

Minimally Invasive Valve Surgery Using High Resolution (3D) Scope

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Disclosures

- Lecturer and consulting fee:

Abbott Medical Japan

Ethicon, Inc.

Mitral intervention matrix (classical)

Low Operative risk High

Complexity

High

Barlow

Sternotomy

Concomitant TAP, Maze, AVR

Active IE
Redo MV repair
MAC in HD

Sternotomy

Low

Type II FED

MICS

Young

ICM DCM

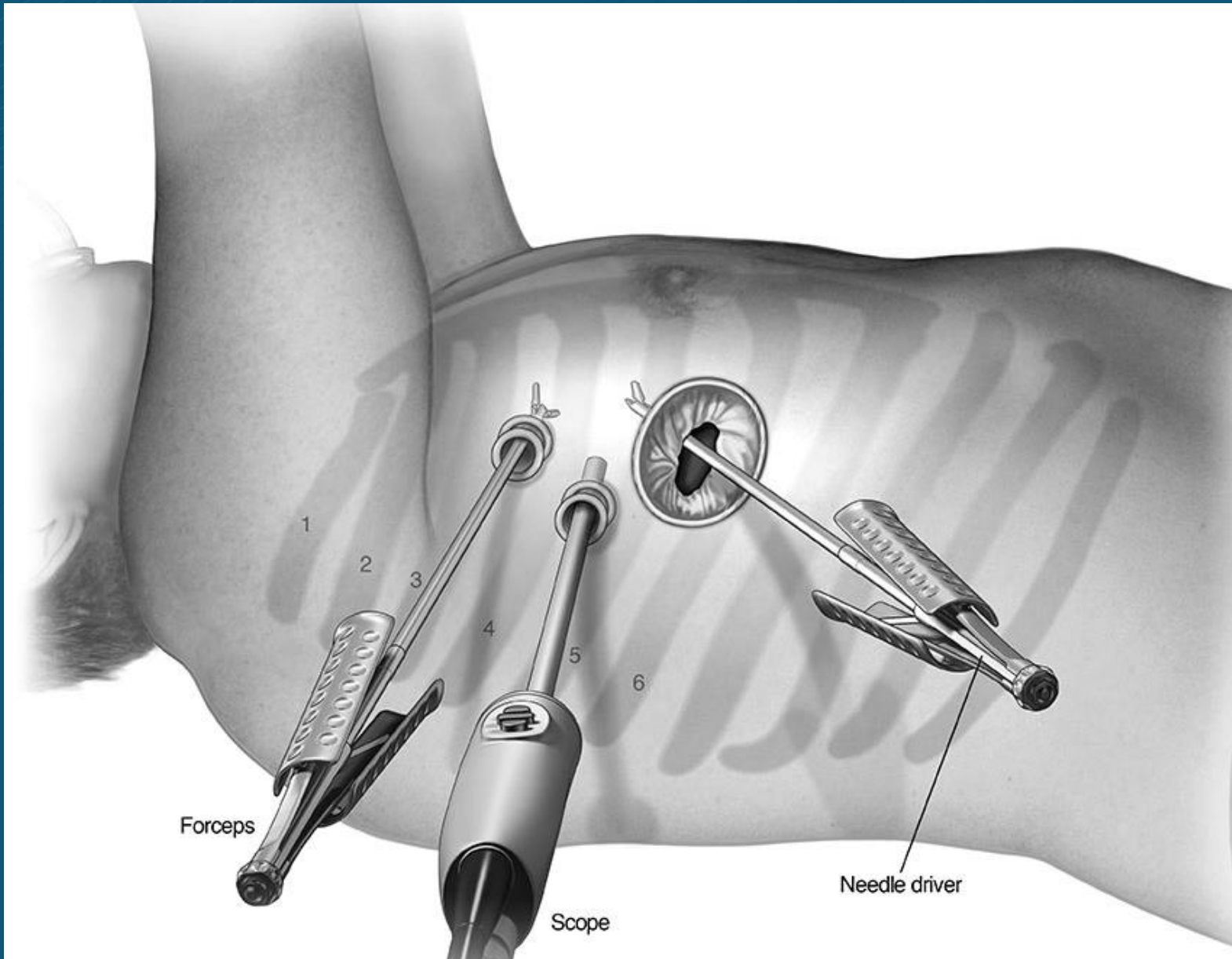
Emergency

Aged

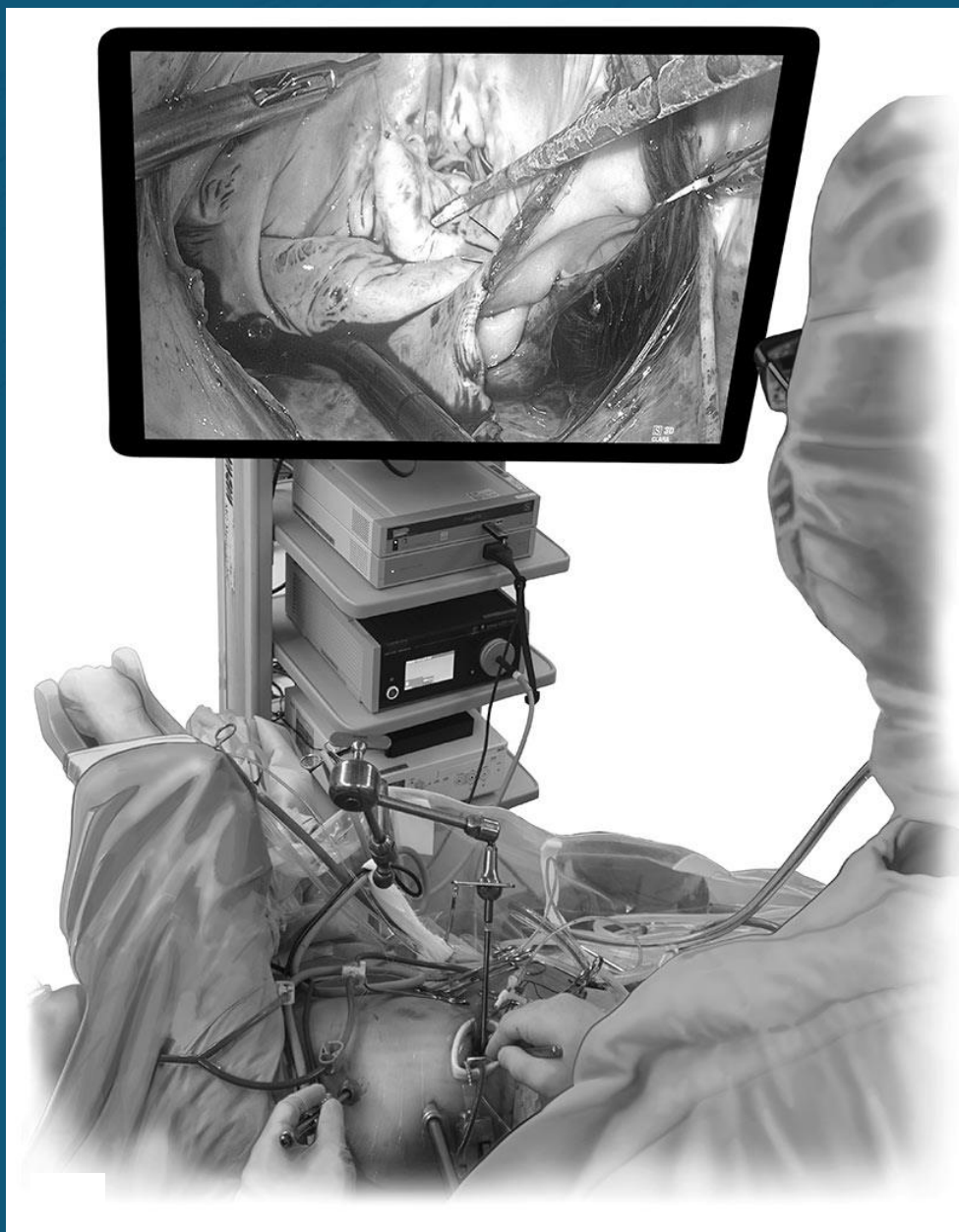
Sternotomy

Mitral intervention matrix (@JRC Nagoya)

		Operative risk	
		Low	High
Complexity	High	Barlow Concomitant TAP, Maze, AVR MICS	Active IE Redo MV repair MAC in HD MICS
	Low	Type II FED Young MICS	ICM DCM Emergency Aged MitraClip MICS



