



9 e 10 aprile 2015
MILANO

LA STENOSI VALVOLARE AORTICA E L'INSUFFICIENZA MITRALICA
Diagnosi, indicazione ad interventismo o cardiocirurgia



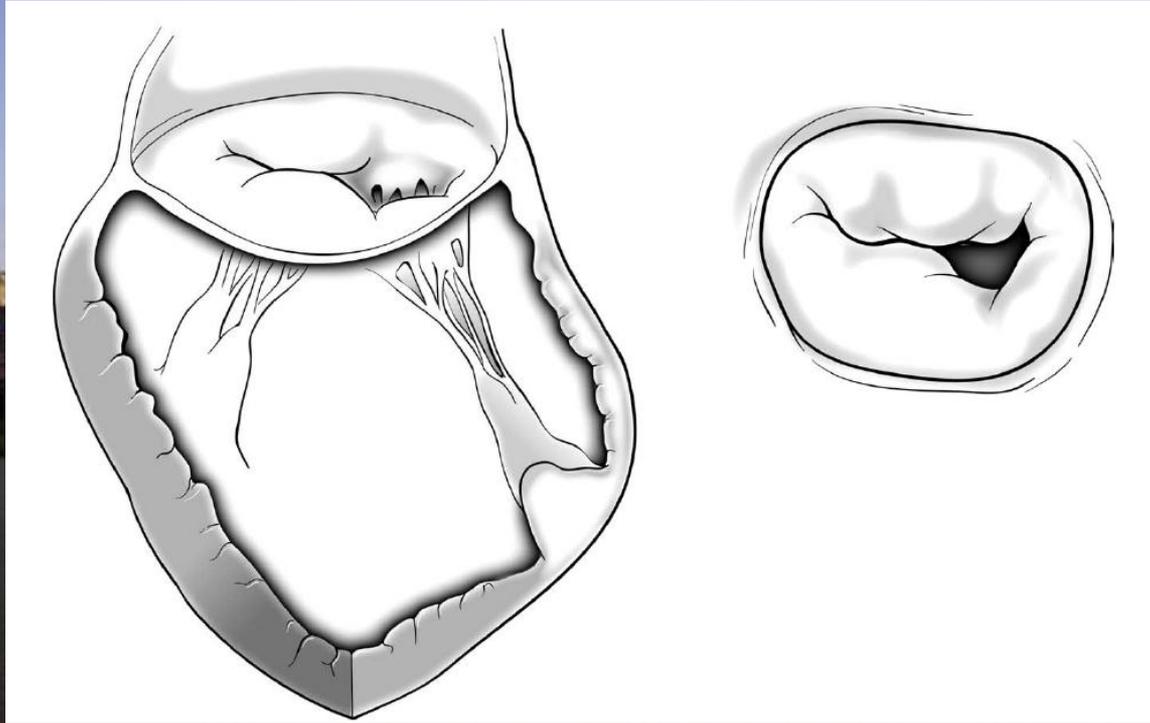
ECO CARDIO CHIRURGIA®
ECO-RM-TC
CHIRURGIA-INTERVENTISTICA



Quando è appropriata la correzione cardiocirurgica nell'insufficienza mitralica ischemica. Le tecniche riparative vs la sostituzione: molti dubbi e qualche certezza.

Stefano Pelenghi Cardiocirurgia "A De Gasperi"

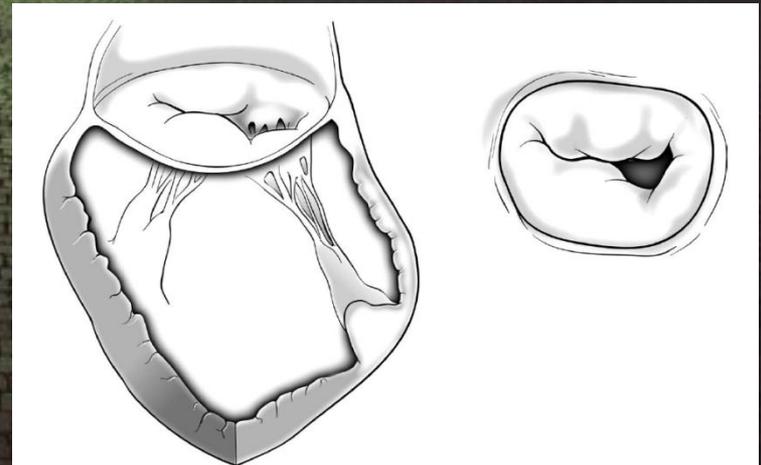
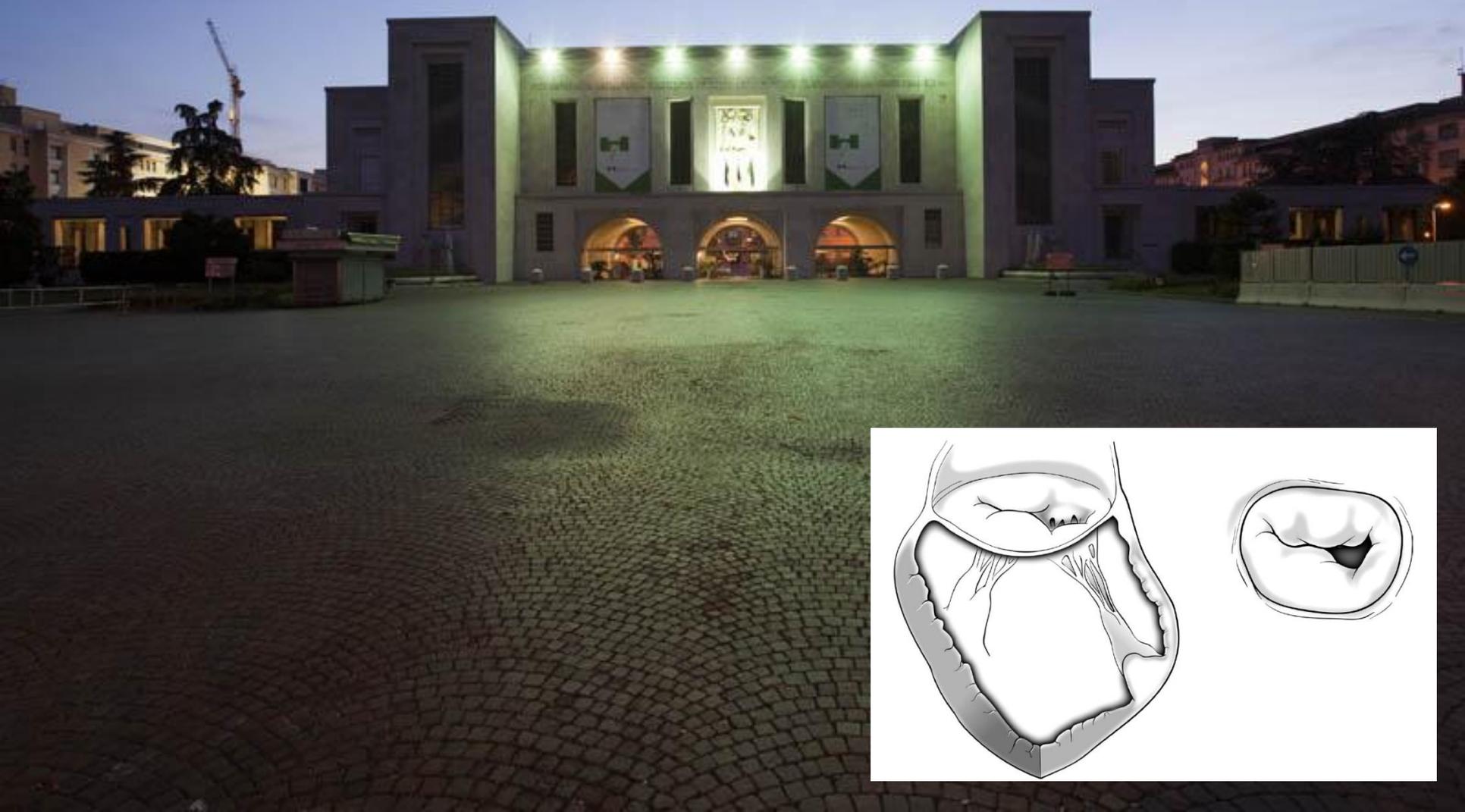
Alterazione regionale o globale in corso di rimodellamento VSx in cui leaflet mitralici, anatomicamente normali, non coaptano adeguatamente



Quando è appropriata la correzione cardiocirurgica nell'**insufficienza mitralica ischemica**. Le tecniche riparative vs la sostituzione: molti dubbi e qualche certezza.

Alterazione regionale o globale in corso di rimodellamento VSx in cui leaflet mitralici anatomicamente normali non coaptano adeguatamente

“Imbalance” tra forze di tethering \Uparrow e forze di chiusura \Downarrow

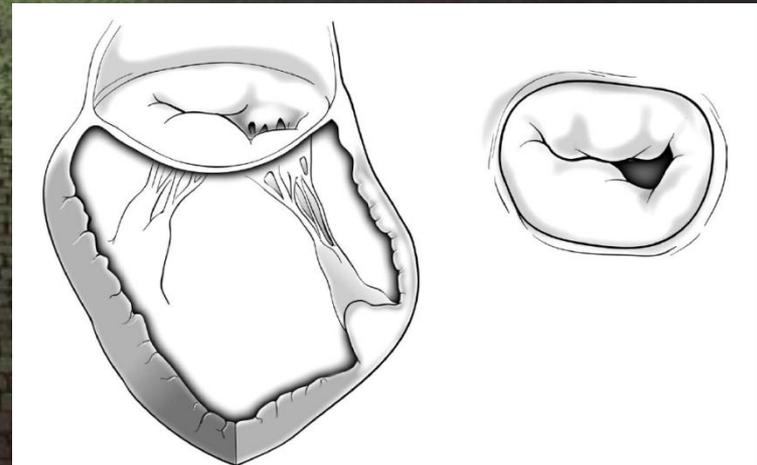


Alterazione regionale o globale in corso di rimodellamento VSx in cui leaflet mitralici anatomicamente normali non coaptano adeguatamente

“Imbalance” tra forze di tethering ↑ e forze di chiusura ↓

dilatazione anulare e rimodellamento geometrico VSx

disfunzione VSx



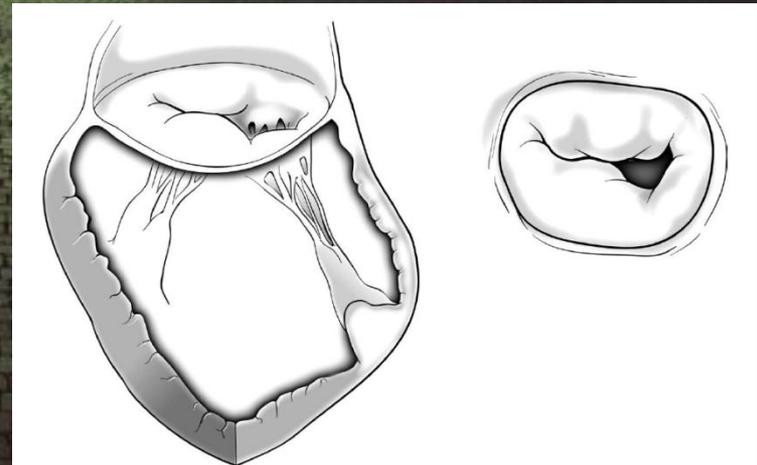
Alterazione regionale o globale in corso di rimodellamento VSx in cui leaflet mitralici anatomicamente normali non coaptano adeguatamente

“Imbalance” tra forze di tethering ↑ e forze di chiusura ↓

dilatazione anulare e rimodellamento geometrico VSx

disfunzione VSx

Leaflet (normali) partecipanti passivi all'evento:
terapie focalizzate su anello mitralico e rimodellamento VSx



Alterazione regionale o globale in corso di rimodellamento VSx in cui leaflet mitralici anatomicamente normali non coaptano adeguatamente

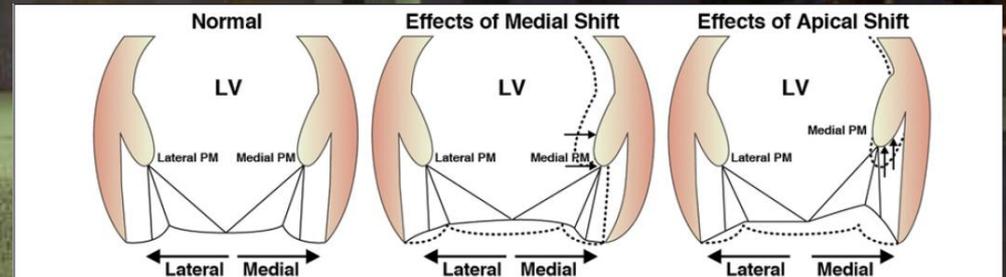
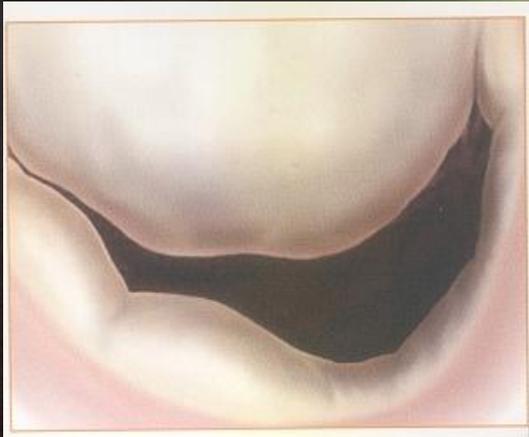
IM ischemica più probabile per IMA inferiore

IMA infero-basali IM importante anche in VSx non severamente rimodellati

IMA antero-apicali hanno bisogno remodelling più avanzato per sviluppare IM

Mechanisms of functional mitral regurgitation in cardiomyopathy secondary to anterior infarction

European Journal of Cardio-Thoracic Surgery 45 (2014) 1089-1096



IMA inf PMMP remodelling simmetrico P3 - IMA ant meccanismo multi tethering

IM fa male

† IM funzionale operatoria	3-4%
† IM funzionale post-op a 5 aa	60-70%

WHY ARE WE HERE?

IM dipende da Vsx

IM peggiora se non corretta

IM se riparata può ripresentarsi 20% e peggiorare

SVM comporta protesi... TAO- DS

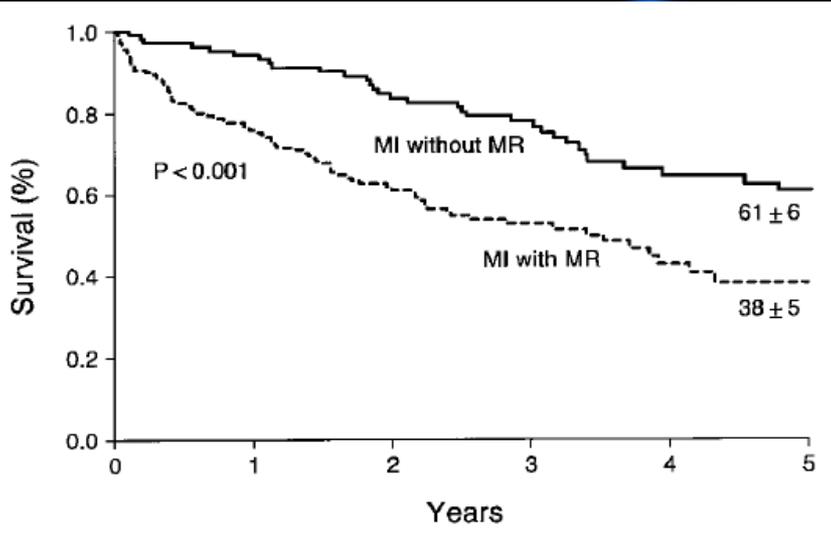


Figure 1. Survival (\pm SE) after diagnosis according to presence of IMR.

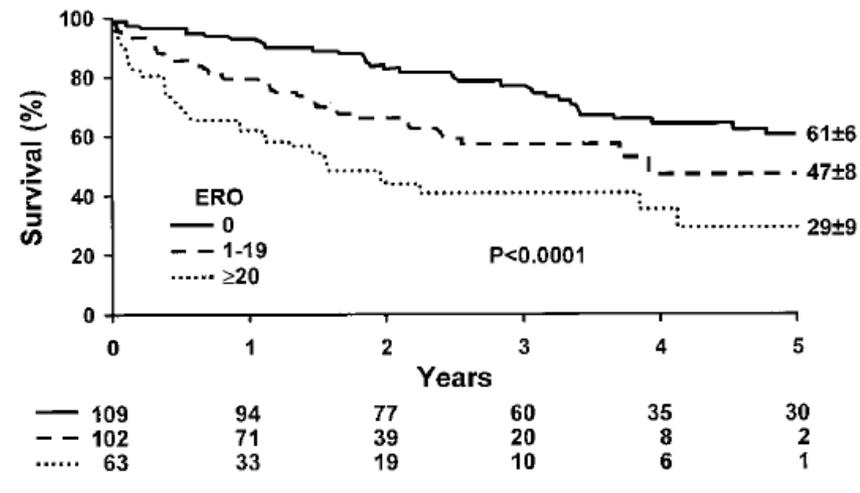


Figure 3. Survival (\pm SE) after diagnosis according to degree of MR as graded by ERO ≥ 20 mm² or < 20 mm². Numbers at bottom indicate patients at risk for each interval.

Grigioni 2001 -- Stich 2012

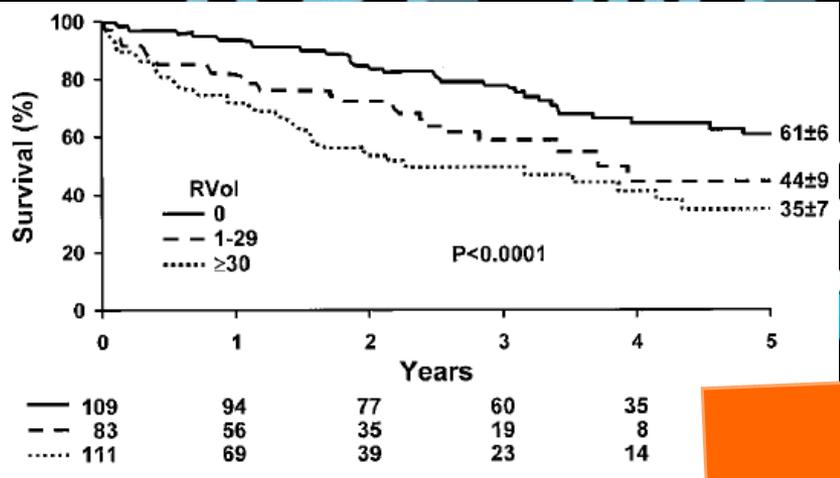
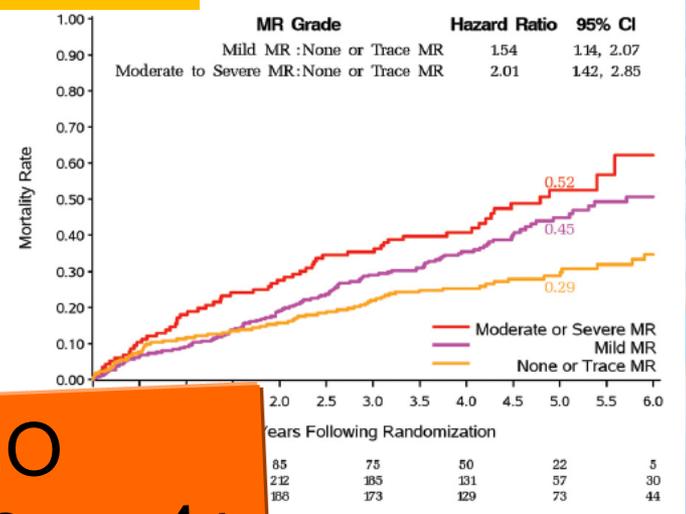


Figure 2. Survival (\pm SE) after diagnosis according to degree of MR as graded by RVol ≥ 30 mL/beat or < 30 mL/beat. Numbers at bottom indicate patients at risk for each interval.



