Five in Fifty: Structural Heart Trials

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HOUSTON Methodist℠
DEBAKEY HEART & VASCULAR CENTER

MITRA-FR Trial

HOUSTON Methodist DEBAKEY HEART & VASCULAR CENTER

- Secondary Mitral Regurgitation: Multicenter open-label randomized trial
- Regurgitant volume > 30 mL/beat or EROA >20 mm^2
- LVEF 15% - 40%
- NYHA II-IV
- One hospitalization for CHF
- Medical treatment for HFrEF by ESC guidelines

Obadia. N Engl J Med.2018;DOI 10.1056/NEJMoa1805374

MITRA-FR Trial

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- Primary EP: Death or Hosp for HF ≤ 12 months.
- Secondary EPs
  - CV death
  - Survival free of
    - Death
    - Stroke
    - MI
    - Unplanned CHF hospitalization

Obadia. N Engl J Med.2018;DOI 10.1056/NEJMoa1805374

Mitra –FR Baseline Characteristics

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	MitraClip (N=152)	Control (N=152)
Age (y)	70.1 ± 10.1	70.6 ± 9.9
Systolic BP (mm Hg)	109 ± 16	108 ± 18
LVEF (%)	33.3 ± 6.5	32.9 ± 6.7
LVEDV (mL/m2)	136.2 ± 37.4	134.5 ± 33.1
EROA (mm2)	31 ± 10	31 ± 11
Regurgitant volume (mL)	45 ± 13	45 ± 14
NT-proBNP ng/mL	3407 (1948-6790)	3292 (1937-6343)

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MITRA FR

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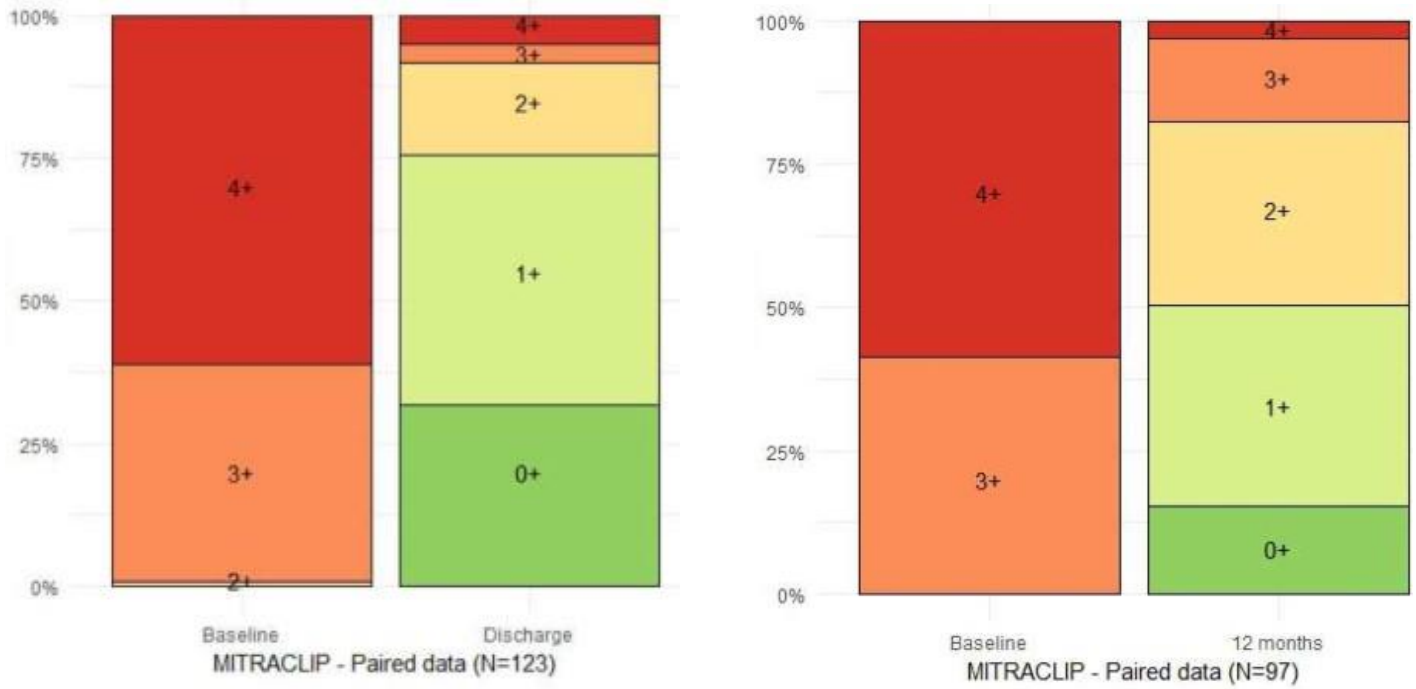
Prespecified Secondary Endpoints

