Cardiac Rehabilitation after Mitral Valve Repair or Replacement

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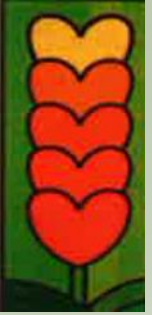
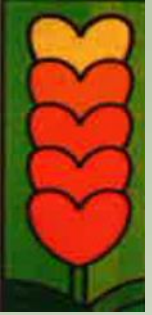


Conflict of interest

none



After Heart Valve Surgery

Cardiac rehabilitation usefulness is poorly documented (Litterature and Guidelines)

While....

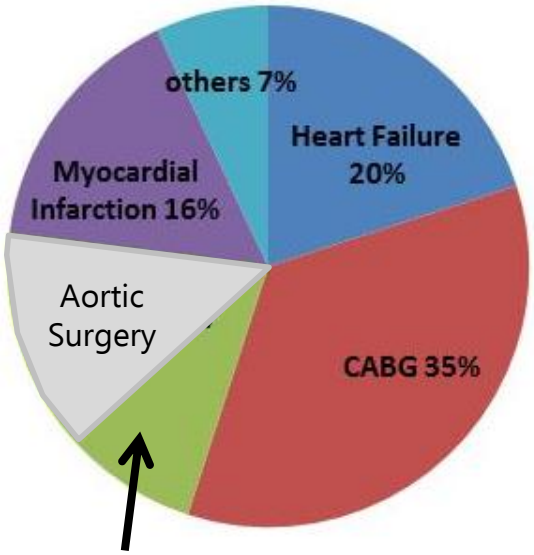
...We should be interested in these patients

They seem to need us

- **Pre-op asymptomatic patients**
  (Younger patients: MV repair)
  - ✓ **Returning to work**
  - ✓ **Being asymptomatic**

- **Pre-op symptomatic patients**
  (Elderly patients)
  - Surgical trauma and complications
  - ✓ **Being self-sufficient**

They are quite numerous



Post-mitral surgery : 5-10 %

Questions about Exercise Training (*ET*) after Mitral Surgery

- **Is it safe ?**
- **Is it necessary ?**
- **Is it efficient in this setting ?**

  Is *ET* as efficient after mitral surgery as in other cardiac patients ?

Supplementary question

Could *ET* be Problematic[1] ?
Clinical Safety

- **Short term problems: during Exercise Training sessions**
  - ✓ **Mitral gradient increase, uncontrolled heart rate, atrial fibrillation…**
  - **- Acute Heart Failure…**

(1) Bethesda 36. J Am Coll Cardiol 2005;1334-40.

ET Safety During the Sessions ?

1) **French multicentric registry of complications during cardiac rehabilitation:**

   Looking for events occurring during or up to 1 hour after exercise testing or training

   25 420 patients:

   - ✓ **4 350 patients < 1 month after heart valve surgery**
   - ✓ **Mitral: 20 % ≈ 1000 pts**

2) **German single-center study:**

   475 patients trained after mitral surgery

No adverse events related to exercise in post-mitral surgery patients

Pavy B, Iliou MC, Meurin P et al. Arch intern Med 2006;166:2329-34.
Gohlke-Barwolf C et al. J Heart valve Dis 1992