SI - NO
1+ - 2+ - 3+ - 4+

estimates of death from any cause with or without medical therapy. Separate curves are shown for patients who reported none or trace, mild, and moderate to severe mitral regurgitation (MR). Hazard ratios and 95% CI indicates



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Potenziale beneficio post-procedura

Dipende essenzialmente dalla probabilità di miglioramento, per effetto della procedura, di 2 principali variabili fra loro combinate:

Quantità di vita

		Giovane Sano	A	B	Giovane Invalido
Qualità di vita	A		Green	Yellow	
	B		Yellow	Red	
		Anziano Sano			Anziano Invalido

Beneficio potenziale

Probabilità di miglioramento

A = alta - B = bassa

massimo



intermedio



minimo/nulla



Potenziale beneficio post-procedura

Dipende essenzialmente dalla probabilità di miglioramento, per effetto della procedura, di 2 principali variabili fra loro combinate:

Qualità di v



Quando è appropriata la correzione cardiocirurgica nell'insufficienza mitralica ischemica. Le tecniche riparative vs la sostituzione: molti dubbi e qualche certezza.

Probabilità di miglioramento

A = alta - B = bassa

massimo



intermedio



minimo/nulla





Appropriatezza





Appropriatezza



2 chiacchiere
Fonendo
Rx torace
Epato/renale
FE



STICH e IM: mortalità in terapia medica direttamente proporzionale a grado IM

Mortalità a 5 aa

Appropriatezza correzione cardiocirurgica ?
IM ischemica

TMed

BPAC

BPAC + M

IM

Deja MA, et al. Influence of mitral regurgitation repair on survival in the surgical treatment for ischemic heart failure trial. Circulation 2012;125(21);2639-2648.

STICH e IM: mortalità in terapia medica direttamente proporzionale a grado IM

Mortalità a 5 aa

Appropriatezza correzione cardiocirurgica ?
IM ischemica



† a 5 aa > 50%

IM

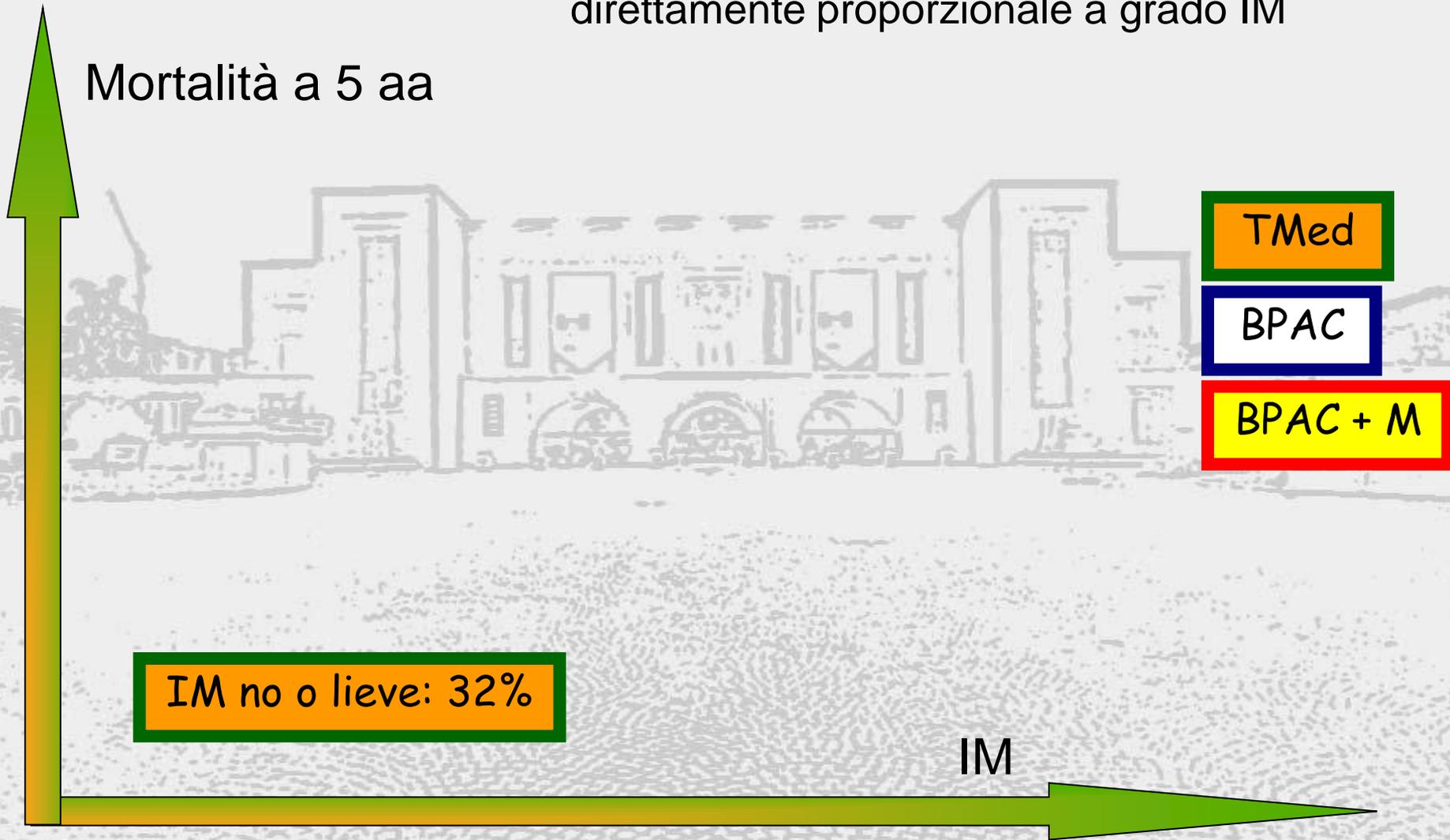
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BPAC

BPAC + M

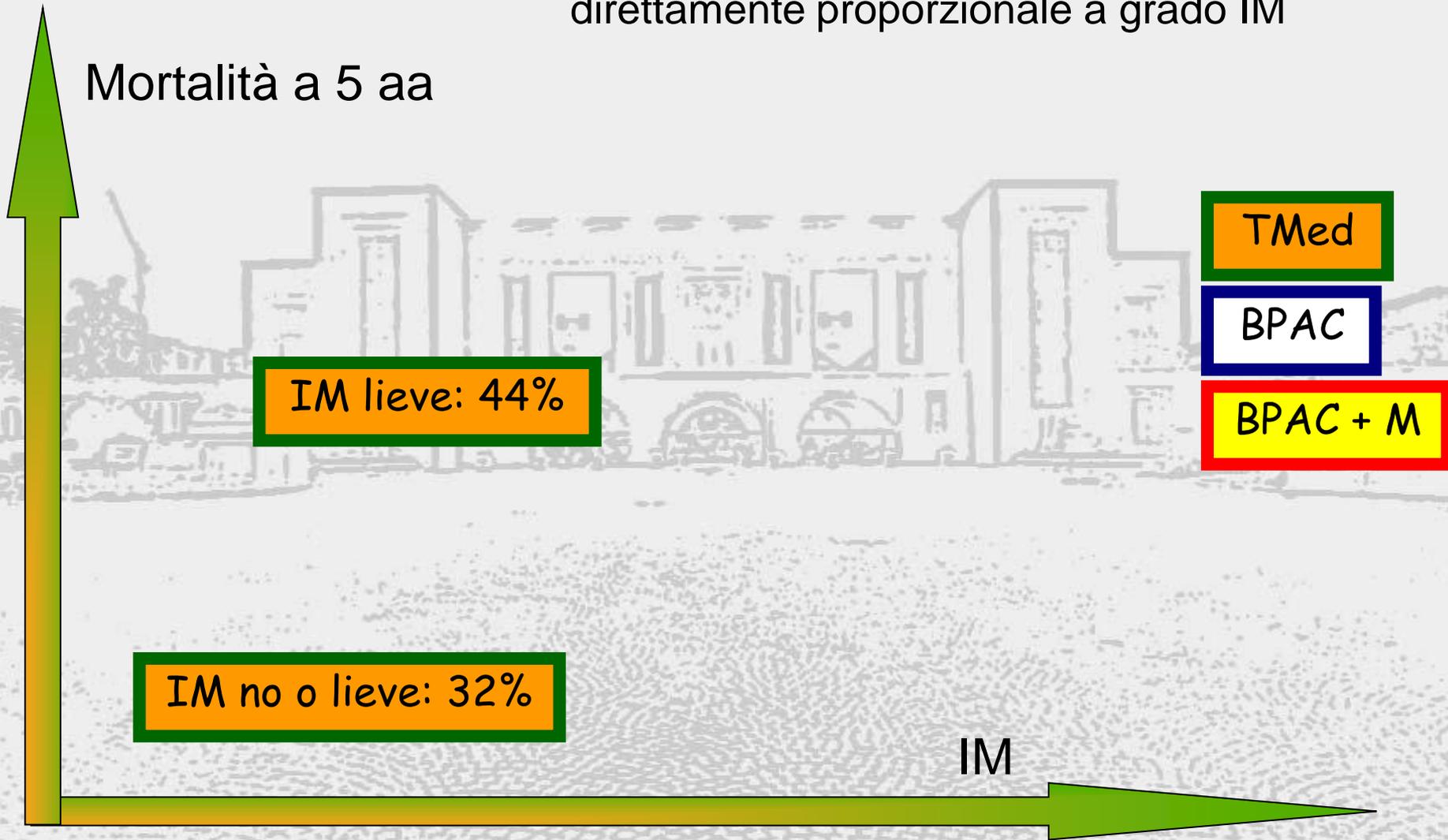
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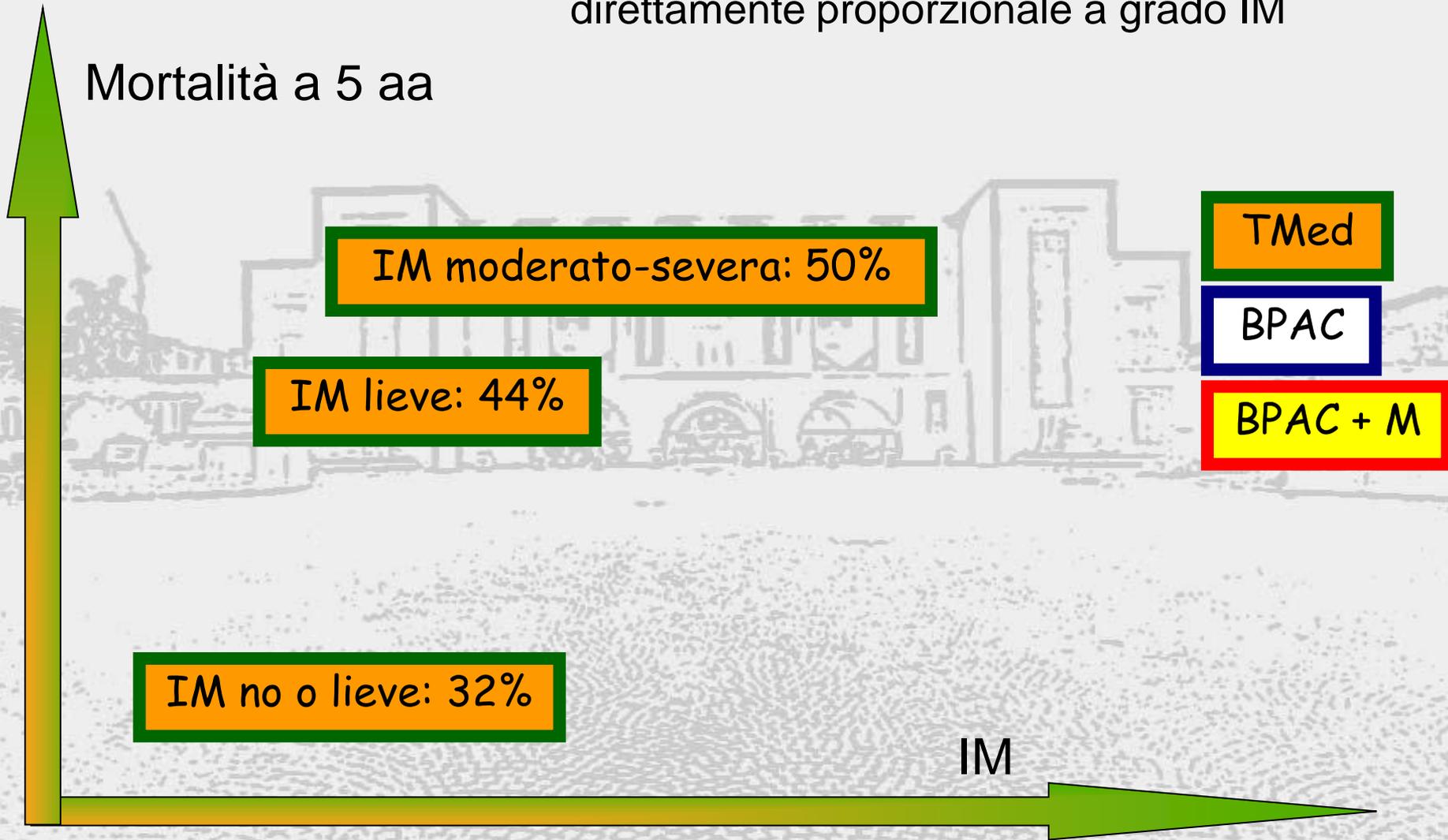
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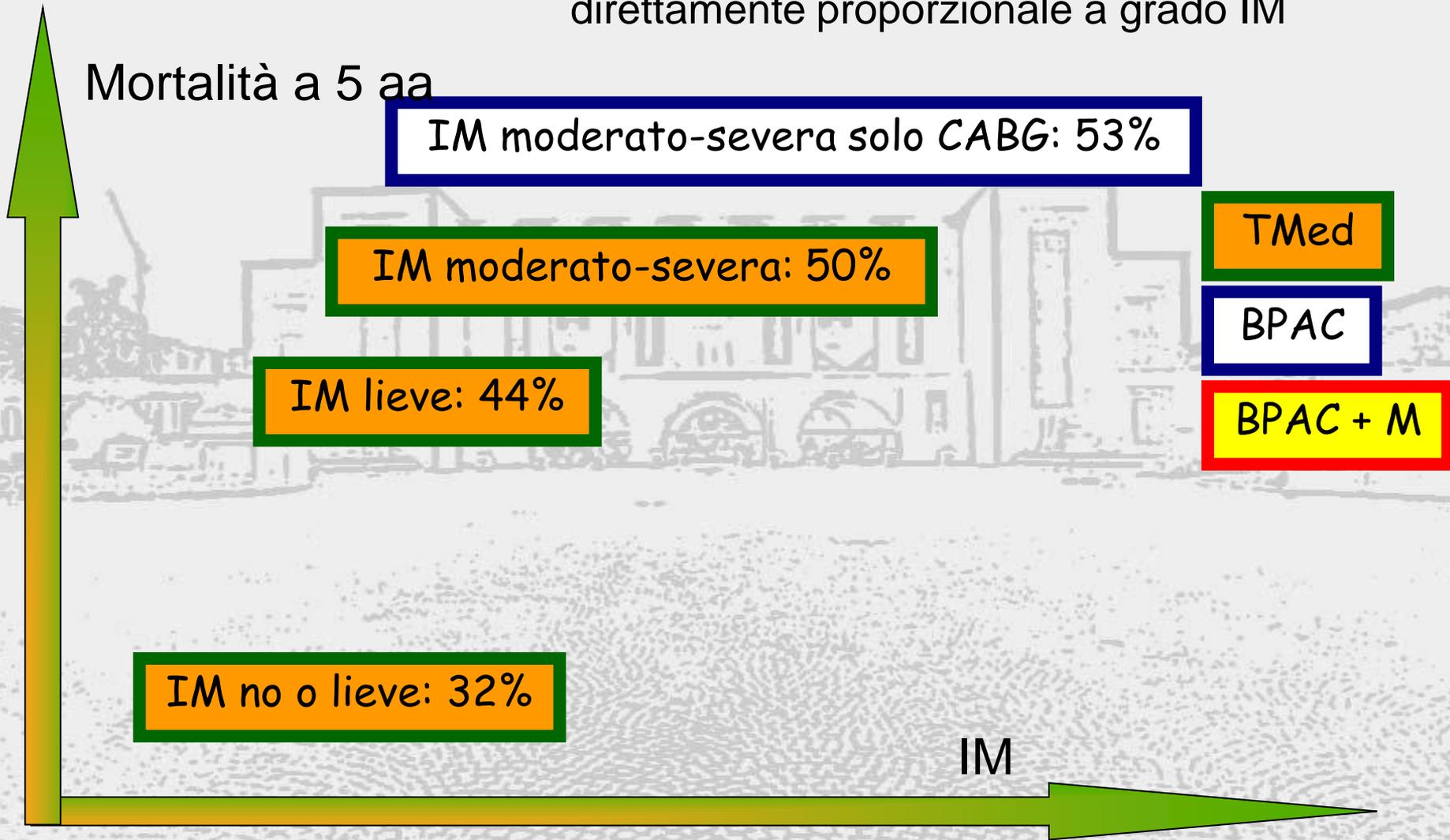
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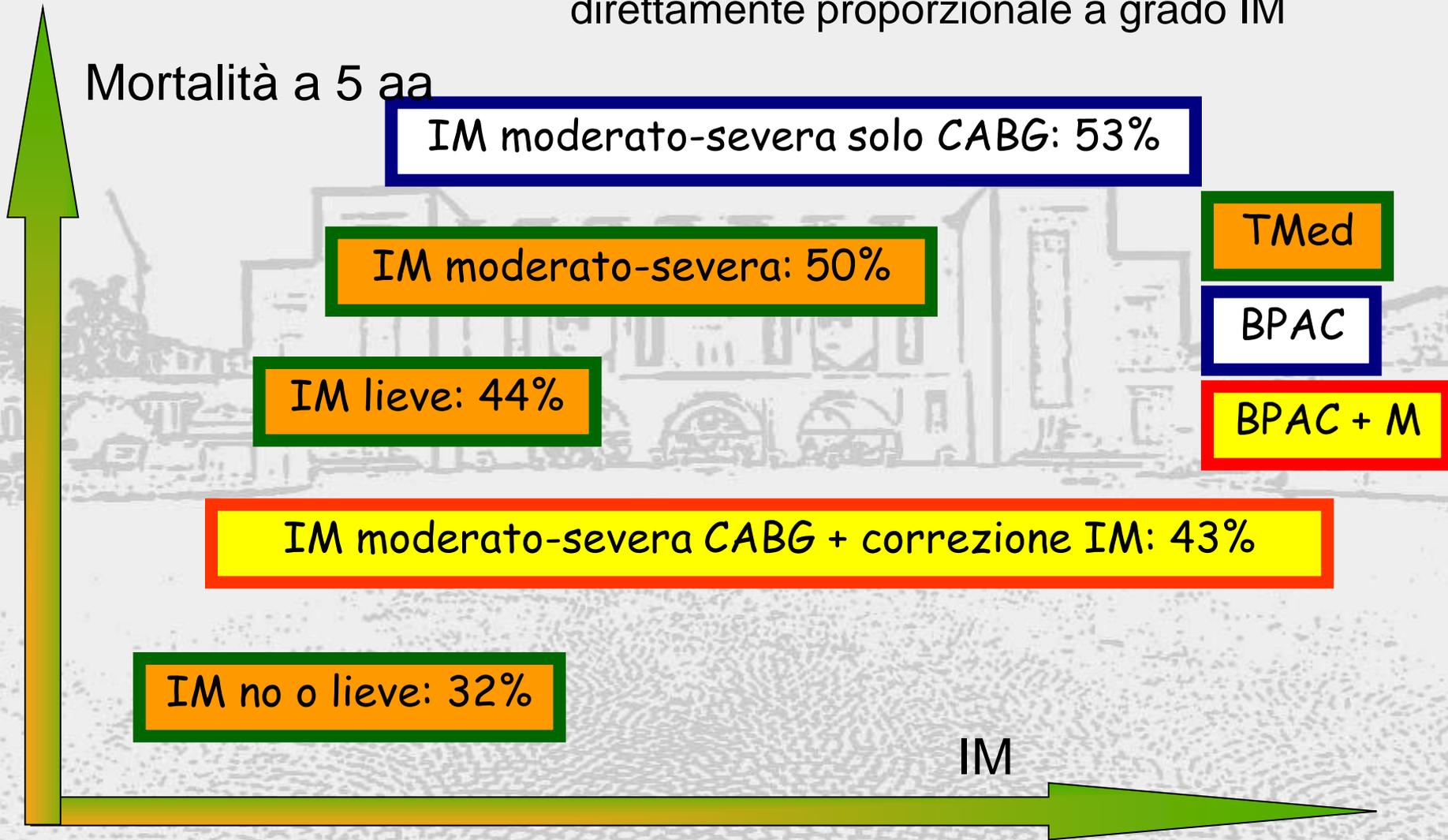
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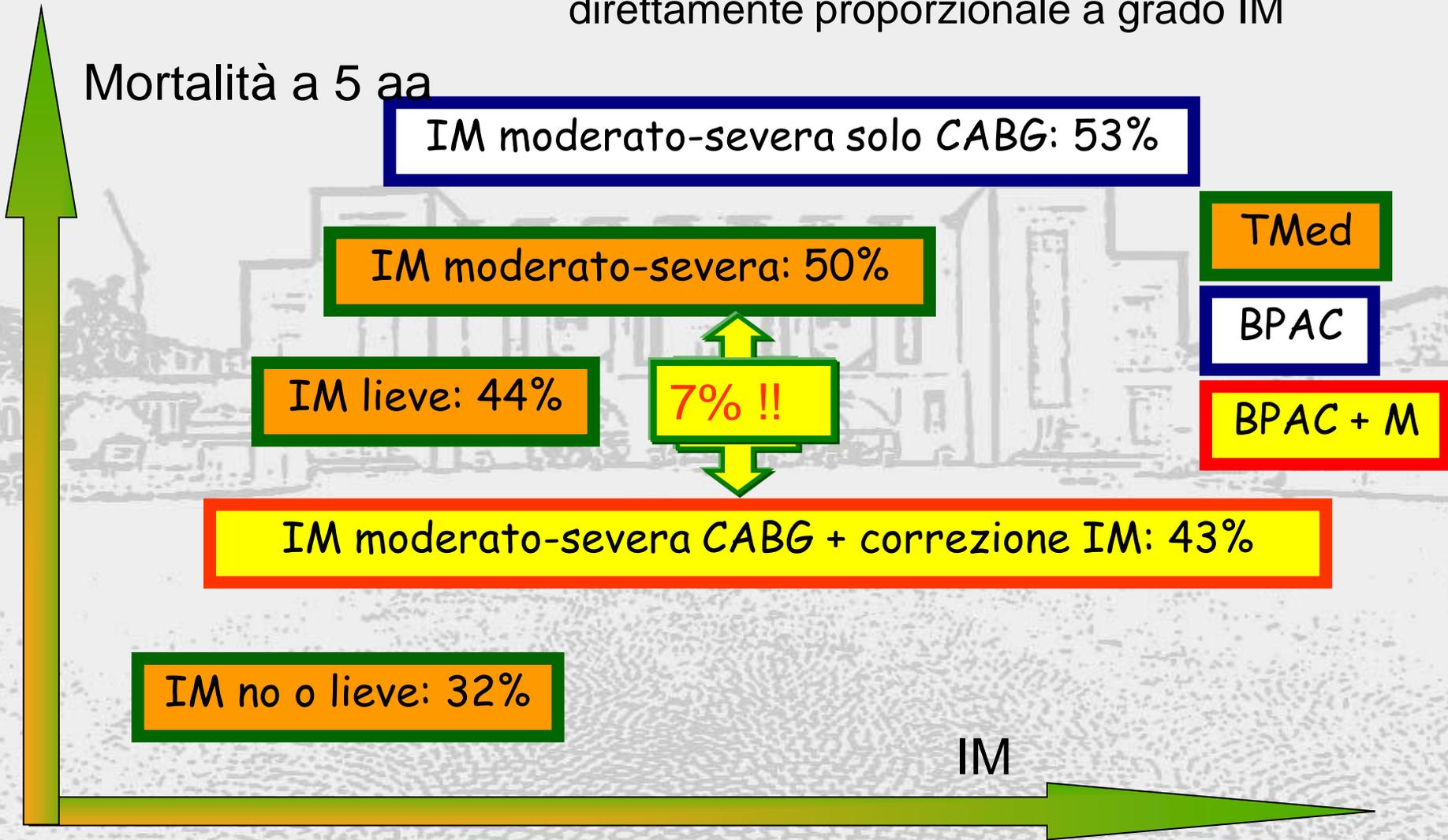
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Stefano Pelenghi Cardiocirurgia "A De Gasperis"

