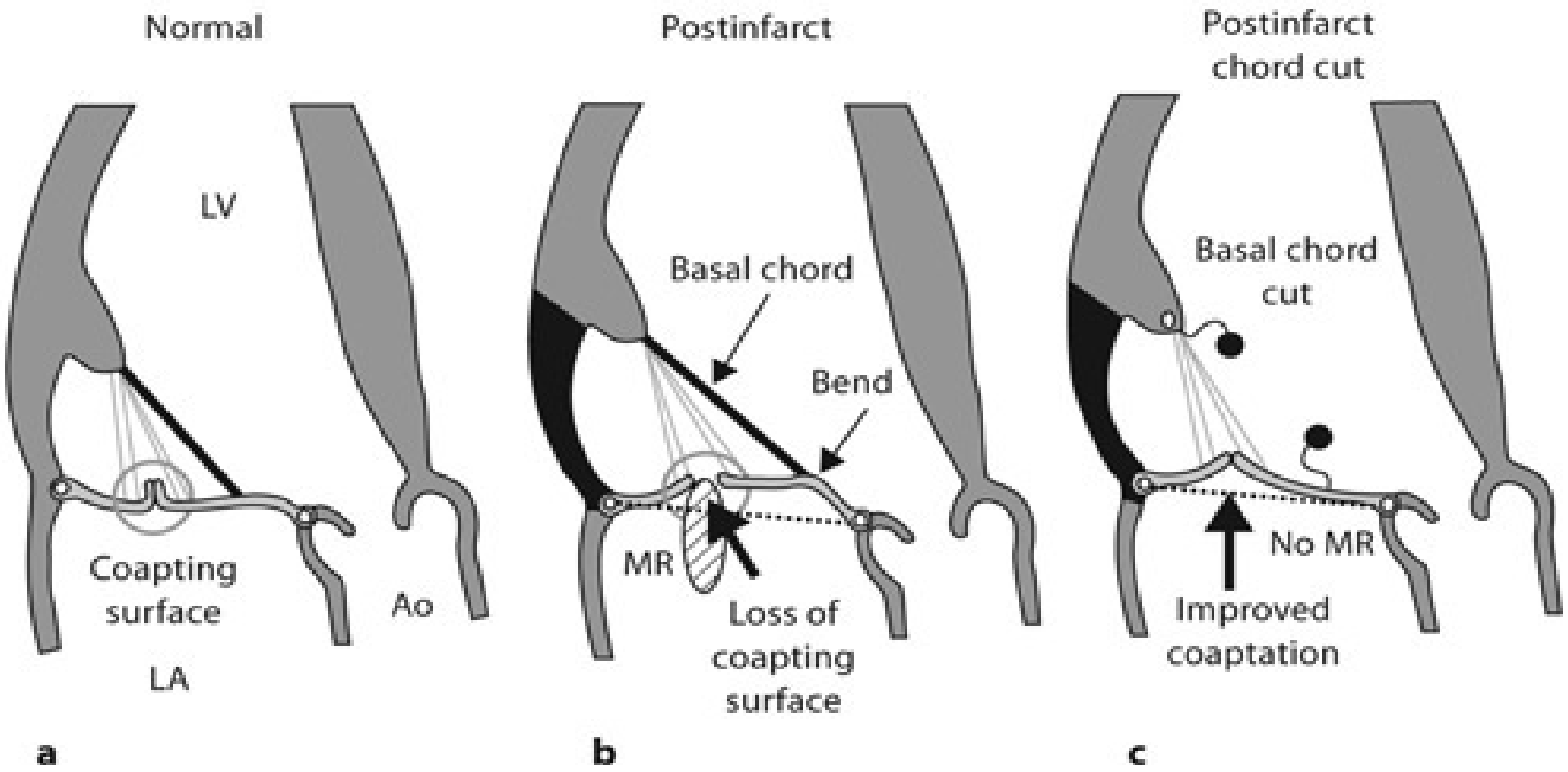
Introduction

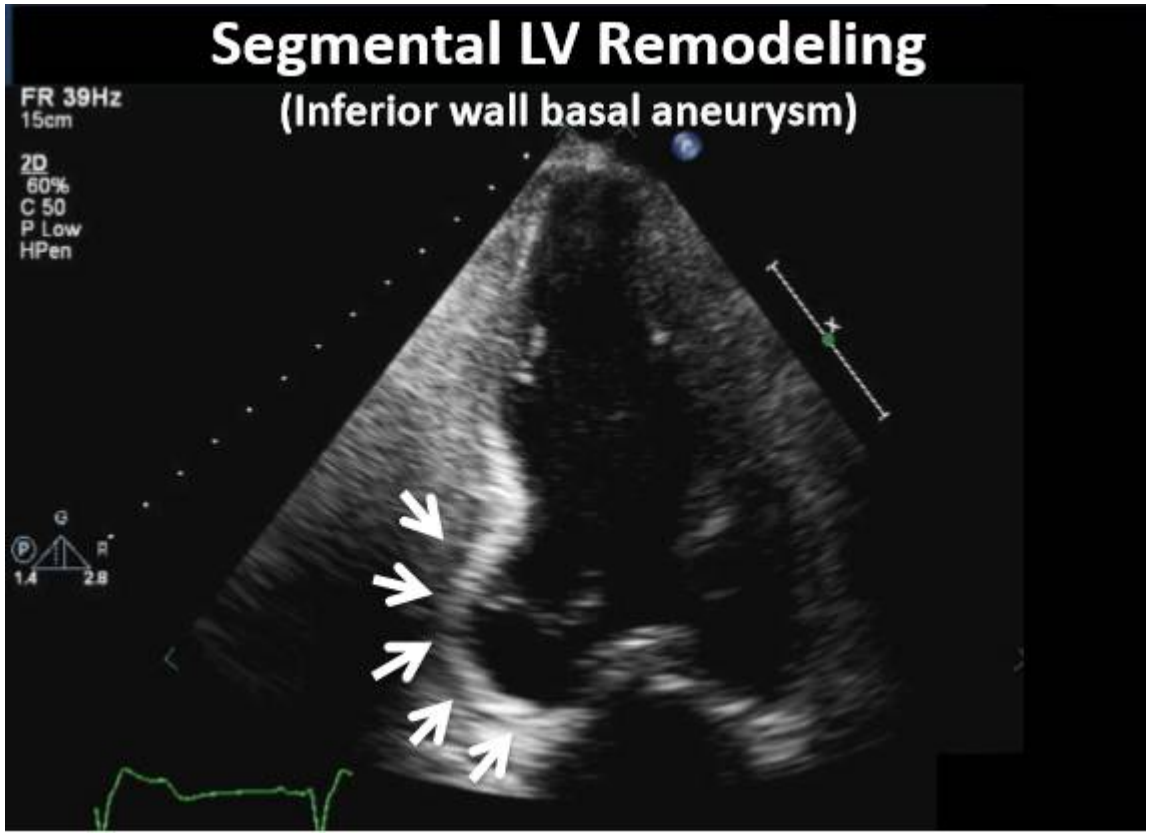
- It is considered to be : a controversial subject and a LV disease
- It has a dynamic nature (loading conditions, on going ischemia)
- Lack of randomized trials beyond 2 years
- Observational features of most studies

