Mitral club: From clinical practice to guidelines: the world upside down

Christina Chrysohoou
Heart Failure Unit
1rst Cardiology Clinic, University of Athens
Hippokrario Hospital, Greece
# Stages of Chronic MR

<table>
<thead>
<tr>
<th>Grade</th>
<th>Definition</th>
<th>Valve Anatomy</th>
<th>Valve Hemodynamics*</th>
<th>Associated Cardiac Findings</th>
<th>Symptoms</th>
</tr>
</thead>
</table>
| A     | At risk of MR | • Normal valve leaflets, chords, and annulus in a patient with coronary disease or cardiomyopathy | • No MR jet or small central jet area $\leq 20\%$ LA on Doppler  
• Small vena contracta $< 0.30$ cm | • Normal or mildly dilated LV size with fixed (infarction) or inducible (ischemia) regional wall motion abnormalities  
• Primary myocardial disease with LV dilation and systolic dysfunction | • Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy |
| B     | Progressive MR | • Regional wall motion abnormalities with mild tethering of mitral leaflet  
• Annular dilation with mild loss of central coaptation of the mitral leaflets | • ERO $< 0.40$ cm$^2$†  
• Regurgitant volume $< 60$ mL  
• Regurgitant fraction $< 50\%$ | • Regional wall motion abnormalities with reduced LV systolic function  
• LV dilation and systolic dysfunction due to primary myocardial disease | • Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy |
| C     | Asymptomatic severe MR | • Regional wall motion abnormalities and/or LV dilation with severe tethering of mitral leaflet  
• Annular dilation with severe loss of central coaptation of the mitral leaflets | • ERO $\geq 0.40$ cm$^2$†  
• Regurgitant volume $\geq 60$ mL  
• Regurgitant fraction $\geq 50\%$ | • Regional wall motion abnormalities with reduced LV systolic function  
• LV dilation and systolic dysfunction due to primary myocardial disease | • Symptoms due to coronary ischemia or HF may be present that respond to revascularization and appropriate medical therapy |
| D     | Symptomatic severe MR | • Regional wall motion abnormalities and/or LV dilation with severe tethering of mitral leaflet  
• Annular dilation with severe loss of central coaptation of the mitral leaflets | • ERO $\geq 0.40$ cm$^2$†  
• Regurgitant volume $\geq 60$ mL  
• Regurgitant fraction $\geq 50\%$ | • Regional wall motion abnormalities with reduced LV systolic function  
• LV dilation and systolic dysfunction due to primary myocardial disease | • HF symptoms due to MR persist even after revascularization and optimization of medical therapy  
• Decreased exercise tolerance  
• Exertional dyspnea |

*ERO = Effective regurgitant orifice area
†Regional effective regurgitant area (ERA)
Stages of Chronic MR

- The best therapy for chronic secondary MR is not clear because MR is only 1 component of the disease, with clinical outcomes also related to severe LV systolic dysfunction, coronary disease, idiopathic myocardial disease, or other diseases affecting the heart muscle.
- There are instances in which both primary and secondary MR are present.
- In patients with secondary MR, compared with primary MR, adverse outcomes are associated with a smaller calculated effective regurgitant orifice.

Why secondary MR has worse prognosis?

- Severity of secondary MR may increase over time because of the associated progressive LV systolic dysfunction
- Doppler methods for calculations of effective regurgitant orifice area by the flow convergence method may underestimate severity because of the crescentic shape of the regurgitant orifice, and multiple parameters must be used to determine the severity of MR
- Even so, on the basis of the criteria used for determination of “severe” MR in RCTs of surgical intervention for secondary MR, the recommended definition of severe secondary MR is now the same as for primary MR (effective regurgitant orifice ≥0.4 cm² and regurgitant volume ≥60 mL), with the understanding that effective regurgitant orifice cutoff of >0.2 cm² is more sensitive and >0.4 cm² is more specific for severe MR

Quantitative parameters for severe MR included RF >50%, RVol >60 ml, and EROA >0.4 cm².

These values were derived from a single-center observational study comparing RVol and EROA calculated by the proximal isovelocity surface area (PISA) method, quantitative Doppler, or the average of both methods to angiographic grading in 180 consecutive patients (Circulation 1997;96:3409–15).

