

# EUROVALVE

DEBATING  
CHAMBER



CAMBRIDGE  
UNION  
SOCIETY  
OCTOBER  
7&8, 2022



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## LOCAL HOST

Madalina Garbi, United Kingdom

**Debate: " This House believes minimally invasive surgery should be considered for patients with previous sternotomy and patent LIMA, before transcatheter techniques."**

Paul Modi

Consultant Cardiac & Mitral Surgeon

Liverpool Heart and Chest Hospital

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## FACULTY DISCLOSURE

I have no relevant financial relationships to disclose

The results of mitraclip aren't that good

*Everest II*

*MitraFR vs COAPT*

The results of minimally invasive surgery are  
really good



# Outcomes With Transcatheter Mitral Valve Repair in the United States



## An STS/ACC TVT Registry Report

Paul Sorajja, MD,<sup>a</sup> Sreekanth Vemulapalli, MD,<sup>b</sup> Ted Feldman, MD,<sup>c</sup> Michael Mack, MD,<sup>d</sup> David R. Holmes, Jr, MD,<sup>e</sup> Amanda Stebbins, MS,<sup>b</sup> Saibal Kar, MD,<sup>f</sup> Vinod Thourani, MD,<sup>g</sup> Gorav Ailawadi, MD<sup>h</sup>