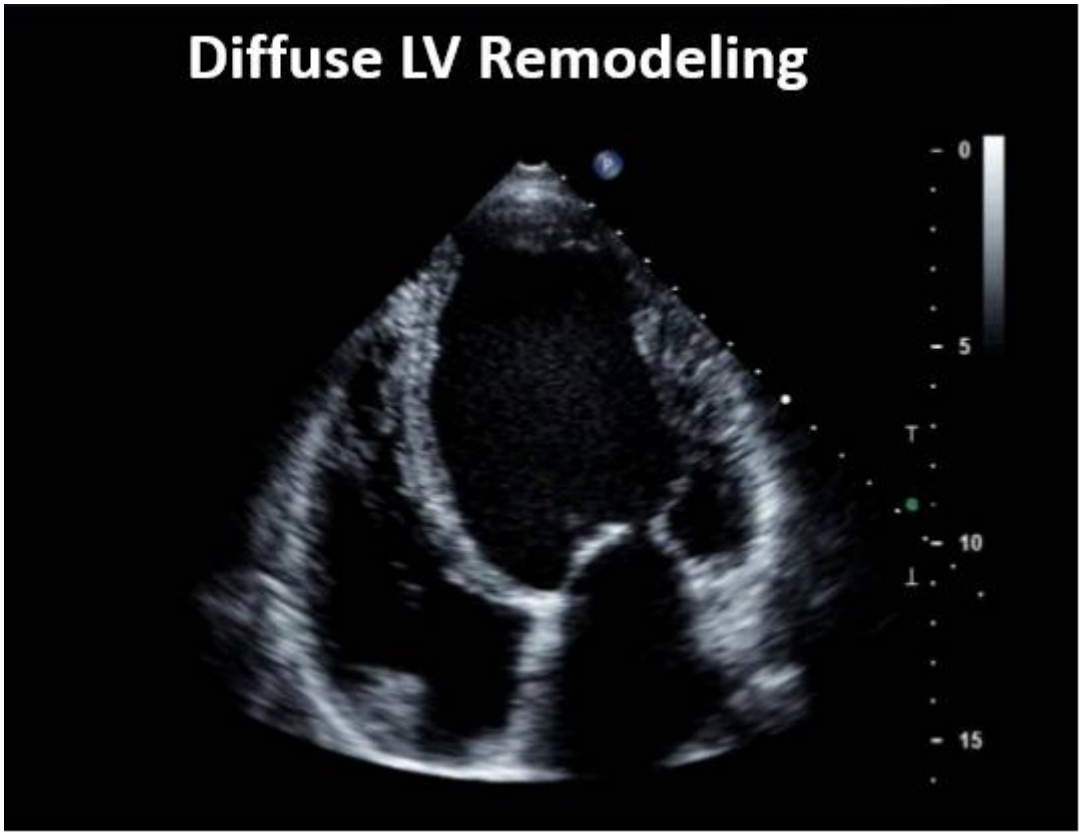
DEFINITIONS AND MECHANISMS OF IMR

- ETIOLOGY : ischemic heart disease resulting in regional or global LV dysfunction

- LESION : leaflet tethering as a result of displacement of papillary muscles leading to restrictions of the free margins of the leaflets and poor coaptation


Normal
LV
Coapting surface
LA
Ao
a
Postinfarct
Basal chord
Bend
MR
Loss of coapting surface
b
Postinfarct chord cut
Basal chord cut
No MR
Improved coaptation
c


Segmental LV Remodeling
(Inferior wall basal aneurysm)
FR 39Hz
15cm
2D
60%
C 50
P Low
HPen
1.4
2.8


Diffuse LV Remodeling
0
5
10
15

DEFINITIONS AND MECHANISMS OF IMR

- PDA occlusion - dominant posterior papillary muscle damage – tethering of P3 – eccentric jet directed along the P3 area

- LAD infarction – global remodelling- diffuse tethering- central jet

DEFINITIONS AND MECHANISMS OF IMR

- ANNULAR DIALATATION is a secondary lesion accompanies the primary entities and is much less than in degenerative mitral disease