LV angiography and echocardiography were performed within 3 months of each other.
### Chronic Primary MR - Recommendations

| IIb | B | Transcatheter mitral valve repair may be considered for severely symptomatic patients (NYHA class III to IV) with chronic severe primary MR (stage D) who have favorable anatomy for the repair procedure and a reasonable life expectancy but who have a prohibitive surgical risk because of severe comorbidities and remain severely symptomatic despite optimal GDMT for heart failure (HF) (124). | 2014 recommendation remains current. |

Nishimura, et al. 2017 AHA/ACC Focused Update on VHD
Ανεπάρκεια μιτροειδούς βαλβίδας

- Αναστολείς νευροορμονικού άξονα
- CRT
- Χειρουργική αντιμετώπιση
- Mitral clip

Isolated surgery of non-ischaemic regurgitant mitral valve in patients with severe functional mitral regurgitation and severe LV systolic dysfunction (LVEF <30%) may be considered in selected patients in order to avoid or postpone transplantation.
Hemodynamic Considerations

- An EROA >0.6 cm² is nearly impossible in secondary MR (unless the LV is extremely large) because MR cannot exceed 100% of total LV stroke.

- An underappreciated dependence of both EROA and RVol on LVEDV is evident, such that an EROA of 0.2 cm² can be associated with RF >50% when LVEDV is normal, but is typically 0.3 cm² at moderately dilated LVEDV values (220 to 240 ml) typical of most clinical trials in heart failure.

- Only at very large LVEDV values is EROA 0.4 cm² associated with RF >50%.
Furthermore, the relationship between EROA and LVEDV is influenced by the mean systolic pressure gradient between the LV and LA, with higher EROA values in decompensated HF patients with hypotension and elevated LA pressure compared with hypertensive patients with normal LA pressure.

- LVEF has an important role (60 ml RVol presumes LVEF is 40% or more and dilated LV; RVol <30 ml can be associated with RF >50% in smaller ventricles or very low LVEF).

The Dynamic Nature of Secondary MR

- EROA also varies notoriously with loading conditions, commonly seen during hypertensive crises and heart failure exacerbations.

- Functional MR severity changes over time with medical therapy, revascularization, and cardiac resynchronization therapy.

- The guidelines do not address how to approach the dynamic nature of secondary MR.

The gap between evidence (guidelines) and clinical practice

• Appropriate settings for optimal follow-up of these patients are not ubiquitous.

• A substantial number of patients are referred for surgery too late in the disease course with long-standing and advanced symptoms, resulting in increased operative risk and suboptimal long-term outcomes.

• Stated reasons for deferring surgery, such as older age, co-morbidities, and poor left ventricular (LV) function illustrate the knowledge gap in the management of VHD as many of these are not considered contraindications to valve intervention.

• In the Euro Heart Survey, surgery was denied to 33% of elderly patients with severe symptomatic aortic stenosis and to 50% of patients with severe symptomatic mitral regurgitation; a high proportion of patients with symptomatic VHD were, thus, inappropriately treated medically.

European Heart Journal (2013) 34, 1597–1606
In 5,737 patients, FMR (74%) and degenerative MR (DMR) (21%) were the predominant mechanisms of MR. MV surgery was performed in 47% (518 of 1,095) of patients, whereas 53% (577 of 1,095) of patients were unoperated and medically managed. Over a mean follow-up period of 4.5 years, ACE-I (31% to 63%), ARB (13% to 25%), BB (35% to 82%), and MRA (13% to 33%). CRT (17%), PCI (10%).

JACC Vol. 63, No. 2, 2014
Independent prognostic value of functional mitral regurgitation in patients with heart failure

Severe FMR was defined quantitatively as ERO>0.2 cm² or RV>30 ml or VC>0.4 cm.

FMR is strongly associated with outcome after adjustment for LVEF and restrictive mitral filling pattern (Dec E<140msec) in patients with both ischaemic and non-ischaemic DCM.

Heart 2011;97:1675e1680
Prognostic implications of functional mitral regurgitation according to the severity of the underlying chronic heart failure: a long-term outcome study

- Acker et al. found that in dilated hearts, mitral valve repair had effects only in modest LV remodeling.
- Similarly, Braun et al. demonstrated in a cohort of patients with ischaemic mitral regurgitation that LV reverse remodelling occurred in the group with an LV end-diastolic diameter <65 mm, while no benefit was demonstrated for patients with an LV end-diastolic diameter >65 mm.
- FMR was independently associated with increased risk of death and heart transplantation in patients with less severe CHF symptoms and in patients at lower overall risk.