*Ito, Hosoba,
Operative techniques
in Thoracic and
Cardiovascular
Surgery 2021*

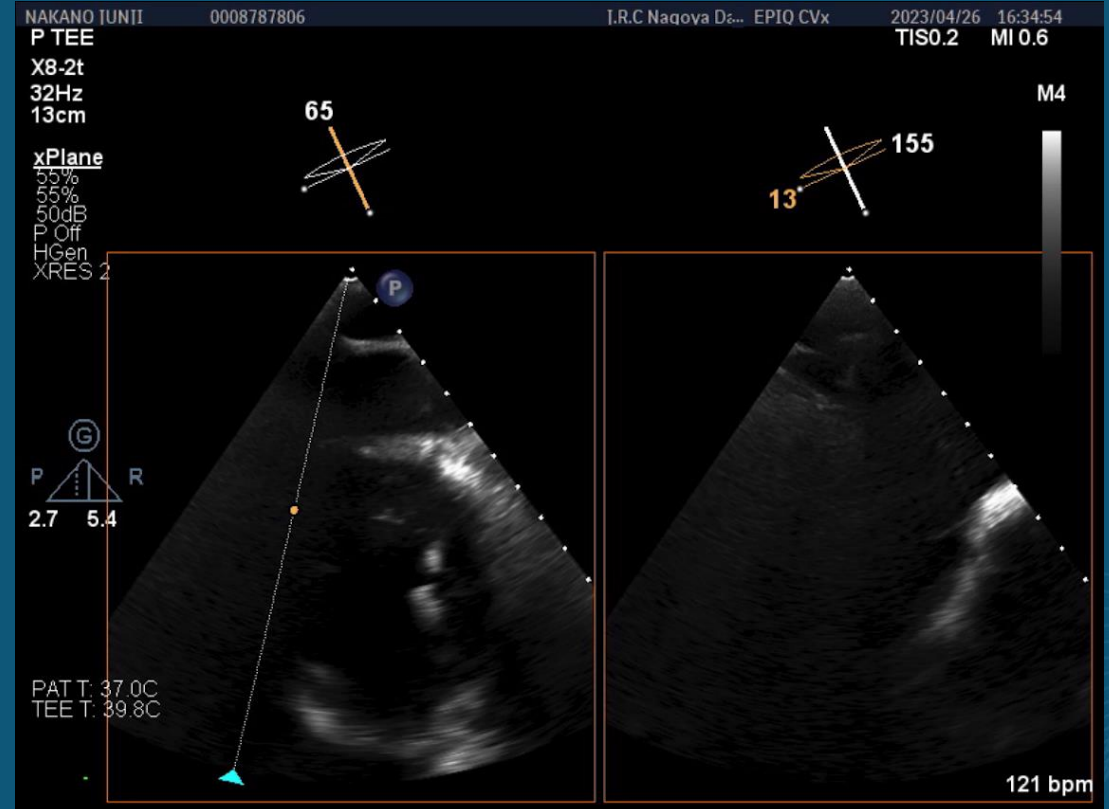
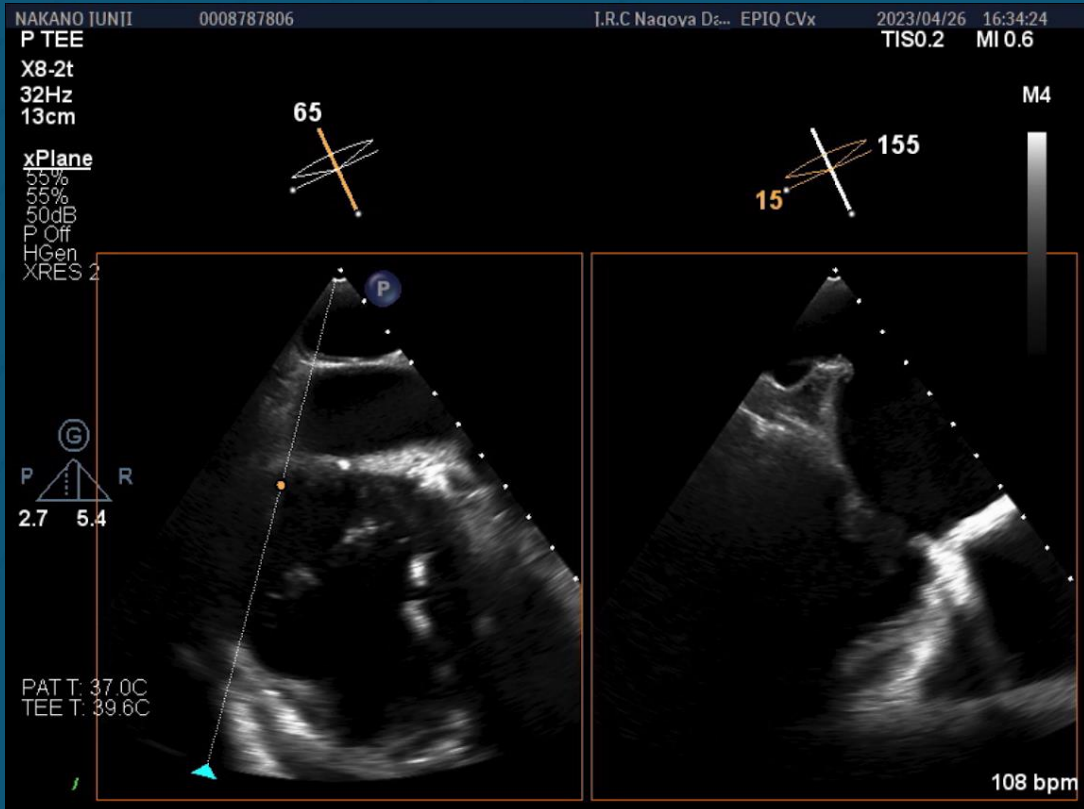


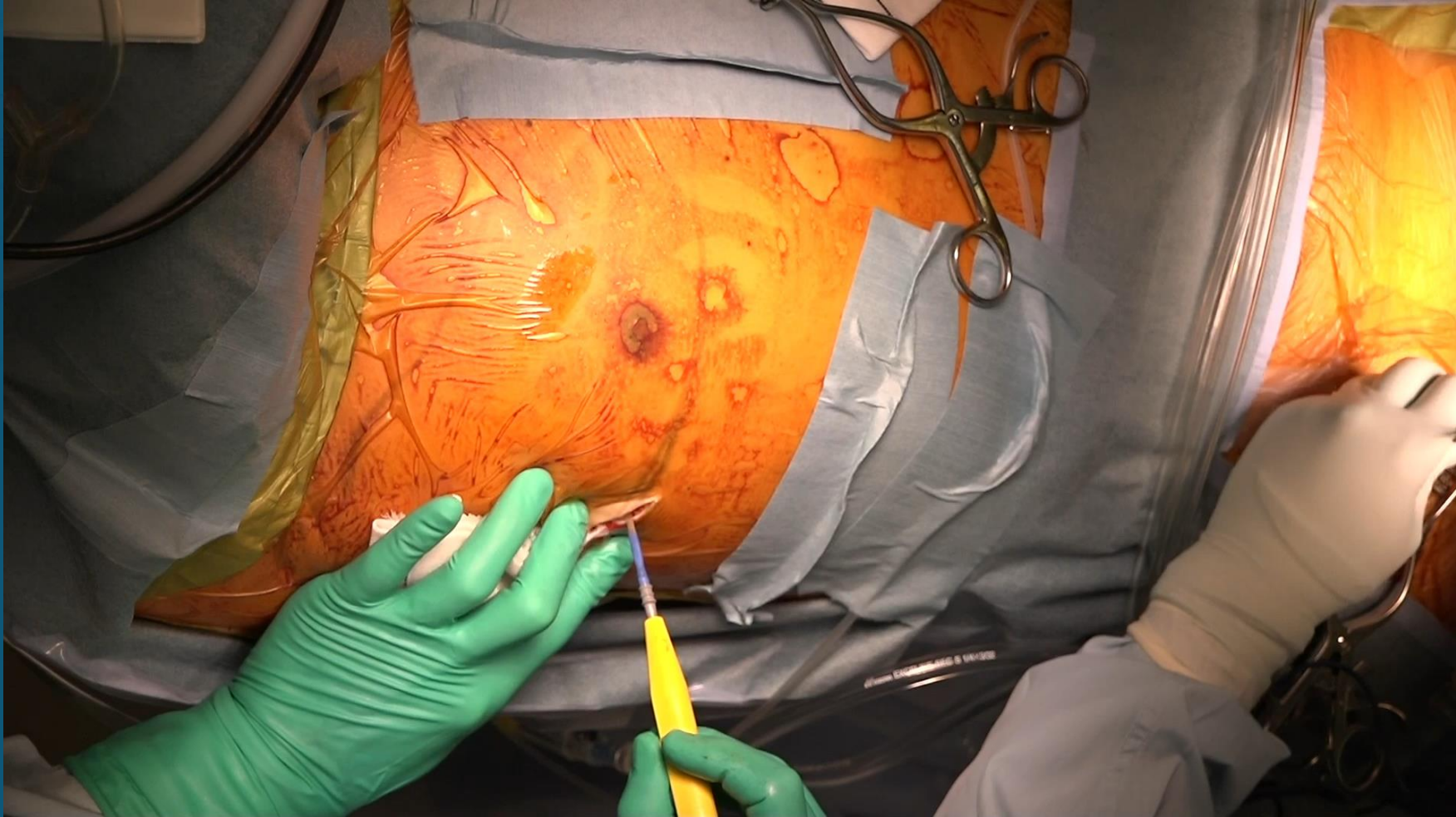
*Ito, Hosoba,
Operative techniques
in Thoracic and
Cardiovascular
Surgery 2021*



