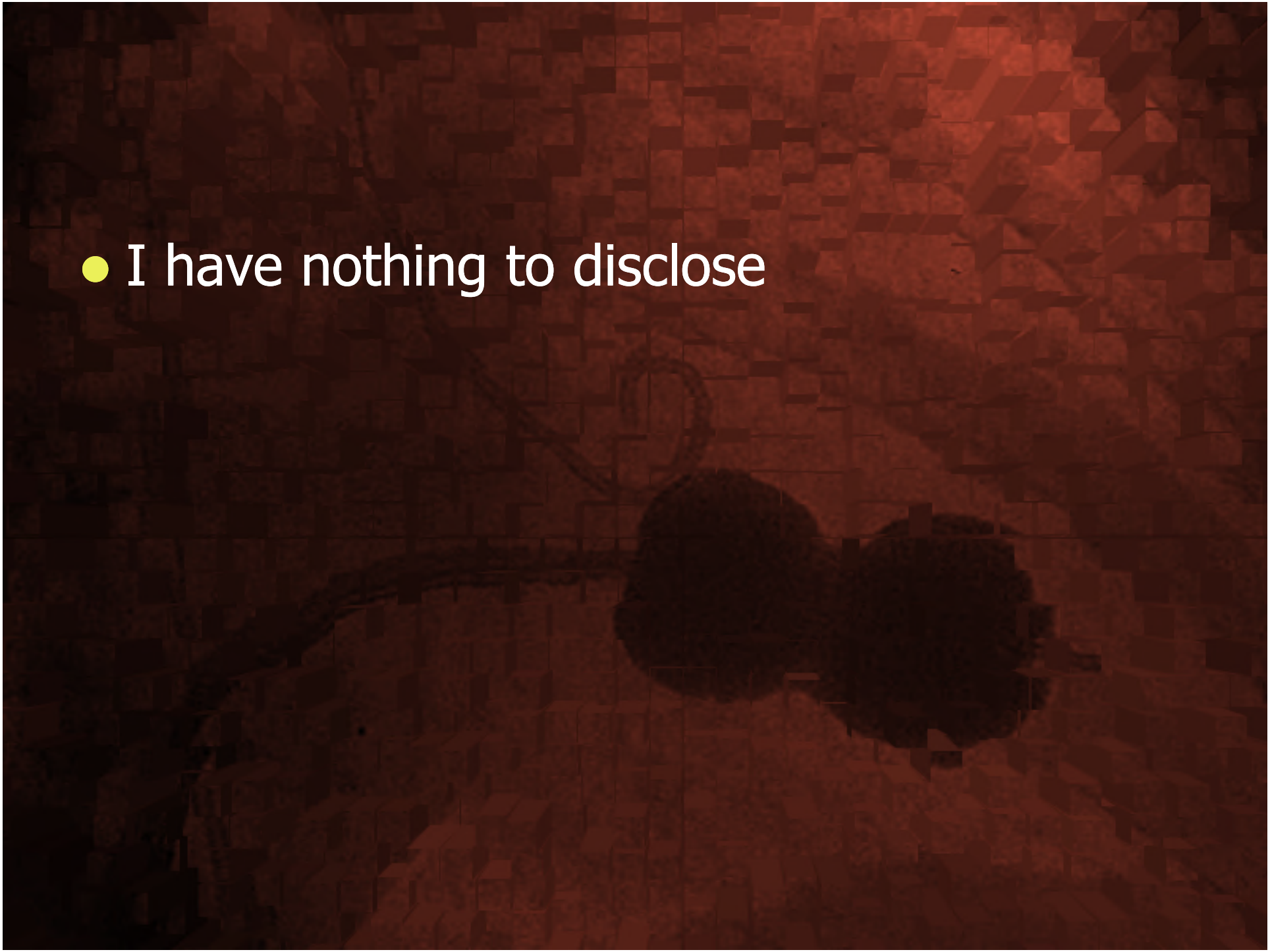
Percutaneous Mitral Valvuloplasty

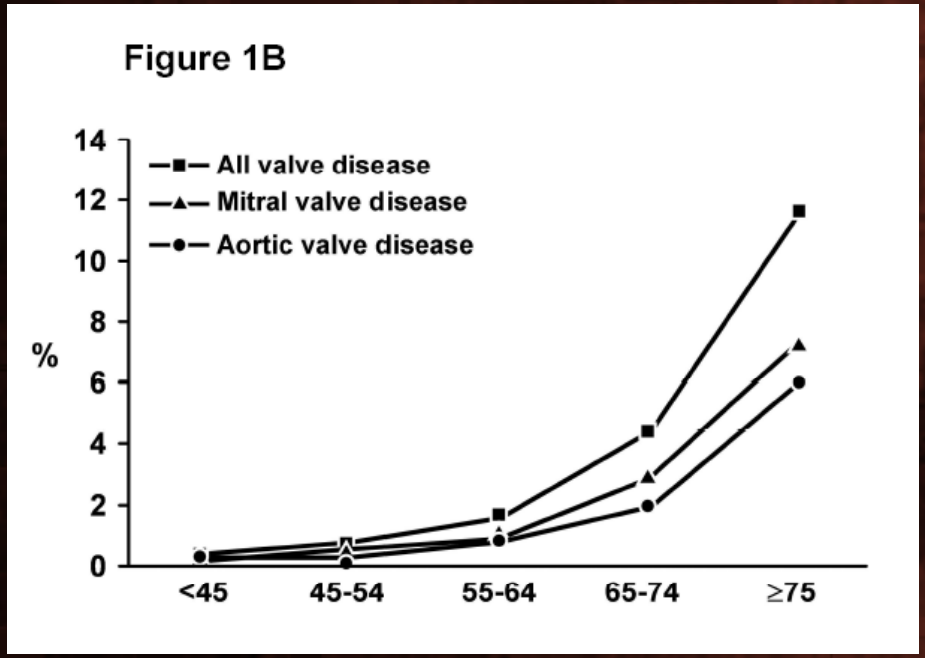
Ştefan Moţ M.D.
Heart Institute "N.Stancioiu"
Cluj-Napoca,România