European Journal of Heart Failure (2010) 12, 382–388
Percutaneous mitral valve repair: The last chance for symptoms improvement in advanced refractory chronic heart failure?

- Seventy-five consecutive patients with FMR grade ≥ 3+ and severe HF symptoms despite optimal medical therapy and CRT underwent PMVR with the MitraClip system (mean age: 67±11 yrs, logEuroSCORE =23±18%, LVEF= 30±9%).

Int J of Cardiol 228 (2017) 191–197
Ασθενής 60 ετών, CABG, CRT-D, EF=20%, συχνές νοσηλείες με οιδήματα ανά σάρκα, ασκίτη, ισχαιμική ηπατίτιδα ONA, εκφορτίσεις απινιδωτή, σοβαρή MVR
<table>
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<th>Day</th>
<th>1st</th>
<th>2nd</th>
<th>4th</th>
<th>5th</th>
<th>6th</th>
<th>7th</th>
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<td>37.4</td>
<td>37.3</td>
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<td>Glu</td>
<td>141</td>
<td>126</td>
<td>121</td>
<td>99</td>
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<td>81</td>
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<td>74</td>
<td>66</td>
<td>64</td>
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<td>2.5</td>
<td>2.8</td>
<td>2.4</td>
<td>1.8</td>
<td>1.6</td>
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<td>9.3</td>
<td>8.9</td>
<td>8.4</td>
<td>8.2</td>
<td>7.3</td>
<td>6.9</td>
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<td>Na/K</td>
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<td>128/3.9</td>
<td>128/3.7</td>
<td>131/3.8</td>
<td>130/3.6</td>
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<td>γGT</td>
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<td>156</td>
<td>98</td>
<td>72</td>
<td>55</td>
<td></td>
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<td>Billirubin</td>
<td>5.0</td>
<td>12.2</td>
<td>14.8</td>
<td>10.7</td>
<td>8.7</td>
<td>4.6</td>
<td>3.1</td>
</tr>
<tr>
<td>SGOT/SGPT</td>
<td>1286/1410</td>
<td>2710/1798</td>
<td>2460/4954</td>
<td>694/1050</td>
<td>398/717</td>
<td>198/521</td>
<td>124/212</td>
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<td>BNP pg/ml</td>
<td>1118</td>
<td>1262.4</td>
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<td>Med treat</td>
<td>Lasix 180 tv Aldactone 50mg, noradrenaline 5μg/Kg/min ACE, b blocker was discontinued.</td>
<td>Lasix 180 tv Aldactone 50 Noradrenaline, dobutamine, N/S</td>
<td>Indapamide 2.5mg Lasix 120-180; Aldactone, noradrenaline, dobutamine, N/S</td>
<td>Indapamide 2.5mg Lasix 120-180; Aldactone, noradrenaline, dobutamine, N/S</td>
<td>Lasix 120mg indapamide Aldactone 50, levosimendan 0.1 μg/kg/min, carvedilol</td>
<td>Lasix 120mg, indapamide Aldactone 50, carvedilol</td>
<td>Lasix 120mg, indapamide Aldactone, noradrenaline, levosimendan,</td>
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<tr>
<td>V urine (ml)</td>
<td>800</td>
<td>1000</td>
<td>1800</td>
<td>2100</td>
<td>3800</td>
<td>4100</td>
<td>3800</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>81</td>
<td>80</td>
<td>78</td>
<td>74</td>
<td>73</td>
<td>71</td>
<td></td>
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</tbody>
</table>
23/08/2016 NYHA I-II, 80 mg furosemide, eplerenone 25 mg, carvedilol 25 mg, valsartan 40-60mg
Creatinine=1.9 mg/dl
Επανελεγχος 26/4/2017 σε NYHA II
Ασθενής 77 ετών με χειρουργηθείσα στεφανιαία νόσο, NYHA IV, υπο πλήρη φαρμακευτική αγωγή με συχνές μηνιαίες νοσηλείες για απορρύθμιση κλινικού σταδίου. KE=30%, πνευμονική υπέρταση, Σοβαρή MR