MR Grade evolution Corelab



MITRA-FR: Primary EP

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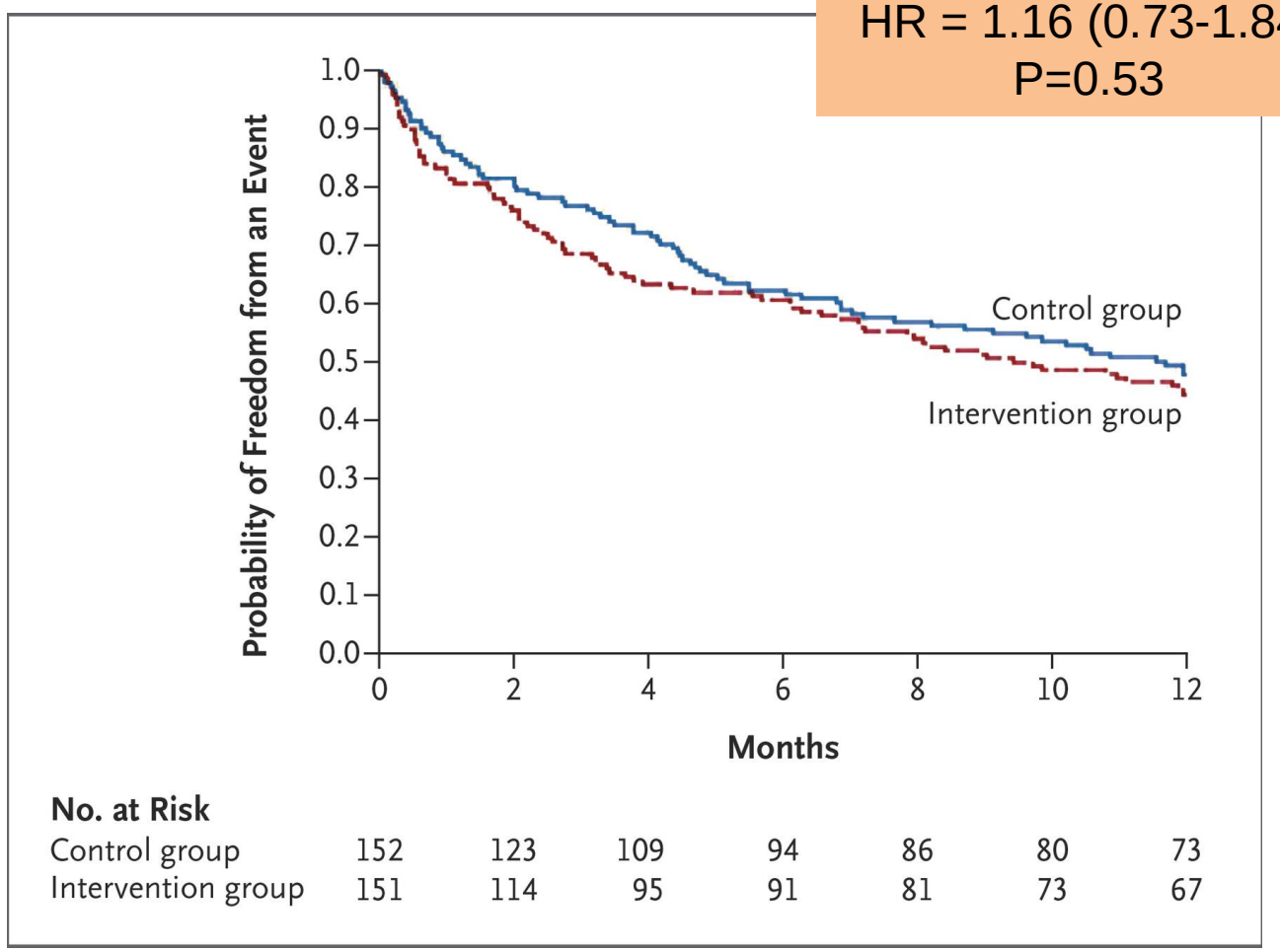
HR = 1.16 (0.73-1.84)
P=0.53