Endoscopic mitral repair

Preop TEE





Endoscopic valve surgery

Limitations

Endoscopic valve surgery- limitations

Hostile aorta

Lung adhesion

Valve issue

Concomitant procedures

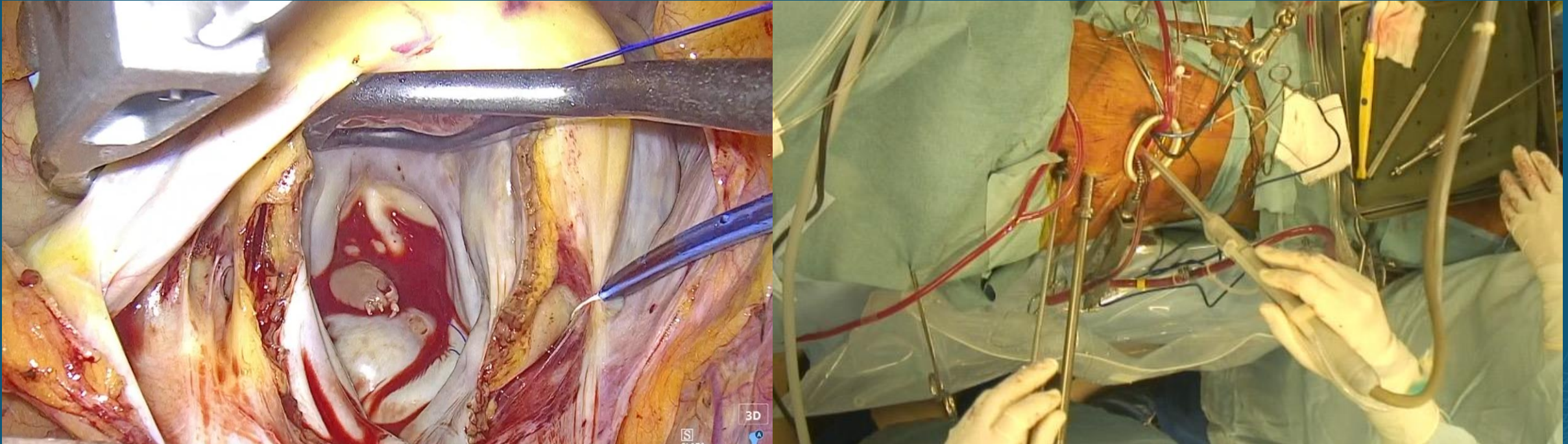
Endoscopic valve surgery- limitations

Valve issue?
-complex repair

Endoscopic mitral valve repair utilizing cavitron ultrasonic surgical aspirator for active endocarditis

Soh Hosoba*, Toshiaki Ito and Riku Kato

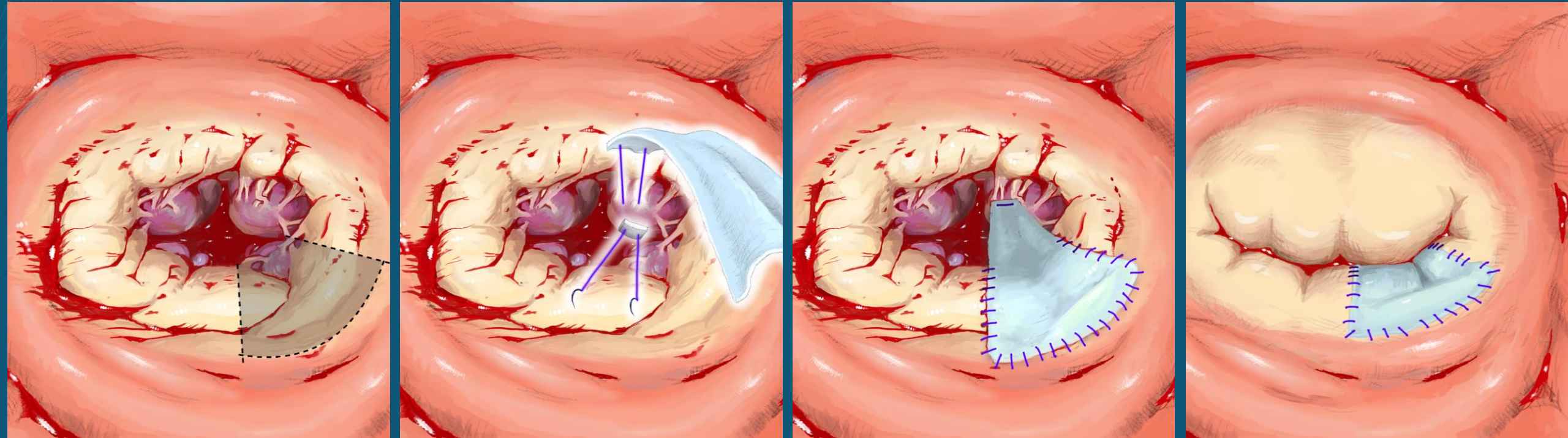
Department of Cardiovascular Surgery, Japanese Red Cross Aichi Medical Center Nagoya Daiichi Hospital, Nagoya, Japan



Hosoba, Ito, *Interact Cardiovasc Thorac Surg* 2022

Midterm results after seamless patch mitral reconstruction

Soh Hosoba, MD, PhD,^a Toshiaki Ito, MD, PhD,^a Makoto Mori, MD, PhD,^b Riku Kato, MD,^a