M Chrysocheris
Percutaneous mitral valve repair

The MitraClip device is a small clip that is attached to your mitral valve. It treats mitral regurgitation by allowing your mitral valve to close more completely, helping to restore normal blood flow through your heart.
Secondary MR in Heart Failure: Interaction Between the Etiology of MR and the Relative Success Rates of MV Surgery and MitraClip in the Randomized EVEREST II Trial

Success was defined as freedom from the combined outcome of death, MV surgery, or reoperation, or MR >2+ (echocardiographic core laboratory determination). Adapted with permission from Feldman et al. (88) and Mauri et al. (89). EVEREST II = Endovascular Valve Edge-to-Edge REpair Study; MR = mitral regurgitation; MV = mitral valve.
The MITRACLIP evidence base: Trials and Registries

• The Endovalvular Valve Edge-to-Edge Repair Study (EVEREST) phase I study enrolled 107 low-risk patients with either primary or secondary MR and established the safety and efficacy of MitraClip, although 25% underwent surgery at 3 years because of recurrent MR.

• The EVEREST II study randomized 279 low-to-intermediate-risk patients in a 2:1 fashion to either MitraClip or isolated mitral surgery. Patients had either primary (73%) or secondary (27%) MR and had conventional indications for surgery. At 5-year follow-up, there was no difference in survival between the MitraClip and surgical arms for either primary or secondary MR. However, freedom from surgery was significantly worse in primary MR patients assigned to MitraClip (69 vs. 95%), whereas no difference was seen in those with secondary MR.

• Patients with a successful index MitraClip procedure had similar freedom from surgery to the surgical arm, highlighting the importance of patient selection and operator experience in procedural outcomes.
Spectrum of diseases treatable with MitraClip

- Carpentier type I, normal leaflet motion with annular dilation;
- type II, increased leaflet motion (leaflet prolapse or flail);
- type IIIb, restricted leaflet motion in systole, seen in ischemic cardiomyopathy.

Eur Heart J 2011; 32:2350–2357
Mitral clip clinical trials

### Table 1. Large MitraClip registries: selected patient characteristics and outcomes

<table>
<thead>
<tr>
<th>Study (Reference)</th>
<th>N</th>
<th>Age</th>
<th>NYHA (3/4 pre)</th>
<th>Secondary (mitral regurgitation)</th>
<th>LVEF</th>
<th>Mitral regurgitation reduction</th>
<th>NYHA (3/4 post)</th>
<th>Mortality (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRAMI [23]</td>
<td>1067</td>
<td>75</td>
<td>87</td>
<td>71</td>
<td>30%</td>
<td>96% mitral regurgitation ≤2+</td>
<td>24</td>
<td>12% at 85 days</td>
</tr>
<tr>
<td>Euro. Sentinel [24]</td>
<td>628</td>
<td>74</td>
<td>86</td>
<td>72</td>
<td>43%</td>
<td>98% mitral regurgitation ≤2+</td>
<td>23</td>
<td>15% at 1 year</td>
</tr>
<tr>
<td>ACCESEU [25]</td>
<td>567</td>
<td>78</td>
<td>85</td>
<td>77</td>
<td>53%</td>
<td>91% mitral regurgitation ≤2+</td>
<td>29</td>
<td>18% at 1 year</td>
</tr>
<tr>
<td>EVEREST II, REALISM [26]</td>
<td>351</td>
<td>76</td>
<td>85</td>
<td>70</td>
<td>48%</td>
<td>84% mitral regurgitation ≤2+</td>
<td>27</td>
<td>22% at 1 year</td>
</tr>
<tr>
<td>GRASP [27]</td>
<td>304</td>
<td>71</td>
<td>83</td>
<td>79</td>
<td>37%</td>
<td>92% mitral regurgitation ≤2+</td>
<td>22</td>
<td>11% at 1 year</td>
</tr>
</tbody>
</table>

**EVEREST, Endovascular Valve Edge-to-Edge Repair Study; LVEF, left ventricular ejection fraction; NYHA, New York Heart Association; TRAMI, Transcatheter Mitral Valve Interventions.**

### Table 2. Novel therapeutic targets for MitraClip

- Failed surgical annuloplasty rings
- Acute papillary muscle rupture
- Hypertrophic cardiomyopathy and systolic anterior motion
- End-stage heart failure and cardiogenic shock
- CRT nonresponders
A Randomized Study of the MitraClip Device in Heart Failure Patients With Clinically Significant Functional Mitral Regurgitation (RESHAPE-HF)

This trial is a randomized study of the MitraClip device in heart failure patients with clinically significant functional mitral regurgitation. A hierarchical composite of all-cause mortality and recurrent heart failure hospitalizations is hypothesized to occur at a lower rate with the use of the MitraClip device in addition to optimal standard medical therapy compared to optimal standard of care therapy alone.