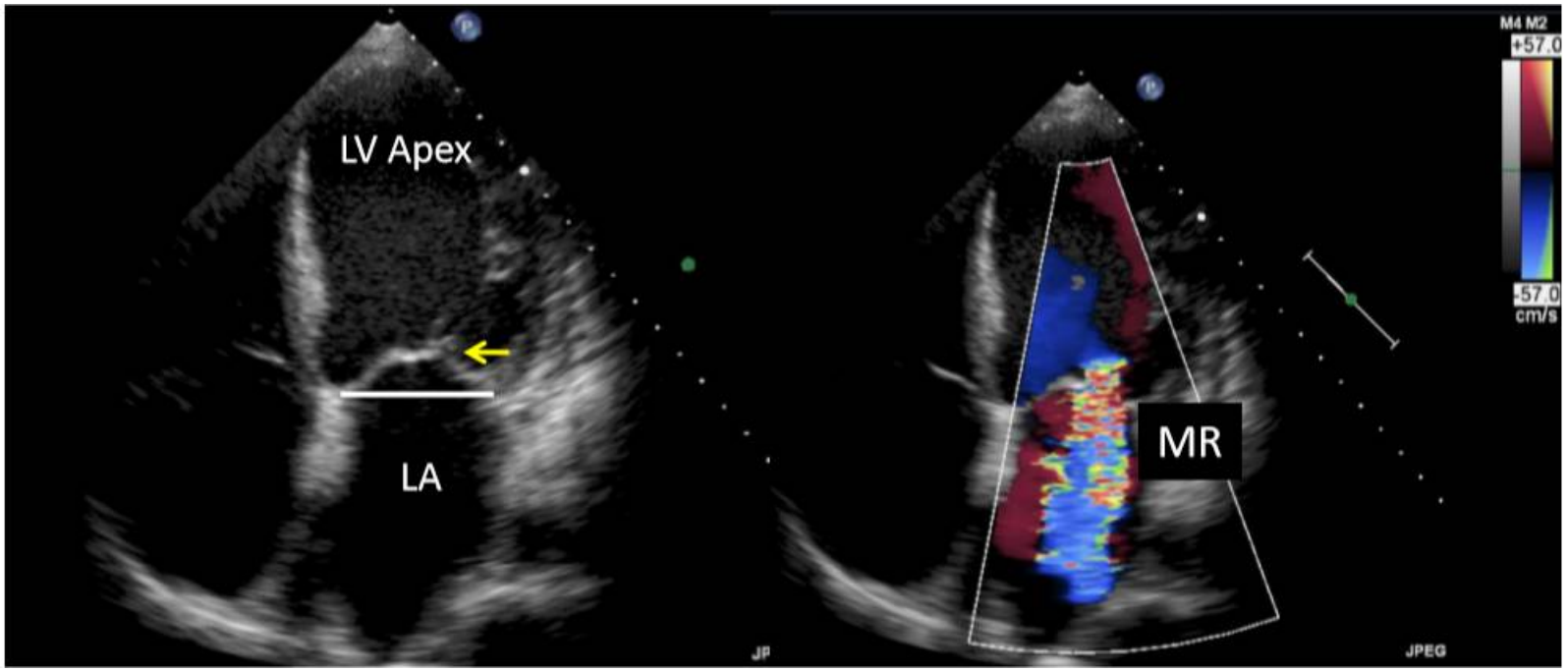
- The p-m portion of the annulus considered the most affected part although there is evidence for anterior leaflet displacement as well

- Posterior infarct : dilatation along the A1-P3 axis
- Anterior infarct : symmetrical and circular enlargement

IMAGING FEATURES OF IMR

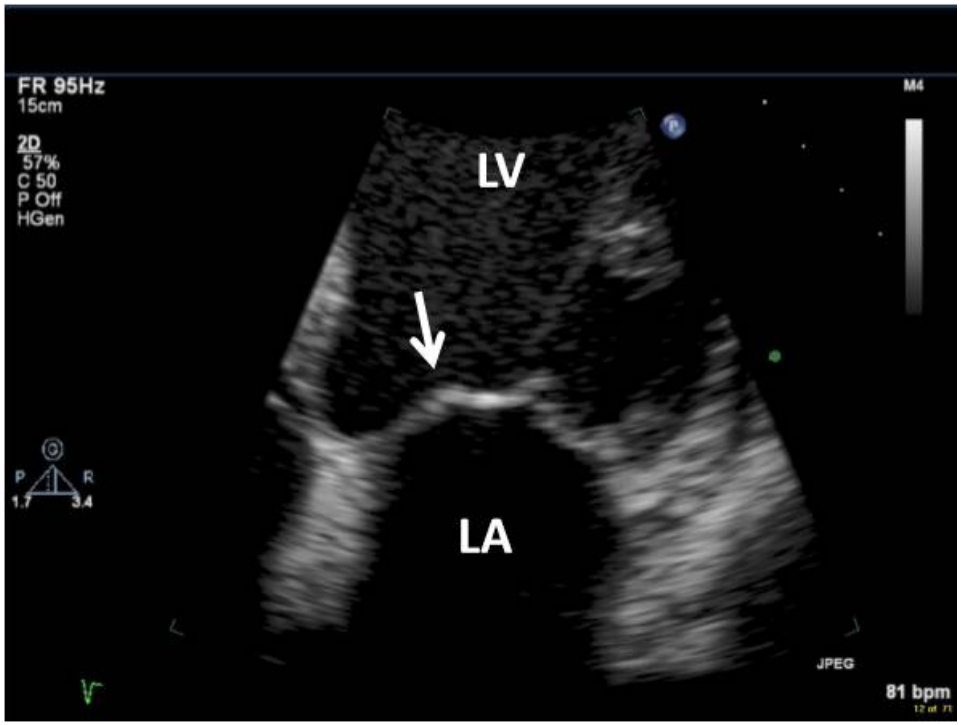
- Apical displacement of the mitral leaflet – apical tethering – abnormal coaptation in annular plane – incomplete closure