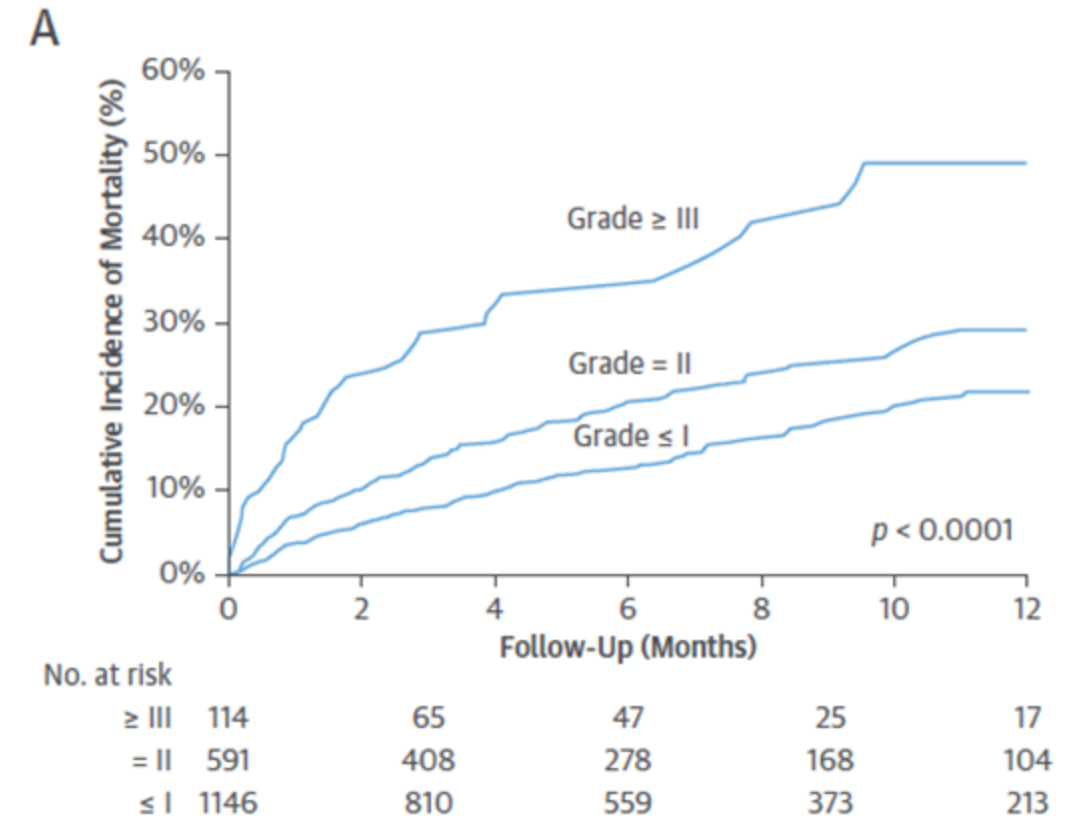
J Am Coll Cardiol 2017;70:2315-27

**TABLE 3** Procedural and In-Hospital Outcomes (N = 2,952)

Number of clips implanted	
1	66.5
≥1	34.5
Site of clip implant	
A2-P2 segments	82.8
Other	17.2
Post-implant MR	
None/trace/trivial	15.0
Mild (grade 1)	46.8
Moderate (grade 2)	31.2
Moderate-severe (grade 3)	2.9
Severe (grade 4)	4.1

38% } (bracketing Moderate, Moderate-severe, and Severe grades)

**FIGURE 4** Post-Procedural Mitral Regurgitation and Clinical Events



# Outcomes With Transcatheter Mitral Valve Repair in the United States



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J Am Coll Cardiol 2017;70:2315-27

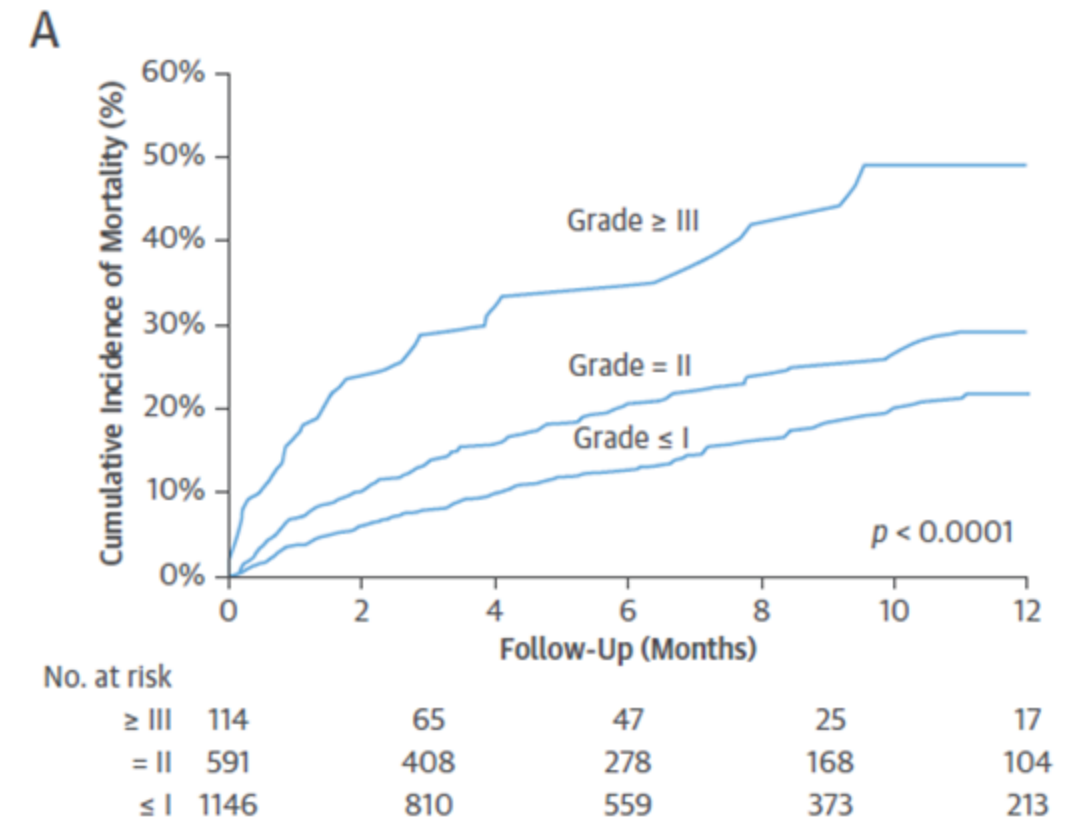
If this was minimally invasive / robotic mitral surgery in Liverpool