• I have nothing to disclose

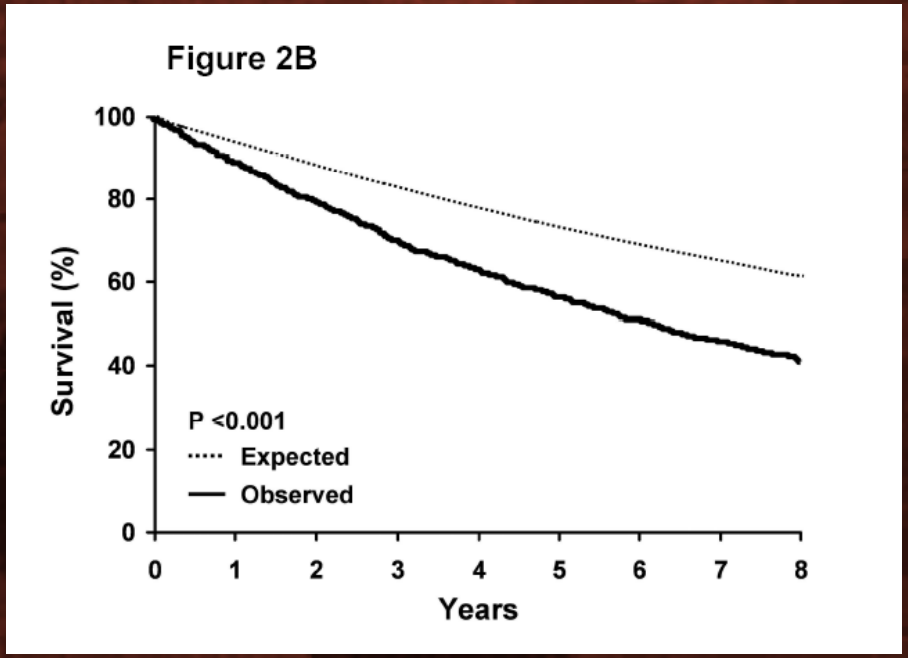
The Burden of Valve Disease

Euro Heart Survey

Prevalence

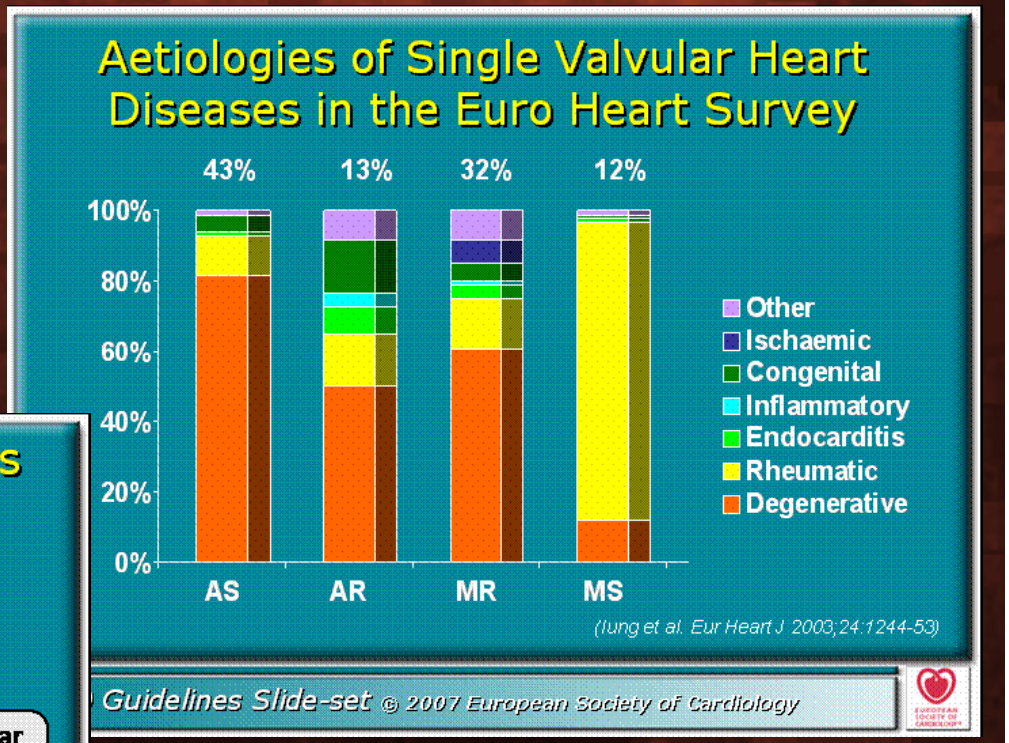


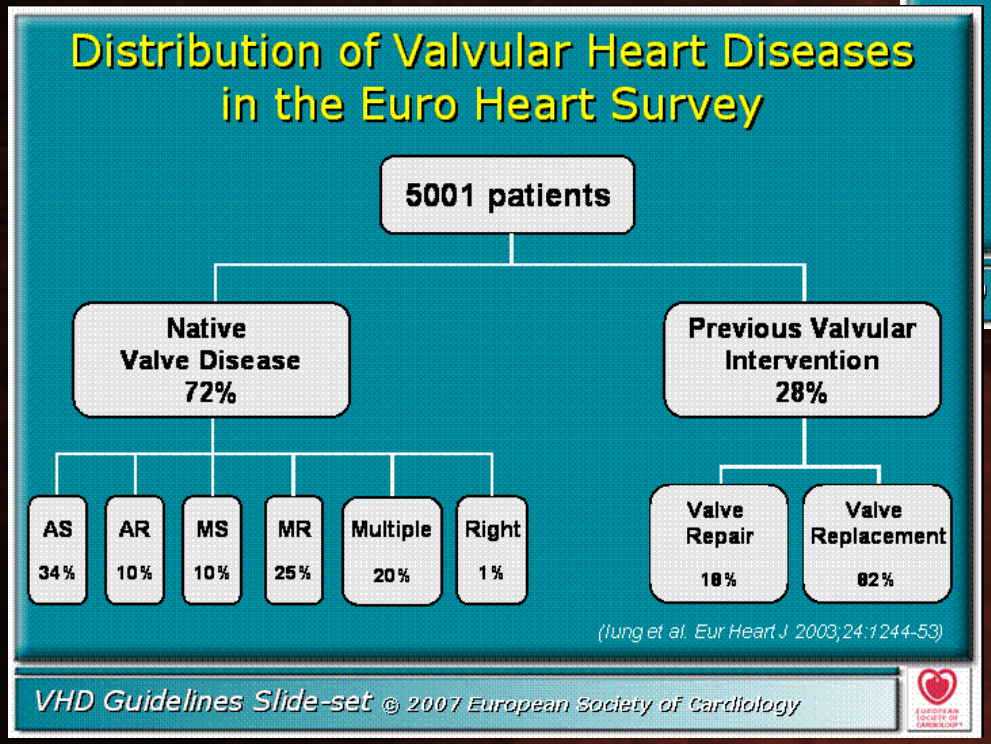
Survival



(Nkomo. *Lancet* DOI:10.1016)

Distribution and etiology of valvular heart disease
EURO HEART SURVEY



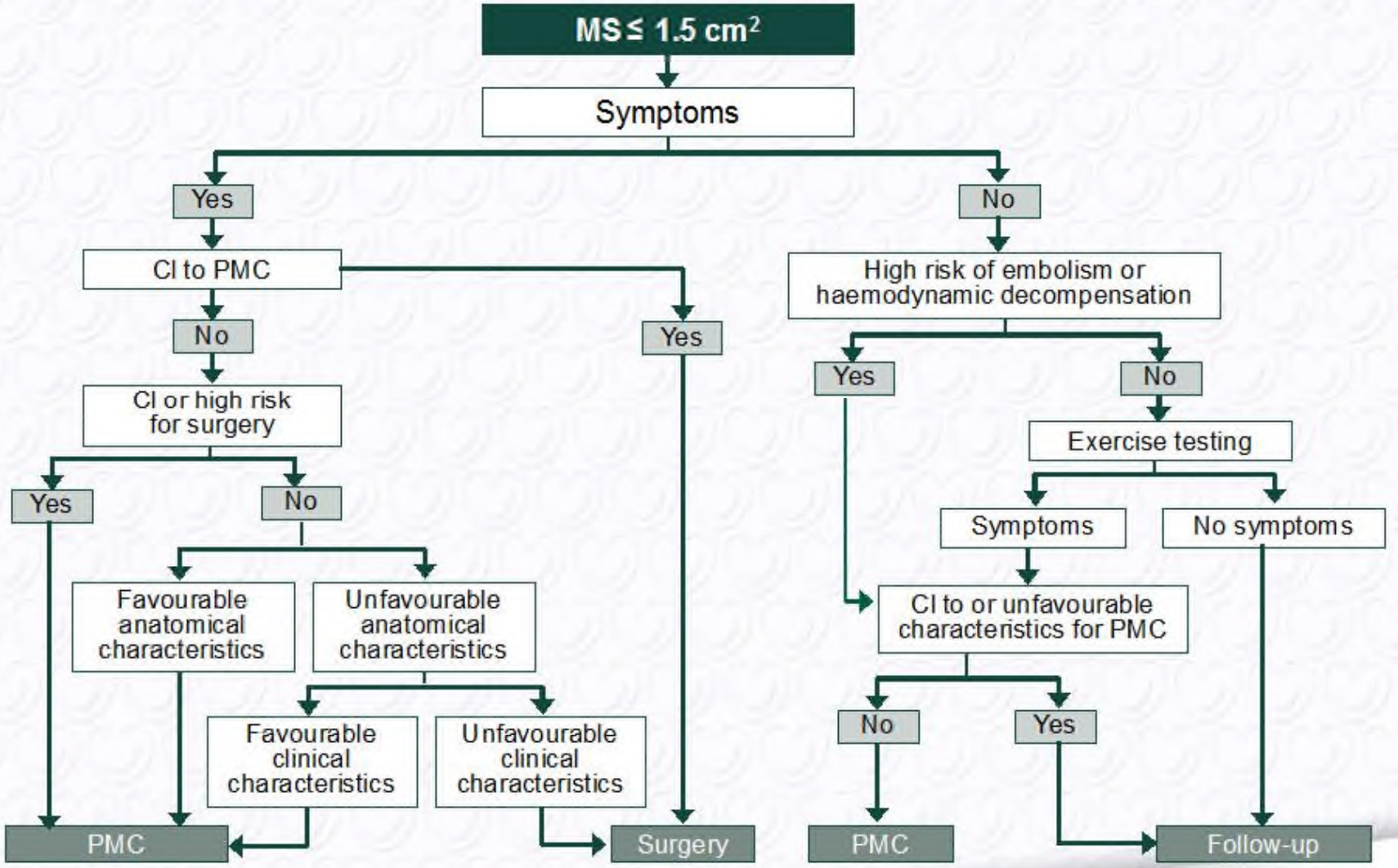


Indications for percutaneous mitral commissurotomy

	Class	Level
PMC is indicated in symptomatic patients with favourable characteristics.	I	B
PMC is indicated in symptomatic patients with contraindication or high risk for surgery.	I	C
PMC should be considered as initial treatment in symptomatic patients with unfavourable anatomy but without unfavourable clinical characteristics.	IIa	C
PMC should be considered in asymptomatic patients without unfavourable characteristics and: • high thromboembolic risk (previous history of embolism, dense spontaneous contrast in the left atrium, recent or paroxysmal atrial fibrillation), and/or • high risk of haemodynamic decompensation (systolic pulmonary pressure > 50 mmHg at rest, need for major non-cardiac surgery, desire for pregnancy).	IIa	C