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MITRA-FR: Primary EP

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Table 3. Primary Outcome and Secondary Efficacy Outcomes at 12 Months (Intention-to-Treat Population).

Outcome	Intervention Group (N=152)	Control Group (N=152)	Hazard Ratio or Odds Ratio (95% CI)*	P Value†
Composite primary outcome: death from any cause or unplanned hospitalization for heart failure at 12 months — no. (%)	83 (54.6)	78 (51.3)	1.16 (0.73–1.84)	0.53
Secondary outcomes‡				
Death from any cause	37 (24.3)	34 (22.4)	1.11 (0.69–1.77)	
Cardiovascular death	33 (21.7)	31 (20.4)	1.09 (0.67–1.78)	
Unplanned hospitalization for heart failure	74 (48.7)	72 (47.4)	1.13 (0.81–1.56)	
Major adverse cardiovascular events§	86 (56.6)	78 (51.3)	1.22 (0.89–1.66)	

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MITRA-FR: Technical Success

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Table 2. Periprocedural Complications and Prespecified Serious Adverse Events (Intention-to-Treat Population).*

Variable	Intervention Group (N=152)	Control Group (N=152)
Periprocedural complications during device implantation — no./total no. (%)†	21/144 (14.6)	NA
Device-implantation failure	6/144 (4.2)‡	NA
Hemorrhage resulting in transfusion or vascular complication resulting in surgical intervention	5/144 (3.5)	NA
Atrial septum lesion or atrial septal defect	4/144 (2.8)	NA
Cardiogenic shock resulting in intravenous inotropic support	4/144 (2.8)	NA
Cardiac embolism, including gas embolism and stroke	2/144 (1.4)	NA
Tamponade	2/144 (1.4)	NA
Urgent conversion to heart surgery	0	NA