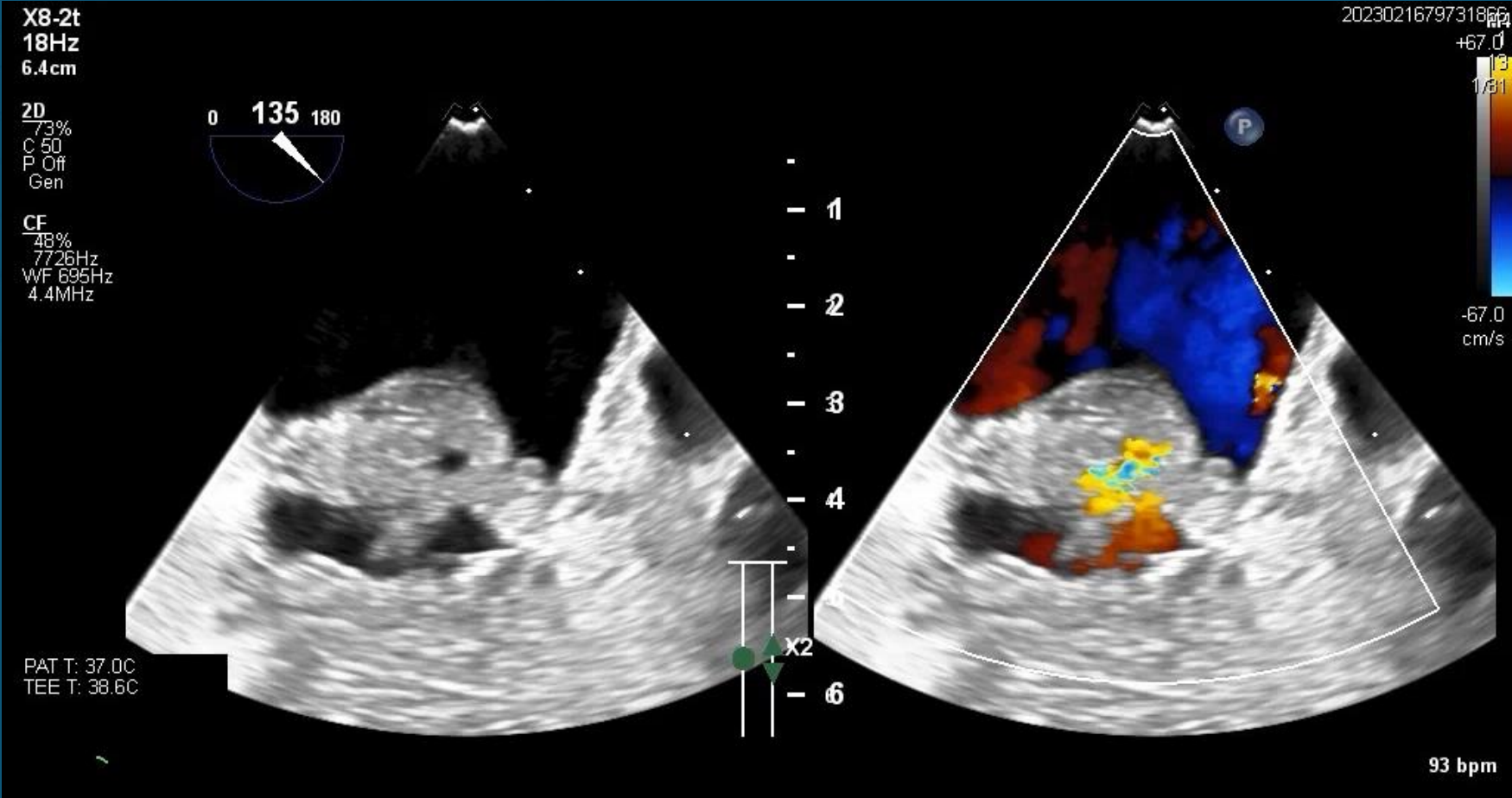


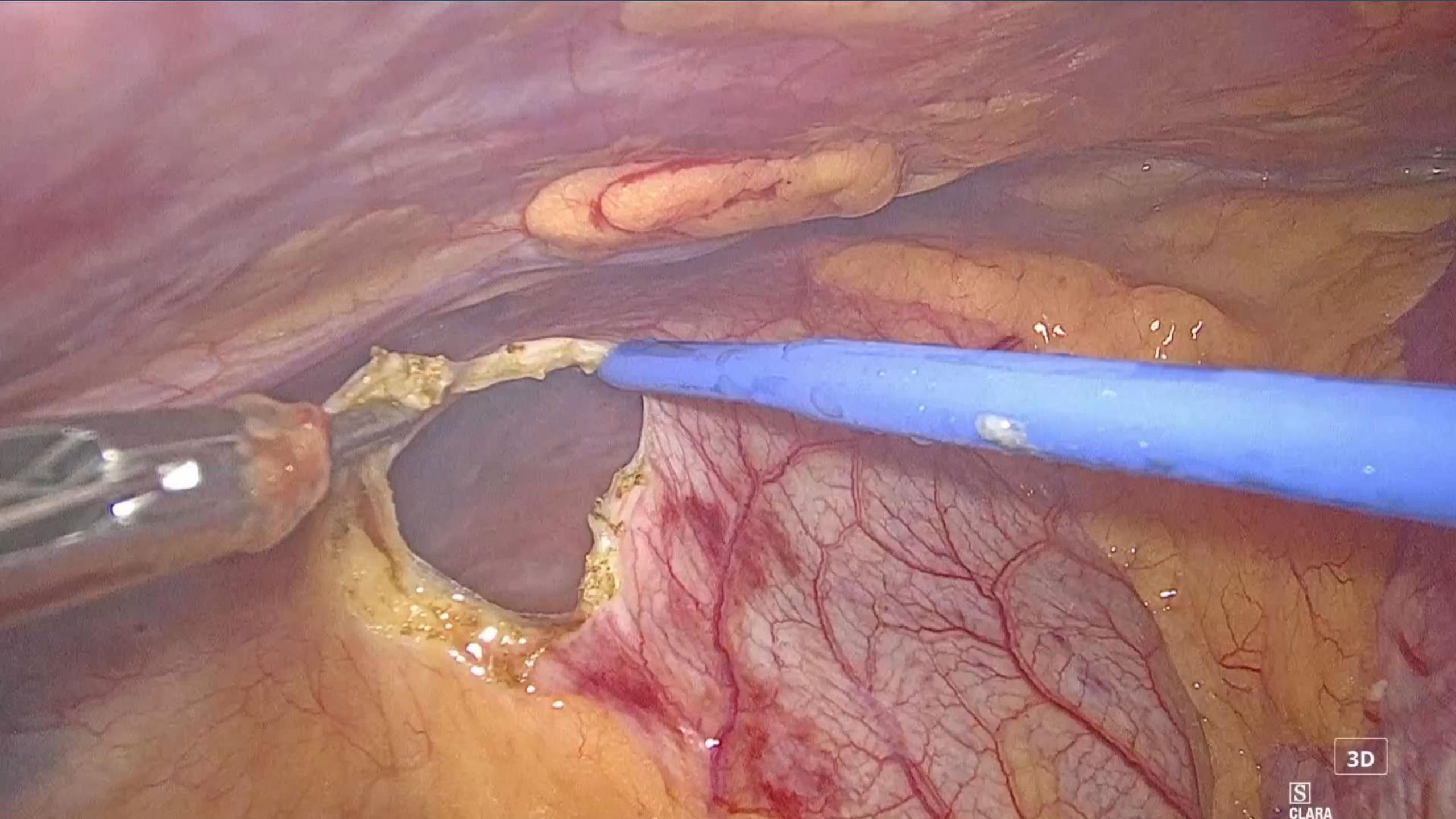
Hosoba, Ito et al. JTCVS techniques 2022

28 yo female

- h/o atopic dermatitis with oral JAK inhibitor
- Febrile up to 40C
- Blood cx positive for MSSA