Aklog L, et al. Does coronary artery bypass grafting alone correct moderate ischemic mitral regurgitation? Circulation. 2001;104(2 Suppl 1):I68-75.

Lamas GA, et al. Clinical significance of mitral regurgitation after acute myocardial infarction. Circulation. 1997;96:827-33.

Society of Thoracic Surgeons. Adult cardiac surgery database: executive summary: Harvest 1, 2013.

Vassileva CM, et al. Meta-analysis of short-term and long-term survival following repair versus replacement for ischemic mitral regurgitation. Eur J Cardiothorac Surg 2011; 39: 295-303.

Mitral-Valve Repair versus Replacement
for Severe Ischemic Mitral Regurgitation

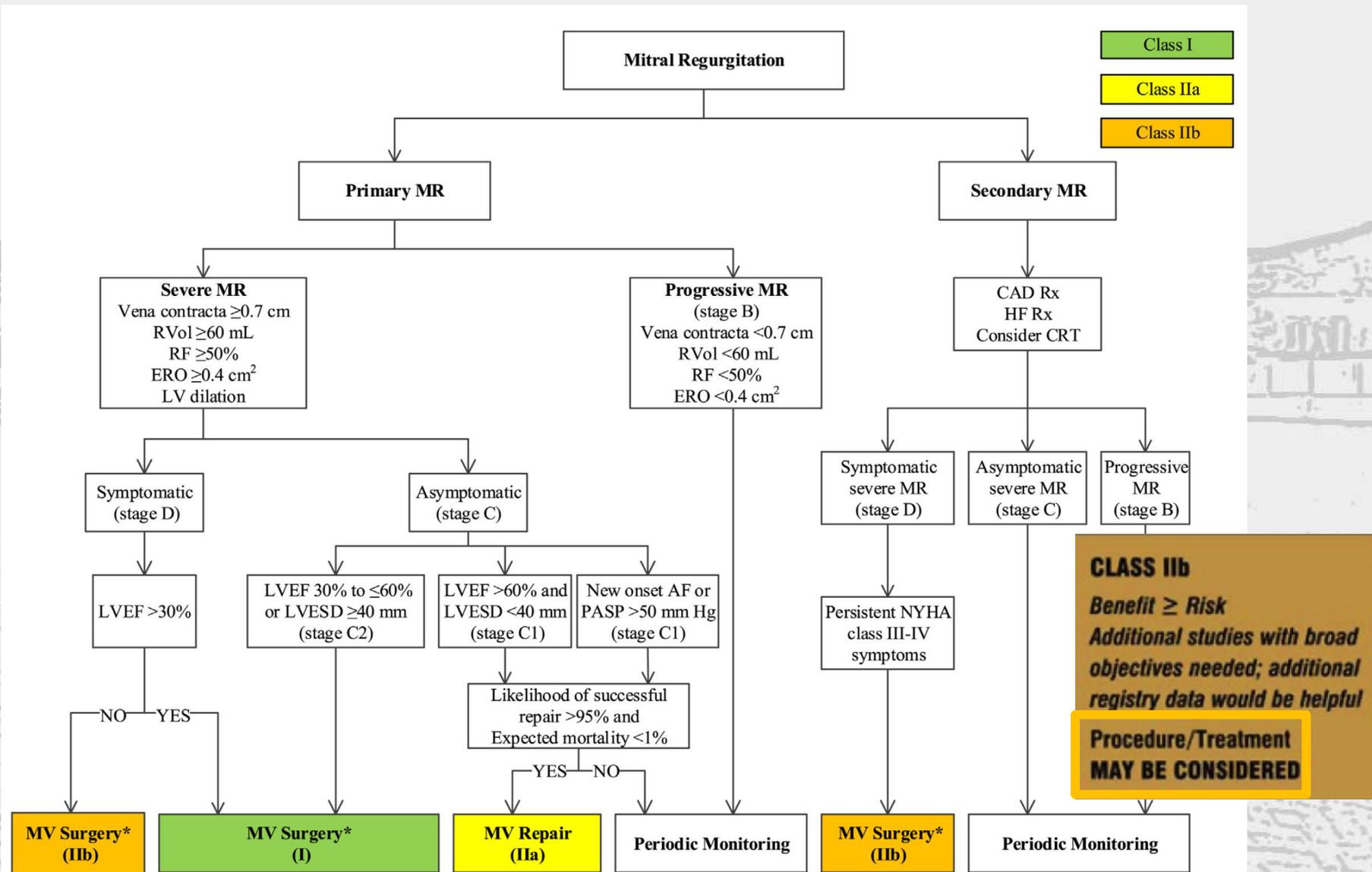
N ENGL J MED 370;1 NEJM.ORG JANUARY 2, 2014

**Ischemic and Functional Mitral Regurgitation in Heart Failure:
Natural History and Treatment**

Curr Cardiol Rep (2014) 16:517

2014 AHA/ACC guideline for the management of patients with valvular heart disease

A report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines



2014 AHA/ACC guideline for the management of patients with valvular heart disease

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Mitral Regurgitation

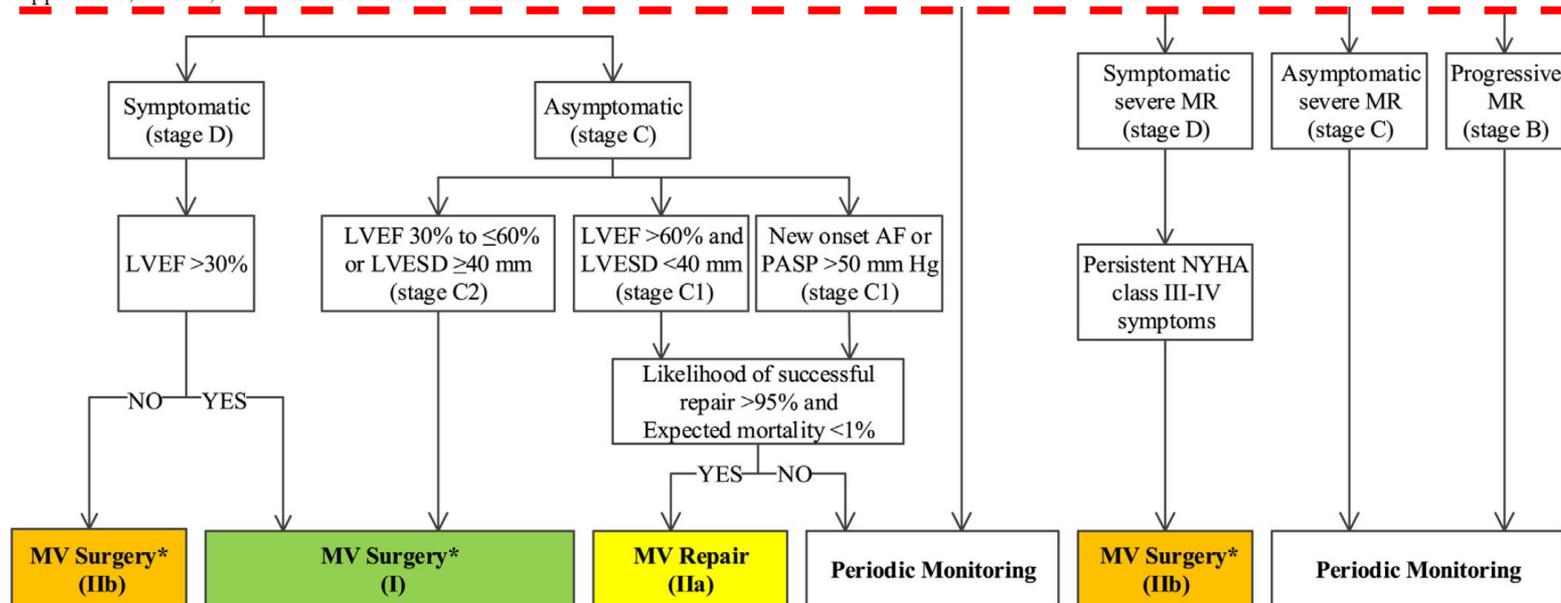
Class I

Class IIa

TABLE 18. Summary of recommendations for chronic severe secondary MR

Recommendations	COR	LOE	References
MV surgery is reasonable for patients with chronic severe secondary MR (stages C and D) who are undergoing CABG or AVR	IIa	C	N/A
MV surgery may be considered for severely symptomatic patients (NYHA class III/IV) with chronic severe secondary MR (stage D)	IIb	B	439,448-458
MV repair may be considered for patients with chronic moderate secondary MR (stage B) who are undergoing other cardiac surgery	IIb	C	N/A

AVR, Aortic valve replacement; CABG, coronary artery bypass graft; COR, Class of Recommendation; LOE, Level of Evidence; MR, mitral regurgitation; MV, mitral valve; N/A, not applicable; NYHA, New York Heart Association.



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Grigioni 2001	303
Lancellotti 2005	161
Chan 2012	73 39/34

MV surgery: non decide se PL o SVM

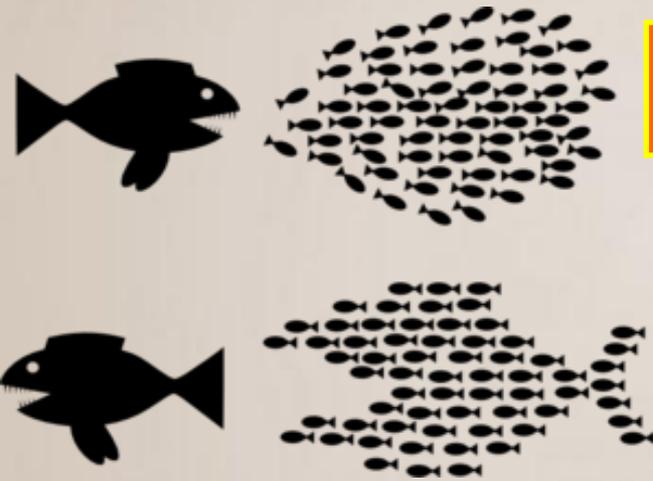
34 cabg + PIM

Grigioni F, Enriquez-Sarano M, Zehr KJ, et al. Ischemic mitral regurgitation: long-term outcome and prognostic implications with quantitative Doppler assessment. *Circulation*. 2001;103:1759-64.

Lancellotti P, Gerard PL, Pierard LA. Long-term outcome of patients with heart failure and dynamic functional mitral regurgitation. *Eur Heart J*. 2005;26: 1528-32.

Chan KM, Punjabi PP, Flather M, et al. Coronary artery bypass surgery with or without mitral valve annuloplasty in moderate functional ischemic mitral regurgitation: final results of the Randomized Ischemic Mitral Evaluation (RIME) trial. *Circulation*. 2012;126:2502-10.