European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

Management of clinically significant mitral stenosis



European Heart Journal 2012 - doi:10.1093/eurheartj/ehs109 & European Journal of Cardio-Thoracic Surgery 2012 - doi:10.1093/ejcts/ezs455).

www.escardio.org/guidelines

EACTS

EUROPEAN SOCIETY OF CARDIOLOGY®

Timing for intervention

PTMC: BEST CHOICE FOR:

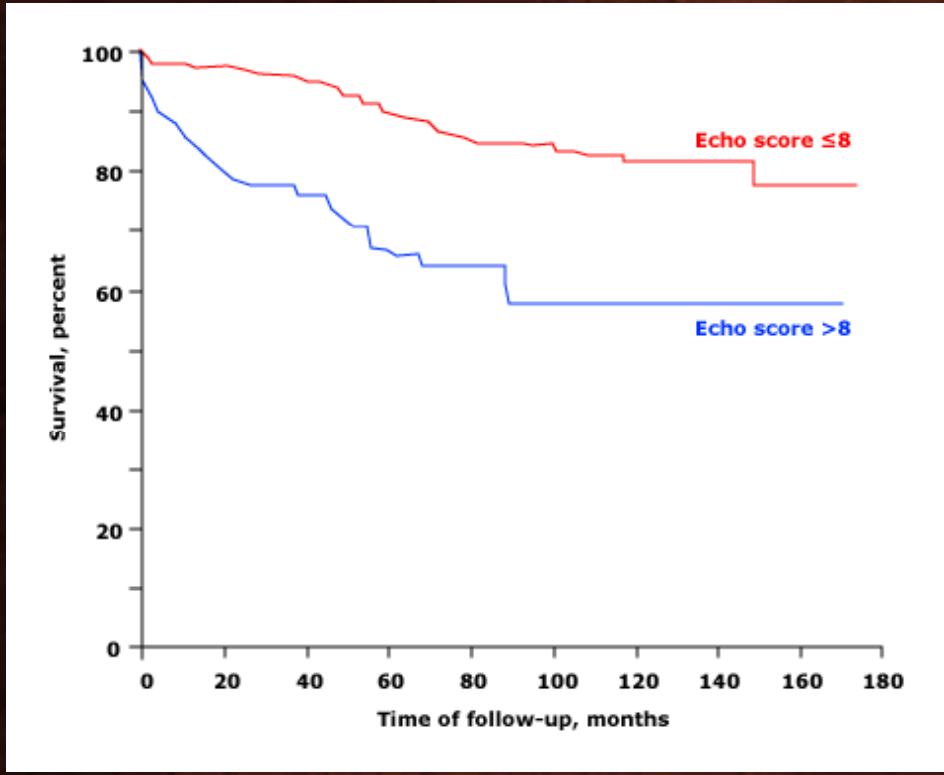
- Patients with contraindications to or high risk for surgery(I C)
- Patients with favorable presenting caractheristics(I B)
  - Predictors of poor late results:
    - Age p=0,003
    - Rhythm before PTMC p=0,001
    - Mitral regurgitation after PTMC p<0,004
    - Gradient after PTMC p=0,0001
    - Valve area after PTMC p=0,001

Iung,Circulation,1999,99
VHD ESC Guidelines,2007

Echocardiographic score

Wilkins score:4 Factors

1. 0----4 Degree of leaflet rigidity
2. 0----4 Severity of leaflet thickening
3. 0----4 Amount of leaflet calcification
4. 0----4 Extent of subvalvular thickening and calcification

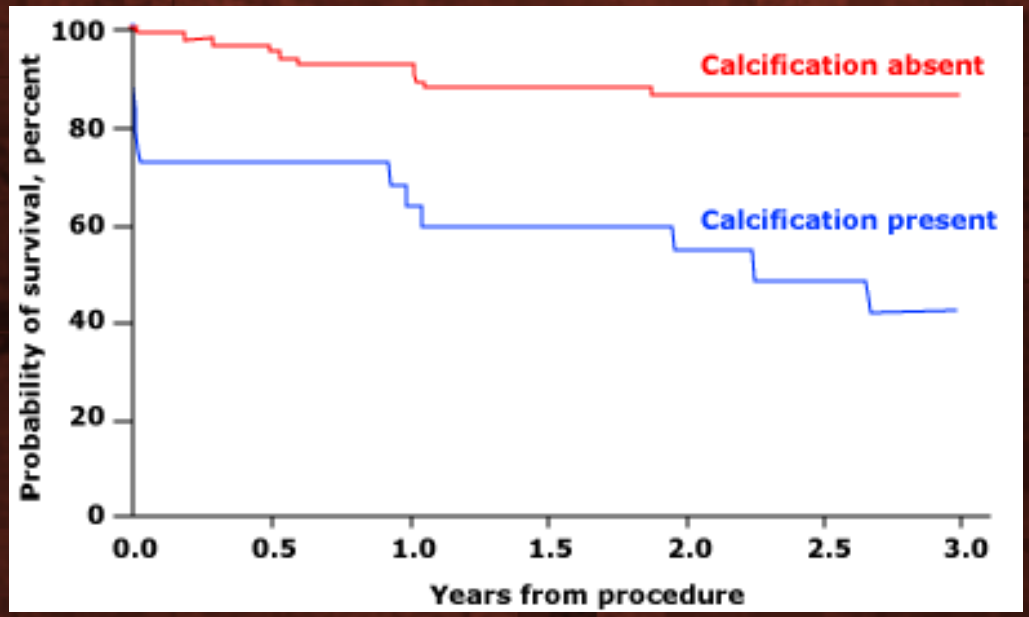


Wilkins,Br.Heart J.1988,60
Palacios,Circulation 2002,105

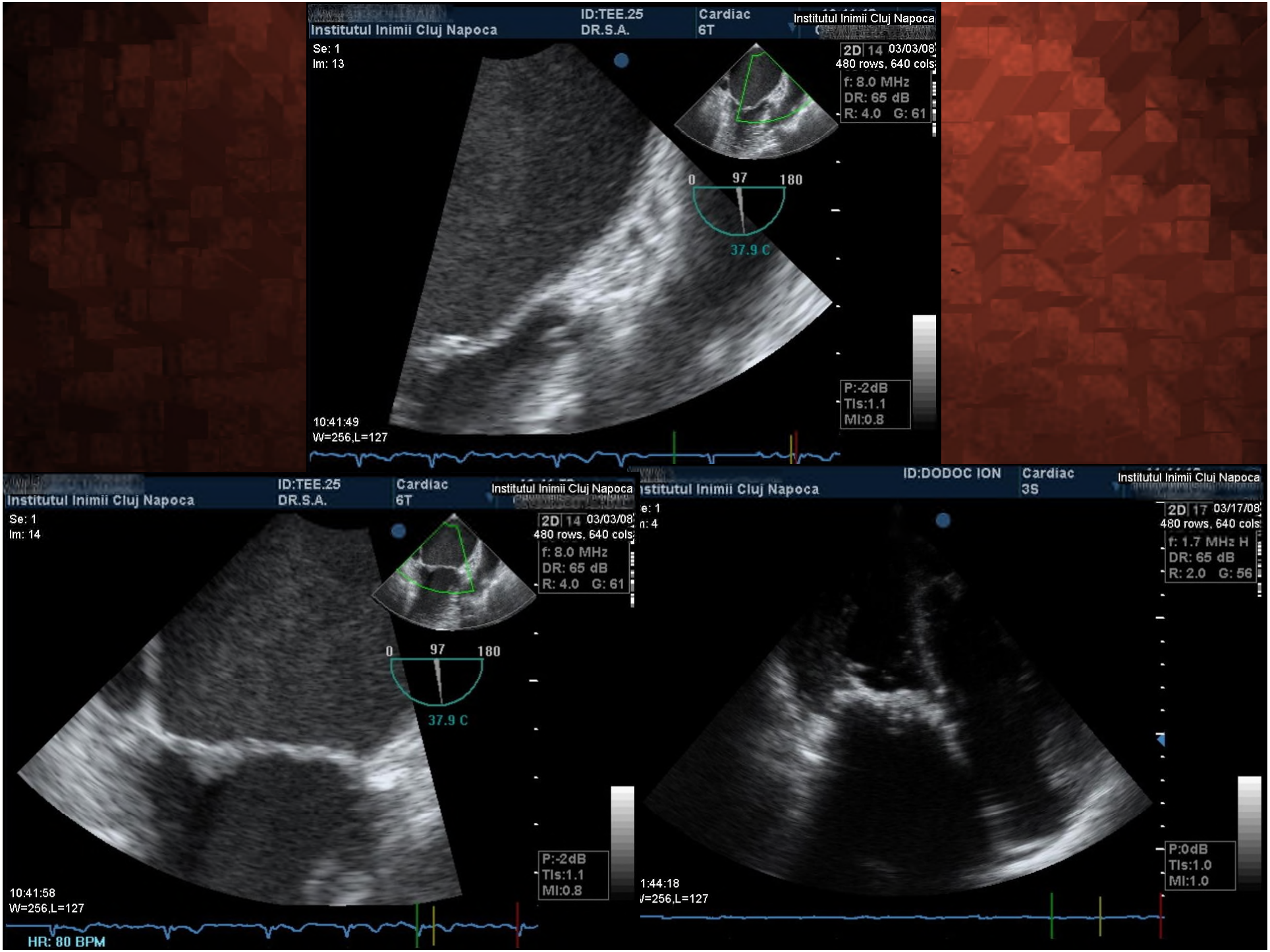
Choice of patients; challenging issues 1