Preop TEE





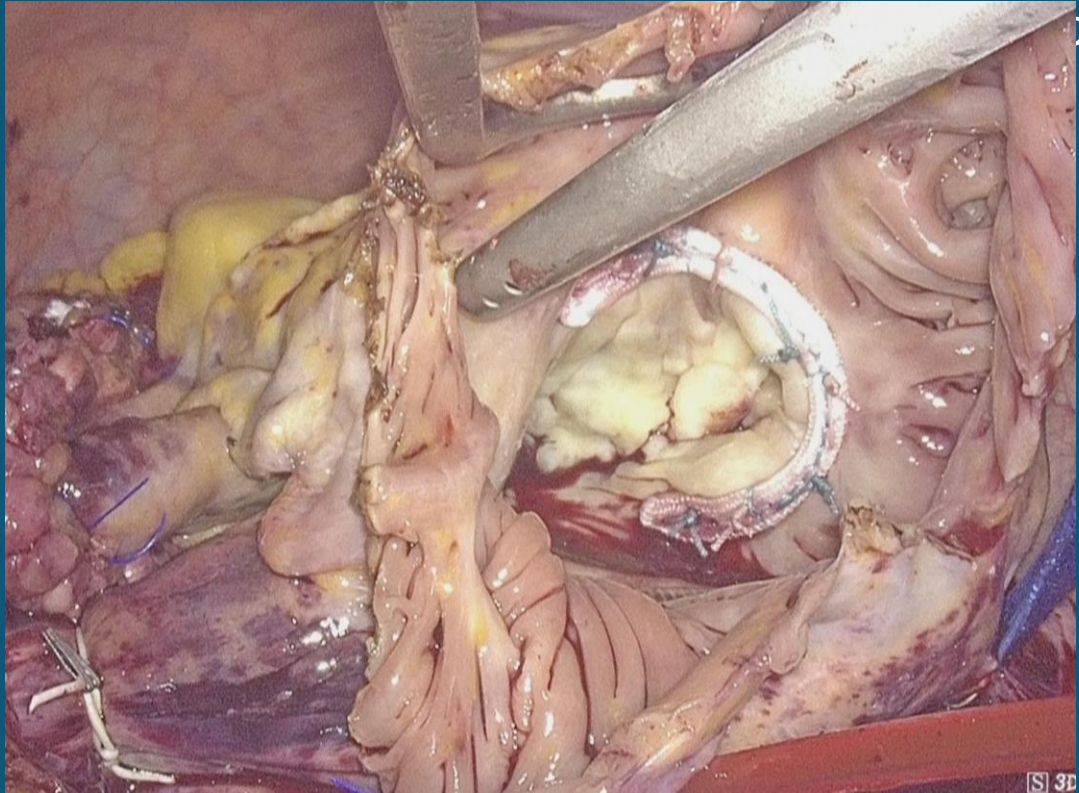
3D

S
CLARA

Endoscopic valve surgery- limitations

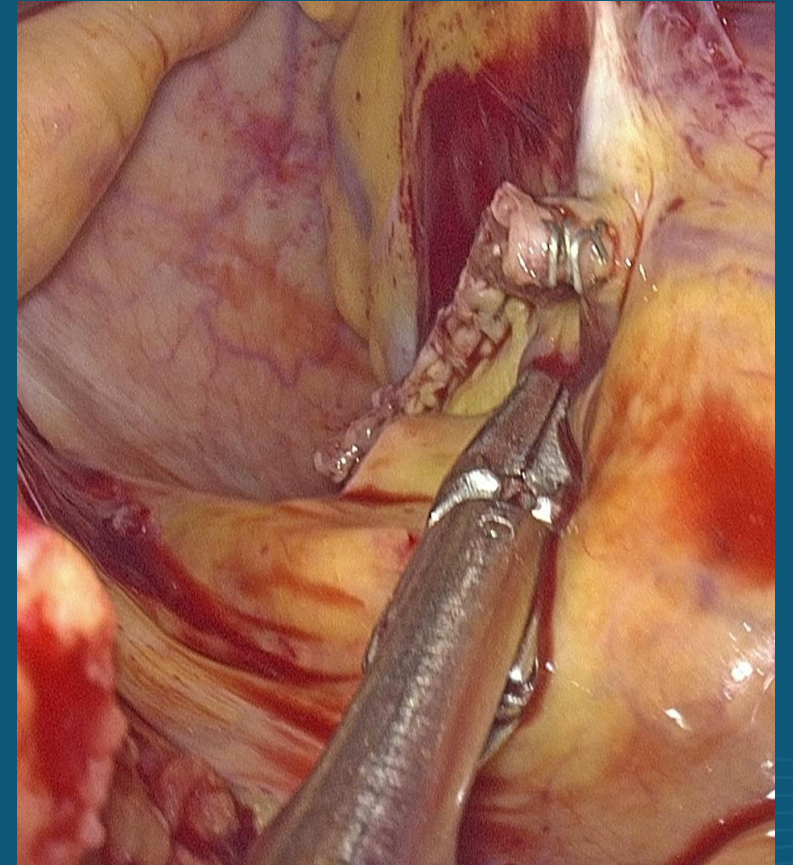
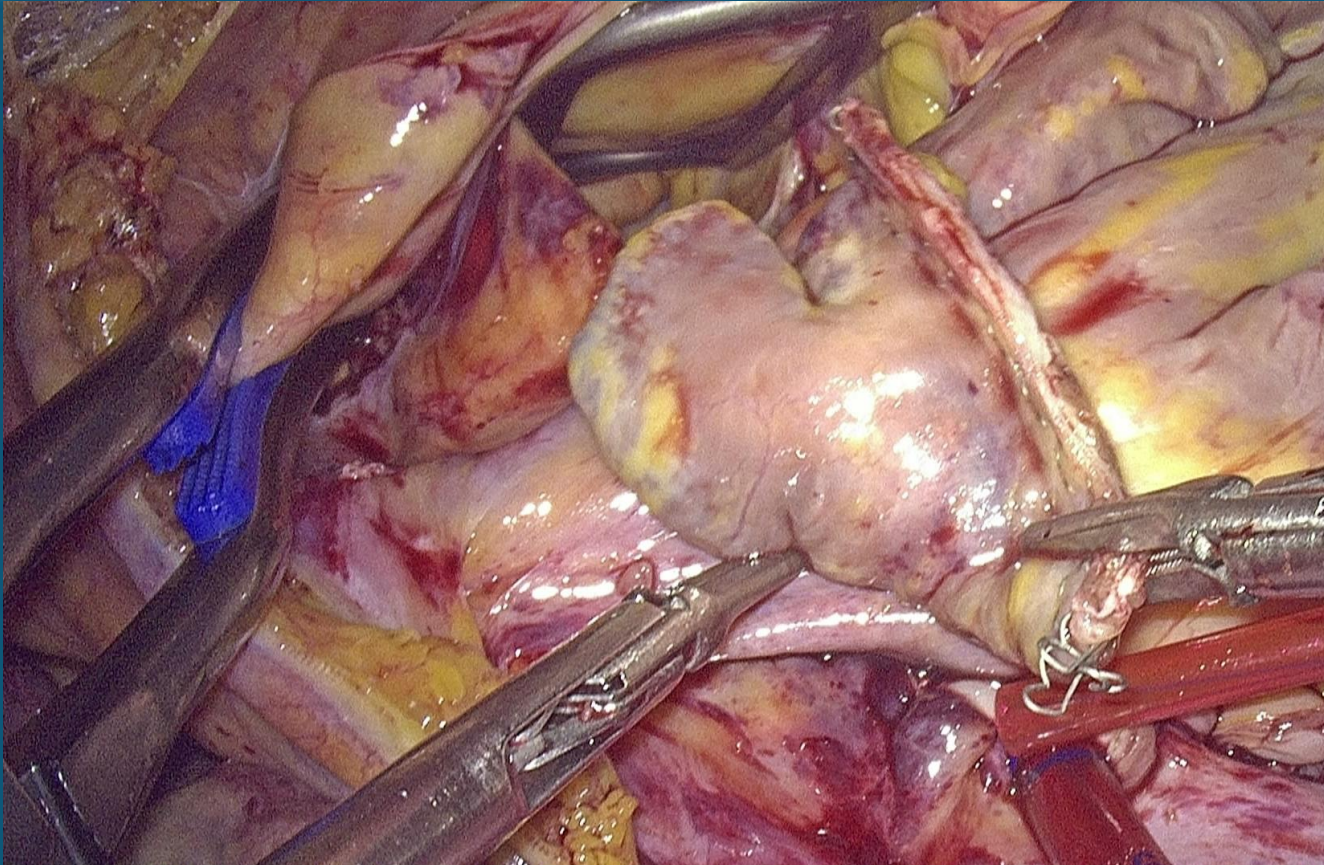
Concomitant
procedures?

Concomitant tricuspid repair and Maze



Fukumoto, Hosoba, Eur J Cardiothorac Surg 2020

LAA ligation with a surgical stapler



Orij, Hosoba, Ito, et al. Surgery Today 2020

LAA ligation with a surgical stapler



Orij, Hosoba, Ito, et al. *Surgery Today* 2020

Endoscopic concomitant tricuspid repair



Endoscopic MV surgery
in 618 consecutive pts
2013 to 2023.



Two surgeons (IT, SH)
performed endoscopic mitral
surgery.

Perioperative results

	MV group (n=502)	TV group (n=116)	p value
Age, years (mean ± SD)	60.1 ± 14.4	69.6 ± 9.6	< 0.001
Male, n (%)	297 (59.3%)	62 (53.4%)	0.3
EuroSCORE II	1.9 ± 2.5	3.6 ± 2.1	< 0.001
Prior cardiac surgery, n (%)	49 (9.8%)	3 (2.6%)	0.02
Urgent/emergent surgery, n (%)	13 (2.6%)	0	0.16
Chronic obstructive pulmonary disease, n (%)	14 (2.8%)	2 (1.7%)	0.74
Chronic kidney disease, n (%)	37 (7.4%)	9 (7.8%)	0.85
New York Heart Association Class III or IV, n (%)	165 (32.9%)	31 (26.7%)	0.22
Atrial fibrillation, n (%)	109 (21.8%)	88 (75.9%)	<0.001
Body mass index (kg/m ²)	22.4 ± 3.5	22.0 ± 3.1	0.24

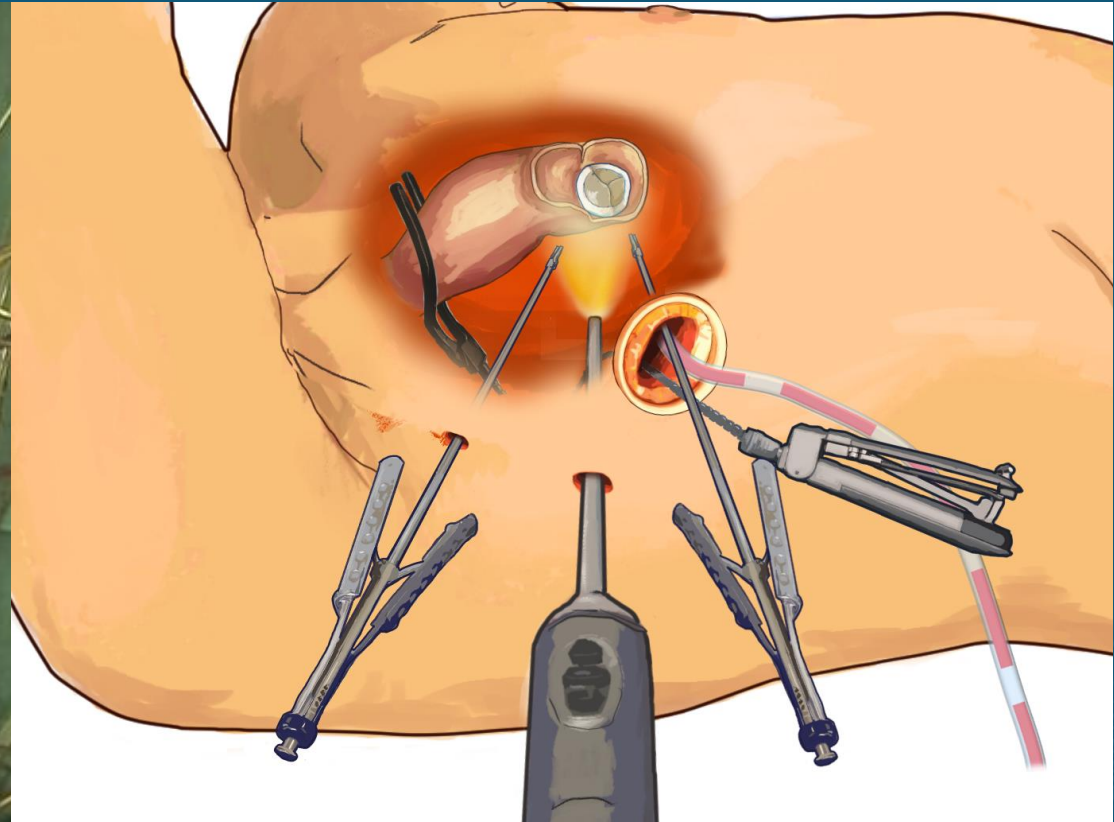
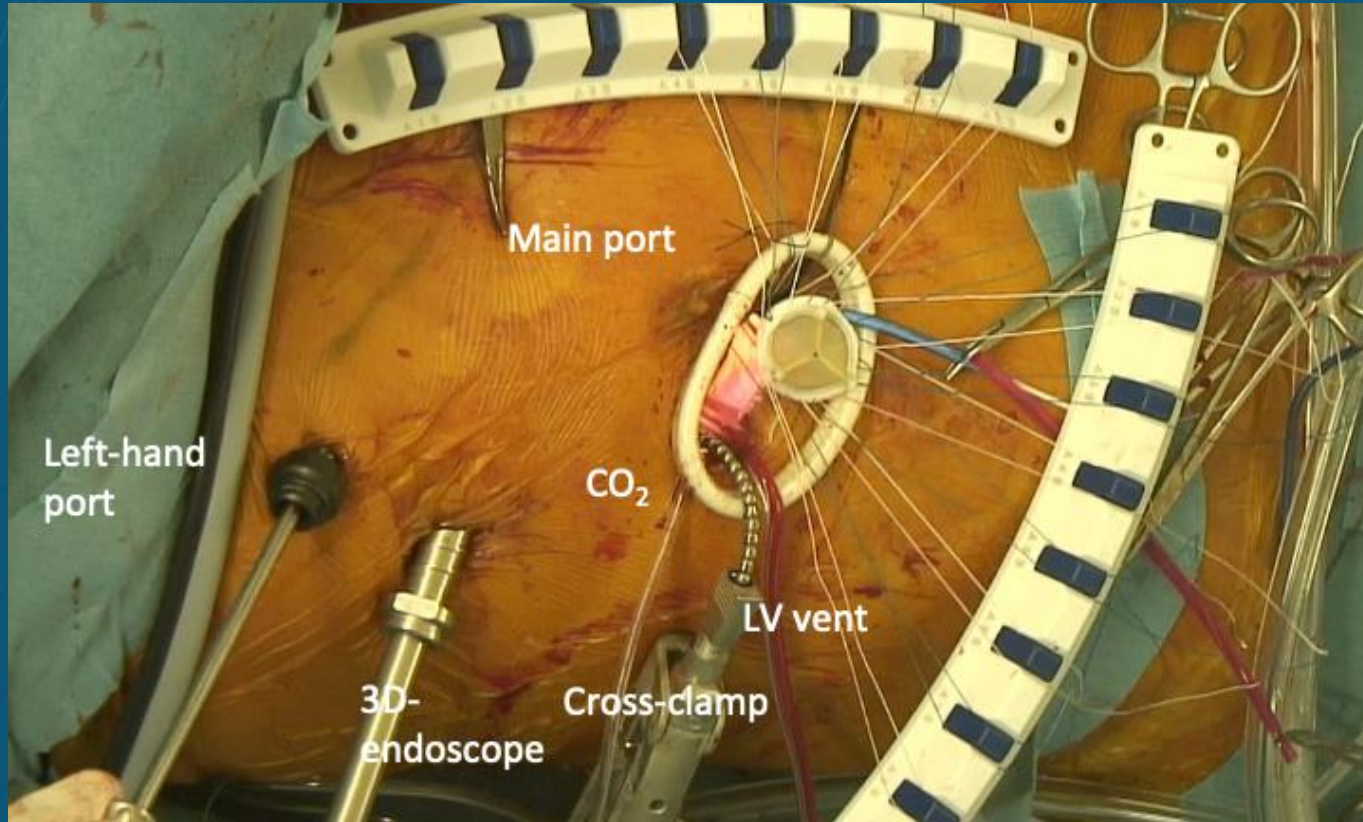
Perioperative results