- Eccentric jet

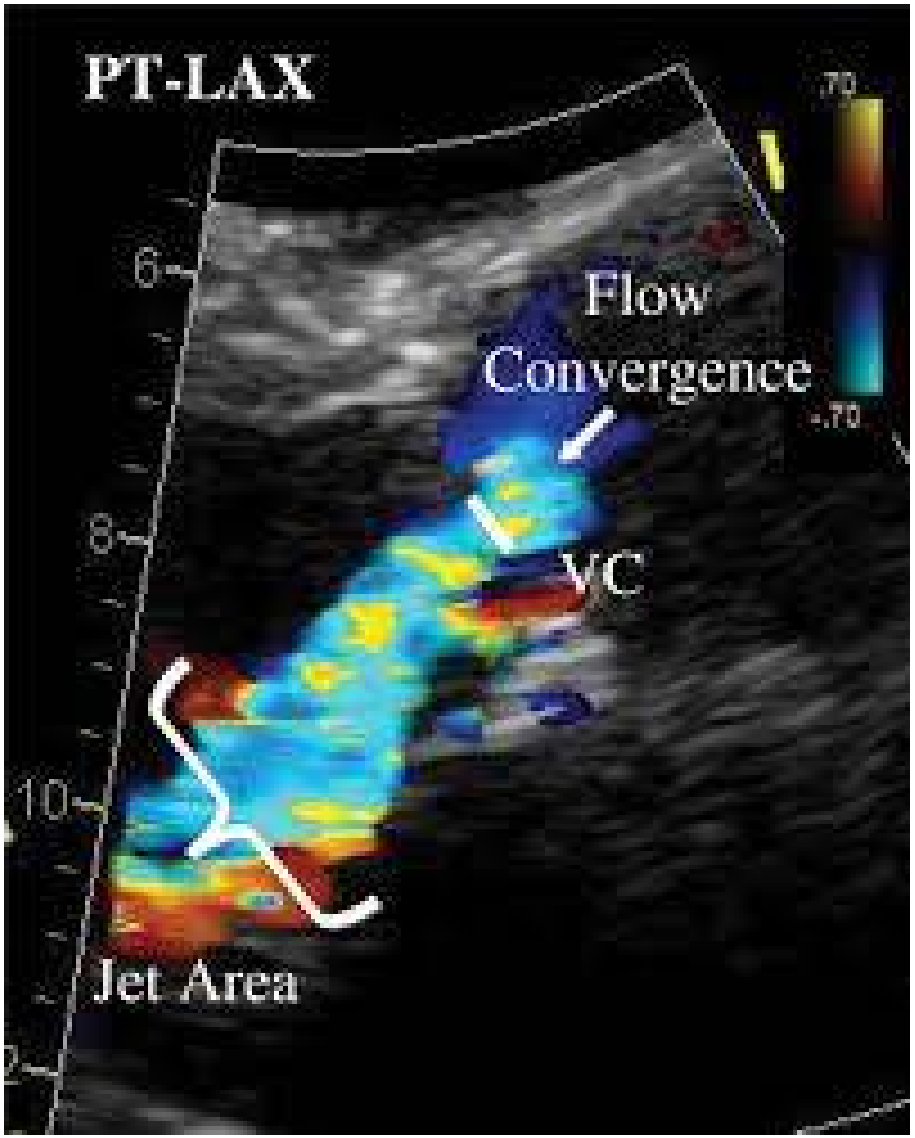


IMAGING FEATURES OF IMR

- Apical displacement of the mitral leaflet – apical tethering – abnormal coaptation in annular plane – incomplete closure
- Seagull sign



GRADING OF IMR



GRADING OF IMR

Should not count on a single parameter

1.The distal jet : MR jet area / LA area > 40% : severe MR

Underestimation in eccentric jets and loading conditions

2.Vena contracta width : 0.3 -0.7 moderate , > 0.7 severe

It should always be maximize by the sector

3. PISA method : limitations to its clinical applicability

DIFFERENCES IN EROA

The cut off values have been defined according to the natural history and the outcomes of the diseases

- Degenerative : severe MR > 0.4 cm2
- Ischemic : severe MR > 0.2 cm

TEE ASSESSMENT

- Clinical decision-making based on MR severity should be avoided during TEE as MR depends on loading conditions

- Grading should be assessed with patient awake, alert and medically stable

INDICATIONS FOR SURGERY

- Strong association between
  heart failure – severity of secondary MR
  degree of MR – 5 year survival

- No association between
  improving survival- IMR correction

- More conservative indications in IMR than in DMR given the correlation of outcomes with LV dysfunction

INDICATIONS FOR SURGERY

- In cases of severe IMR there is a Landmark Randomized Control Trial comparing MV Repair with chordae –sparing MV Replacement

- In cases of moderate IMR there is a Landmark Randomized Control Trial comparing Annuloplasty +CABG with only CABG

INDICATIONS FOR SURGERY 2014 guidelines for pts with secondary IMR

- Moderate secondary MR : MV repair may be considered at the time of other cardiac surgery (COR IIb, LOE B)
- Severe secondary MR : MV surgery is reasonable at the time of other cardiac surgery (COR IIa, LOE C)

- May be considered FOR any severe symptomatic patient with NYHA III, IV (COR IIb, LOE B)

REPAIR vs REPLACEMENT FOR SEVERE IMR

- 2014 AHA/ACC guidelines don't specify whether repair or replacement should be performed.