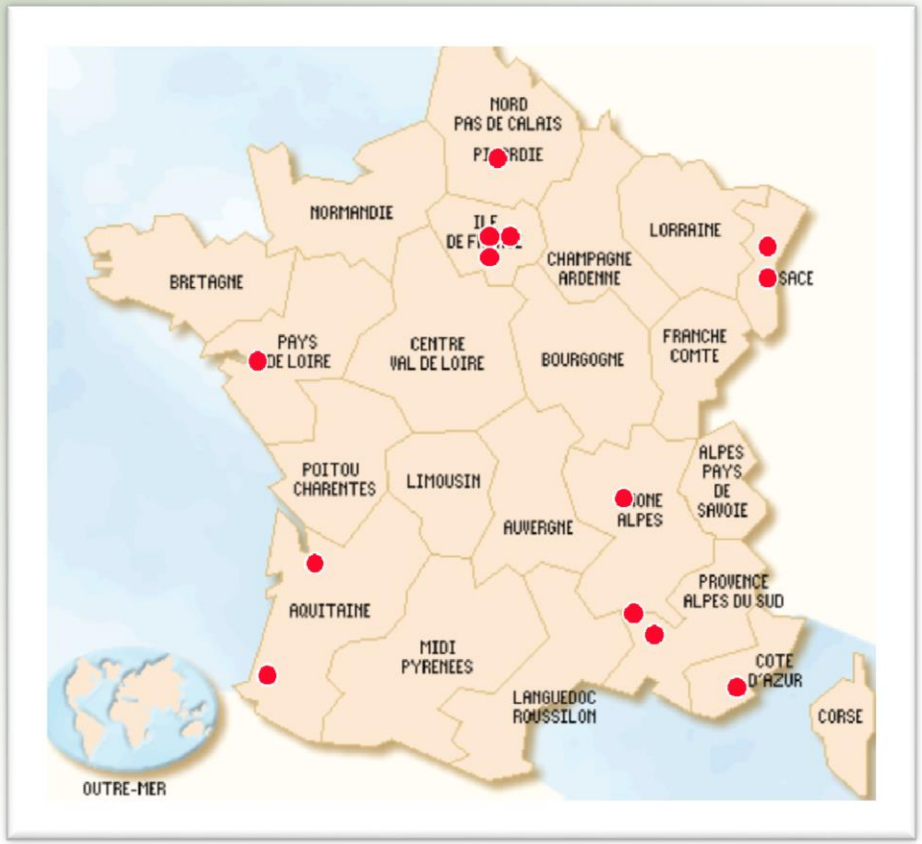
Could *ET* be problematic[1] ?
Echographic Safety

Could regular exercise accelerate the deterioration of a mitral prosthesis or repair ?

(1) Bethesda 36. J Am Coll Cardiol 2005;1334-40.

ET Echographic Safety: Does Exercise Deteriorate MV Repair ?