	MV group (n=502)	TV group (n=116)	p value
Mitral Valve Repair, n (%)	452 (90.2 %)	94 (81.0%)	0.03
Mitral Valve Replacement, n (%)	50 (9.8 %)	22 (19.0 %)	0.02
Maze procedure, n (%)	65 (13.0%)	56 (48.3%)	< 0.001
Left atrial appendage closure, n (%)	147 (29.3%)	95 (81.9%)	< 0.001
Operation time, minute (mean ± SD)	188 ± 65	230 ± 69	< 0.001
Cardiopulmonary bypass time, minute (mean ± SD)	127 ± 50	171 ± 48	< 0.001
Aortic Cross-clamp time, minute (mean ± SD)	91 ± 36	130 ± 33	< 0.001

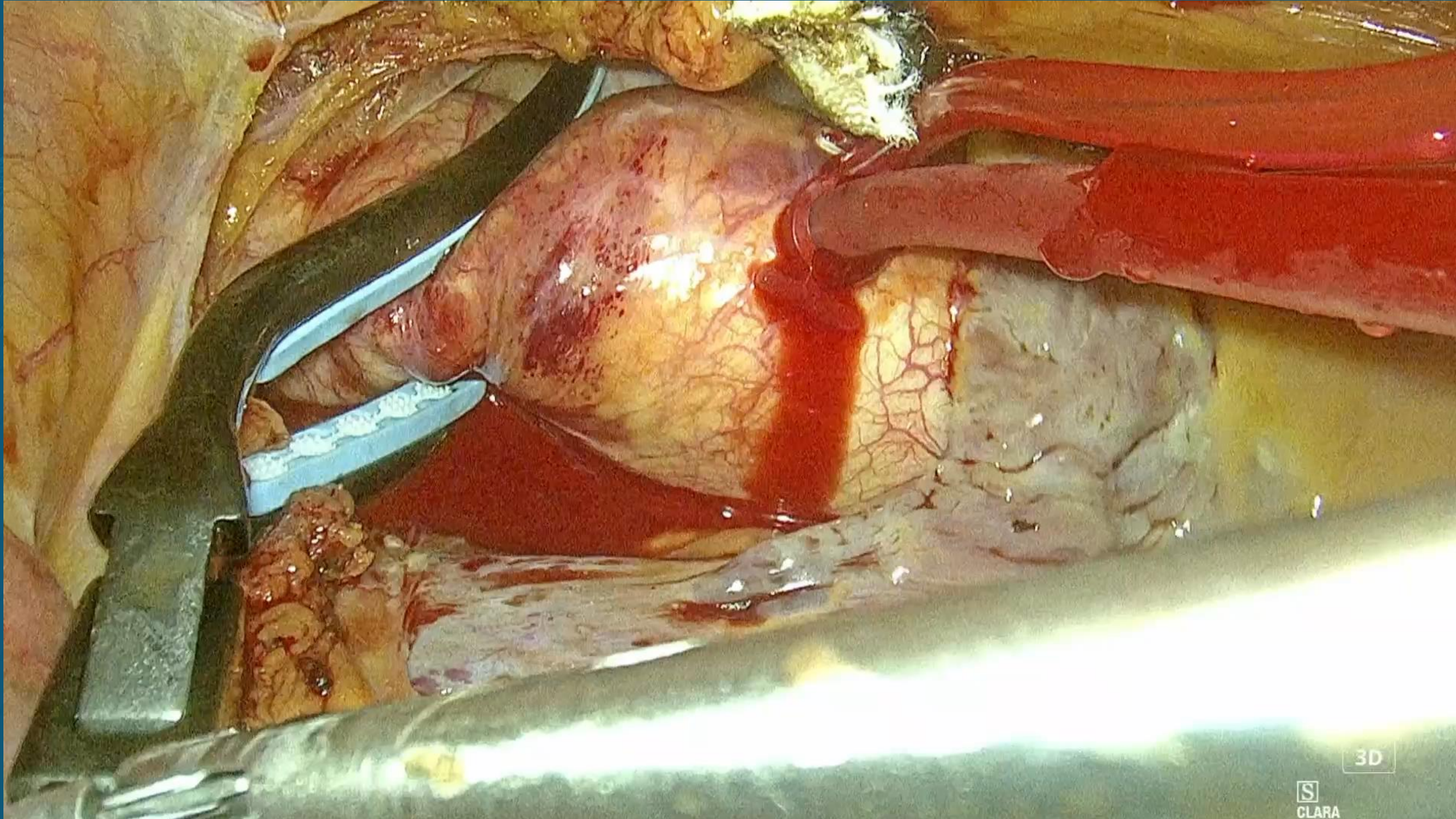
Postoperative results

	MV group (n=502)	TV group (n=116)	p value
30day mortality, n (%)	2 (0.4 %)	0	1
Temporary or perm renal replacement therapy, n (%)	2 (0.4 %)	0	1
Stroke / TIA, n (%)	2 (0.4 %)	2 (1.7 %)	0.16
Re-exploration for bleeding, n (%)	10 (2.0%)	5 (4.7 %)	0.26
Red blood cell transfusion, n (%)	103 (22.6 %)	37 (34.9%)	0.01
Prolonged ventilation > 72 hours, n (%)	4 (0.9 %)	1 (0.9 %)	1
ICU stay, days (median; IQR)	1; 1,1	1; 1,2	0.16
Hospital stay, days (median; IQR)	7; 6,9	9; 7,11	<0.001
Mitral regurgitation > mild, n (%)	3 (0.6%)	1 (0.9%)	1
Permanent pacemaker implantation, n (%)	0	1 (0.9 %)	0.42