Appropriatezza chirurgia mitrale ischemica



Mortalità Pz CAD a 3.5 aa

SI IM 29%

NO IM 12%

Solo BPAC spesso è insufficiente e lascia 40% pz con IM residua significativa

Se CABG e IM mod-severa non corretta
IM persiste 77%

IM non dipende da estensione IMA
IM recidiva ed evolve per no remodelling

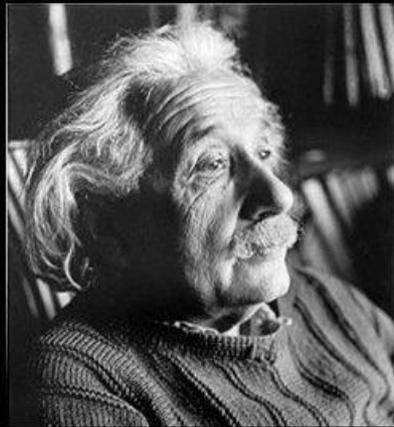


IM deve essere corretta

Biblio discute su COME trattare IM non su SE trattarla

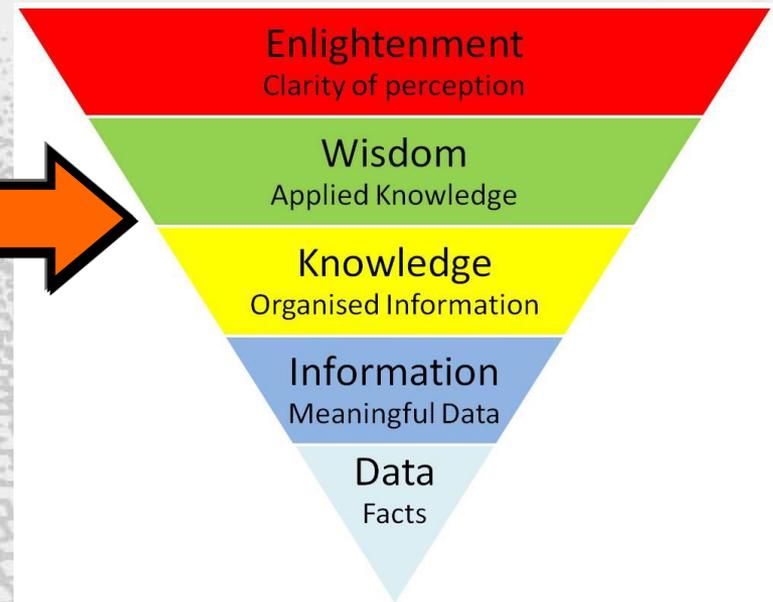
Per "IM moderata" la spinta a correggere IM è l'evolutiveità

L'evolutiveità è la causa del ritorno alla SVM



« Those who have
the privilege to
know have the
duty to act. »

~ Albert Einstein (1879-1955)



Correzione IM PI o SVM?

STS db: mortalità Pz BPAC + PIM o SVM

BPAC + PIM 5.3%

BPAC + SVM 8.5%

RIME trial: 73 pz IM moderata + CAD

Randomizzati CABG ± PIM

Early Stop too better + PIM

PIM > IM recidiva mod-severa > 30% rispetto SVM

1990-2000 Anelli non riduttivi. Risultati scarsi

Nuovi approcci: resezione corde, ampliamento lembi, ricostruzione geometria MP



If a man will begin with certainties, he shall end in doubts, but if he will content to begin with doubts, he shall end in certainties.

(Francis Bacon)

izquotes.com

Letteratura > PI M ma
SVM no preservati lembi

Correzione IM
PI o SVM?

Rischio † > 35% SVM vs PIM

older&sicker !!

PIM 2 misure inferiori
no TAO (forse)
ridotto rischio endocardite
5 aa 58% vivi SVM 36% vivi
anche 30-40% IM residua



If a man will begin with certainties, he shall end in doubts, but if he will content to begin with doubts, he shall end in certainties.

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izquotes.com

SVM per plastiche complesse
per pz critici
riduce tempi operatori

Correzione IM
PI o SVM?

Poor prognosis



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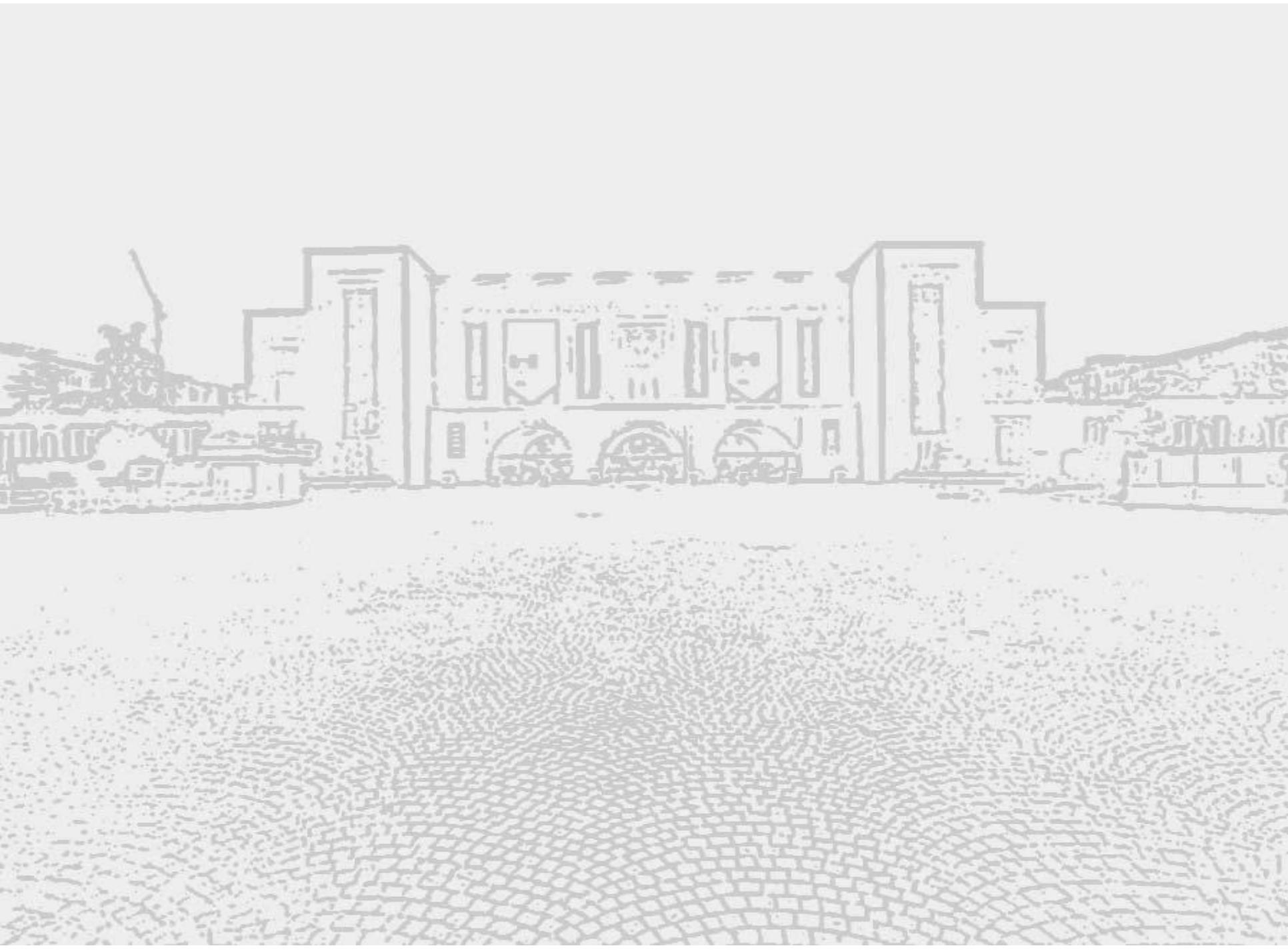
(Francis Bacon)

izquotes.com

Rischio IM residua anche in mani esperte

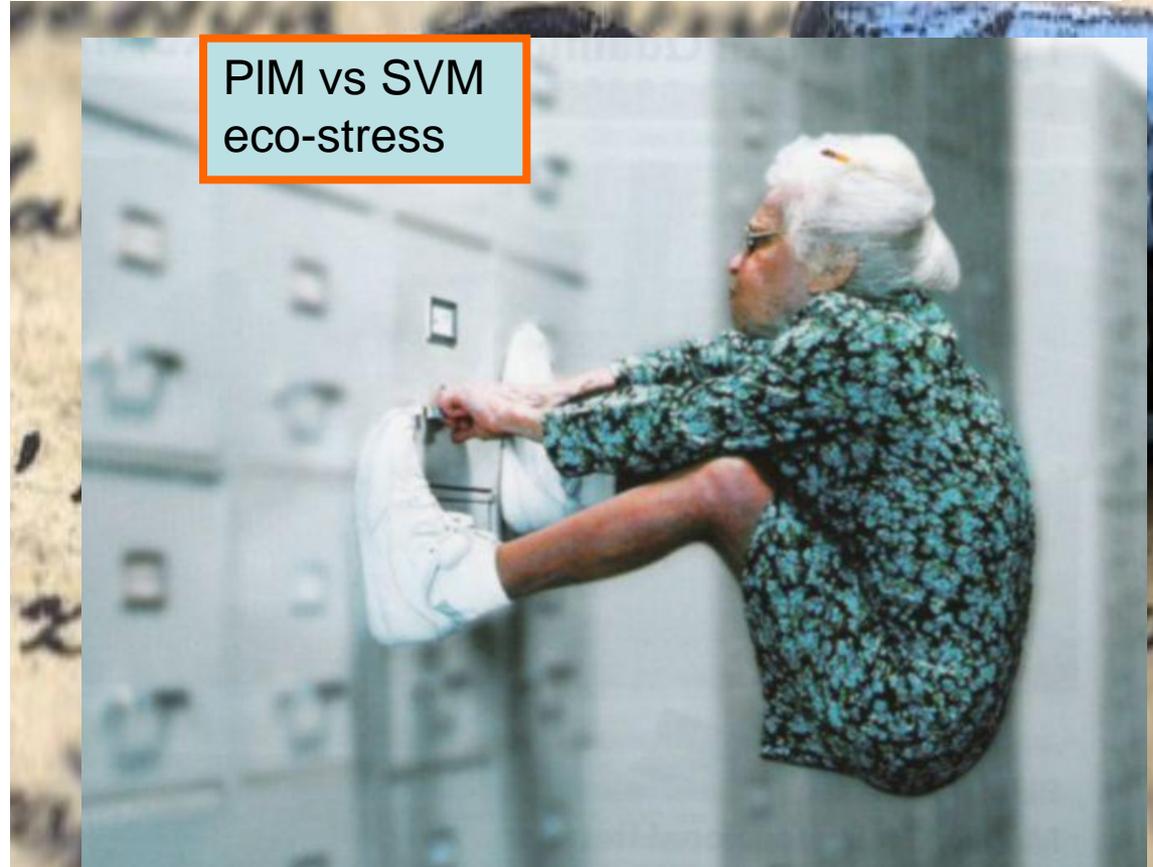
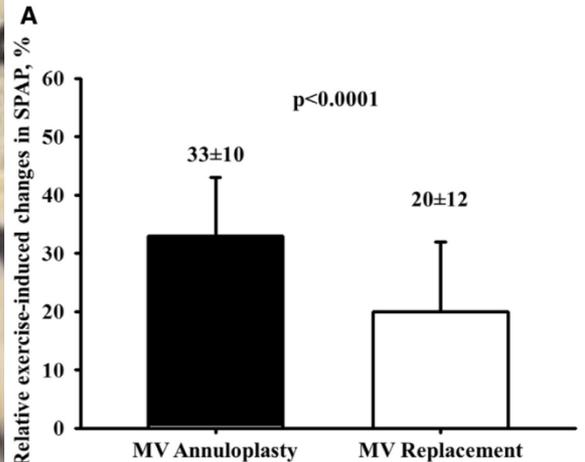
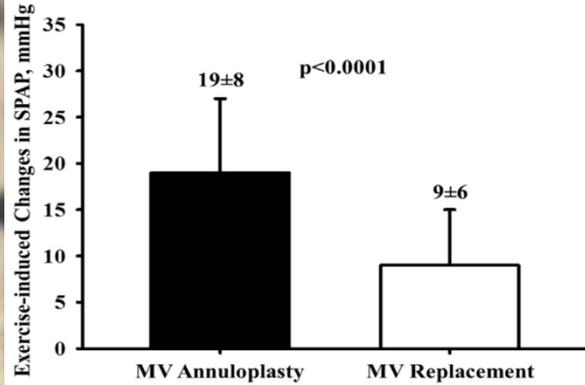
Dati SVM senza mantenimento valvola nativa

STA' CAMBIANDO STRATEGIA a favore SVM



Restrictive mitral valve annuloplasty versus mitral valve replacement for functional ischemic mitral regurgitation: An exercise echocardiographic study

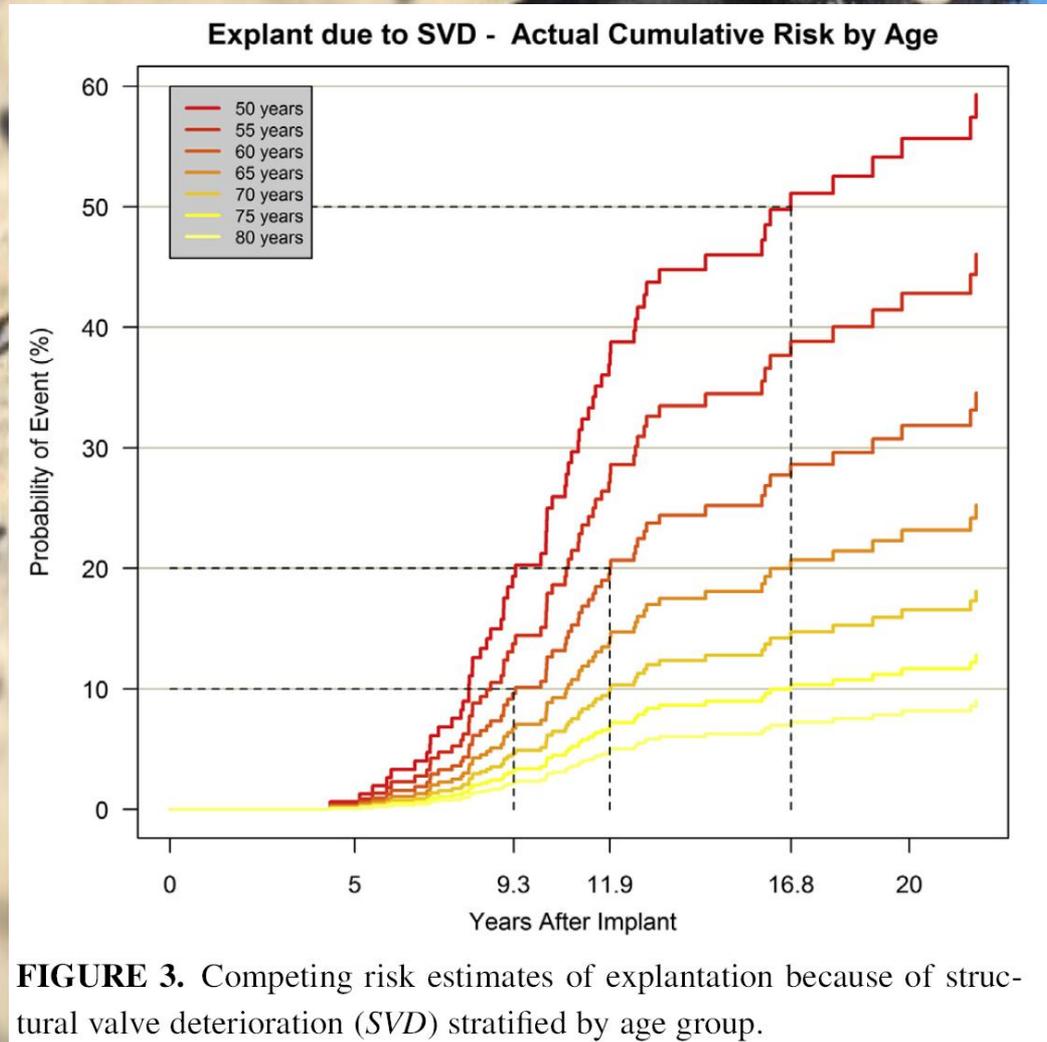
Fino et al



Conclusions: In patients with functional ischemic mitral regurgitation, mitral valve annuloplasty may cause functional mitral stenosis, especially during exercise. Mitral valve annuloplasty was associated with poor exercise mitral hemodynamic performance, lack of mitral valve opening reserve, and markedly elevated postoperative exercise systolic pulmonary arterial pressure compared with mitral valve replacement. (J Thorac Cardiovasc Surg 2014;148:447-53)

Very late outcomes for mitral valve replacement with the Carpentier-Edwards pericardial bioprosthesis: 25-year follow-up of 450 implantations

(J Thorac Cardiovasc Surg 2014;148:2004-11)





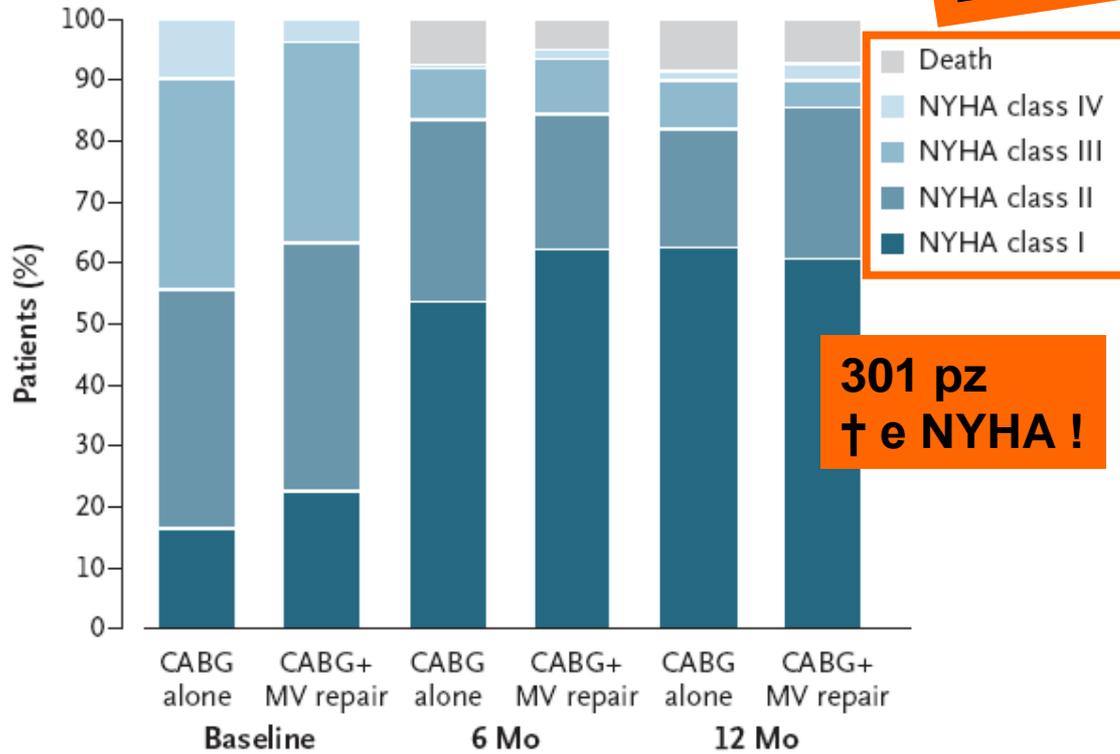
Se BPAC devo correggere IM MODERATA?

Se devo fare Mitrale: Plastica o SVM?

Surgical Treatment of Moderate Ischemic Mitral Regurgitation

P.K. Smith, J.D. Puskas, D.D. Ascheim, P. Yoon, J.W. Hung, M.K. Parikh, J. S. Alpert, E.A. Rose, E.G. Moquete, N. Jeffries, T.J. Gardner, J.H. Alexander, and R.E. Michler, for the Cardiothoracic Surgical Trials Network Investigators*

Differenza tra CABG e ± Mitrale



**301 pz
† e NYHA !**

Figure 2. NYHA Class and Death, According to Treatment Group.