251 patients (mean age: 59) 16 ± 10 days after surgery

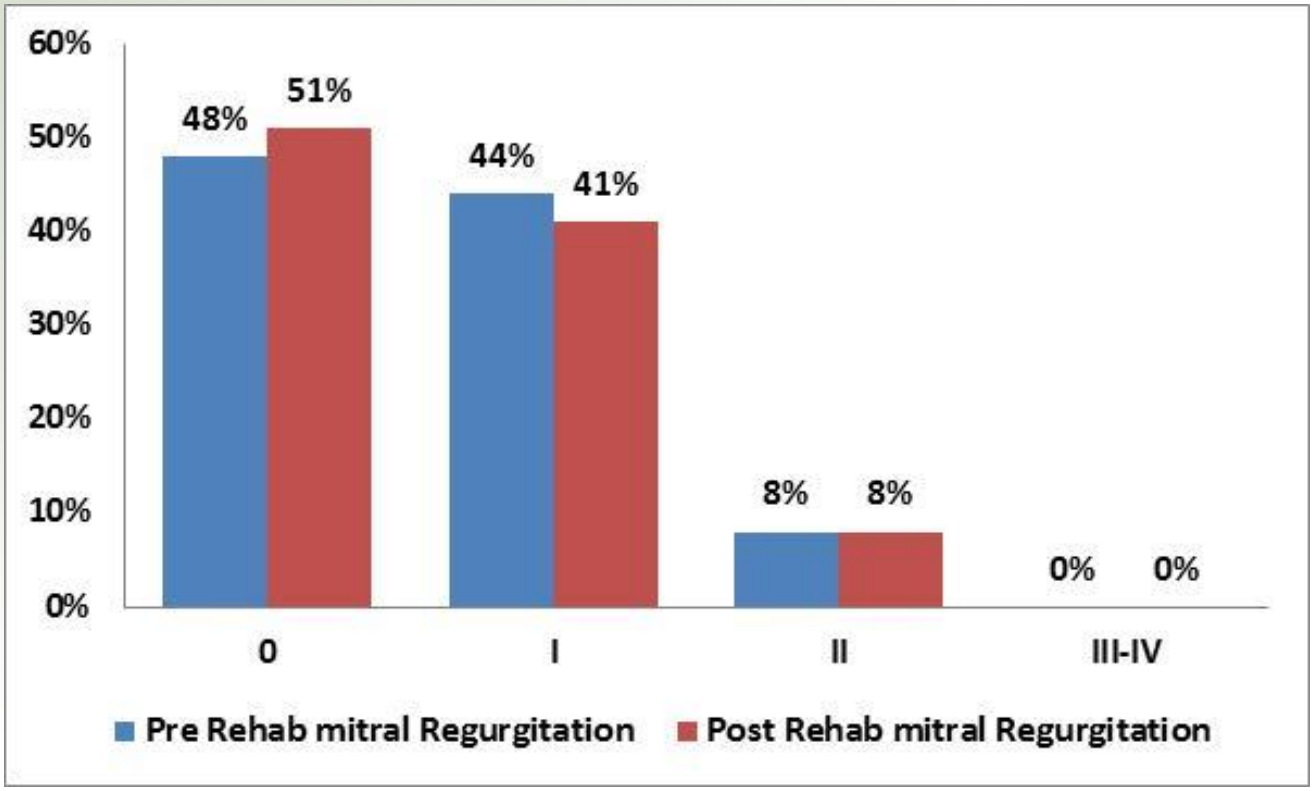


- **First Echo and CPT**
  - **19 ± 10 days after surgery**
- **3-week *ET* program**
  - **Daily bicycle + gym**
- **Second Echo and CPT**
  - **39 ± 10 days after surgery**

Meurin P, Iliou MC, Bendriss A. Chest 2005;128:1638-44.

ET does not deteriorate mitral repair

Post-op residual MR evolution after Training: no aggravation

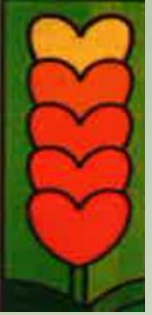


No adverse events related to exercise

To sum-up, *ET* after mitral valve surgery is safe[1]

« Following mitral surgery, athletes can return to sports although they should avoid high static and high dynamic sports. »

(1) Bethesda 36. J Am Coll Cardiol 2005;1334-40.



Is *E*xercise *T*raining necessary ?

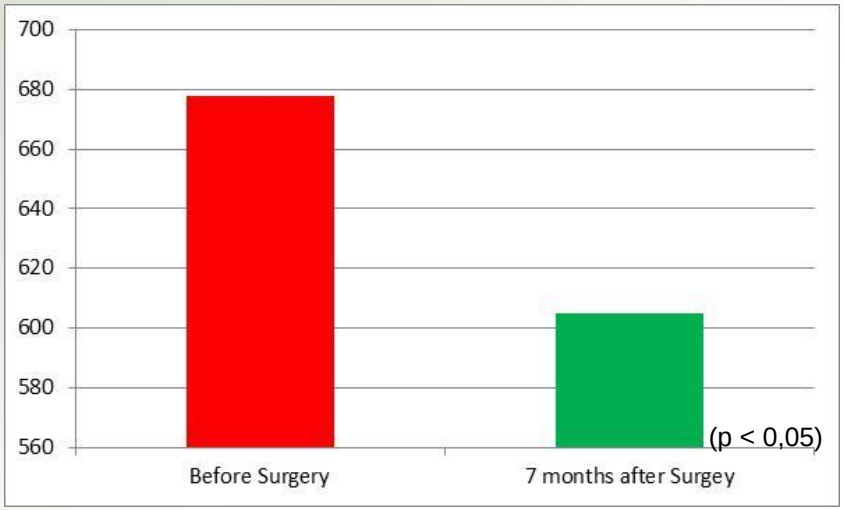
Does patients recover their physical capacity completely and spontaneously after Mitral Surgery ?