Endoscopic aortic valve replacement



Hosoba, Ito, Ann Thorac Surg 2023



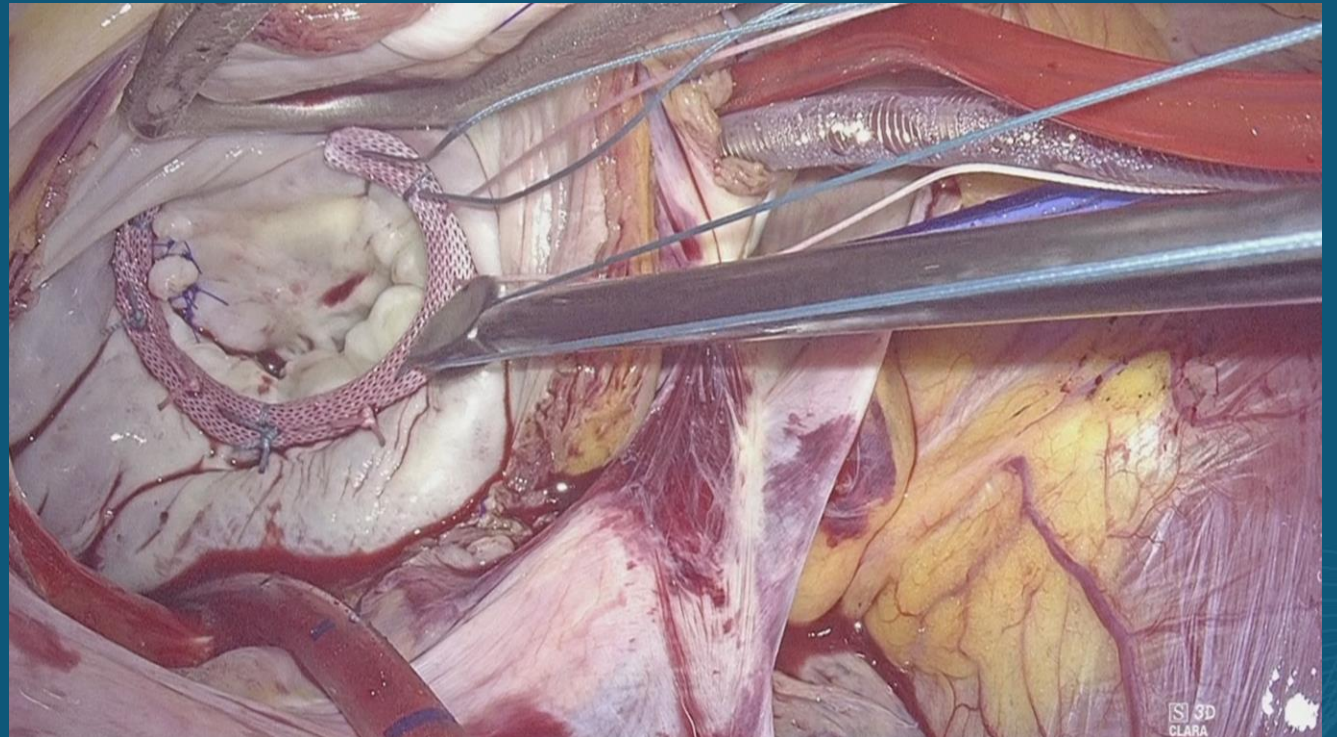
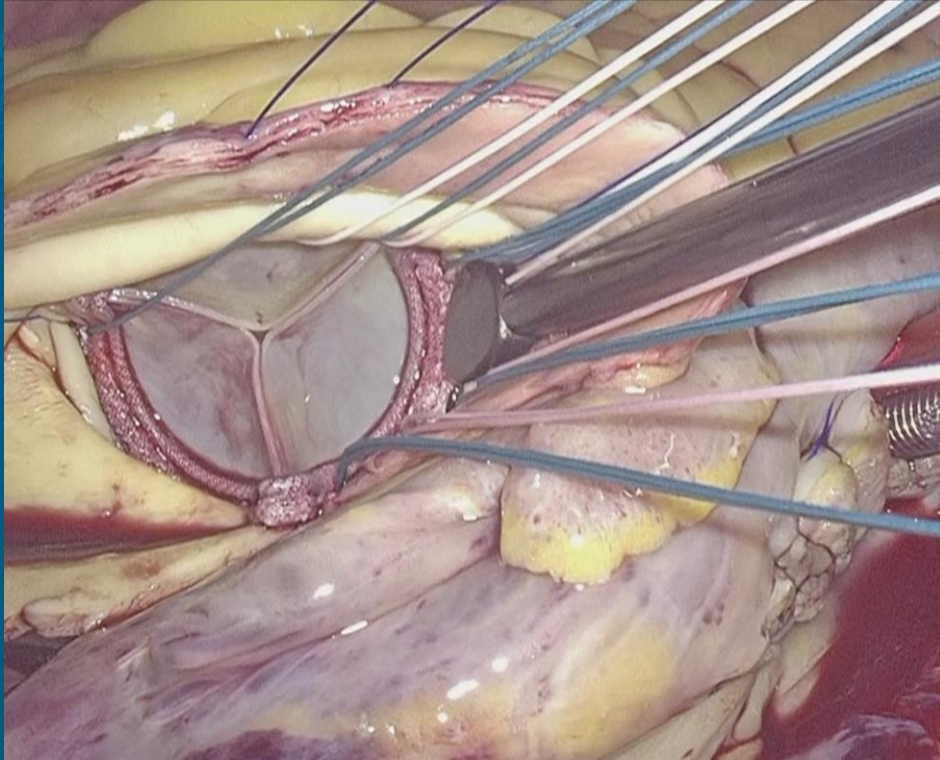
3D

S
CLARA

Three-Dimensional Endoscopic-Assisted Concomitant Mitral and Aortic Valve Surgery

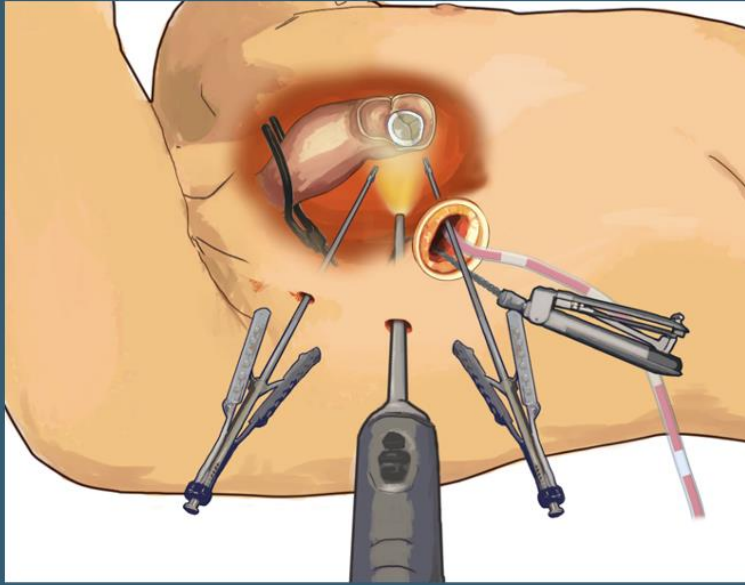
Soh Hosoba, MD, PhD, Toshiaki Ito, MD, PhD, and Mamoru Orii, MD

Department of Cardiovascular Surgery, Japanese Red Cross Nagoya First Hospital, Nagoya,