Primary Outcome Measures:

- Hierarchical composite of all-cause mortality and recurrent heart failure hospitalizations [Time Frame: two years]
  
  The analysis will be carried out when the last patient completes 12-month follow-up. All follow-up, up to 24 months, will be included in the analysis.

Secondary Outcome Measures:

- Composite of all-cause mortality, stroke, myocardial infarction, new need for renal replacement therapy, and non-elective cardiovascular surgery for device related complications in the Device group at 30 days [Time Frame: 30 days]
- Mitral regurgitation severity reduction to mild or mild-to-moderate at 12 months [Time Frame: 12 months]
- Change in Left Ventricular End Diastolic Volume (LVEDV) at 12 months over baseline [Time Frame: 12 months]
- Change in Left Ventricular End Systolic Volume (LVESV) at 12 months over baseline [Time Frame: 12 months]
- Change in 6 Minute Walk Test (6MWT) distance at 12 months over baseline [Time Frame: 12 months]
- Change in Quality of Life (QoL) score, as measured by Kansas City Cardiomyopathy Questionnaire (KCCQ), at 12 months over baseline [Time Frame: 12 months]
- New York Heart Association (NYHA) Functional Class III at 12 months [Time Frame: 12 months]
The COAPT Trial

The COAPT Trial is a trial in the U.S. and Canada that will study an investigational device in patients who have functional mitral regurgitation and are not appropriate candidates for mitral valve surgery.

Patients will be randomly assigned to a Device Group or Control Group. Both groups will receive the current recommended treatment, also known as the standard of care. For patients with mitral regurgitation who are not appropriate candidates for mitral valve surgery, the standard of care may include one or more of these therapies:

- Medications
- Implantation of a pacemaker, a device that delivers electrical impulses to help the heart beat normally
More mitral-clip evidence

- A recent meta-analysis of 875 patients from nine studies investigated the impact of MitraClip on secondary MR.
- On an average, 1.48 clips were implanted/patient and after a median follow-up of 9 months, 78% were NYHA I/II and 89% had less than 2þ mitral regurgitation, with 15% mortality.
- Moreover, 6-min walk test improved by 100 m, and a significant reduction in LV volumes and pulmonary pressures was seen.
- Increased LV systolic volumes at baseline were associated with a significant reduction in volumes after MitraClip, whereas baseline atrial fibrillation reduced the positive effect of MitraClip on ejection fraction and LV volumes.

A meta-analysis of MitraClip system versus surgery for treatment of severe mitral regurgitation

Patients in the MitraClip group were older, had a higher EuroSCORE and a lower LVEF at baseline. The number of patients with post-procedure residual MR severity >2 was significantly higher in the MitraClip.  