- Retention of both anterior and posterior leaflet in MV replacement would preserve the function of LV

- There is a perception that repair is associated with lower morbidity and mortality but with higher recurrence rate than replacement

REPAIR vs REPLACEMENT FOR SEVERE IMR

- Italian study found no difference in short and long term results

- In the CTSN study severe IMR trial the strongest predictor of recurrent MR was a basal infarction (aneurysm or dyskinesis)

REPAIR vs REPLACEMENT FOR SEVERE IMR

Multiple studies : strongest predictors of recurrent MR are :

- significant anterior leaflet angle > 25°
- LVEDD > 65mm
- Sphericity
- Degree of MR

REPAIR vs REPLACEMENT FOR SEVERE IMR

- MV REPLACEMENT is reasonable in symptomatic pts who have basal infarction, severe tethering, and/or LVEED >65mm

  (COR IIa, LOE B)

- MV REPAIR with complete undersized rigid ring should be considered in symptomatic pts who do not have basal infarction, severe tethering, and/or LVEED >65mm

  (COR IIa, LOE B)

MODERATE IMR
CABG ± MV REPAIR

2014 AHA/ACC guidelines are relatively conservative

FACTS

MV repair +CABG :

1. reduce the regurgitant grade
2. no impact on survival, LV remodelling, MACCE
3. greater number of neurologic events and SV arrhythmias

MODERATE IMR
CABG ± MV REPAIR

QUESTIONS

- What symptoms are dominant ?

Angina, dyspnea/heart failure or both ?

- If dyspnea is present or left sided filling pressures are elevated a repair procedure should be added
- On the contrary if angina is present CABG alone should be considered as the proper method

MODERATE IMR
CABG ± MV REPAIR

QUESTIONS

What about the annulus ?

- 1. annular dilatation more than 38-40mm should be considered factor for adding MV plasty

- 2. a large left atrium should play the same role

MODERATE IMR
CABG ± MV REPAIR

CONCLUSIONS

- In patients with moderate MR undergoing CABG MV repair with an undersized complete rigid ring may be considered

TECHNICAL ASPECTS OF MV REPAIR IN IMR

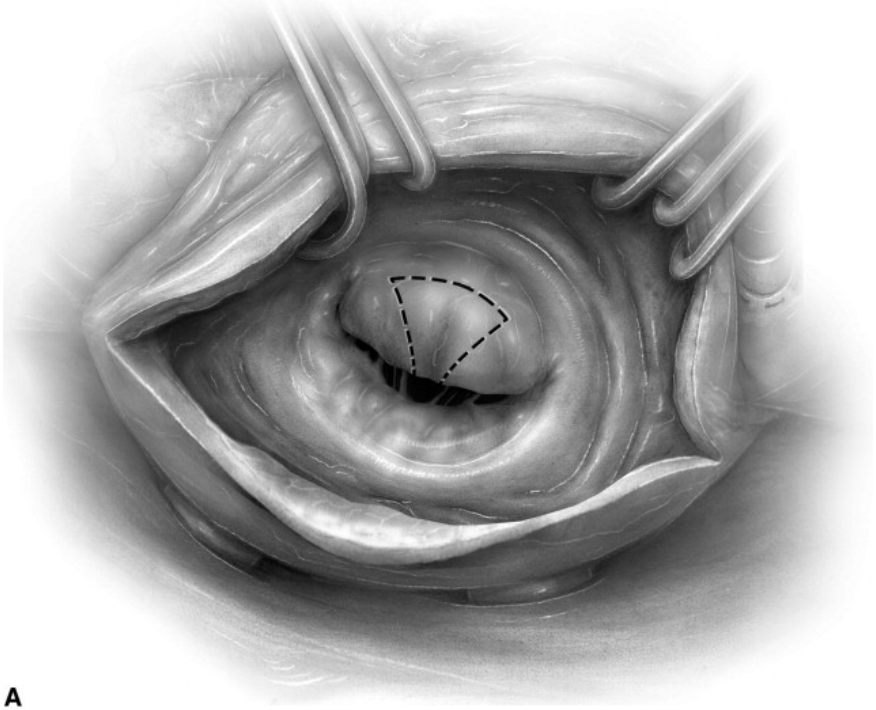
- Proposed by Bolling in 1995
- Large number of sutures distributing the annular workload in a deductive way
- SAM and MS sequalae don’t happen in any follow-up series
- The complete rigid ring is essential since the anterior fibrous and the posterior muscular portion of the annulus are both dilated in IMR
- Coming off bypass the coaptation depth should be at least 8-10mm
- Regurgitation degree would be greater in patients who are awake

TECHNICAL ASPECTS OF MV REPLACEMENT IN IMR

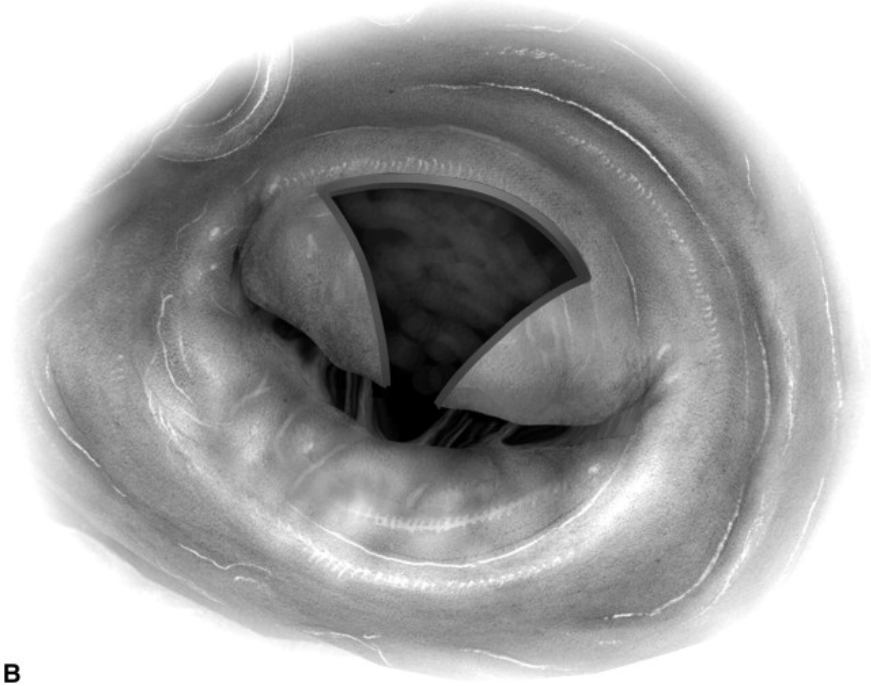
THERE IS CLEAR CONSENSUS

- LV function and volume is better preserved in total valve sparing procedure than in partial