- PTMC is to be considered as an initial treatment in symptomatic patients with unfavorable anatomy but otherwise favorable clinical characteristics (IIa C)

PTMC can be preferred as initial procedure in patients with mild to moderate calcification and otherwise favorable characteristics
In case of massive calcification valve replacement is indicated



Cannan,J.Am.Coll.Cardiol.1997,29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DR: 65 dB
R: 4.0 G: 61
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P:-2dB
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MI:1.0
1:44:18

Choice of patients; challenging issues 2

Which patients with few or no simptoms are candidates for balloon valvuloplasty?

MS<1.5 cm^2,favorable presenting parameters, experienced team and:

- Increased thrombembolic risk
  - previous embolism
  - dense contrast in the left atrium
  - recent onset of recurrent paroxismal atrial fibrilation

OR

- High risk for hemodynamic decompensation
  - pulmonary hypertension(50 mmHg-rest; 60 mmHg-stress)
  - desire of pregnancy
  - need for major extracardiac surgery

Iung,Eur.Heart J.2002,23

Contraindications for balloon valvuloplasty

- Valve area > 1,5cm^2
- Left atrial thrombus
- Mitral regurgitation > 2/4
- Massive calcification or bicomissural calcification
- Absence of comissural fusion
- Severe aortic valve disease or severe combined tricuspid stenosis and regurgitation
- Concomitant coronary artery disease requiring by-pass surgery

ESC-VHD Guidelines 2012

Left atrial thrombus

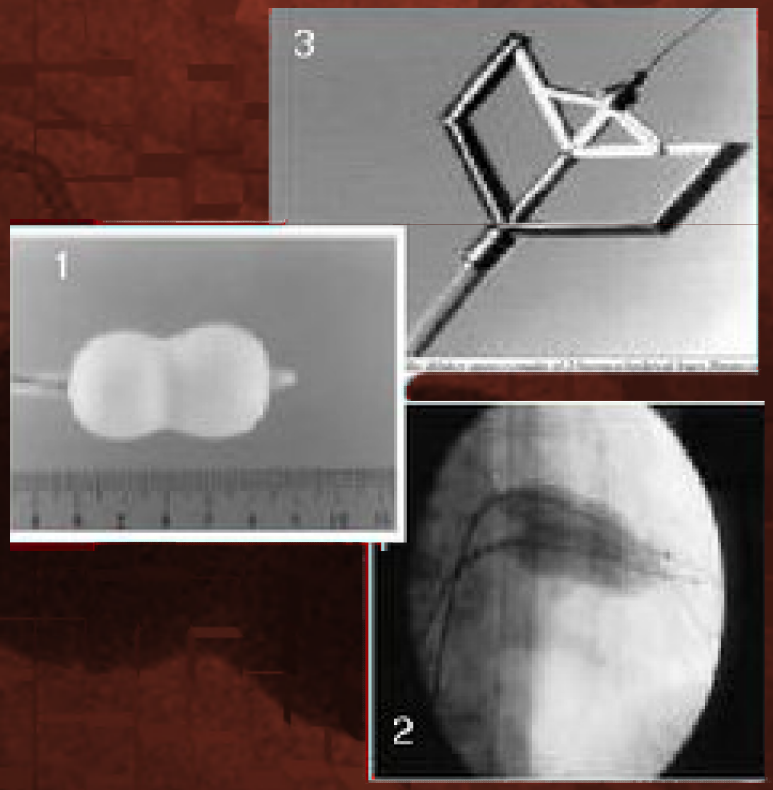
- Present in 32% of patients not previously treated with anticoagulants(Sillarnks,2004)
- Detection of thrombus is easily done with TEE
- Factors influencing dissapearance of LA thrombus after 6 months of warfarin:
  - Thrombus size < 1.6 cm^2
  - Localization in the left appendage
  - NYHA class I/II
  - Less marked spontaneous contrast
  - Maintenance of INR > 2,5
- Resolution or organization of thrombus 32-94%
- Mobile thrombus on the interatrial septum remain a total contraindication for PTMC

Shaw,Heart,2005,91

Techniques of PTMC

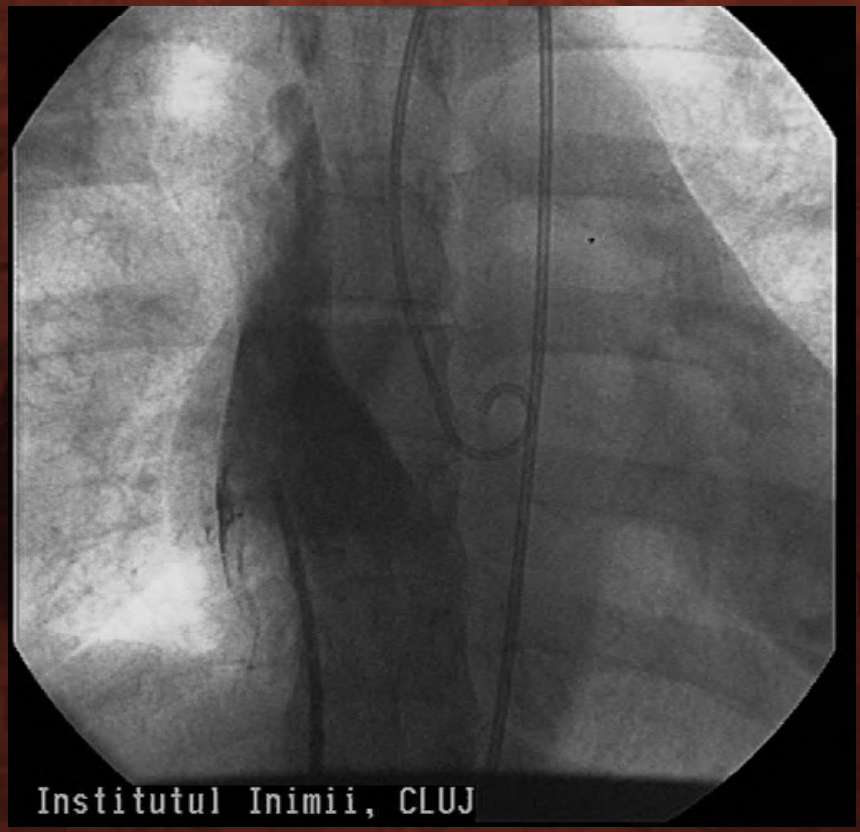
- Balloon Commissurotomy
  1. Inoue technique
  2. Double balloon technique

- Metallic Commissurotomy



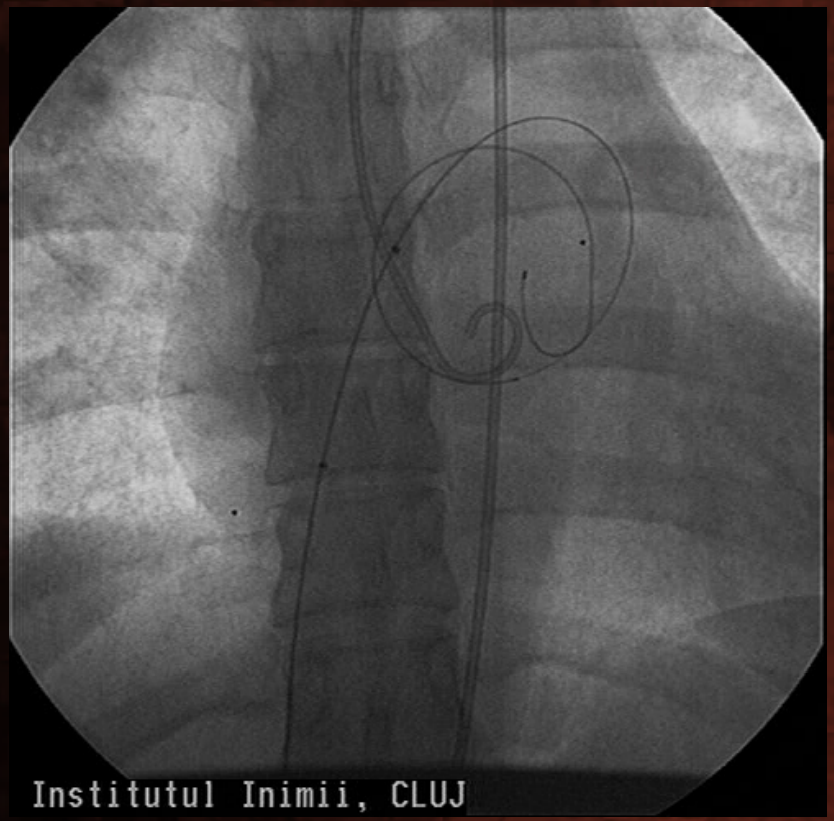
Technique of pecutaneous balloon mitral valvuloplasty
The INOUE technique