Mitral clip in clinical practice
<table>
<thead>
<tr>
<th></th>
<th>EVEREST II (30-day FU)⁷</th>
<th>TRAMI¹⁵ (EuroSCORE ≥20%/EuroSCORE &lt;20%), data for in-hospital events</th>
<th>ACCESS-EU¹</th>
<th>Meta-analysis¹⁸</th>
</tr>
</thead>
<tbody>
<tr>
<td>Procedural death</td>
<td>0.0%</td>
<td>–</td>
<td>0.0%</td>
<td>0.1%</td>
</tr>
<tr>
<td>30-Day mortality</td>
<td>7.7%</td>
<td>4.3%/1.1% (in hospital)</td>
<td>3.4%</td>
<td>4.2%</td>
</tr>
<tr>
<td>All-cause mortality during FU</td>
<td>24.4%</td>
<td>13.4%/9.6% (mean FU of 72 days)</td>
<td>17.3% (12-month FU)</td>
<td>15.8% (mean FU of 310 days)</td>
</tr>
<tr>
<td>Vascular complications</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>1.0%</td>
</tr>
<tr>
<td>needing intervention</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Major bleeding requiring</td>
<td>17.9%</td>
<td>13.7%/8.7%</td>
<td>–</td>
<td>9.7%</td>
</tr>
<tr>
<td>transfusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bleeding complications</td>
<td>–</td>
<td>3.9%</td>
<td>–</td>
<td></td>
</tr>
<tr>
<td>Tamponade or significant</td>
<td>–</td>
<td>1.1%/1.6%</td>
<td>1.1%</td>
<td>0.7%</td>
</tr>
<tr>
<td>pericardial effusion</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Emergent cardiac surgery</td>
<td>0.0%</td>
<td>–</td>
<td>0.4%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Nonfatal myocardial infarction</td>
<td>2.6%</td>
<td>0.0%/0.2%</td>
<td>0.7%</td>
<td>0.4%</td>
</tr>
<tr>
<td>Chordal rupture</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>0.8%</td>
</tr>
<tr>
<td>Single leaflet clip detachment</td>
<td>–</td>
<td>4.8% (diagnosed within 6 months)</td>
<td></td>
<td>2.3%</td>
</tr>
<tr>
<td>Clip embolism</td>
<td>–</td>
<td></td>
<td>0.0%</td>
<td>0.04%</td>
</tr>
<tr>
<td>Hemorrhagic or ischemic stroke/TIA</td>
<td>2.6%</td>
<td>0.7%/0.0%</td>
<td>0.7%</td>
<td>1.3%</td>
</tr>
<tr>
<td>Acute renal failure</td>
<td>3.8%</td>
<td>1.8%/0.2% (dialysis at discharge)</td>
<td>4.8%</td>
<td>4.2%</td>
</tr>
<tr>
<td>Need for repeat MitraClip</td>
<td>0.0%</td>
<td>1.8%/1.6%</td>
<td>3.4%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

**Abbreviations:** EuroSCORE, European System for Cardiac Operative Risk Evaluation; FU, follow-up; TIA, transient ischemic attack.
Timeline of FDA Approval of Mitral Repair Devices, Procedure Volume, and Mortality

Mortality (In Hospital)

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
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<td>2013</td>
<td>48</td>
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<tr>
<td>2014</td>
<td>1,141</td>
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<tr>
<td>2015</td>
<td>2,556</td>
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</table>

Role of Echocardiography in Percutaneous Mitral Valve Interventions

- Assessing the mechanism of MR
- Quantitating the severity of MR
- Guiding transseptal crossing
- Aligning the delivery system perpendicular to the mitral plane at the location of the MR jet
- Alignment of clip’s arms perpendicular to MV coaptation line
- Determining success of grasping both leaflets
- Verification of clip stability after release from delivery system
- Reassessing MR severity
- Locating of persistent leak(s)
Predictors of outcome in patients undergoing MitraClip implantation: An aid to improve patient selection

The 2-year survival was 81%. Predictors for two-year mortality in multivariate analysis were:
- Baseline NT-proBNP $\geq 5000 \mu$g/L (HR: 5.4, 95% CI: 1.8–16.2),
- Previous valve surgery (HR: 4.5, 95% CI: 1.7–12.2),
- Tricuspid regurgitation (TR) $\geq$ grade 3 prior to MCI (HR: 2.8, 95% CI: 1.2–6.8) and
- Absence of MR reduction after MCI (HR: 2.1, 95% CI: 1.2–3.8).

The 2-year survival of patients with 0, 1 or $\geq 2$ of these predictors was: 87%; 78% and 38%
Conclusions

- Mitral valve surgery is recommended in patients with severe symptomatic MR.
- Quantification of MR severity is an imperfect art.
- The role of MV surgery is unclear in patients with severe MR secondary to left ventricular dysfunction. (the heart is sick)
- The current class IIb recommendation for MV surgery in the presence of LV dysfunction is based on lack of survival benefit and a high recurrence rate of MR.
- Many patients with severe MR are at high surgical risk due to advanced age, LV dysfunction, or comorbidities.
- The MitraClip device provides a novel percutaneous option for patients with severe MR with significant improvement (less re-hospitalizations).
- Recent data from the MitraClip device clinical trials show significant LV and LA remodeling in secondary MR when MR is reduced from severe (as previously defined) to either mild or moderate.