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MITRA FR

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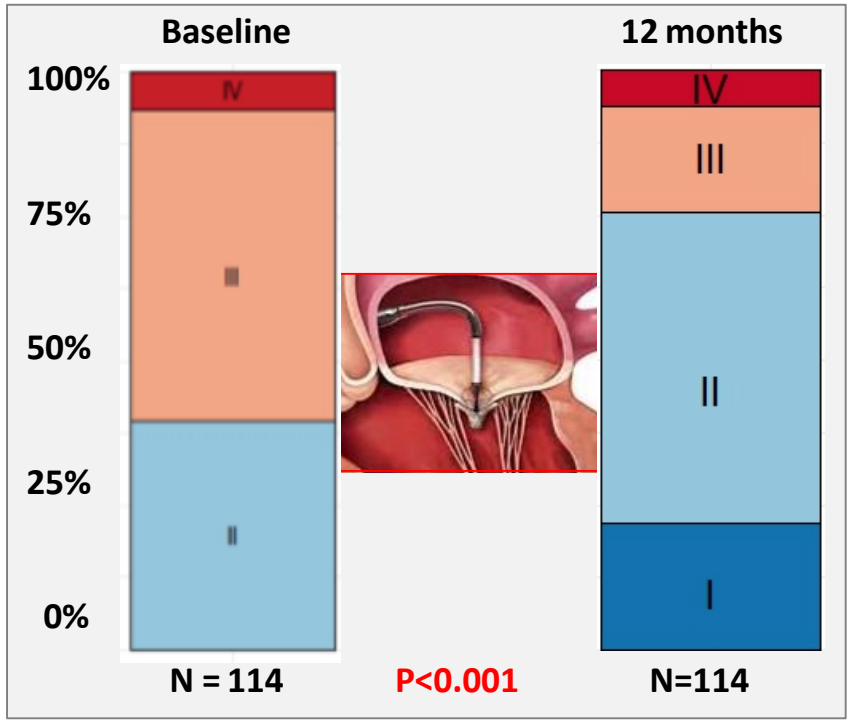
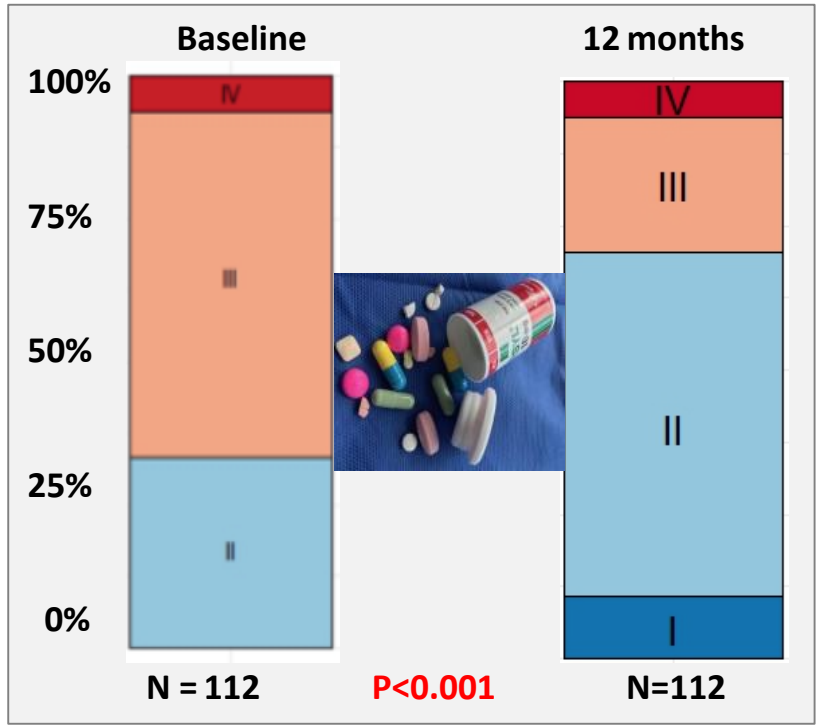
NYHA evolution (*paired data)*





P = NS

COAPT Trial

- Secondary Mitral Regurgitation: Open label randomized trial
- LV Ejection Fraction 20% - 50%
- Grade 3+ or 4+ MR *after vigorous titration of medications*
- NYHA Grade II-IVa
- STS > 8%

Stone. NEJM.2018;DOI: 10.1056/NEJMoa1806640

COAPT Trial

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- Primary EP: Hosp for HF ≤ 12 months.
- Primary Safety EP: Freedom from device-related complications at 12 months.
- Secondary EPs
  - MR < Grade 2
  - Mortality (all cause)
  - Death/recurrent HF hospitalization at 24 months
  - Change in QOL (on KCCQ) at 12 months
  - All cause hospitalization at 24 months

Stone. NEJM.2018;DOI: 10.1056/NEJMoa1806640

CoAPT Key Exclusion Criteria

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- LVEF < 20%
- PA systolic BP > 70 mm Hg
- LVESD > 70 mm
- Clinical evidence of R sided CHF w/echo evidence of RV dysfunction

Stone. NEJM.2018;DOI: 10.1056/NEJMoa1806640

CoAPT Baseline Characteristics

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	MitraClip (N=302)	Control (N=312)
Age (y)	71.7 ± 11.8	72.8 ± 10.5
STS Risk (mean)	7.8 ± 5.5	8.5 ± 6.2
LVEF (%)	33.3 ± 6.5	32.9 ± 6.7
LVEDV (mL)	194.4 ± 69.2	191.0 ± 72.9
EROA (mm2)	41 ± 15	40 ± 15
LVESV (mL)	135.5 ± 56.1	134.3 ± 60.3
NT-proBNP ng/mL	5174.3 ± 6566.6	5943 ± 8437.6