- Femoral access (venous and arterial)
- Right atrial angiography (optional) with levogram

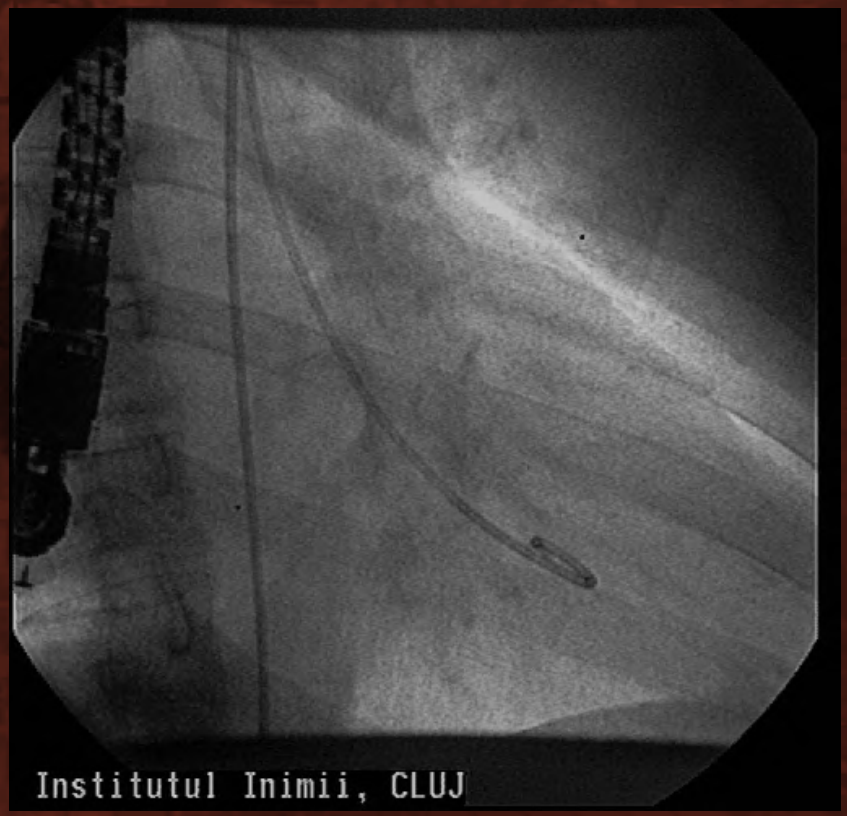


The Inoue Technique

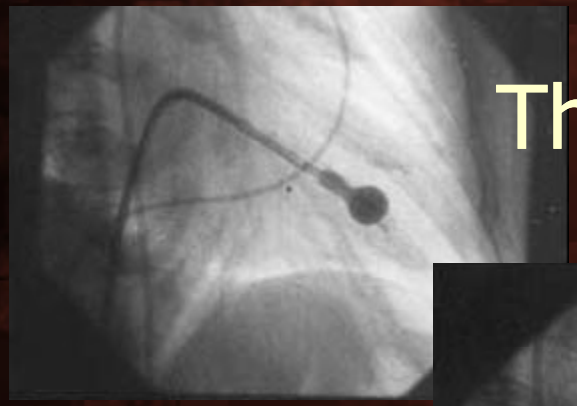
The transeptal puncture: Mullins sheath and Brockenbrough needle (*fossa ovalis*)