The proportions of patients in each NYHA class are shown at baseline and at 6 and 12 months; the proportions of patients who died are shown at 6 and 12 months.

CABG	31% IM	25.9 moderata	5.2 severa
CABG + M	11.2% IM	10.4 moderata	0.8 severa



Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

N ENGL J MED 370;1 NEJM.ORG JANUARY 2, 2014

Michael A. Acker, M.D., Michael K. Parides, Ph.D., Louis P. Perrault, M.D.

Differenza tra PIM e SVM



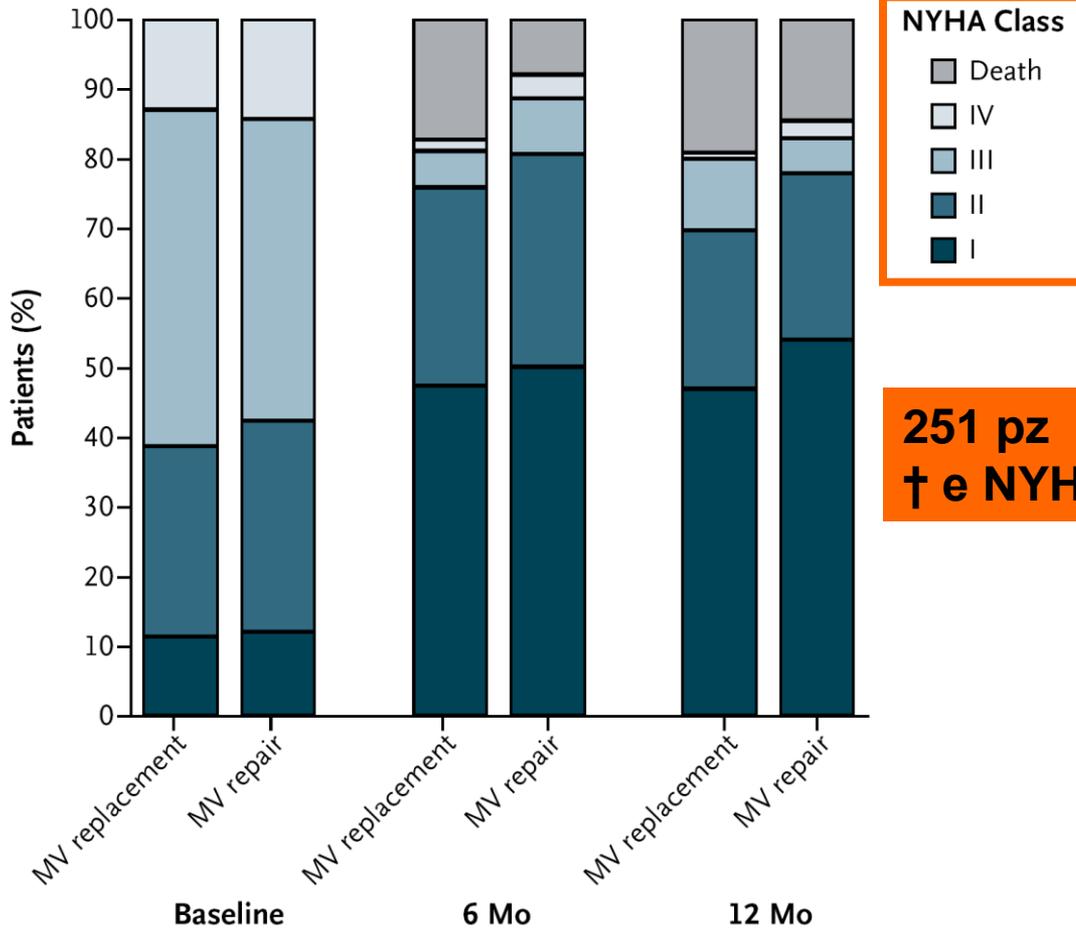
The NEW ENGLAND
JOURNAL of MEDICINE

251 pz
† e NYHA !



Mitral-Valve Repair versus Replacement for Severe Ischemic Mitral Regurgitation

Differenza tra PIM e SVM



251 pz
† e NYHA !



Figure 2. Rates of New York Heart Association Class and Death at Baseline, 6 Months, and 12 Months.



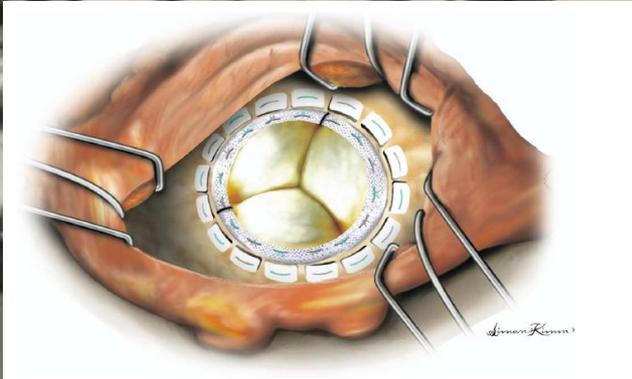
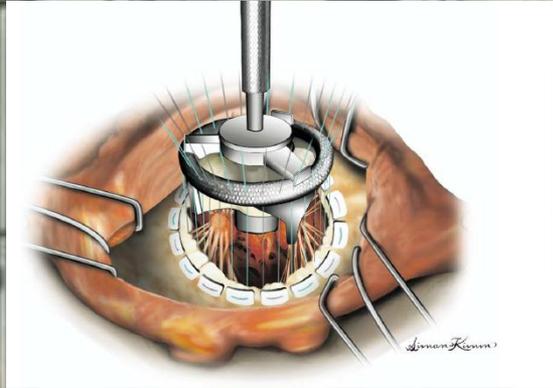
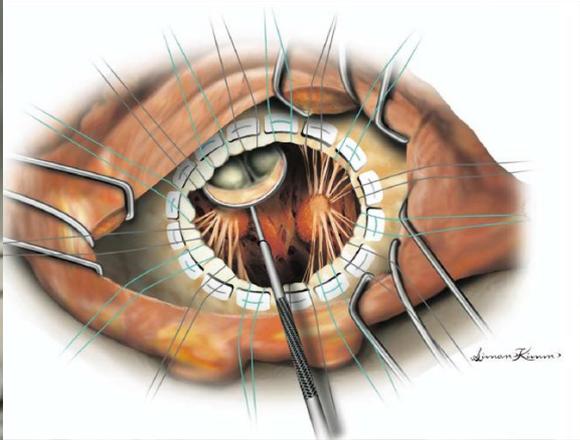
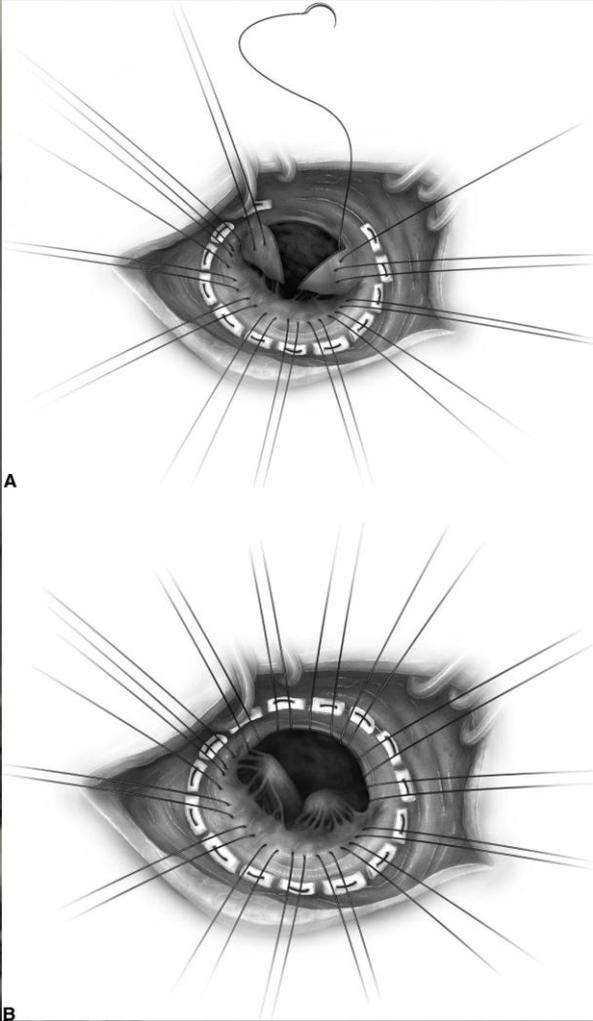
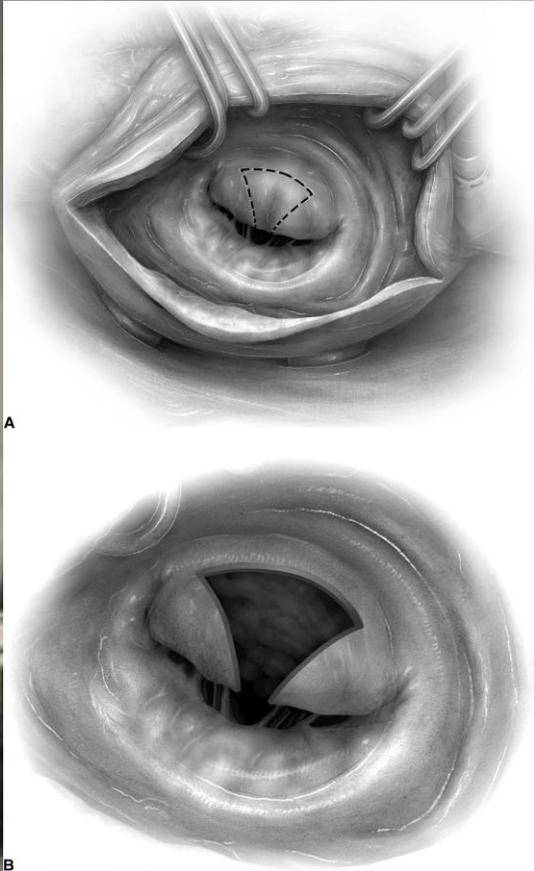
Sostituzione Valvolare Mitralica

Plastica Mitralica

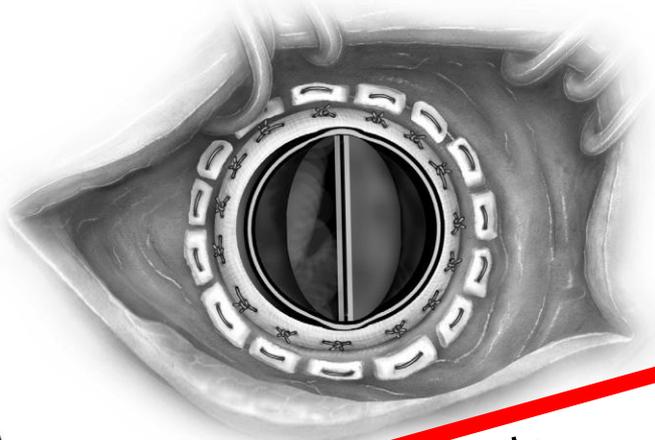


Milano Niguarda - Nuovo Ospedale Maggiore - Ingresso

Sostituzione Valvolare Mitralica

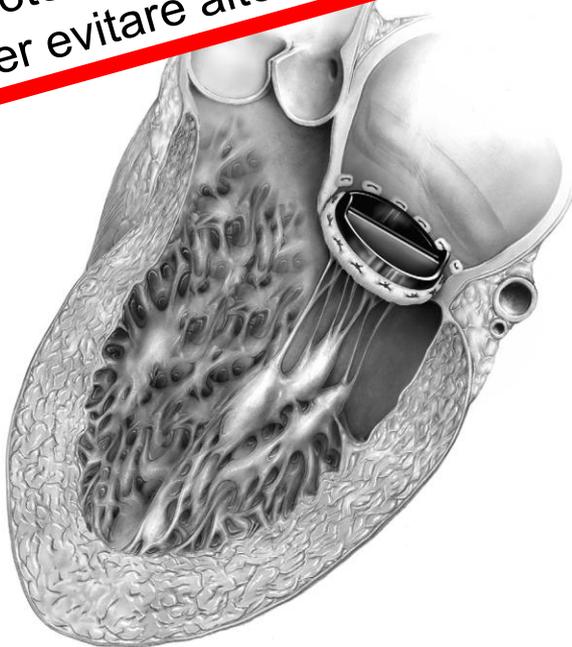


Sostituzione Valvolare Mitralica



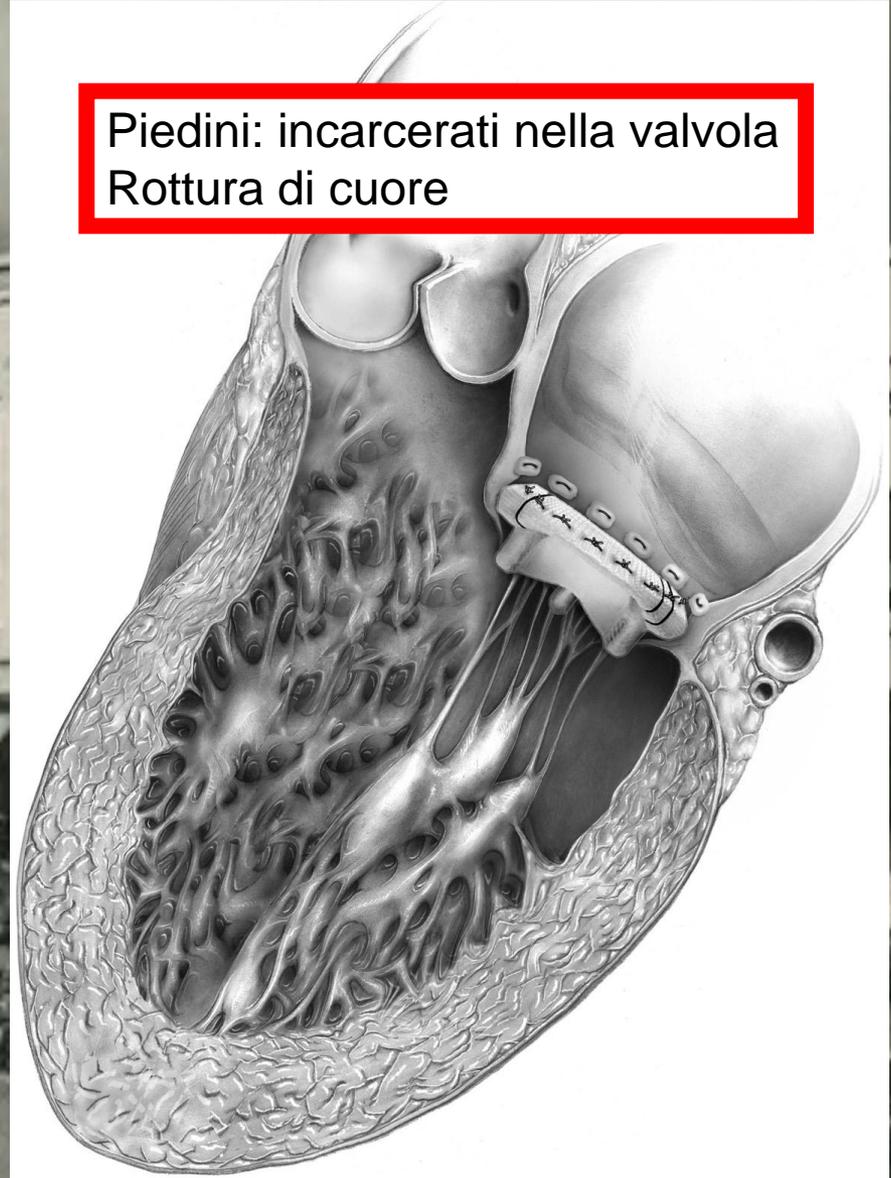
A

Protesi con cerniere in atrio
per evitare alterata apertura dischi

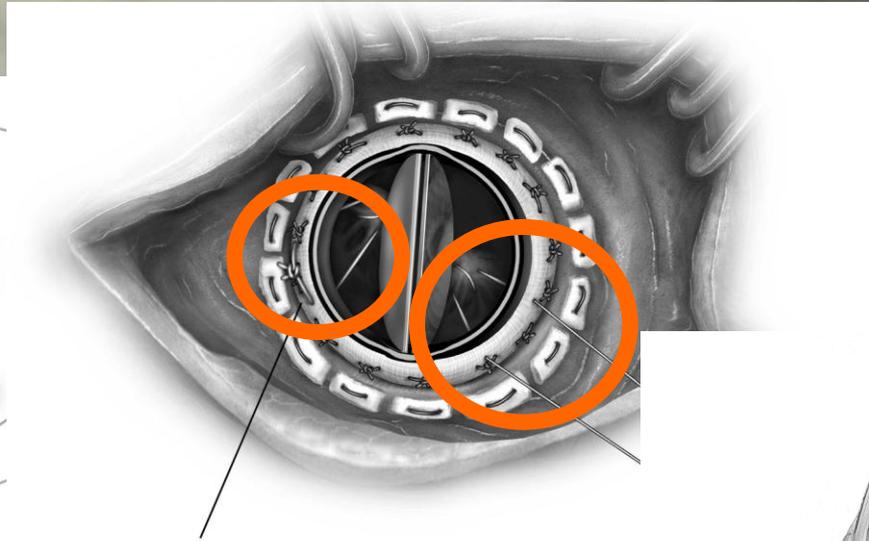
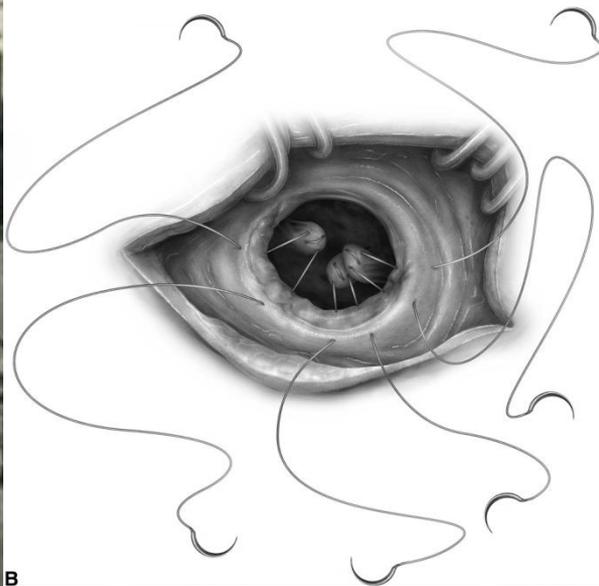
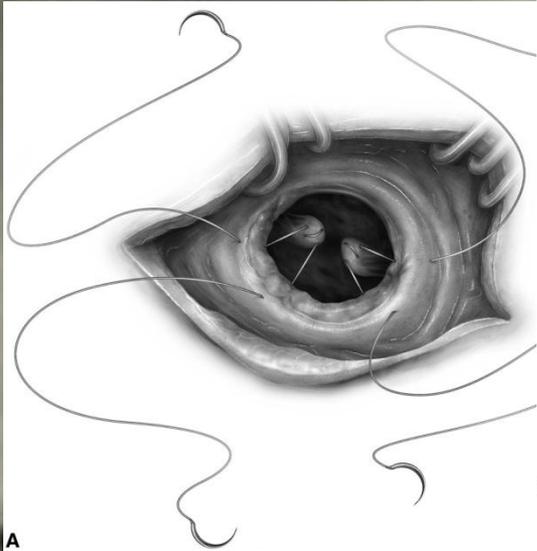