- If they do, there is no point in training these patients

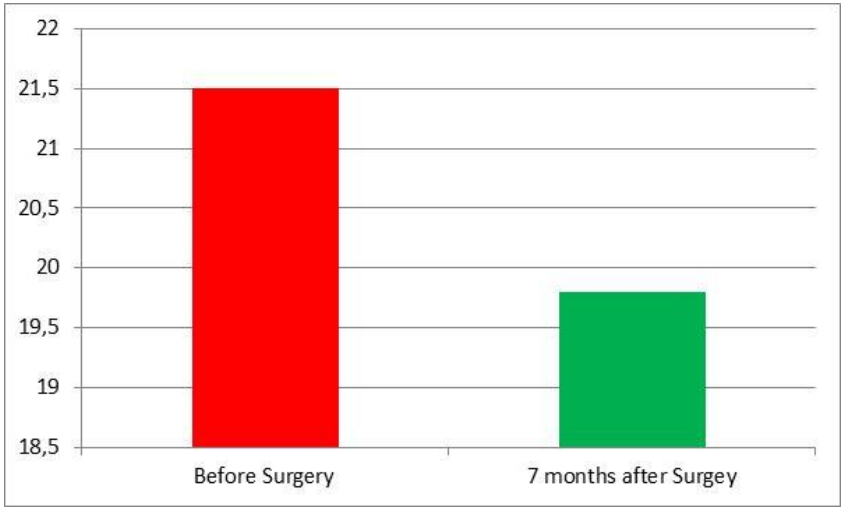
Exercise tolerance after mitral valve repair[1,2]

216 ± 80 days after mitral valve surgery

Exercise Duration (sec)

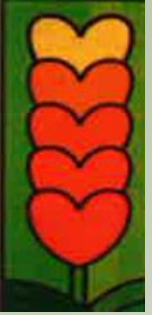


VO2 Peak



They returned to their regular life

(1) Le Tourneau. J Am Coll Cardiol 2000;36:2263-9.
(2) Kim HJ. Am J Cardiol 2004;93:1187-89.



Is-it efficient in this setting?

(Evidence Based Medecine)

Few studies… old and with questionable methodologies

- n = 10 to 68 (157 patients total)
  - ✓ Mostly after aortic surgery
  - ✓ No randomized study after mitral surgery
- Late exercise training programs:

  ET beginning at least 8 weeks (to three years) after surgery:

  - ✓ Not in keeping with daily life practice: Post-op day **10-15**

(1) Sire S. Eur Heart J 1987;8:1215-20.
(2) Jairath. J Cardiopulm Rehabil 1995;15:424-30.
(3) Toyomasu K. Jpn Circ J 1990;54 :1451-8.
(4) Habel-Verge et al . CMAJ 1987;136(2):142-7

3 studies are worth to be presented

- **Douard et al[1]**

  13 patients trained early after **balloon mitral valvuloplasty**

  ✓ Peak VO_2 improved in trained patients but not in the control group

- **Gohlke-Barwolf C et al[2]: « Pionneer » study**

  475 mitral replacement:

  ✓ exercise training modalities

  » Seems to begin late: exercise tests 1 and 6 months after surgery

- **French mitral repair study[3]**

(1) Douard H et al . Eur Heart J 1997;18:464-9.
(2) Gohlke-Barwolf C et al. J Heart valve Dis 1992;189-195.
(3) Meurin P, Iliou MC, Bendriss A. Chest 2005;128:1638-44

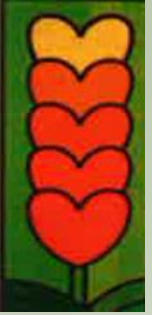
French Multicentric Registry (MV Repair)
251 patients included 16 ± 10 days after surgery

3-week ET program

- 13.7 ± 5.4 gymnastic sessions
- 11 ± 4 bicycle training sessions
  - ✓ Mean training workload 58.3 ± 27.5 Watts

	% increase	p
Peak VO2	+ 22 %	10^{-4}
AT	+ 16 %	10^{-4}
Ex duration	+ 34 %	10^{-4}