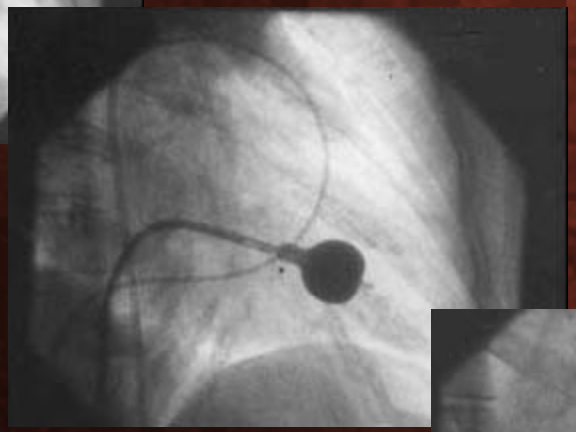


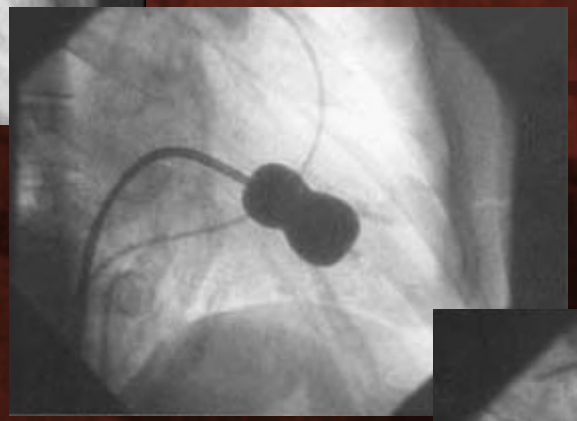
TEE guidance

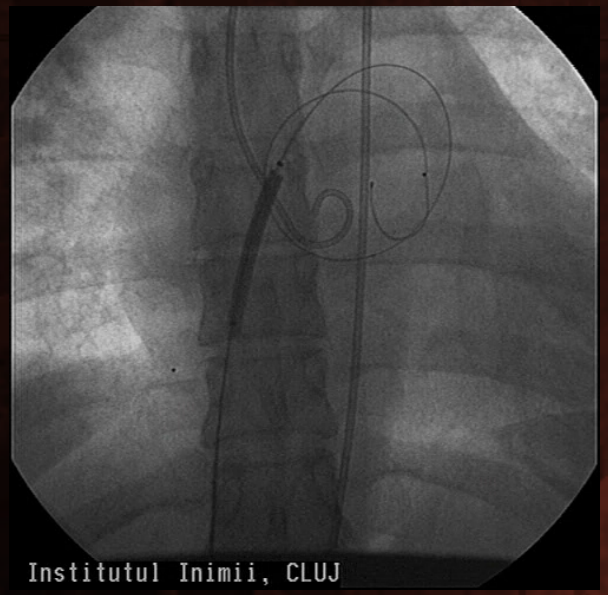


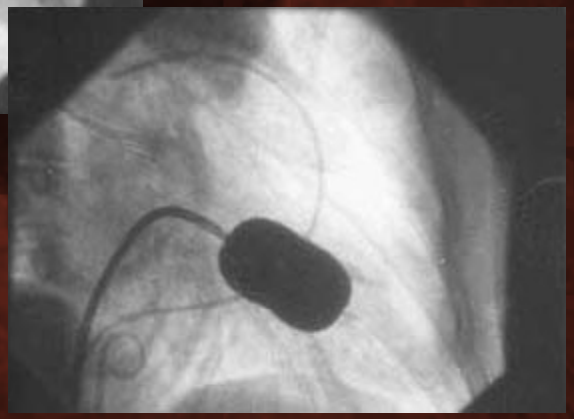
The INOUE technique





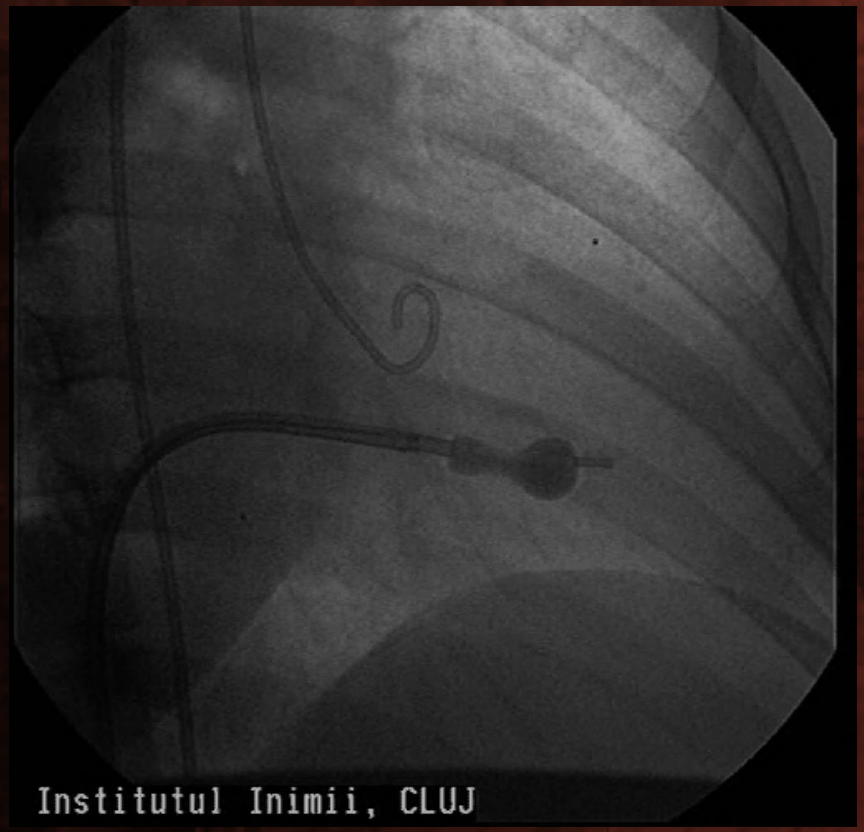


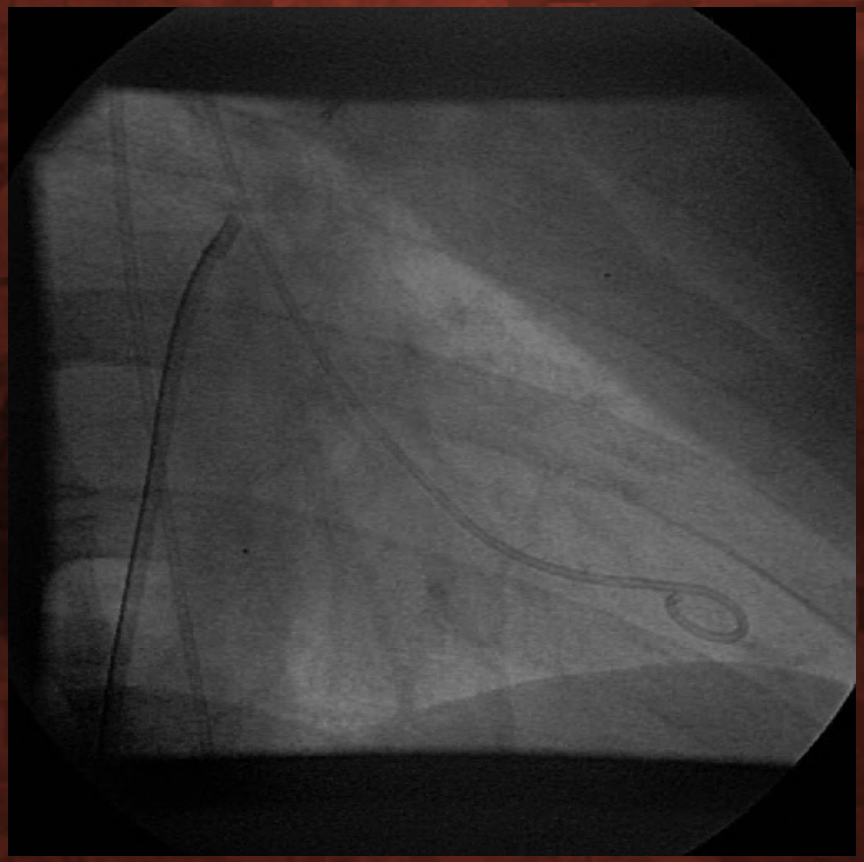




- Balloon advancement in LA and through the mitral valve in the LV
- Stepwise dilatation with hemodynamic and echocardiographic measurements