- Non- valve sparing procedure should be abandoned



A



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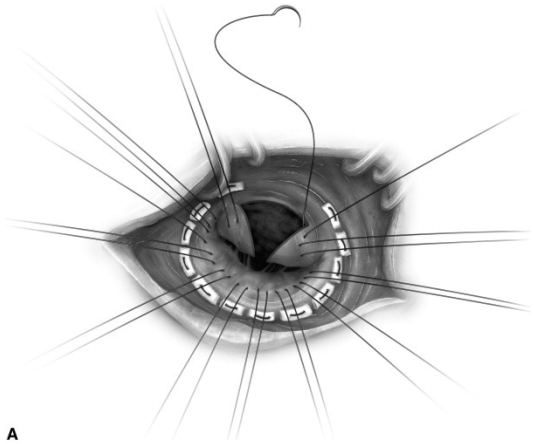
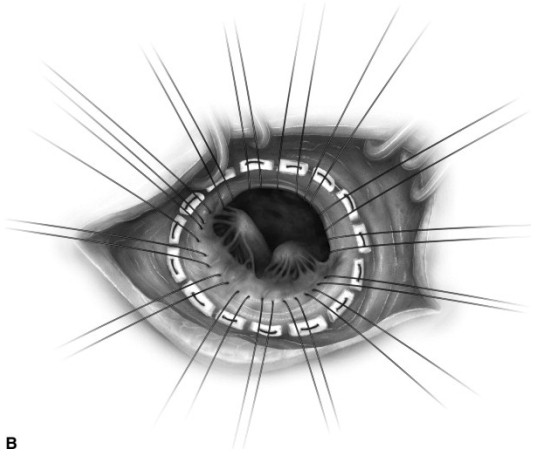


A



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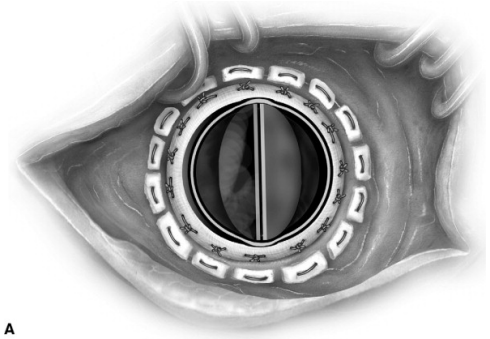
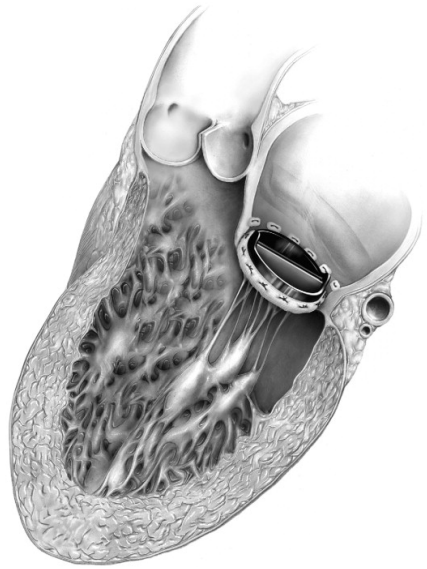


A



B

TECHNICAL ASPECTS IN PROCEDURES FOR IMR CONCLUSIONS

- MV Replacement should be performed with complete preservation of both posterior and anterior leaflet chords

(COR I, LOE B)

MV Repair for IMR should be performed with small undersized rigid annuloplasty ring

(COR IIa, LOE B)

PERCUTANEOUS TRANSCATHETER MITRAL REPAIR

- Mitra Clip is a percutaneous transcatheter mitral repair system based on Alfieri technique