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COAPT Trial Primary Results

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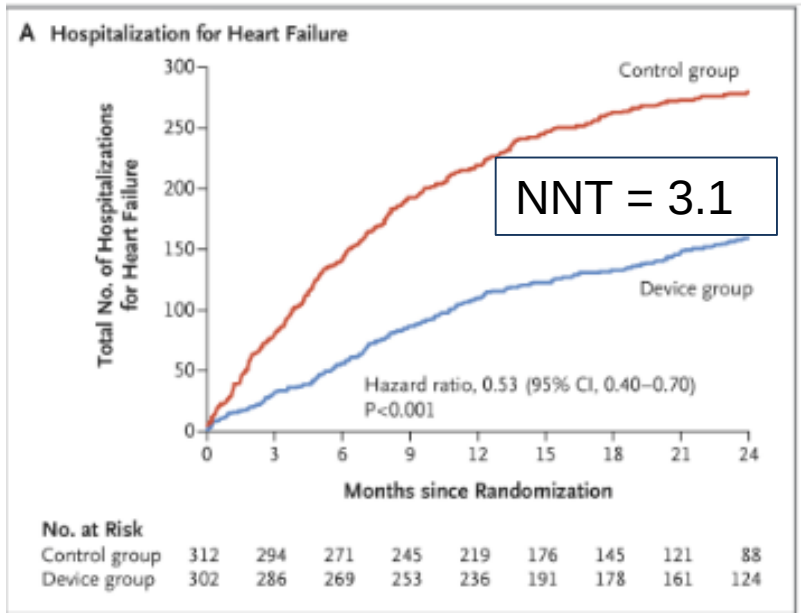