All degenerative valves, n=450,  
repair rate 96-100%, 1% reoperation @11y

### Post-implant MR

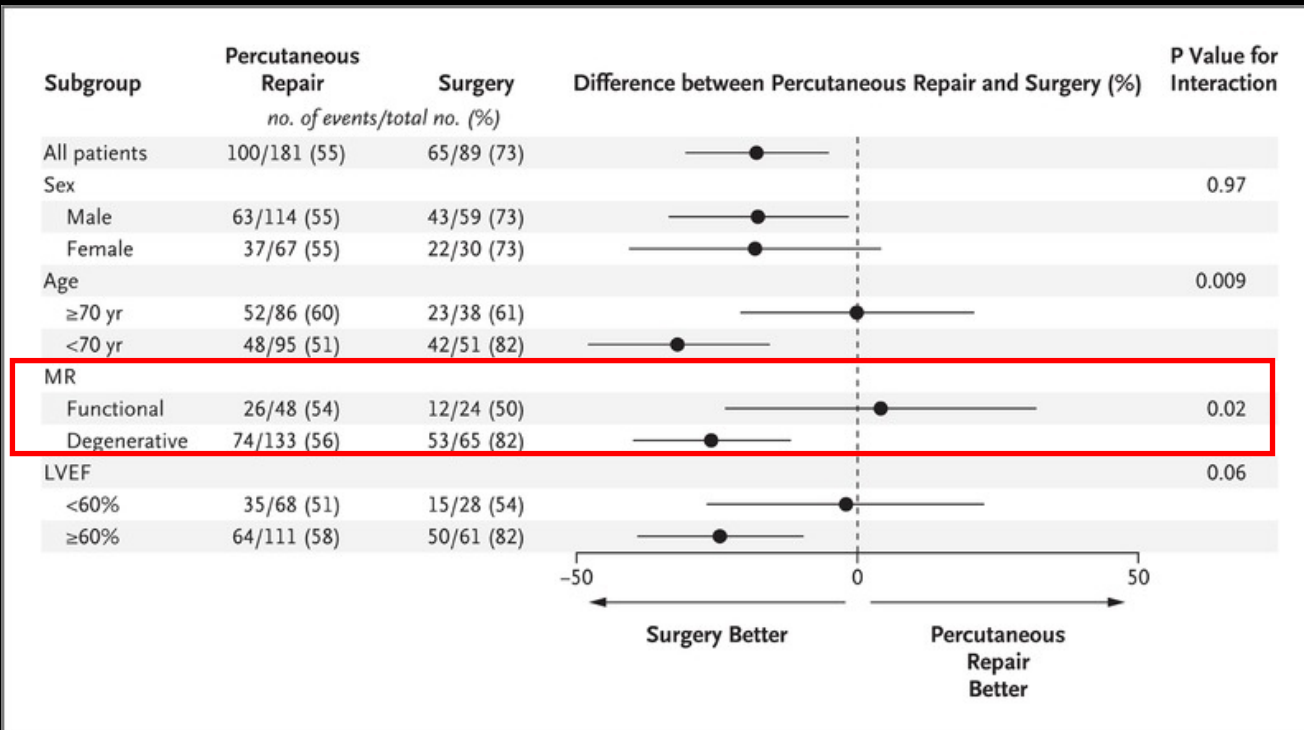
None/trace/trivial	95%	<del>1.1</del>
Mild (grade 1)	5%	<del>0.8</del>
Moderate (grade 2)	0%	<del>1.2</del>
Moderate-severe (grade 3)	0%	<del>1.1</del>
Severe (grade 4)	0%	<del>1.1</del>

**FIGURE 4** Post-Procedural Mitral Regurgitation and Clinical Events



# EVEREST II Trial – 12 months

- 279 patients, 2:1 randomisation
- TEER (n=184), surgery (n=95)
- 73% degenerative, 27% functional