- Europe : Class II b recommendation based on EVEREST II trial

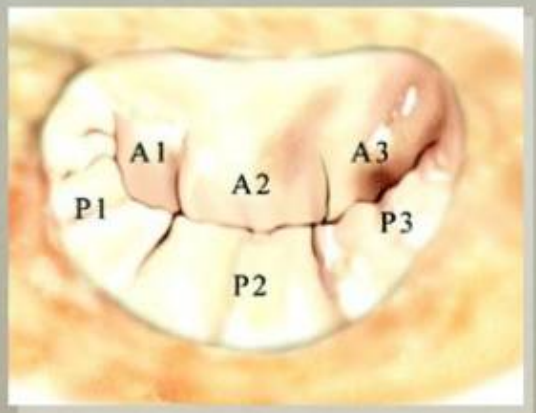
- USA : Under investigation COAPT trial

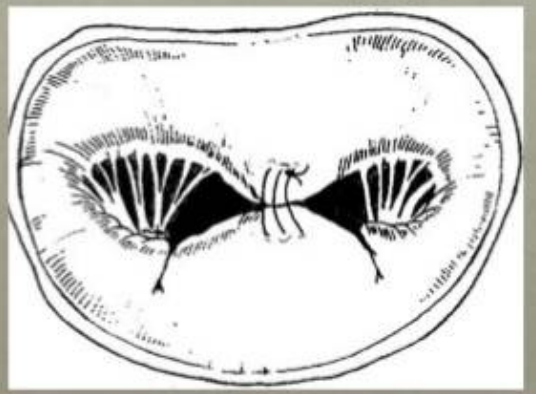
ALFIERI PROCEDURE

Anterior 2 leaflet
A2

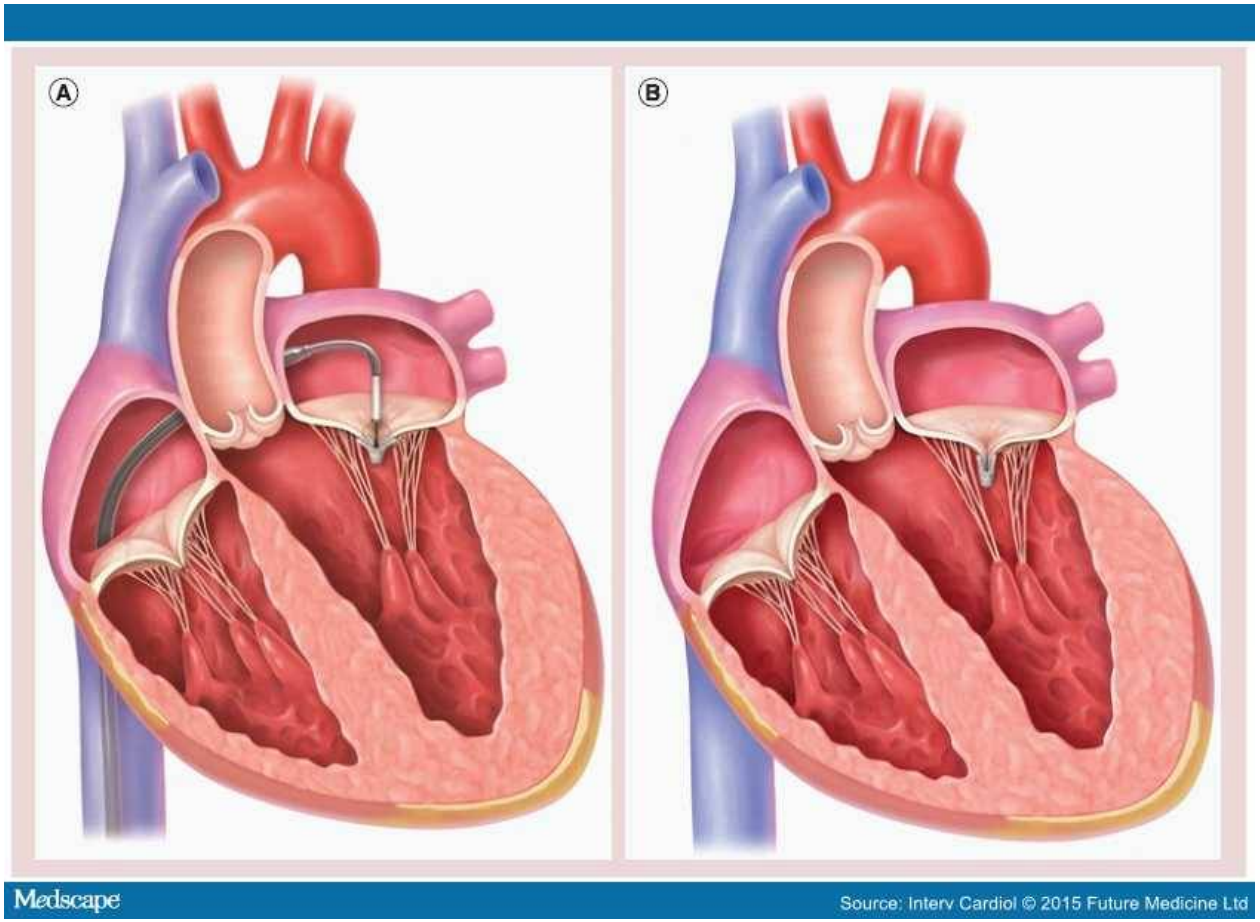
Posterior leaflet
P2

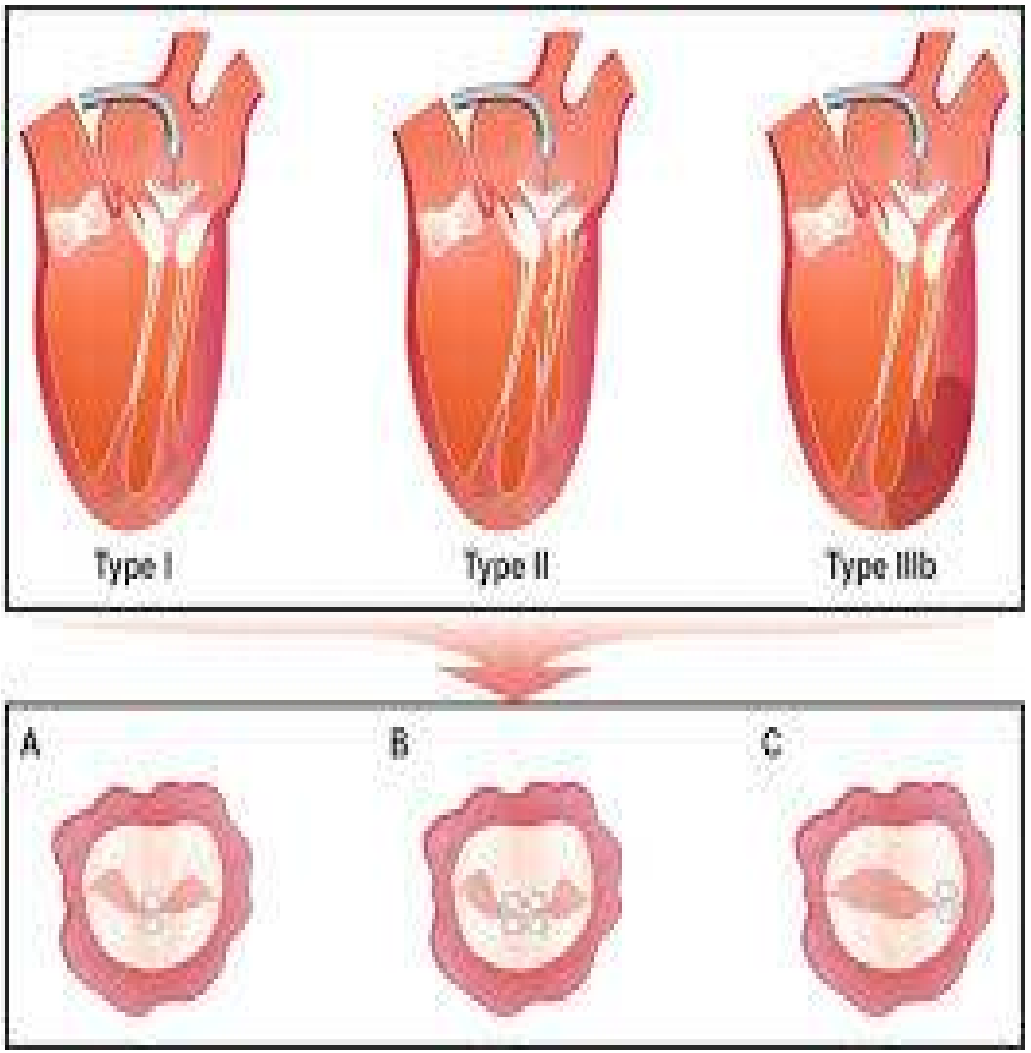
Figure 8





MitraClip procedure




Type I
Type II
Type IIIb
A
B
C

MITRA CLIP DATA FOR FUNCTIONAL MR

EVEREST II STUDY

The mortality of mitral clip patients is comparative with STS patients' mortality and have a better 12 month survival than medically treated patients

These data formed the fundamental for COAPT study

MITRA CLIP DATA FOR FUNCTIONAL MR

COAPT study

- Is underway at 80 sites in USA to investigate the safety and effectiveness of the MitraClip in comparison to standard medical therapy

ΚΑΡΔΙΟΘΩΡΑΚΟΧΕΙΡΟΥΡΓΙΚΗ ΚΛΙΝΙΚΗ Γ.Ν.Θ. Γ. ΠΑΠΑΝΙΚΟΛΑΟΥ

Σύνολο 2207 περιστατικα (Ιούνιος 2012 – Απρίλιος 2017)

1374 CABG
34 CABG + moderate or severe MR

	CABG N=25	CABG +MV N=9
Ηλικία	65,04±7,6	72,3±7,17
Euro	3,13±4	3,76±2
EF	39,6±11,3	47,8±10,9
PULM HYPERTENSION	8/25	8/9
Επείγον	5/25	0
CPB min	98,9±41,7	177±59

Σύνολο 2207 περιστατικα (Ιούνιος 2012 – Απρίλιος 2017)

1374 CABG
34 CABG + moderate or severe MR

	CABG N=25	CABG +MV N=9
IABP	3/25	2/9
Mechanical Ventilation (median)	9	12
Prolonged ventilation	4	1
LCOS	6	3
AEE	2	0
NIV	2	1
AKI	2	2
ΘΑΝΑΤΟΙ	1	1

Βιβλιογραφία

- 1. Goldstein D, Moskowitz AJ, Gelijns AC, Ailawadi G, Parides MK, Perrault LP, et al. Two-Year Outcomes of Surgical Treatment of Severe Ischemic Mitral Regurgitation. The New England journal of medicine. 2016;374:344-353.