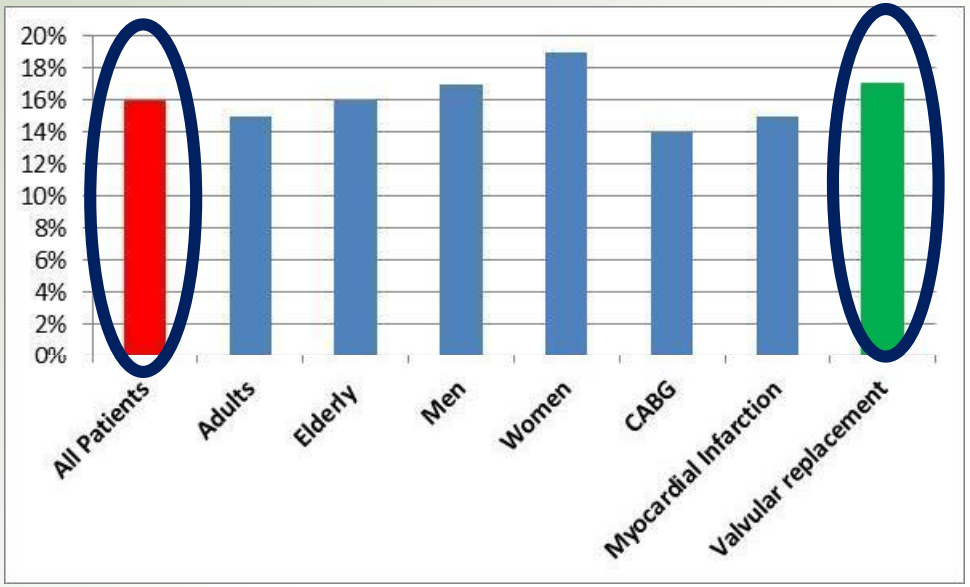
Meurin P, Iliou MC, Bendriss A. Chest 2005;128:1638-44



Is *E*xercise *T*raining more or less efficient after mitral valve surgery than in other cardiac diseases ?

Post heart valve surgery: ET has the same efficacy as in other populations

Post Rehab Peak VO_2 Improvement in various cardiac conditions



Whatever the diagnosis…

… Peak VO2 incresased in the same proportion after ***ET***

Temfeno A et al. Cardiol J 2011;18:632-38.
Vanhees L. Eur J Prev Rehab 2004;11:304-12

Determinants of Exercise capacity improvement

- Training characteristics: frequency and intensity of the sessions
  - ✓ no pain no gain.
- Baseline fitness
  - ✓ The lower the initial Peak VO_2 the easier it is to improve it
- Age and gender? No clear consensus
- Atrial fibrillation: No
- Type of Cardiac Disease: No

Temfeno A et al. Cardiol J 2011; 18: 632-38. Vanhees L. Eur J Prev Rehab 2004;11:304-12
Meurin P, Iliou MC, Bendriss A. Chest 2005; 128:1638-44.
Gohlke-Barwolf C et al. J Heart valve Dis 1992

Recommendations[1]

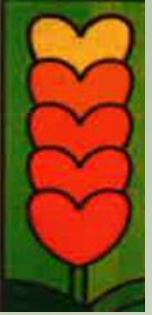
- Evaluation:

  - ECG, Echo, clinical evaluation
  - Exercise Test: systematic:
    - ✓ Sub-maximal : 10-14 days post op
    - ✓ Symptom limited: 3-4 weeks

- Training sessions:

  - « Aerobic »:
    - ✓ 20 to 60 min; 3 to 5 times per week
    - ✓ Intensity assessed by The« talk test » (Borg 12-14) or a training heart rate
    - ✓ **Control heart rate (specially in AF, specially in MV replacement)**
  - Resistance:
    - ✓ 2-3 times a week
  - Pulmonary rehabilitation

(1) Gohlke-Barwolf C. Exercise training in valvular heart disease. Springer ed. Chap 20



Cardiac Rehabilitation ≠ Exercise Training

To finish my talk …

Rehabilitation after Heart Valve Surgery: European Recommendations

« A multidisciplinary programme should be available for all patients undergoing valve surgery »

- Management of post-operative complications
  - Atrial fibrillation, pericardial effusion, heart failure…
- Anticoagulation management
- Therapeutical education
  - Secondary prevention (20%: concomittant CABG)
- Return-to-work counseling
- Exercise training ….

Butchart E, Gohlke-Barwolf C, Antunes MJ et al. Recommendations for the management of patients after heart valve surgery; Eur Heart J 2005: 26: 2463-71

Conclusion

- Early after Mitral valve surgery, an exercise training program:
  - Seems to allow for better and faster recovery
  - Results are not modified by:
    - ✓ Valve
    - ✓ Age
    - ✓ Rythm
    - ✓ LVEF
- Furthermore, it allows
  - Education (VKA, endocarditis…)
  - Management of early post-operative complications