Subgroup analyses for primary end point at 12 months (free from death, mitral valve surgery or 3+/4+ MR)

Table 3. Secondary End Points at 12 Months in the Intention-to-Treat Population.\*

End Point	Percutaneous Repair (N=184)			Surgery (N=95)			P Value for Comparison between Study Groups
	No. of Patients	Value	P Value for Comparison between Baseline and 12 Mo	No. of Patients	Value	P Value for Comparison between Baseline and 12 Mo	
<b>Change from baseline in left ventricular measurement</b>							
End-diastolic volume — ml	144	-25.3±28.3	<0.001	66	-40.2±35.9	<0.001	0.004
End-diastolic diameter — cm	148	-0.4±0.5	<0.001	67	-0.6±0.6	<0.001	0.04
End-systolic volume — ml	144	-5.5±14.5	<0.001	66	-5.6±21.0	0.04	0.97
End-systolic diameter — cm	146	-0.1±0.6	0.06	67	-0.0±0.6	0.86	0.38
Ejection fraction — %	144	-2.8±7.2	<0.001	66	-6.8±10.1	<0.001	0.005
<b>Change from baseline in quality-of-life score†</b>							
30 days							
Physical component summary	147	3.1±9.4	<0.001	64	-4.9±13.3	0.004	<0.001
Mental component summary	148	4.4±11.3	<0.001	64	1.8±13.4	0.29	0.14
12 months							
Physical component summary	132	4.4±9.8	<0.001	60	4.4±10.4	0.002	0.98
Mental component summary	133	5.7±9.9	<0.001	60	3.8±10.3	0.006	0.24
<b>Severity of mitral regurgitation at 12 mo — no. (%)</b>							
0+ (none)		9 (6)	NA		13 (19)	NA	
1+ (mild)		57 (37)	NA		39 (57)	NA	
1+ to 2+ (mild to moderate)		18 (12)	NA		5 (7)	NA	
2+ (moderate)		41 (27)	NA		9 (13)	NA	
3+ (moderate to severe)		21 (14)	NA		3 (4)	NA	
4+ (severe)		7 (5)	NA		0	NA	