Technique of balloon mitral valvuloplasty



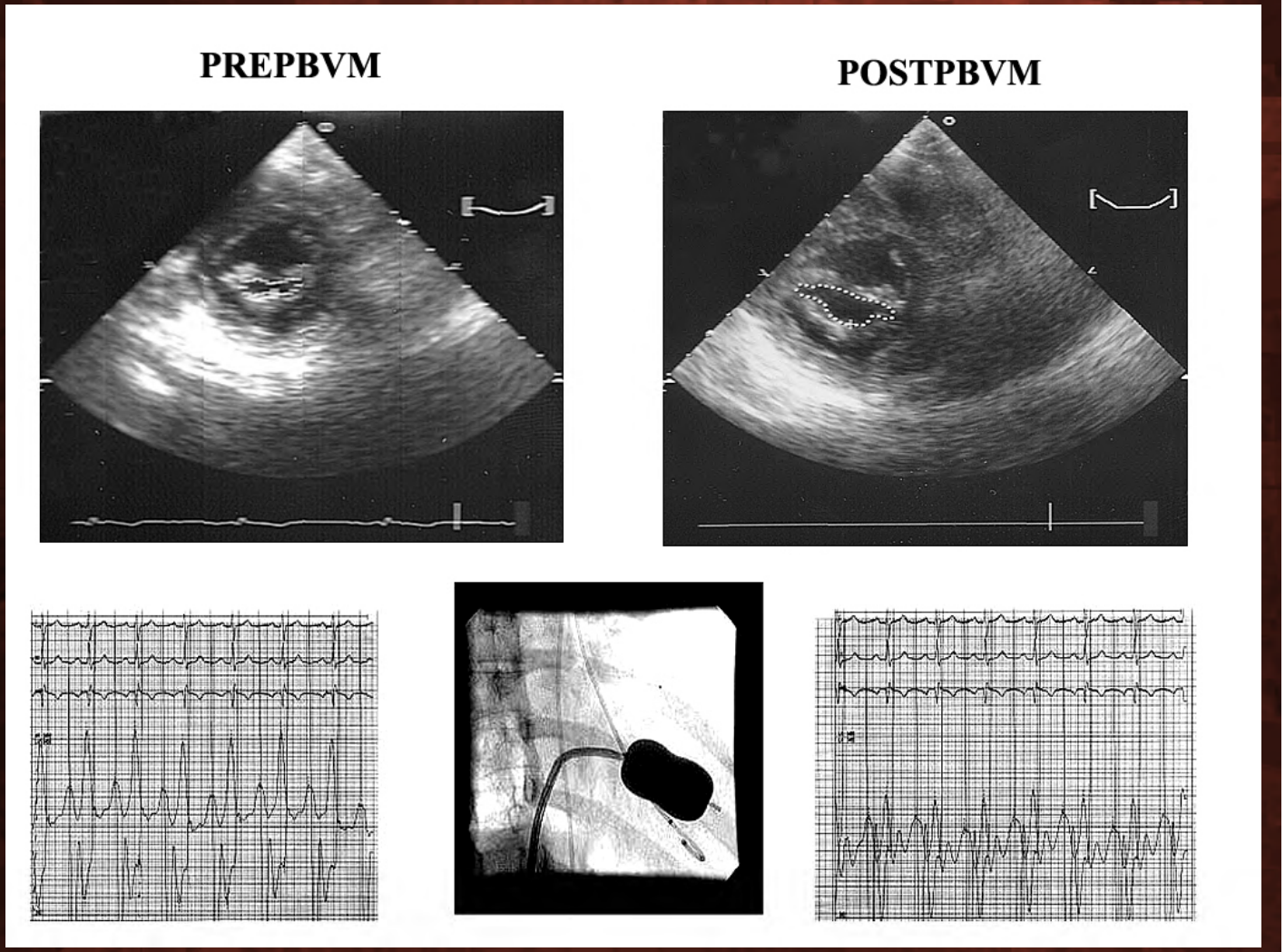


Step-wise dilatation

Immediate outcome

Achievement of a mitral valve area ~2 cm^2

Immediate drop in transmitral gradient



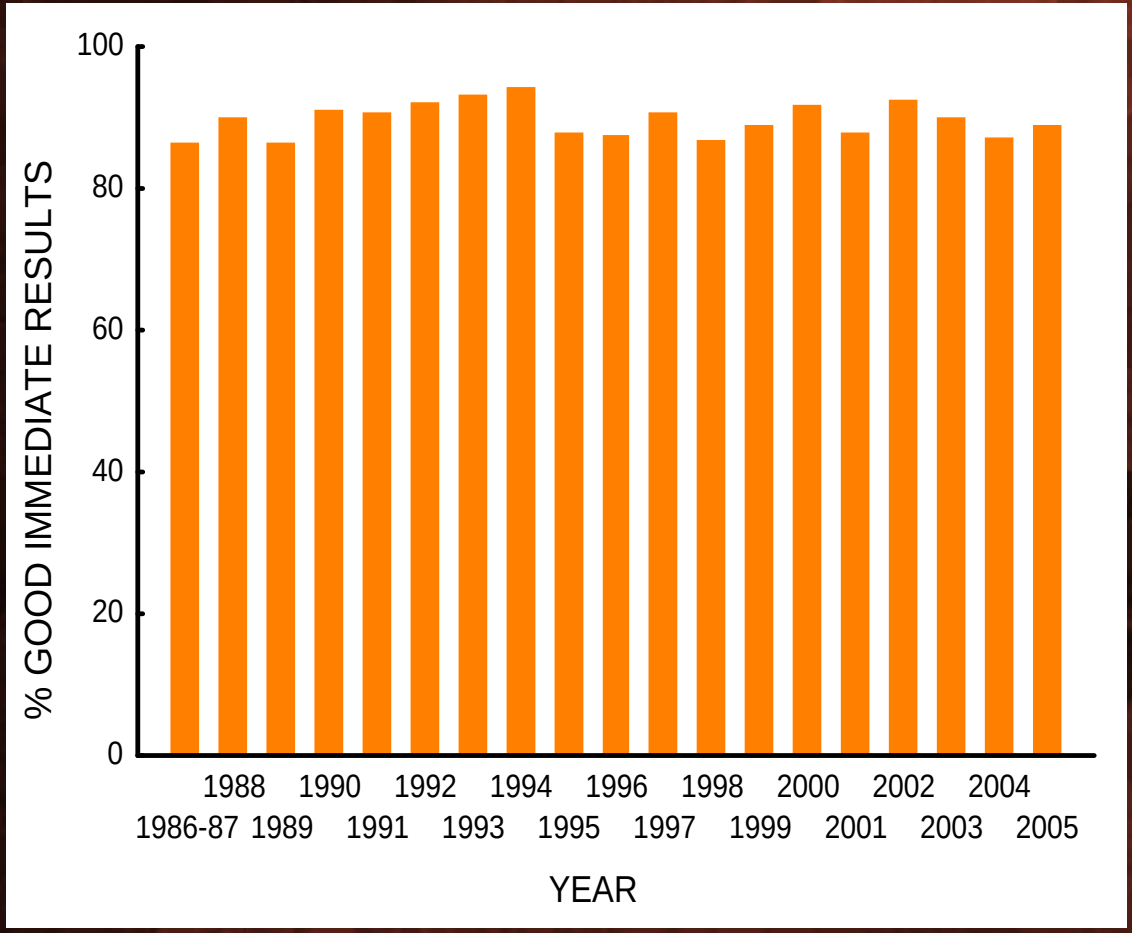
Short term outcome,
Complications:

- Agravation of mitral regurgitation >3/4
- Left-Right resting shunt
- LA or LV perforation with tamponade
- Embolic accidents
- Acute MI

Immediate Results

Good Immediate Results *(V.A. ≥ 1.5 cm² without MR > 2/4)*

3284 /3709 patients (88.5%)



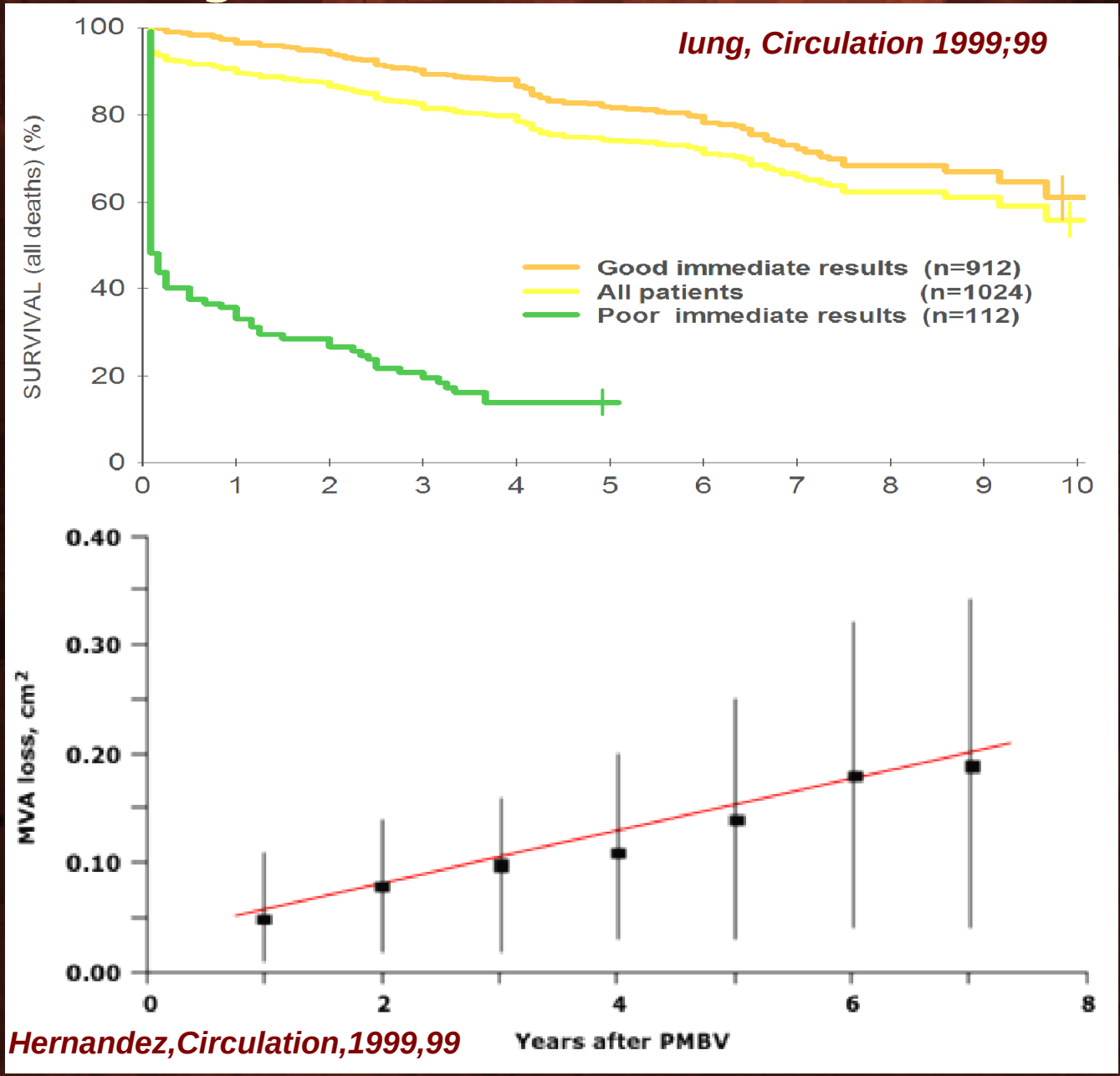
(Madjoub. ESC 2006)

Long term results

Survival at 4 years=84%

Event free survival at 4 years (death,surgey,re-PTMC=60%)

Continous loss in mitral valve area over time with>0,3cm^2 in 7 years



Experience in Heart Institute of Cluj-Napoca

2005-2010

- 198 patients with mitral stenosis underwent percutaneous balloon valvuloplasty

- 167 patients-long term study group-all with clinical and echocardiographic follow up between jan-mar 2014 (4-9 years/average 5.8)

PARAMETER	AVERAGE	LIMITS
Age	44.9 ± 7.21	19 - 65
Gender	3/1 female/male	
Mitral valve area	1.10 ± 0.20	0.5 – 1.6
Peak MV gradient	16.12 ± 5.06	6.98 - 35
Mean MV gradient	9.29 ± 3.44	3 - 25
Sistolic pulmonary pressure	48.56 ±15.10	12 - 125