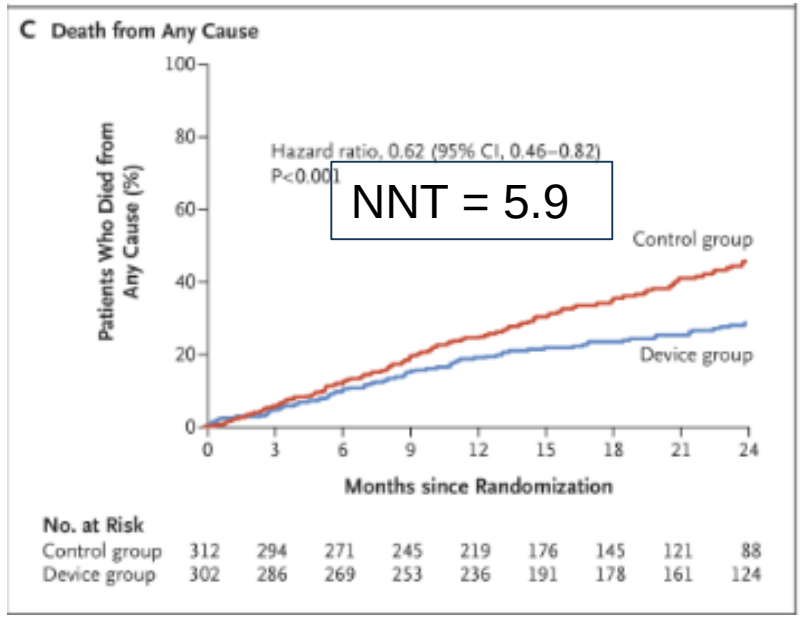

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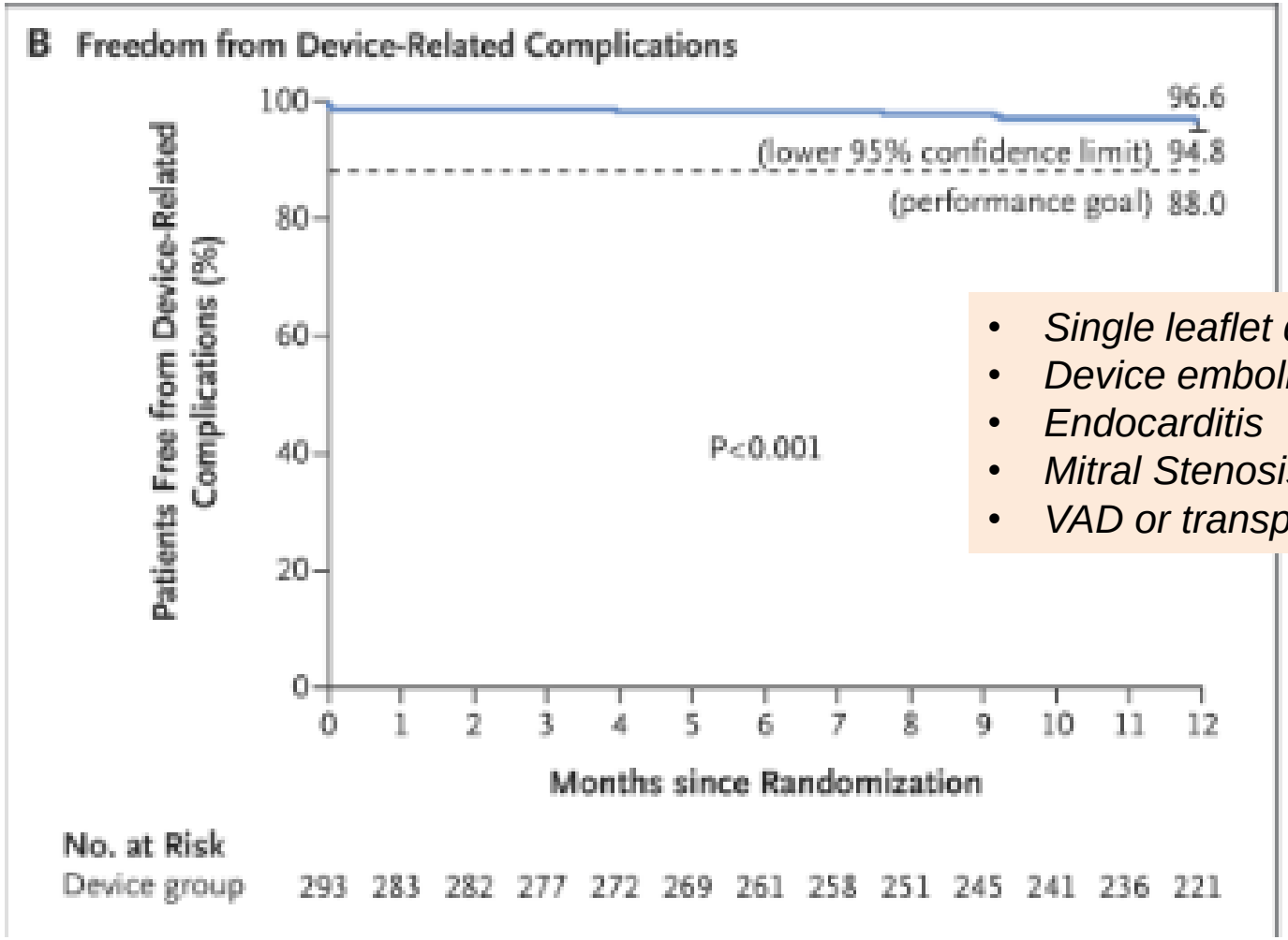
COAPT Trial Procedure Safety



- *Single leaflet detachment*
- *Device embolization*
- *Endocarditis*
- *Mitral Stenosis*
- *VAD or transplant*