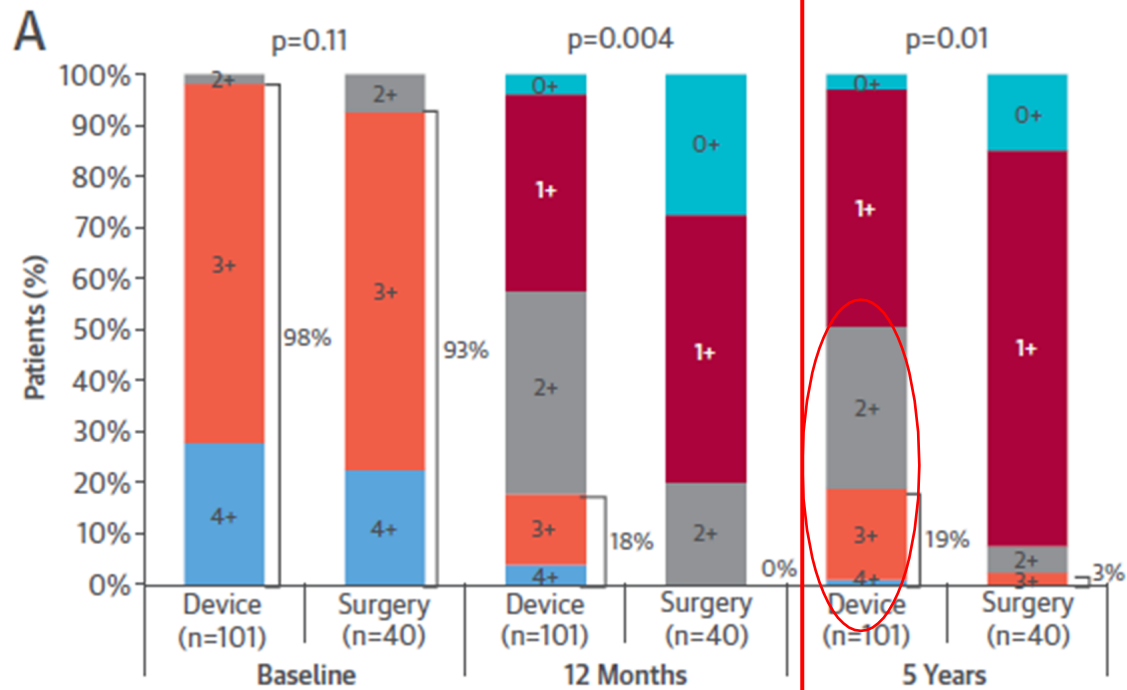
46% } 17%

\* Plus-minus values are means ±SD. NA denotes not applicable.

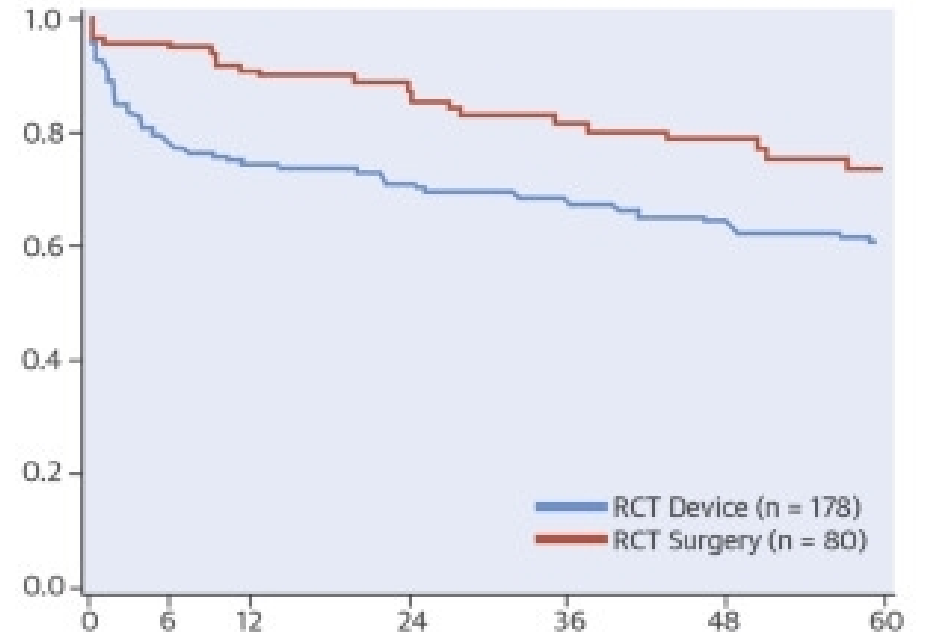
† Quality of life was measured with the use of the Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36), with scores ranging from 0 to 100, with higher scores indicating better quality of life.

# EVEREST II Trial – 5 years

**FIGURE 2** Severity of MR and Heart Failure Symptoms Post-Treatment



**A. Freedom From Death, MV Surgery or Reoperation**



Patients At Risk	Months						
	0	6	12	24	36	48	60
Device Group	178	136	128	117	109	98	45
Control Group	80	75	69	63	54	49	21

# How do I know the outcomes of TEER will never match surgery #1



## Edge-to-edge surgical mitral valve repair in the era of MitraClip: what if the annuloplasty ring is missed?

*Michele De Bonis, Elisabetta Lapenna, Alberto Pozzoli, Andrea Giacomini, and Ottavio Alfieri*

### KEY POINTS

- The results in the long term of the surgical edge-to-edge technique without annuloplasty are not satisfactory.
- In patients without annular calcification, the ringless edge-to-edge repair provides acceptable results in the mid term but is associated with a high failure rate in the long term.
- To improve the long-term outcomes of the currently available transcatheter edge-to-edge procedure, postprocedural residual mitral regurgitation should be minimized by careful patient selection and a concomitant annuloplasty should be added.