- 2. Michler RE, Smith PK, Parides MK, Ailawadi G, Thourani V, Moskowitz AJ, et al. TwoYear Outcomes of Surgical Treatment of Moderate Ischemic Mitral Regurgitation. The New England journal of medicine. 2016.
- 3. American Association for Thoracic Surgery Ischemic Mitral Regurgitation Consensus Guidelines Writing C, Kron IL, Acker MA, Adams DH, Ailawadi G, Bolling SF, et al. 2015 The American Association for Thoracic Surgery Consensus Guidelines: Ischemic mitral valve regurgitation. J Thorac Cardiovasc Surg. 2016;151:940-956.
- 4. Nishimura RA, Otto CM, Bonow RO, Carabello BA, Erwin JP, 3rd, Guyton RA, et al. 2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol. 2014.

Βιβλιογραφία (συν.)

- 5. Acker MA, Parides MK, Perrault LP, Moskowitz AJ, Gelijns AC, Voisine P, et al. Mitral valve repair versus replacement for severe ischemic mitral regurgitation. The New England journal of medicine. 2014;370:23-32.
- 6. Smith PK, Puskas JD, Ascheim DD, Voisine P, Gelijns AC, Moskowitz AJ, et al. Surgical treatment of moderate ischemic mitral regurgitation. The New England journal of medicine. 2014;371:2178-2188.

Βιβλιογραφία (συν.)

- 7. AATS Ischemic Mitral Regurgitation Consensus Guidelines Writing Committee:

Kron IL, LaPar DJ, Acker MA, Adams DH, Ailawadi G, Bolling SF, Hung JW, Lim DS, Mack MJ, O'Gara PT, Parides MK, Puskas JD

2016 Update to The American Association for Thoracic Surgery (AATS)

Consensus Guidelines:Ischemic Mitralvalve Regurgitation (IMR)

The Journal of Thoracic and Cardiovascular Surgery (2017), doi: 10.1016/j.jtcvs.2017.01.031.