B

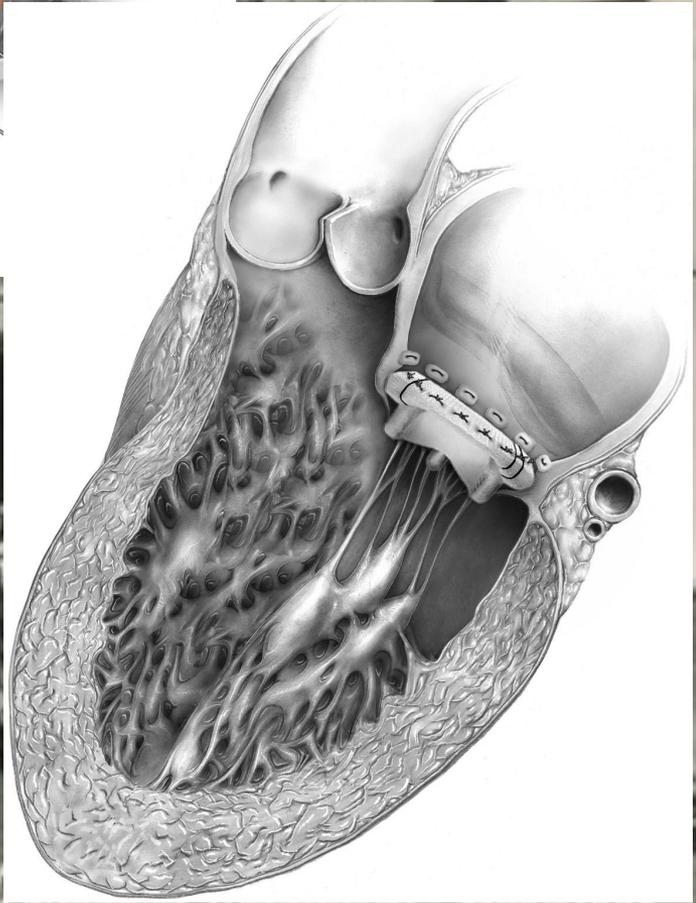
Piedini: incarcerati nella valvola
Rottura di cuore



Sostituzione Valvolare Mitralica

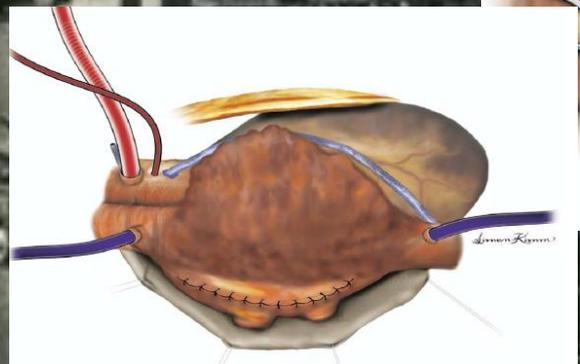
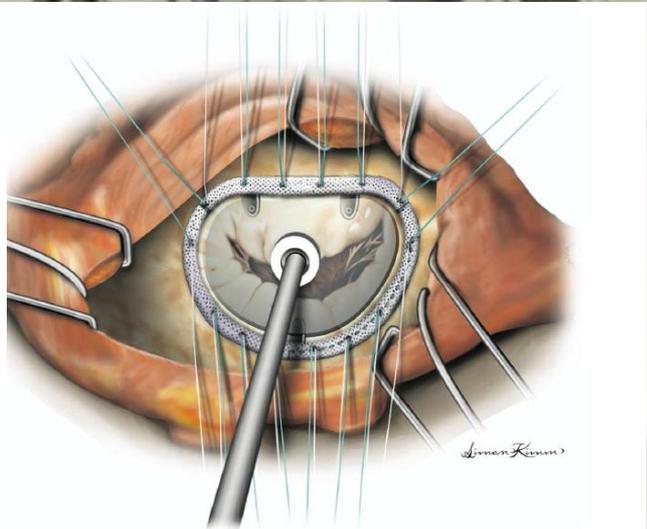
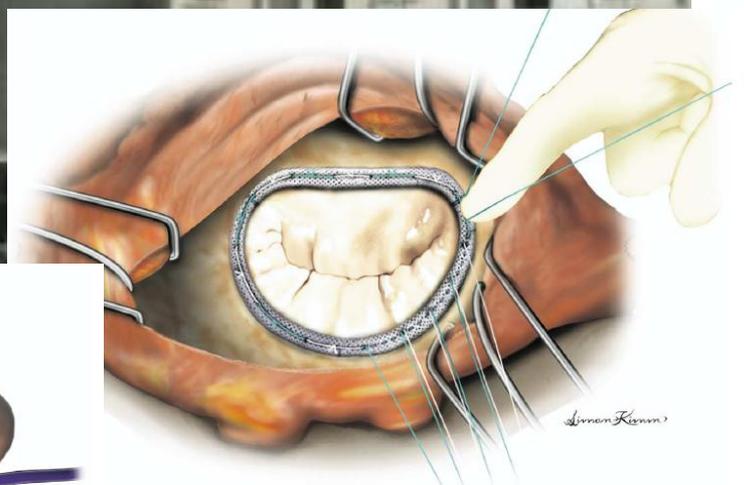
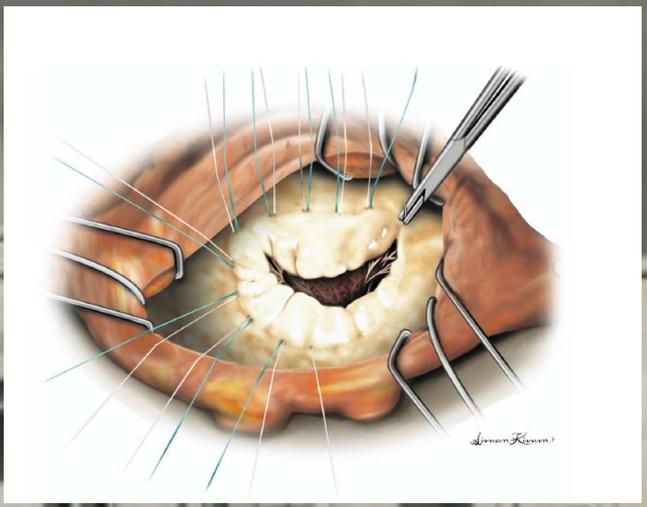
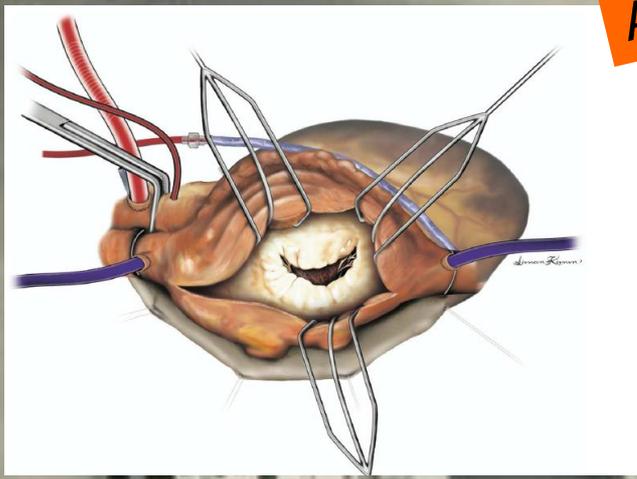


Papillary sutures passed through sewing ring & tied



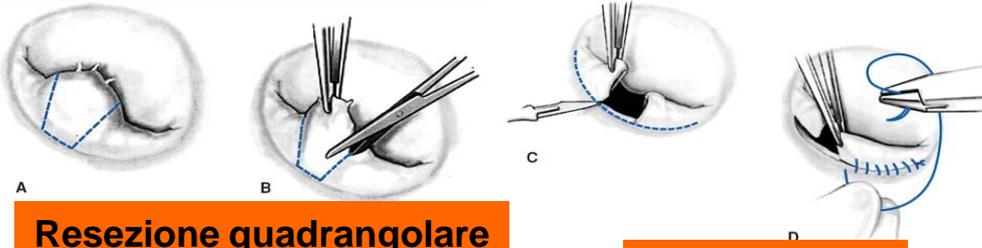
Plastica Mitralica

Anuloplastica



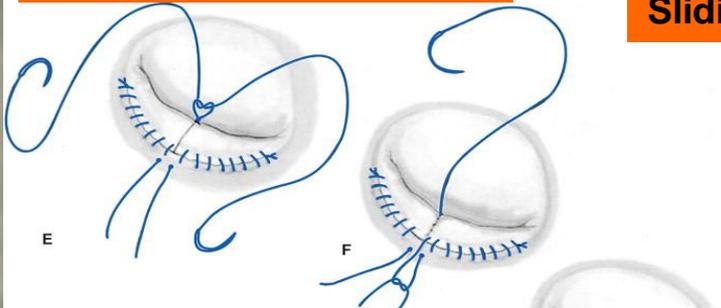
Milano Niguarda - Nuovo Ospedale Maggiore - Ingresso

Plastica Mitralica

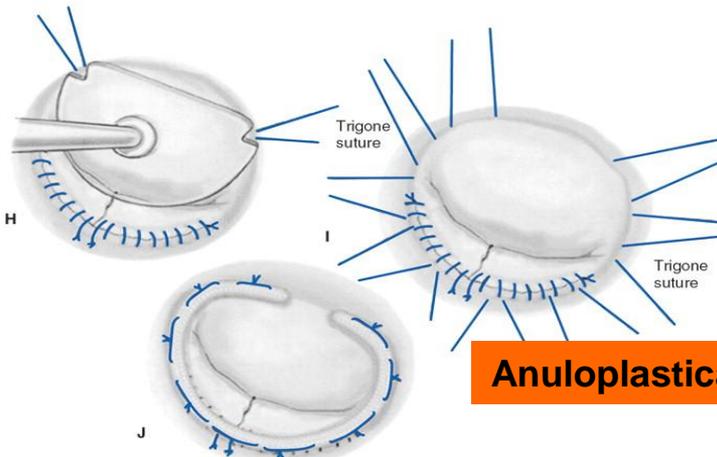


Resezione quadrangolare

Sliding-plasty



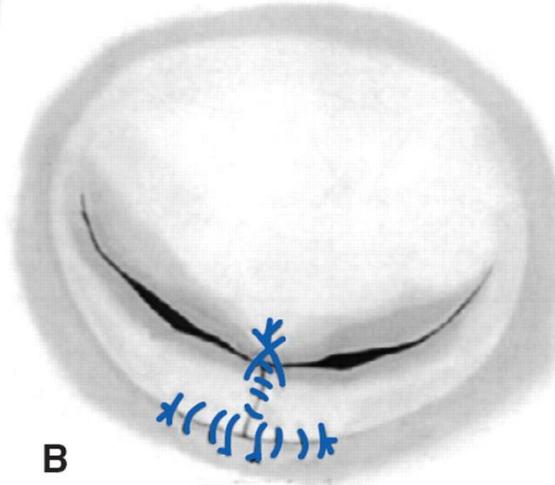
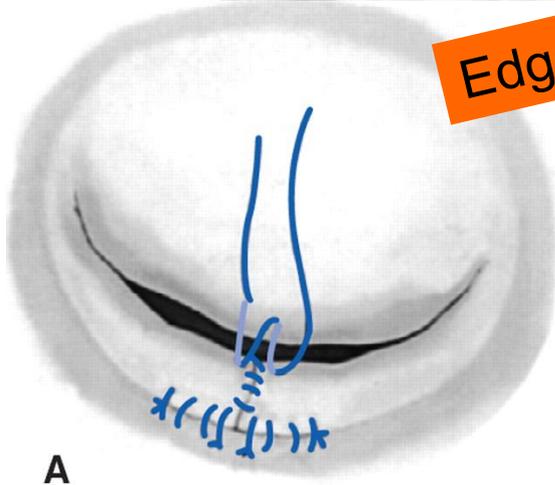
Edge to edge-Alfieri stich



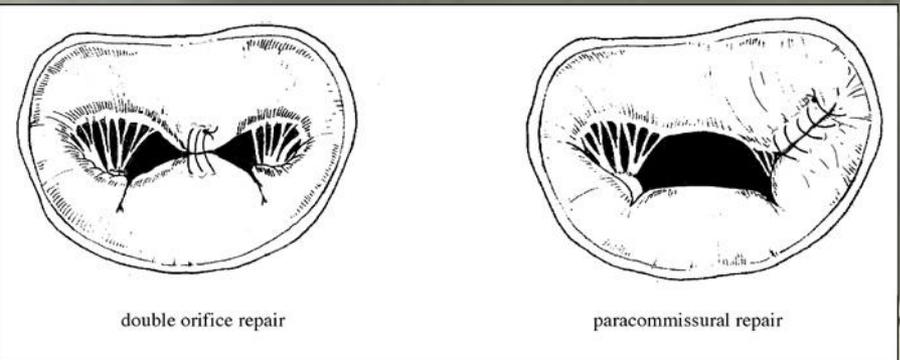
Anuloplastica



Edge to edge-Alfieri stich



Plastica Mitralica

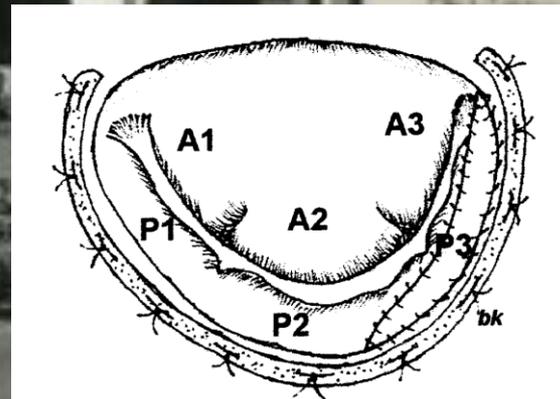
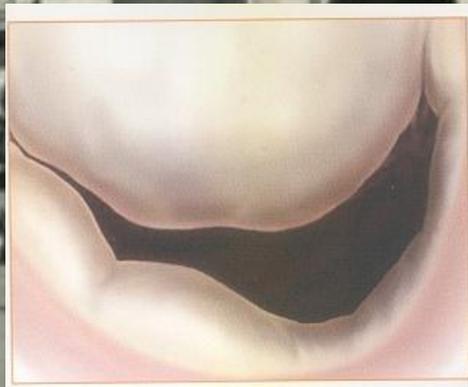


Riparazione leaflet:

edge-edge

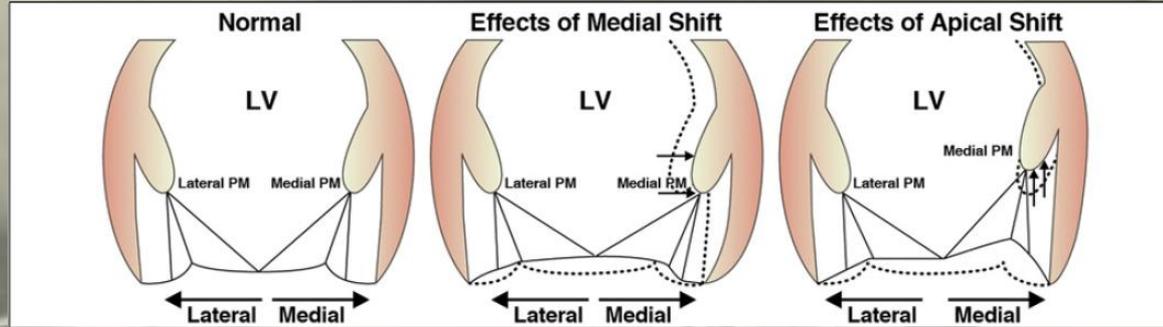
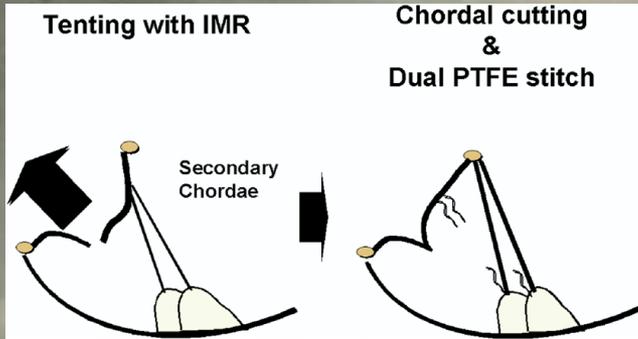
ok x teth LPM e dilataz annulare
deve essere usata con anello
peggiore se calcificazioni anulari

augmentation LPM

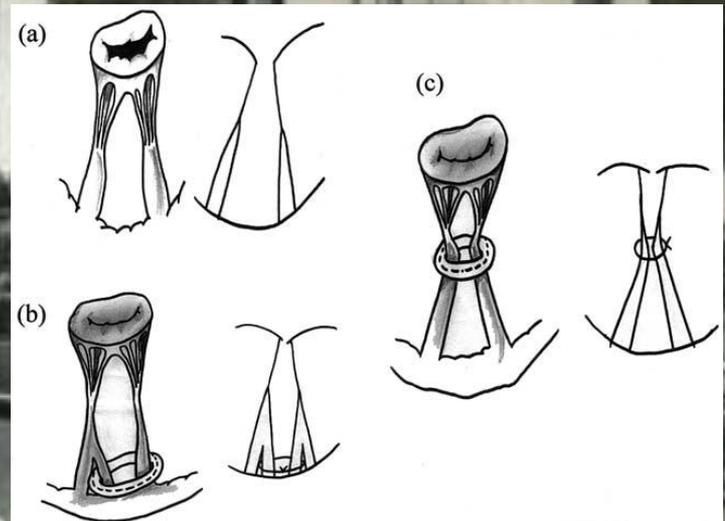
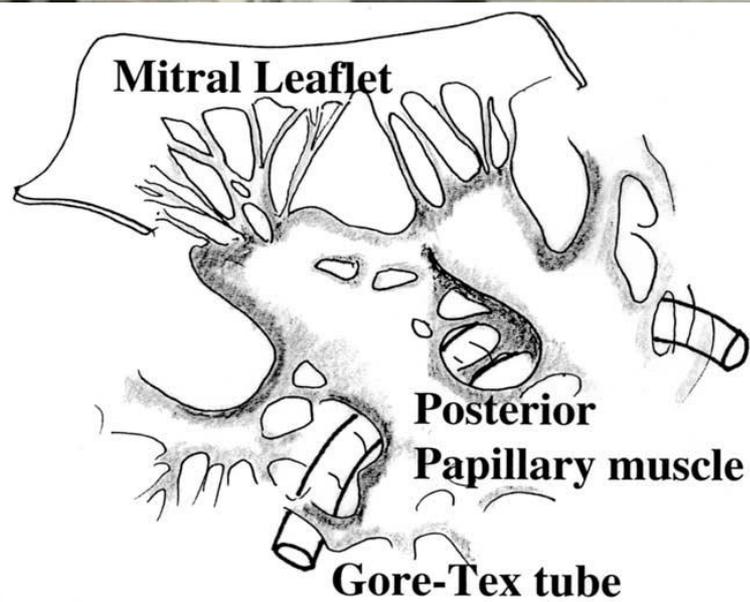


