«Ισχαιμική ανεπάρκεια της μιτροειδούς βαλβίδας.
Σοβαρή ανεπάρκεια:
Διόρθωση – είναι η περιοριστική δακτυλιοπλαστική αρκετή;»

ΚΑΡΑΠΑΝΑΓΙΩΤΙΔΗΣ Θ. ΓΕΩΡΓΙΟΣ
ΚΑΡΔΙΟΧΕΙΡΟΥΡΓΟΣ
ΕΠΙΚΟΥΡΟΣ ΚΑΘΗΓΗΤΗΣ
ΚΑΡΔΙΟΘΡΑΚΟΧΕΙΡΟΥΡΓΙΚΗΣ ΑΠΘ
The commonest mitral regurgitation etiologies

- Degenerative (60%)
- Rheumatic post-inflammatory (12%)
- Functional (25%)

Due to the large number of patients with acute MI, the incidence of ischaemic MR is also high
Ischaemic mitral regurgitation is a complex multifactorial disease

That involves

- Left Ventricular Geometry,
- Mitral Annulus,
- Valvular/Subvalvular Apparatus.

Ischaemic mitral regurgitation is an important consequence of LV remodeling after myocardial infarction.
Results from **tethering** (apical and lateral papillary muscle displacement, annular dilatation) and reduced dysfunction and distortion of the components of the mitral valve including the chordae, annulus and leaflets.

Ischaemic MR affects patients’ prognosis, **doubling mortality** following myocardial infarction and heart failure.
Ischaemic MR occurred after inferior myocardial infarction and secondary dysfunction of the medial PM.
In patients with ischaemic mitral regurgitation after myocardial infarction, the mitral annulus enlargement is one of the determinants of the regurgitant volume and of the effective regurgitant orifice area.
Echocardiographic diagnosis and assessment of ischaemic mitral regurgitation

TTE or TOE
Echocardiographic Assessment of Ischaemic Mitral Regurgitation, Mechanism, Severity, Impact on Treatment Strategy and Long Term Outcome

Blood leaking back into left atrium (regurgitation)

Mitra valve prolapse

Type I

Type II

Type IIIa

Type IIIb
ΤΥΠΟΣ Ι: Φυσιολογική Κινητικότητα Γλωχίνων

- Διάταση δακτυλίου
- Διάτρηση γλωχίνας

ΤΥΠΟΣ ΙΙ: Υπέρμετρη Κινητικότητα Γλωχίνων

- Επιμήκυνση τενόντιων χορδών
- Ρήξη τενόντιων χορδών
- Επιμήκυνση θηλοειδούς μυός
- Ρήξη θηλοειδούς μυός

ΤΥΠΟΣ ΙΙΙ: Περιορισμένη Κινητικότητα Γλωχίνων

- Πάχυνση τενόντιων χορδών
- Σύντηξη κομισουρών
- Πάχυνση γλωχίνων
- Έλξη γλωχίνων

ΤΥΠΟΣ ΙΙΙΑ (Ρευματικής αιτιολογίας) Διαστολική δυσλειτουργία

ΤΥΠΟΣ ΙΙΙΒ (Διάταση Αρ. κοιλίας) Συστολική δυσλειτουργία
SAVE study (Survival And Ventricular Enlargement), suggested that even mild MR is associated with high mortality after AMI.
Currently, the “gold-standard” treatment if IMR is concomitant down-sized ring annuloplasty at the time if CABG surgery.

However, this procedure has a failure rate around 20-30% in terms of recurrent IMR after the first 2 - 4 years, and there are few, if any, other disciplines in cardiac surgery where we consider such a result a “gold standard”.
Myocardial revascularization does not necessarily reverse ischaemic MR
Mitral Valve Before & After Annuloplasty

1. Annular dilatation.
2. Restricted mitral leaflet closure.
3. Chordal tethering.
4. Posterolateral papillary muscle displacement.
5. Left ventricular dilatation and increased sphericity.
Approximation of papillary muscles for ischaemic mitral regurgitation combined with coronary artery bypass grafting and left ventricular aneurysmectomy: a case report