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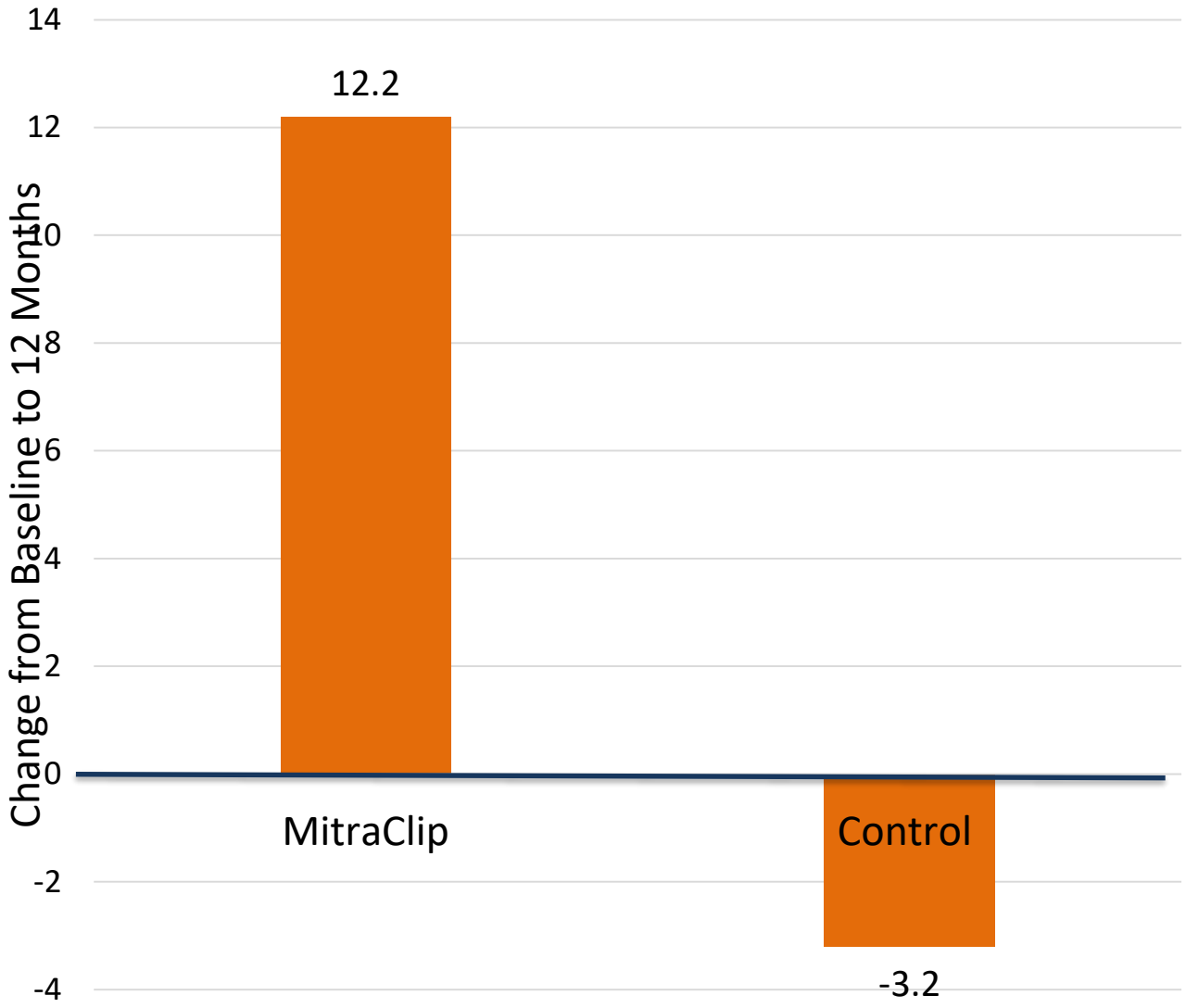
COAPT: KCCQ Score



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COAPT: Residual Mitral Regurgitation at 24 Months