Milano Niguarda - Nuovo Ospedale Maggiore - Ingresso

Plastica Mitralica

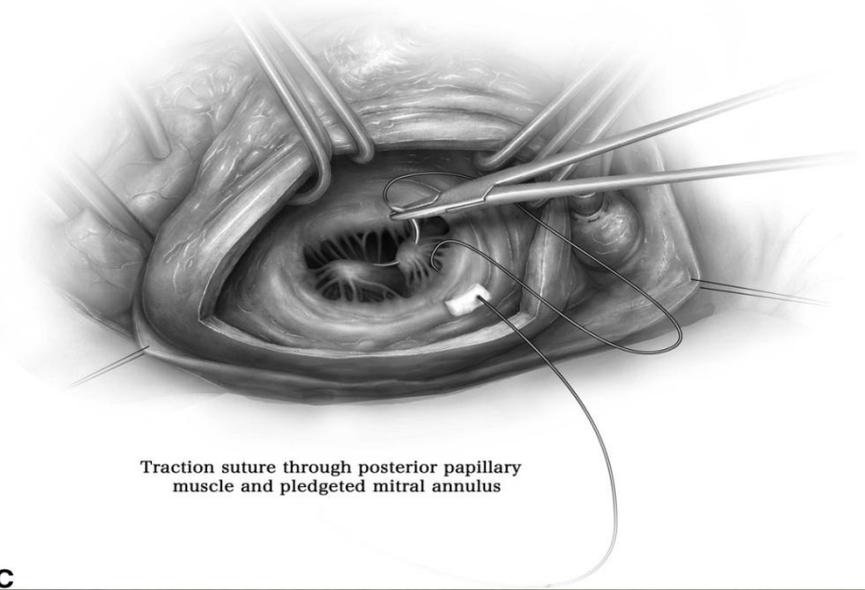
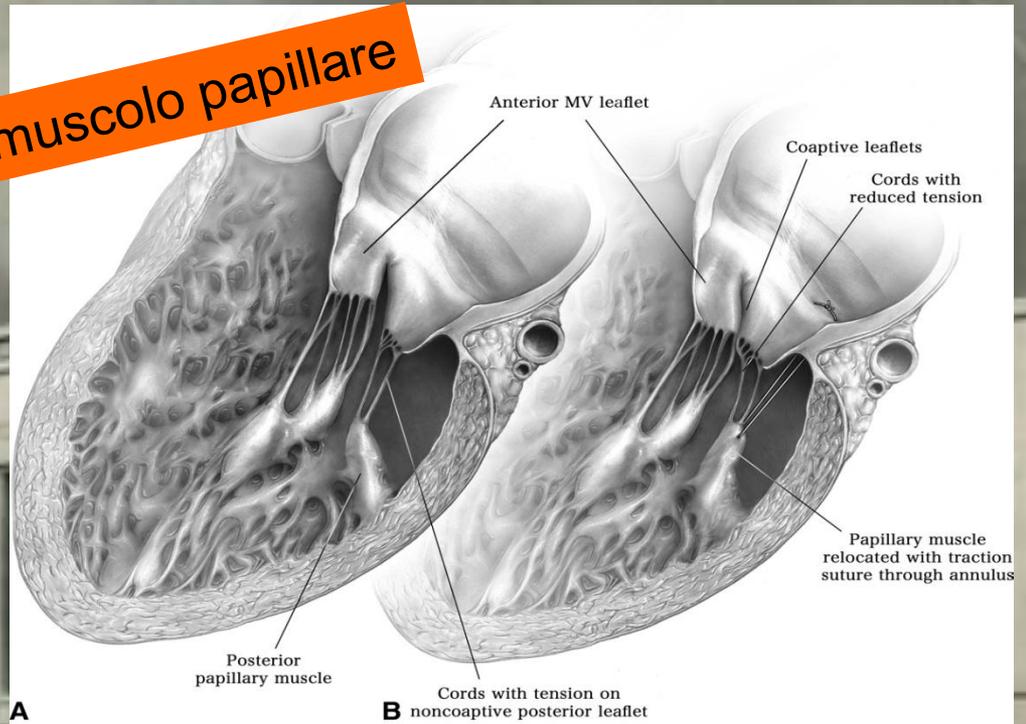
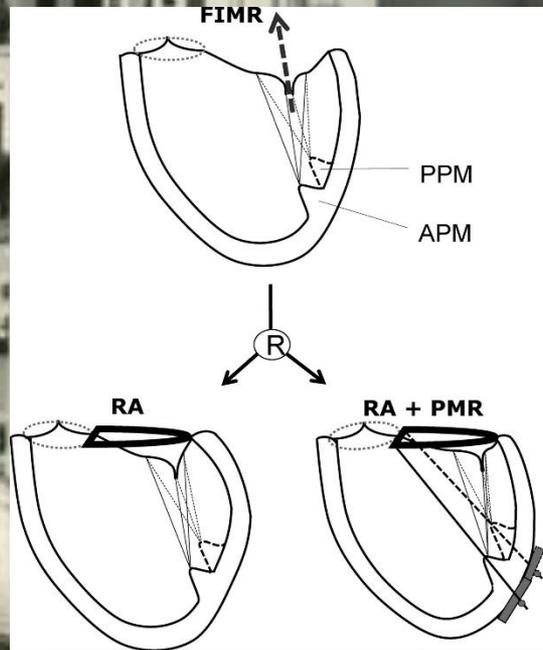
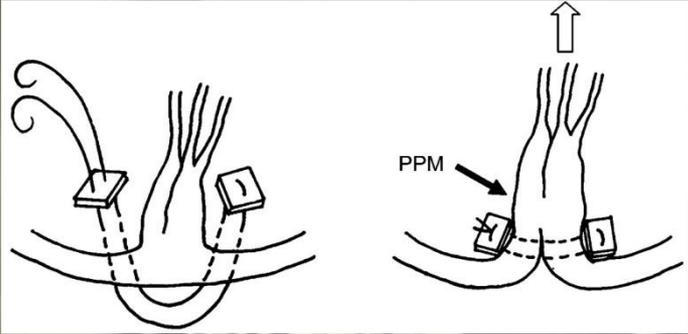


Approccio riparativo sottovalvolare divisione corde secondarie
 bendare muscolo papillare
 plastica muscolo papillare...%...



Plastica Mitralica

Plastica muscolo papillare

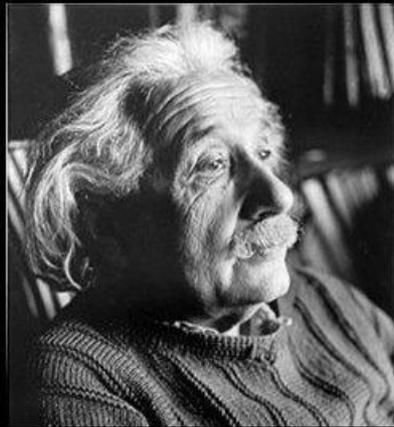


IM deve essere corretta

Biblio discute su COME trattare IM non su SE trattarla

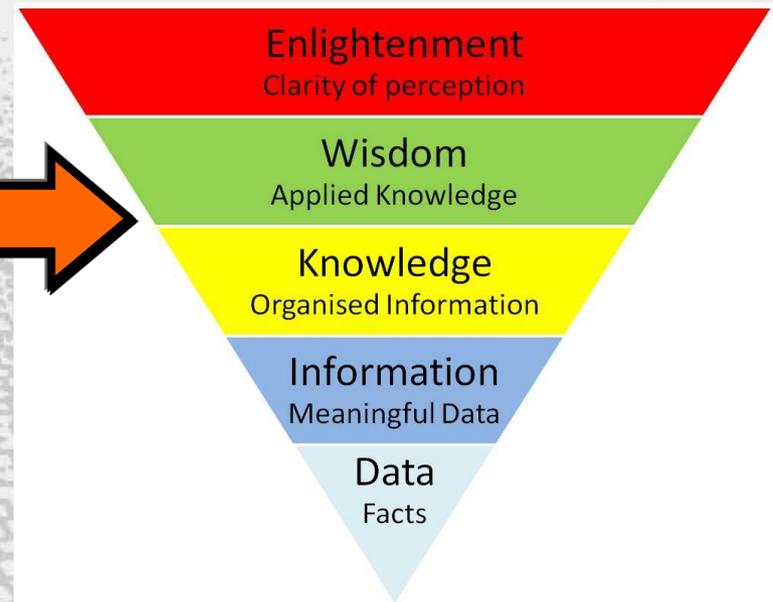
Per "IM moderata" la spinta a correggere IM è l'evolutiveità

L'evolutiveità è la causa del ritorno alla SVM



« Those who have
the privilege to
know have the
duty to act. »

~ Albert Einstein (1879-1955)

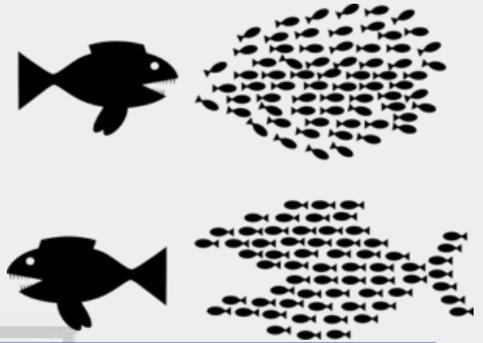


IM deve essere corretta

L'evolutiveità è la causa del "ritorno" alla SVM

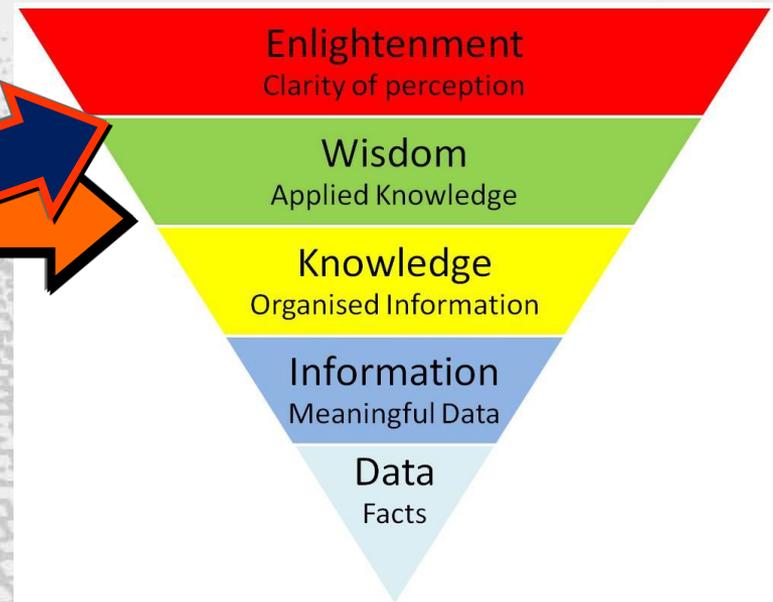
SVM non recidiva ma non esente da rischi/complicanze

PIM semplice e duratura è soluzione ideale



Giuseppe Tarelli

« Those who have the privilege to know have the duty to act. »



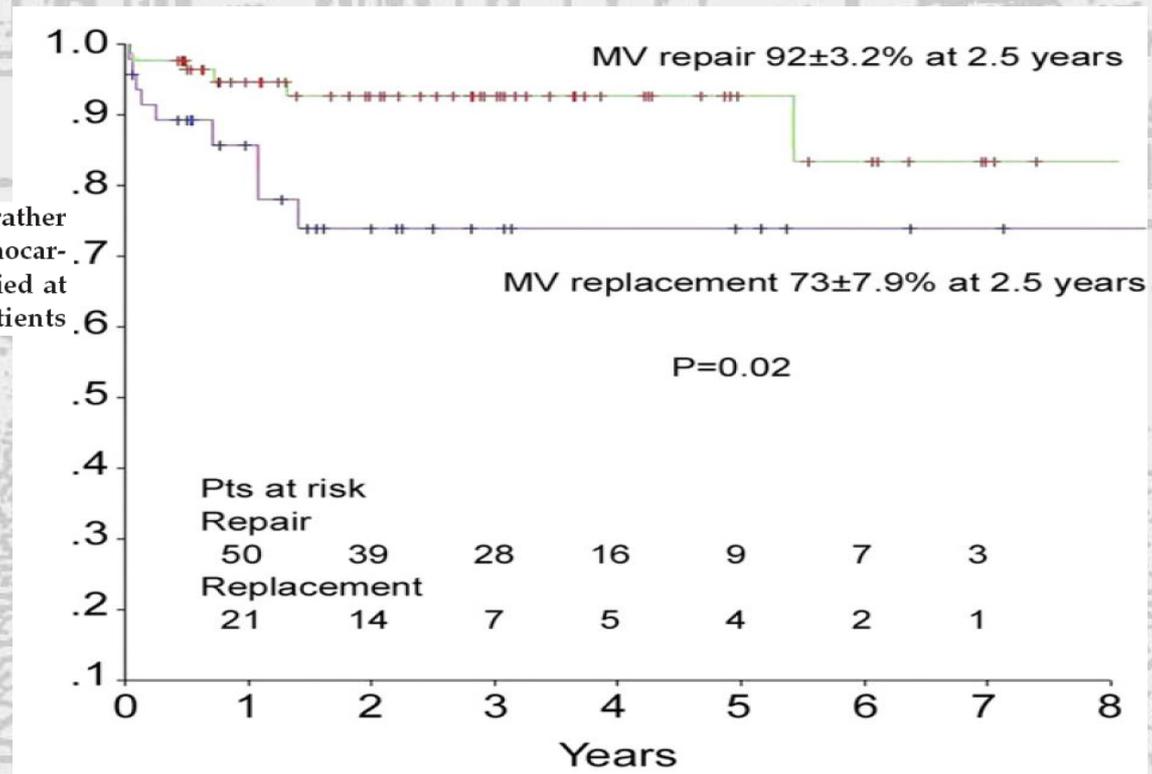
Mitral Replacement or Repair for Functional Mitral Regurgitation in Dilated and Ischemic Cardiomyopathy: Is it Really the Same?

Ann Thorac Surg 2012;94:44-51

Conclusions. In patients with advanced dilated and ischemic cardiomyopathy and severe functional MR, MV replacement is associated with higher in-hospital and late mortality compared with repair. In this clinical setting,

In pz con CMP ischemica, dilatativa e IM funzionale severa: SVM è associata a mortalità H e a distanza maggiore rispetto a PIM

in the same time frame. The decision to replace rather than repair the MV was taken when 1 or more echocardiographic predictors of repair failure were identified at the preoperative echocardiogram. Eighty-five patients



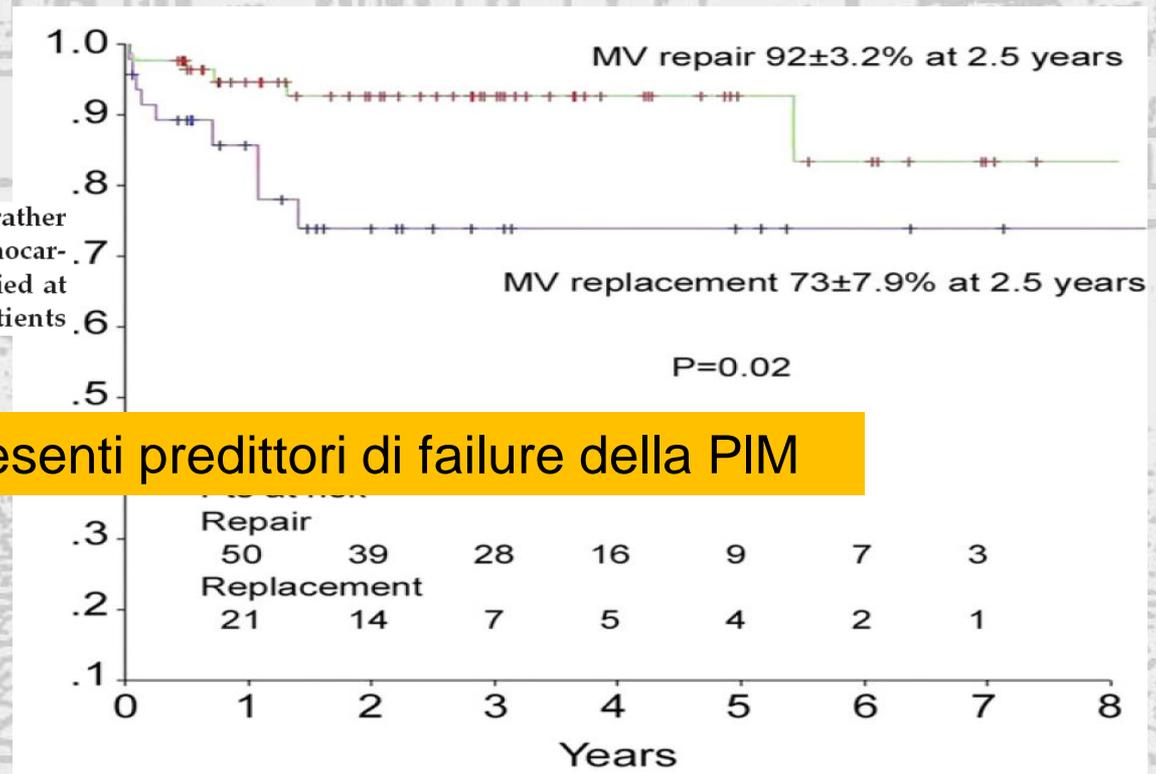
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Decisione di SVM se presenti predittori di failure della PIM



Ischemic mitral regurgitation: current trends and treatment

Elsayed Elmistekawy, Thierry Mesana, and Vincent Chan

Division of Cardiac Surgery, University of Ottawa Heart Institute, Ottawa, Ontario, Canada

Curr Opin Cardiol 2013, 28:661–665

Michele De Bonis, MD,

Ann Thorac Surg 2012;94:44–51

Fattori predittivi di failure della riparazione

Mitral Replacement or Repair for Functional Mitral Regurgitation in Dilated and Ischemic Cardiomyopathy: Is it Really the Same?