# How do I know the outcomes of mitralclip will never match surgery #2

## The Mitral Valve Complex is Complex

- It's not round nor flat – it is saddle-shaped
- Its annulus is not rigid – it's dynamic
- It's not passive – it contracts, reducing valve area during systole
- It's a high (systolic) pressure closure valve, not a high pressure opening valve
- It's got lots of chords
- It's relatively easy to obstruct the aortic outflow
- It's easier to form thrombus on than the AV
- It has a much larger annulus than the AV
- Its annulus changes size as the heart fails
- MR is not one disease – degen vs functional



# How do I know the outcomes of mitraclip will never match surgery #2

Aortic valve



Mitral valve



# Surgery – this is historic for MR



- >1+ AR
- MAC
- Endocarditis with annular abscess



Mini mitral – 4cm



Robotic mitral – 2cm





# Robotic mitral – 2cm

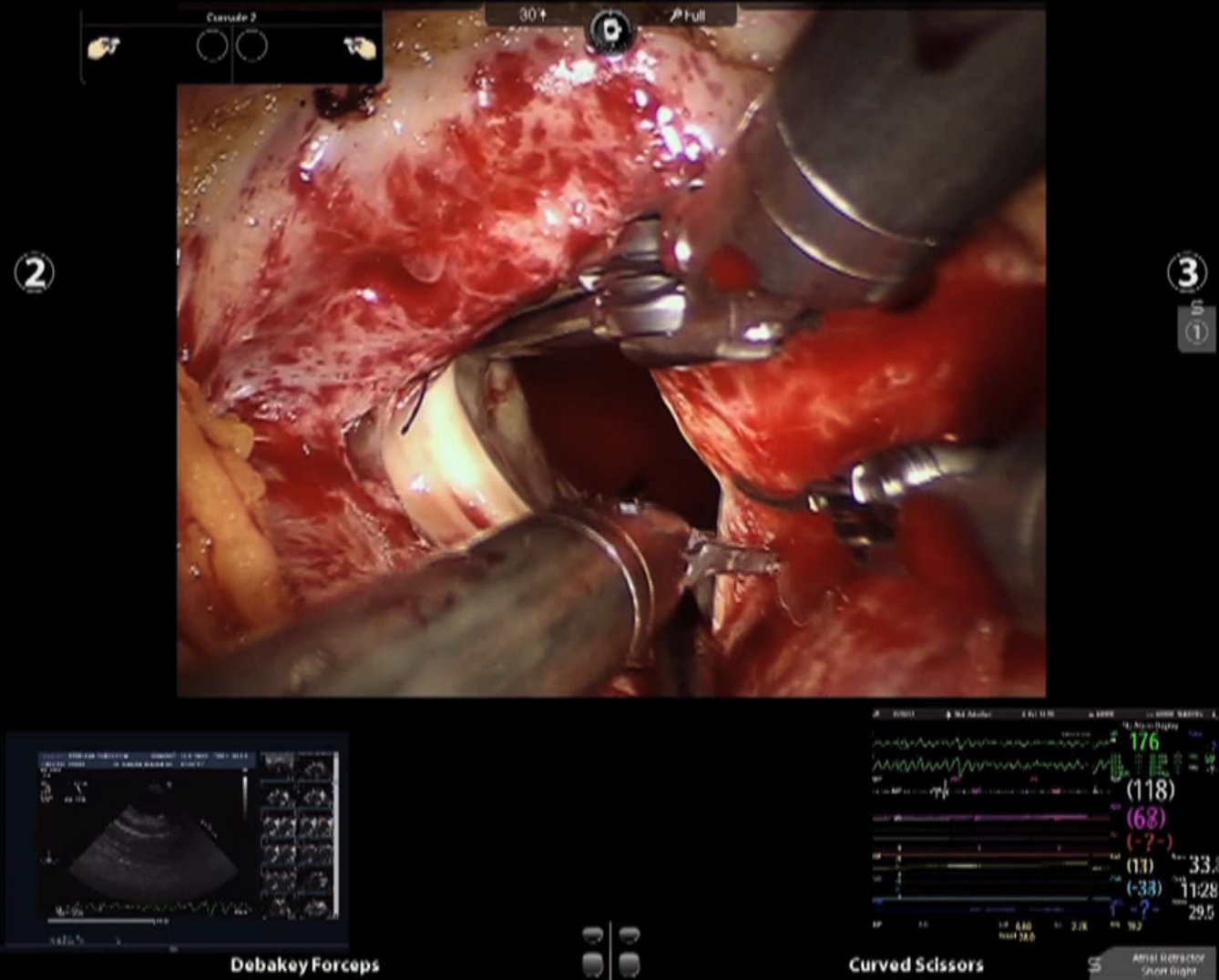
Post op day 2



Post op day 4



# Reoperation with patent LIMA



# MI vs Sternotomy Mitral

## Minimally invasive mitral valve surgery after previous sternotomy: A propensity-matched analysis

Mohanad Hamandi MD<sup>1</sup> | John J. Squiers MD<sup>1</sup> | Allison T. Lanfear BS<sup>1</sup> |  
Jasjit K. Banwait PhD<sup>1</sup> | Talia G. Meidan BS<sup>1</sup> | Robert L. Smith MD<sup>2</sup> |  
Kelley Hutcheson MD<sup>2</sup> | John Michael DiMaio MD<sup>1,2</sup> | Michael J. Mack MD<sup>1,2</sup>  
Timothy J. George MD<sup>2</sup> | William H. Ryan MD<sup>2</sup>

J Card Surg. 2021;36:3177-3183.

- n=88 pairs
- 30-day mortality MI 3.4% vs ST 8%