GT Karapanagiotidis, M Zakkar, P Gukop and MAI Sarsam

Figure 1. (A) Pre-operative MRI image, (B) Post-operative MRI showing the sling in situ around the mitral muscles (arrow), (C) Schematic presentation of the operative technique. (1. Anterolateral papillary muscle, 2. Apex, 3. Posteromedial papillary muscle, 4. Chord, 5. Sling).
Mitral valve repair or replacement for ischemic mitral regurgitation? The Italian Study on the Treatment of Ischemic Mitral Regurgitation (ISTIMIR)

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Conclusions: Mitral valve replacement is a suitable option for patients with chronic ischemic mitral regurgitation and impaired left ventricular function. It provides better results in terms of freedom from reoperation with comparable valve-related complication rates. (J Thorac Cardiovasc Surg 2013;145:128-39)
Restrictive mitral valve annuloplasty versus mitral valve replacement for functional ischemic mitral regurgitation: An exercise echocardiographic study

Carlo Fino, MD, a,c Attilio Iacovoni, MD, a Paolo Ferrero, MD, a Michele Senni, MD, a Maurizio Merlo, MD, a Diego Cugola, MD, a Paolo Ferrazzi, MD, a Massimo Caputo, MD, c Antonio Miceli, MD, PhD, c and Julien Magne, PhD b

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)

However, our comparison between chordal-sparing mitral-valve replacement and repair in patients with severe ischemic mitral regurgitation did not show significant differences.
Proposed Algorithm for Surgery of IMR

- CABG
  - Mild MR: CABG alone
  - Moderate MR: CABG alone or CABG+MVA (if HF Symptoms prominent)
  - Severe MR: MV Annuloplasty or MVR

- Tethering area $\geq 1.6 \text{ cm}^2$
- Annular diameter $\geq 3.7 \text{ cm}$
- Complex regurgitant jet
- Sphericity index $>0.7$
- Posterobasal aneurysms
- LVEDD $>6.5 \text{ cm}$
We randomly assigned 251 patients to mitral-valve repair or replacement. Patients were followed for 2 years, and clinical and echocardiographic outcomes were assessed.

In patients undergoing mitral-valve repair or replacement for severe ischemic mitral regurgitation, we observed no significant between-group difference in left ventricular reverse remodeling or survival at 2 years.

Mitral regurgitation recurred more frequently in the repair group, resulting in more heart-failure–related adverse events and cardiovascular admissions.
When such patients undergo CABG, current guidelines support MV surgery (repair or replacement) but do not make a recommendation as to whether either is superior.

Currently, ring annuloplasty appears to be optimal to correct ischemic MR provided that there is no major leaflet or chordal pathology.

However, if major leaflet or chordal work is required, especially on the anterior leaflet, then MVR is likely to be most effective.
Subvalvular techniques may be added in addition to annuloplasty for the correction of IMR.
Severe ischemic MR

Guideline-directed medical therapy
Revascularization of ischemic/viable myocardium

Persistent severe MR

Yes

Echocardiography

Advanced left ventricular remodeling
1. Wall motion score index >1.5
2. Myocardial perfusion index >0.9
3. Basal aneurysm/dyskinesis

Mitral valve geometry
1. Interpapillary muscle distance >20 mm
2. Mitral valve tenting height ≥11 mm
3. Mitral valve tenting area ≥2.5 cm²

No

Continue medical therapy

Yes

Restrictive annuloplasty

Annuloplasty + subvalvular repair or chordal-sparing valve replacement
ΣΥΜΠΕΡΑΣΜΑΤΙΚΑ

➢ MVRepair did not confer any substantial benefit compared with MVReplplacement in terms of early- and long-term survival, valve-related complication rates, and effects on LV performance.

➢ In contrast, it exposes operated patients to higher recurrence of MR and to higher re-operation rate.

➢ MVReplacement appears to be a valuable surgical option for patients with IMR and LV dysfunction undergoing mitral valve surgery and CABG.

➢ SVD should be taken into consideration when tissue valves are implanted, based on a favorable postoperative life expectancy.
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