Recidiva IM: precoce, tardiva, progressione della malattia

- Precoce: La tecnica deve essere ottima: **meglio SVM che plastica fallita**
SI anuloplastica rigida sottodimensionata; NO anelli flessibili
- Tardiva: Coaptazione minima in CO: alta % failure: > 8 mm A2-P2: OK
- Progressione patologia nativa: 2-4%/ anno per allungamento/rottura corde
Progressione dilatazione VSx **30% a 2 aa**

Posterior leaflet angle > 45°
Distal anterior leaflet angle > 25°
Tenting height > 10 mm
Tenting area > 2.5 cm²
Bileaflet tethering
Absence or small anular dilatation
Multiple complex regurgitaiton



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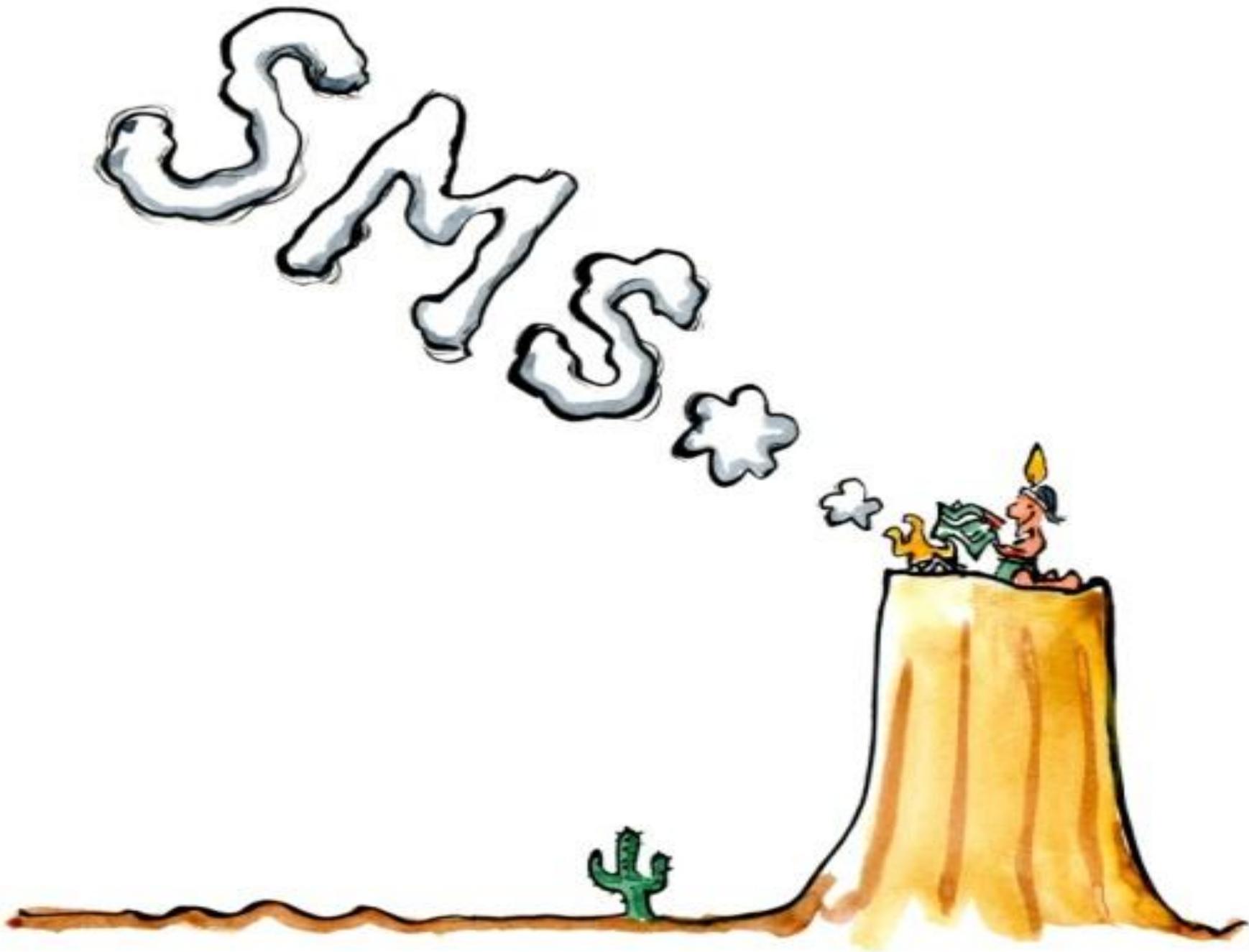
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GAME OVER!

LVEDD > 65 mm rimodellamento poco probabile anche se BPAC in presenza di miocardio vitale !!!



Predictors and prognosis of early ischemic mitral regurgitation in the era of primary percutaneous coronary revascularisation

MacHaalany et al. *Cardiovascular Ultrasound* 2014, **12**:14

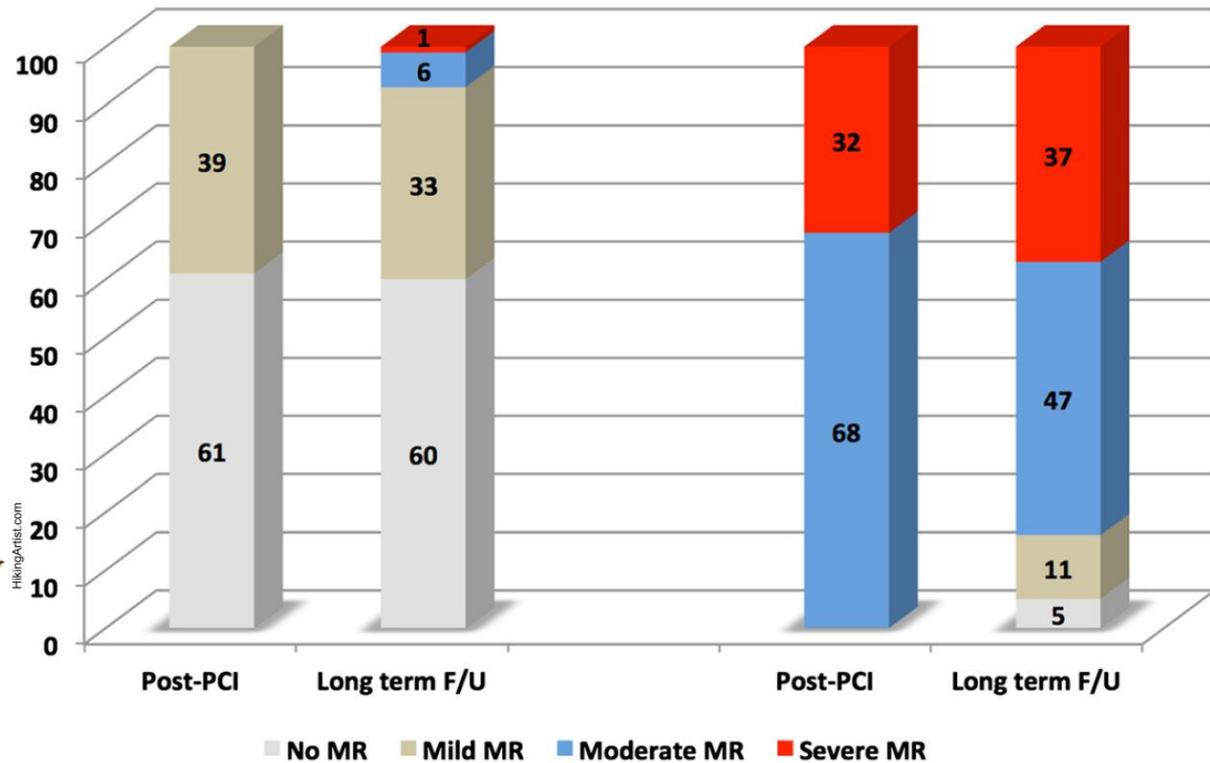
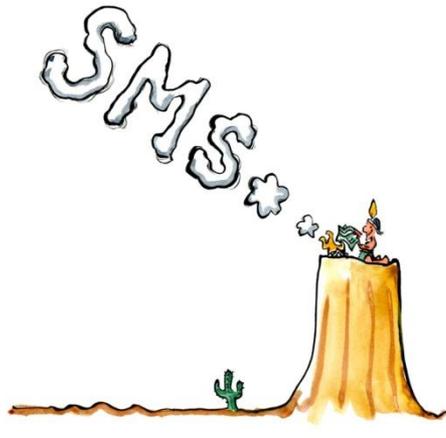


Figure 1 Distribution of ischemic functional mitral regurgitation (MR) over time according to baseline MR grade.

Conclusions: After primary PCI, IMR is a frequent finding. Regression of early IMR during long-term follow-up is uncommon. Since moderate to severe IMR post-primary PCI appears to be correlated with worse outcomes, close follow-up is required.



Se BPAC correggo anche IM moderata

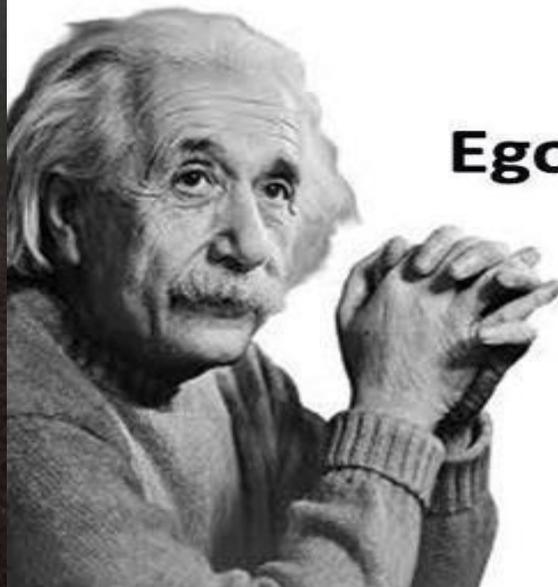
PIM se semplice e caratteristiche favorevoli x DURATA

Se PIM stretto f-u per recidiva

Se SVM mantengo valvola nativa

Se SVM attenta scelta della protesi

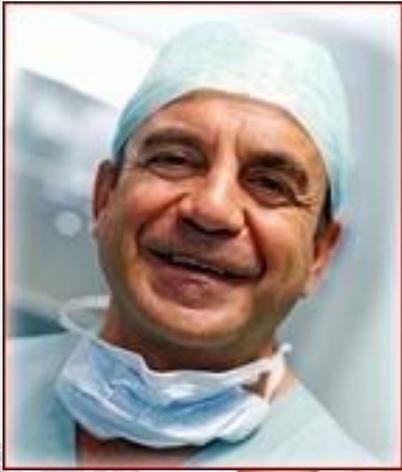
Quando è appropriata la correzione cardiocirurgica nell'insufficienza mitralica ischemica. Le tecniche riparative vs la sostituzione: molti dubbi e qualche certezza.



$$\text{Ego} = \frac{1}{\text{Knowledge}}$$

*“More the Knowledge
Lesser the Ego,
Lesser the Knowledge
More the Ego...”*

-Albert Einstein.



Differenze per Chirurgo

PIM solo anello rapida
PIM complessa molto lenta.....e complessa!!

SVM biologica rapida..piedini e deterioramento cuspidi...
SVM BPAC laterali non controllabili post CEC
SVM meccanica più demanding



Differenze per Chirurgo

PIM solo anello rapida
PIM complessa molto lenta.....e “demanding”!!



SVM biologica rapida..piedini e deterioramento cuspidi...
SVM BPAC laterali non controllabili post CEC
SVM meccanica più demanding



Differenze per Paziente

PI M TAO ± ASA o duplice.. FA.. remodelling

SVM biologica deterioramento strutturale ± TAO
SVM meccanica TAO ± ASA o duplice

Differenze per Chirurgo

PIM solo anello rapida
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Differenze per Paziente

PI M TAO ± ASA o duplice.. FA.. remodelling

SVM biologica deterioramento strutturale ± TAO
SVM meccanica TAO ± ASA o duplice

Se SVM si spera no IM BIO DS, Mecc trombosi
Se PIm remodelling e IM ± TAO ± ASA o duplice

Differenze per Cardiologo

COMUNQUE attento f.u. clinico strumentale **EVOLVENTE**
non solo di VSx=> FA, ixt polm. CAD....etc...etc

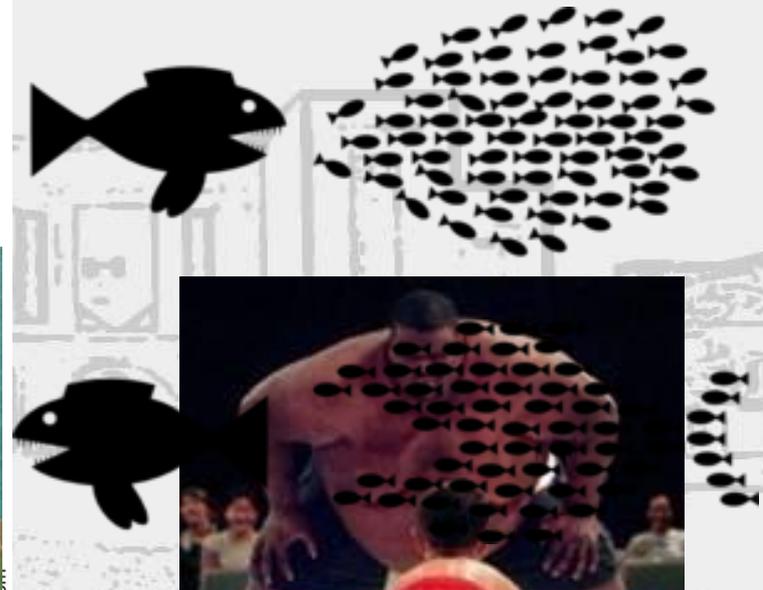


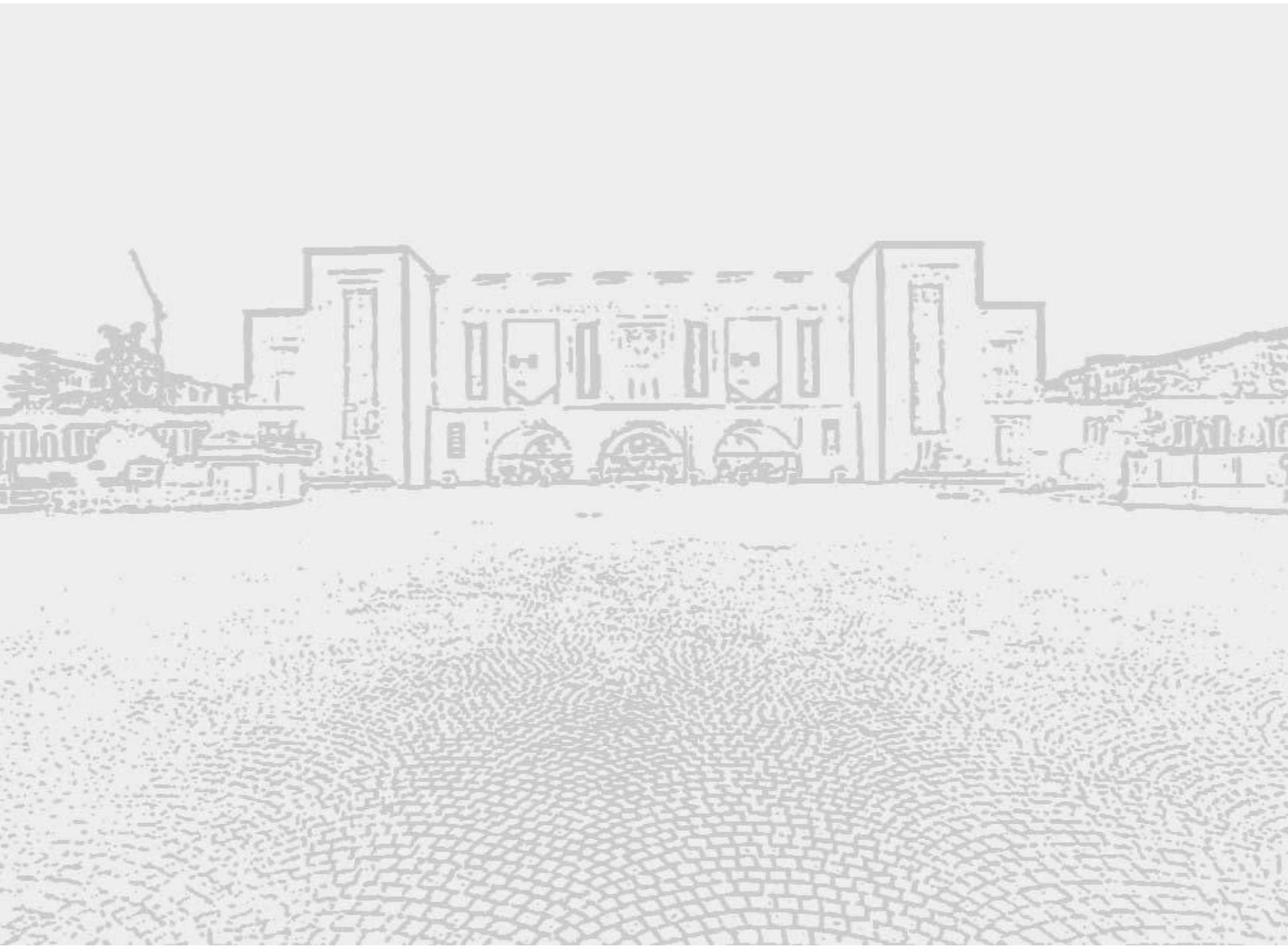
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Stefano Pelenghi Cardiocirurgia "A De Gasperis"



Avviso ai naviganti: PCI con articolo conclusioni abstract predictors pci



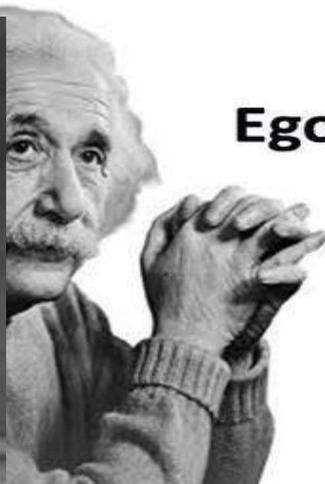
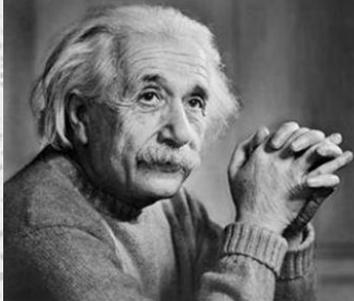




<http://www.youtube.com/uncielosereno> --- <http://verylemon.blogspot.com/>

If you can't explain it **simply**, you don't understand it well enough.

– Albert Einstein



$$\text{Ego} = \frac{1}{\text{Knowledge}}$$

*"More the Knowledge
Lesser the Ego,
Lesser the Knowledge
More the Ego..."*

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