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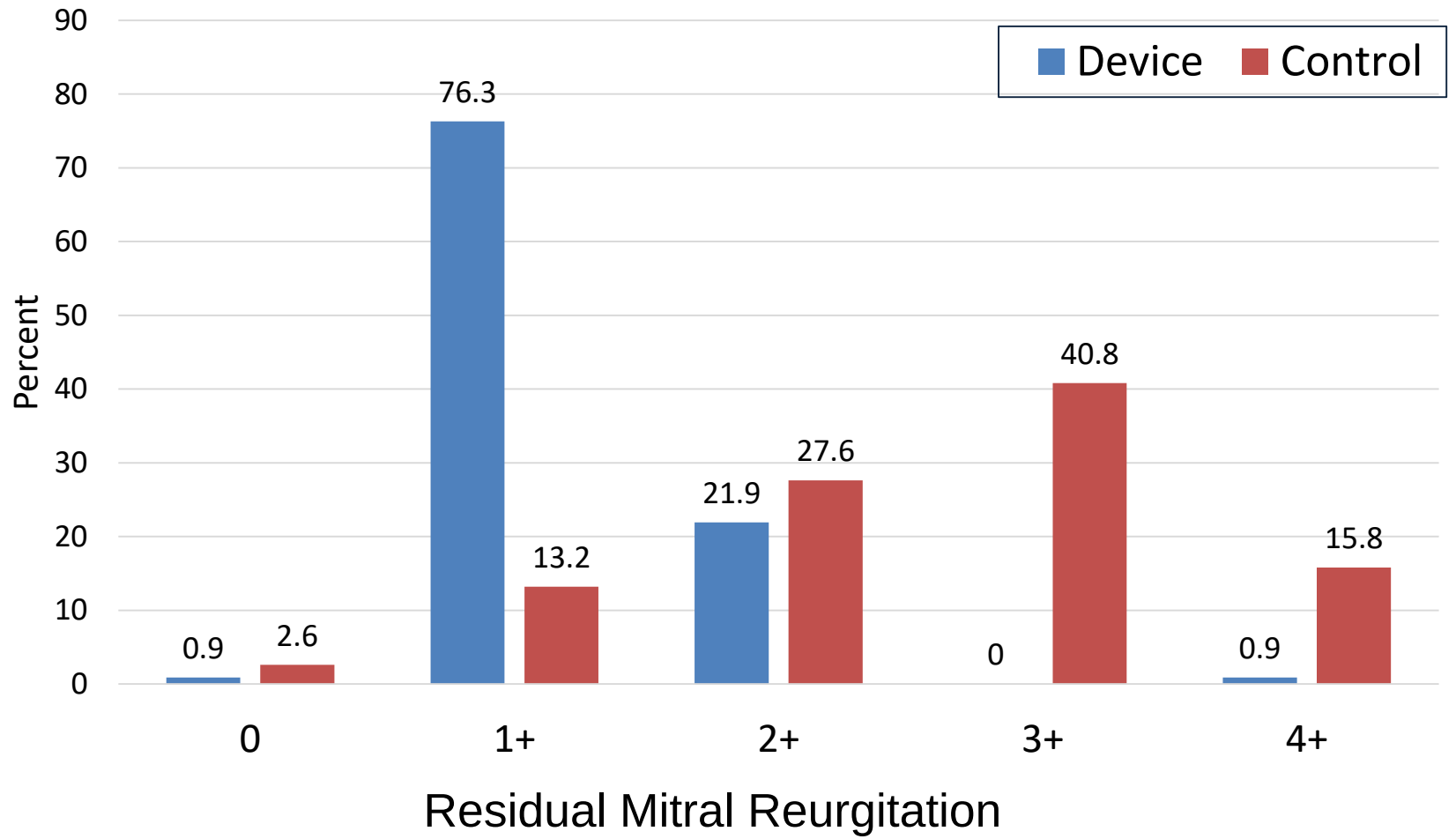

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MITRA FR vs COAPT

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- Degree of LV dysfunction
- Procedural safety
- Elimination of MR
- Titration of meds

Conclusions: Edge-to-Edge Repair for Secondary MR

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- There are patients with severe heart failure and mitral regurgitation despite vigorous medical therapy who benefit from edge-to-edge repair.
- There are patients with severe heart failure and mitral regurgitation despite vigorous medical therapy who don't benefit from edge-to-edge repair.

Conclusions

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- Finding the “sweet spot” – patients who have persistent mitral regurgitation but whose ventricles are not “burned out” is a challenge.
- To be successful at mitral repair/replacement, structural interventionalists are going to have to become very familiar with imaging physiology.