## Endoscopic Mitral and Tricuspid Valve Surgery After Previous Cardiac Surgery

Filip P. Casselman, MD, PhD, FETCS; Mark La Meir, MD; Hughes Jeanmart, MD;  
Enzo Mazzarro, MD; Jose Coddens, MD; Frank Van Praet, MD; Francis Wellens, MD;  
Yvette Vermeulen, MSc; Hugo Vanermen, MD, FETCS

(Circulation. 2007;116[suppl I]:I-270-I-275.)

- n=80
- O/E mortality 0.24

## Minimally invasive right thoracotomy approach for mitral valve surgery in patients with previous sternotomy: A single institution experience with 173 patients

Michele Murzi, MD, Antonio Miceli, MD, PhD, Gioia Di Stefano, MD, Alfredo G. Cerillo, MD,  
Pierandrea Farneti, MD, Marco Solinas, MD, and Mattia Glauber, MD

(J Thorac Cardiovasc Surg 2014;148:2763-8)

- n=173
- O/E mortality 0.37

## Robotic mitral valve surgery after prior sternotomy

Check for updates

Talia G. Meidan, BS,<sup>a</sup> Allison T. Lanfear, BS,<sup>a</sup> John J. Squiers, MD,<sup>a</sup> Mohanad Hamandi, MD,<sup>a</sup>  
Bruce W. Lytle, MD,<sup>b</sup> J. Michael DiMaio, MD,<sup>b</sup> and Robert L. Smith, MD,<sup>b</sup> the Redo Robotic Mitral Valve  
Surgery Collaborative\*

JTCVS Techniques • June 2022

- n=21
- STS predicted risk of mortality 4.2±3.8%
- No mortality

# Conclusion

- Minimally invasive & robotic surgery gives all the benefits of surgery without the prolonged recovery and no risk of LIMA injury
- Degenerative - the outcomes of TEER (immediate MR reduction and durability) will never match surgery
- Functional – if operable, remains to be established, e.g TEER vs chord-sparing MVR vs repair incl subannular procedures
- Outcomes for patients are best when we work as a team



*Thank you*