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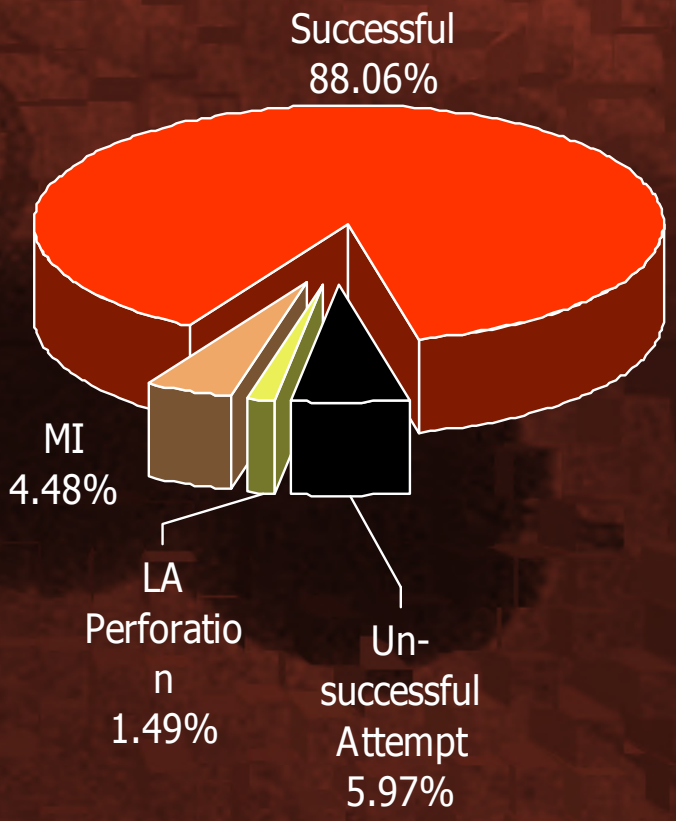
Experience in Heart Institute Cluj-Napoca

COMORBIDITY	No.	%
Mitral regurgitation(<2/4)	150	76.12
Comissural calcification	75	38.8
Aortic valve disease	17	59.7
Left atrial thrombus (after coumadine)	15	7.46
Coronary heart disease	9	4.48
NYHA class ≥ III	125	62.69



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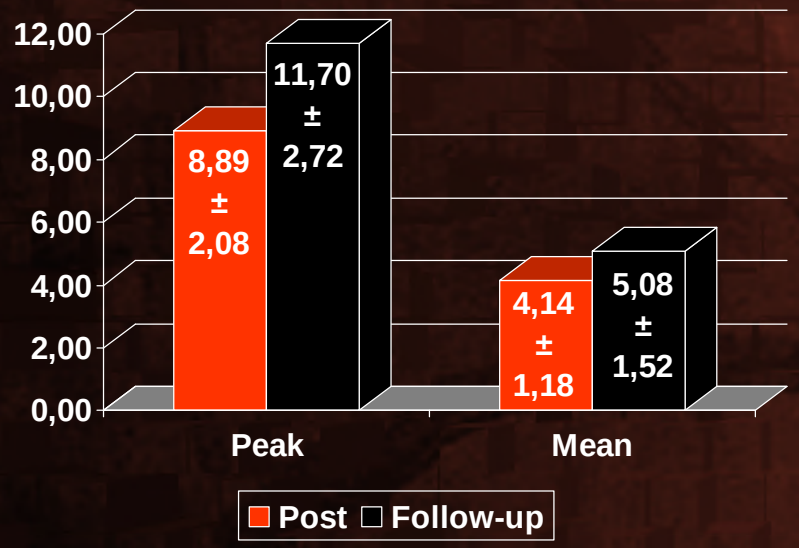
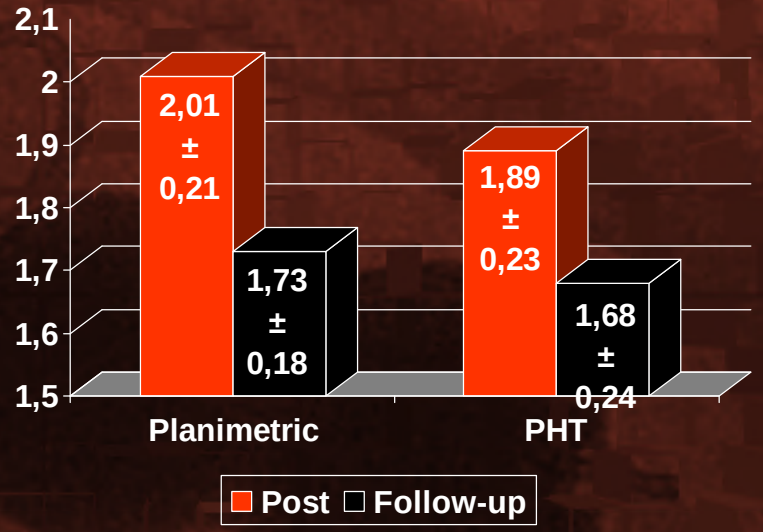
Long term follow up

GRADIENT



MV AREA



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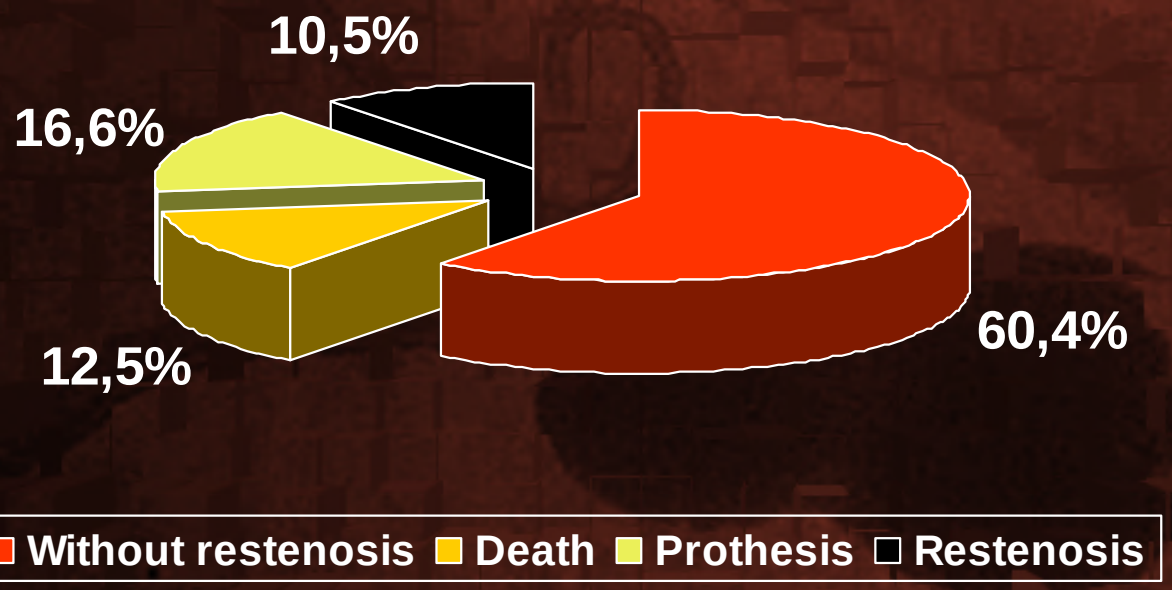
Long term follow up

Patients alive,with or without surgery - 139



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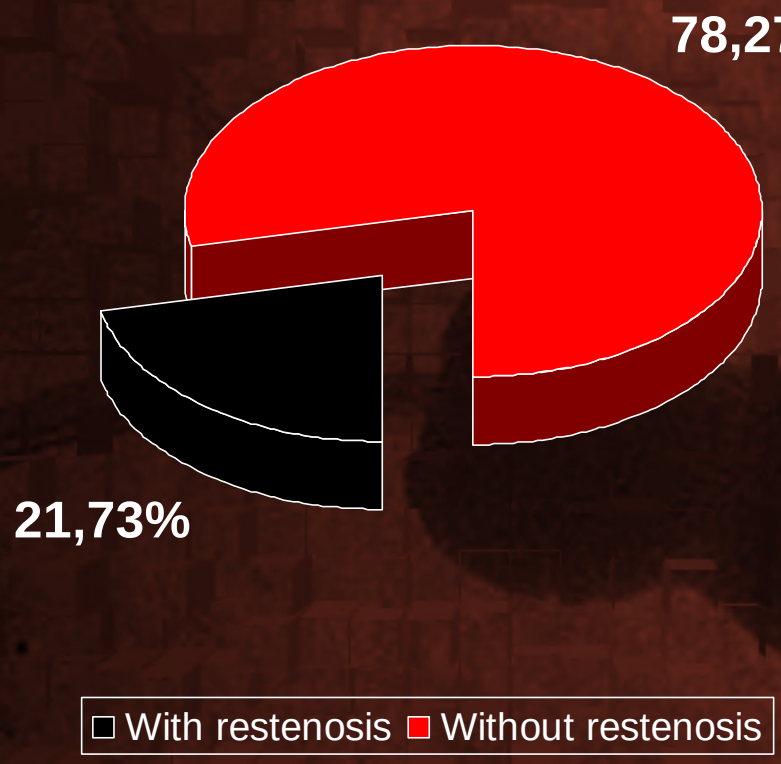
Long term follow up

MVA > 1,5 cm^2 and NYHA class ≤ II ~80%



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CONCLUSIONS

- Percutaneous mitral valvuloplasty is very effective for short,medium and also long term follow up
- The decision to recommend a patient mitral valvuloplasty depends of the various factors that are influencing the outcome
- Particullary in young patients reintervention is possible to be necessary during long term follow up