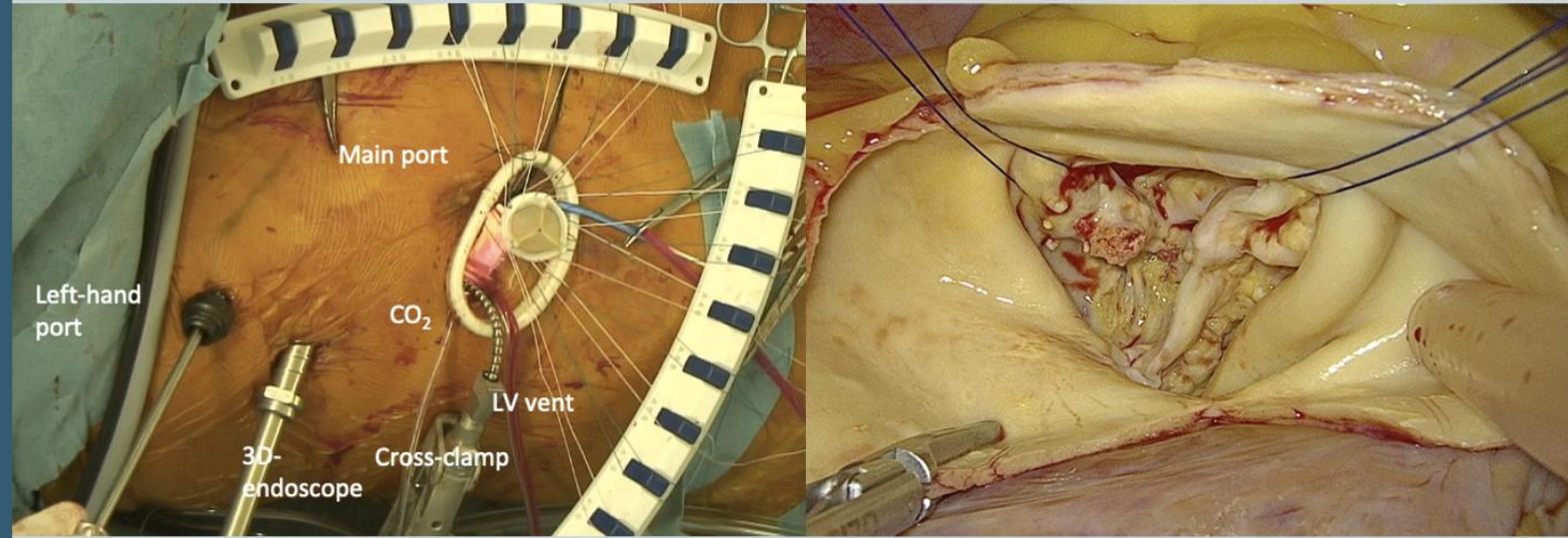


Ann Thorac Surg 2022

216 patients underwent totally endoscopic AVR

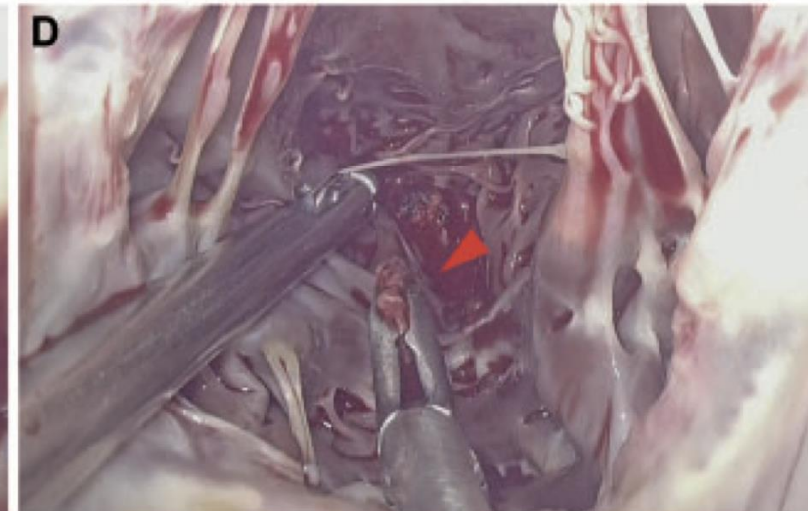
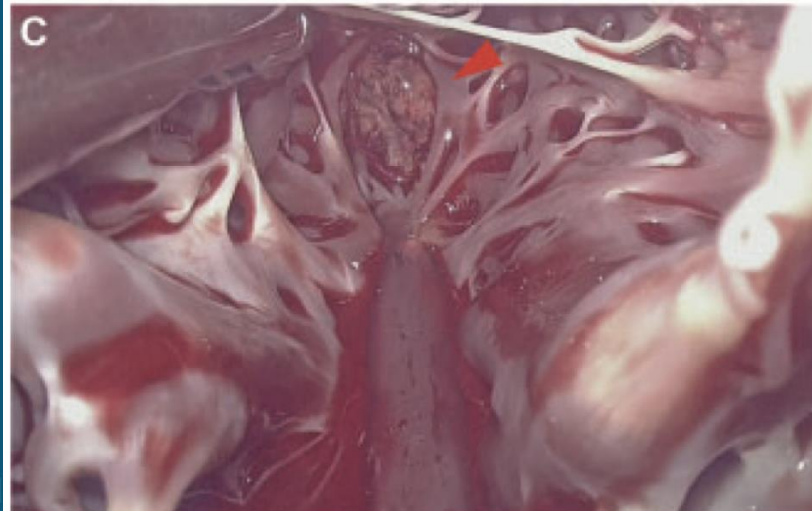
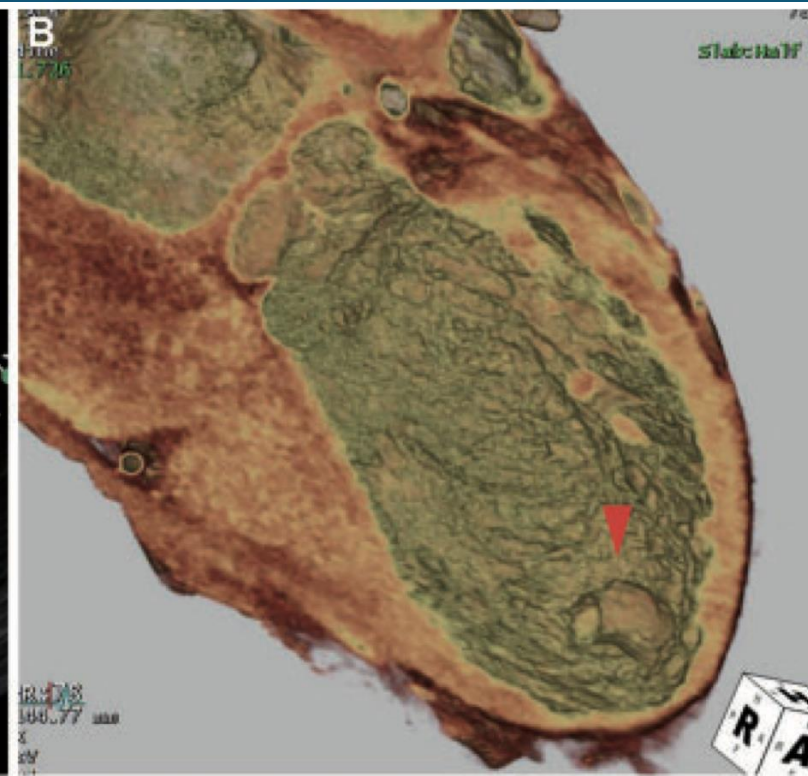
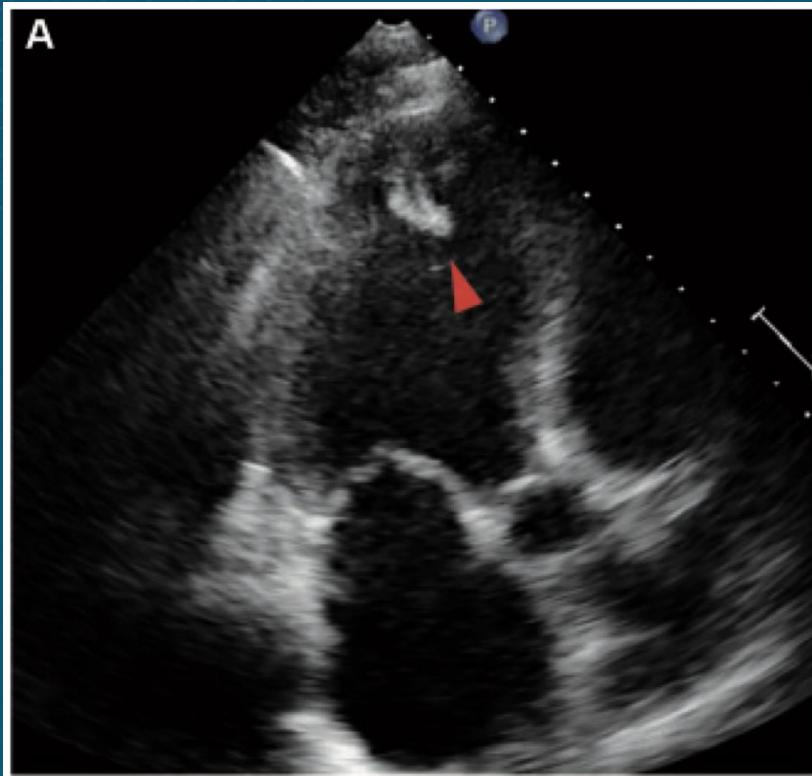


Concomitant surgery in 33 patients
21 had a concomitant mitral procedure

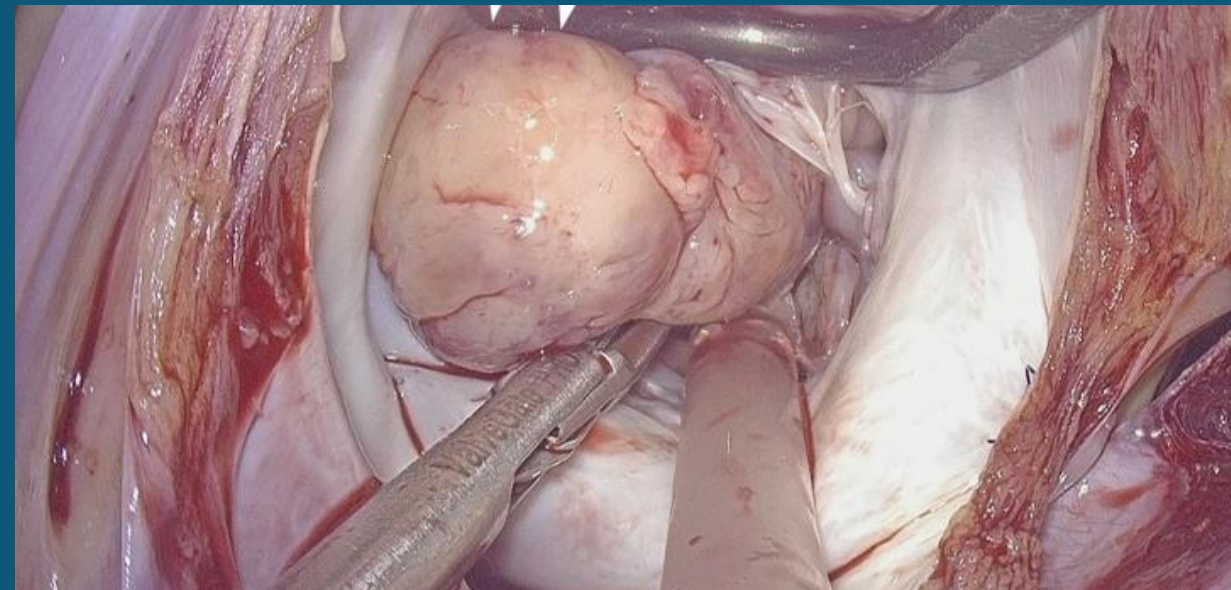
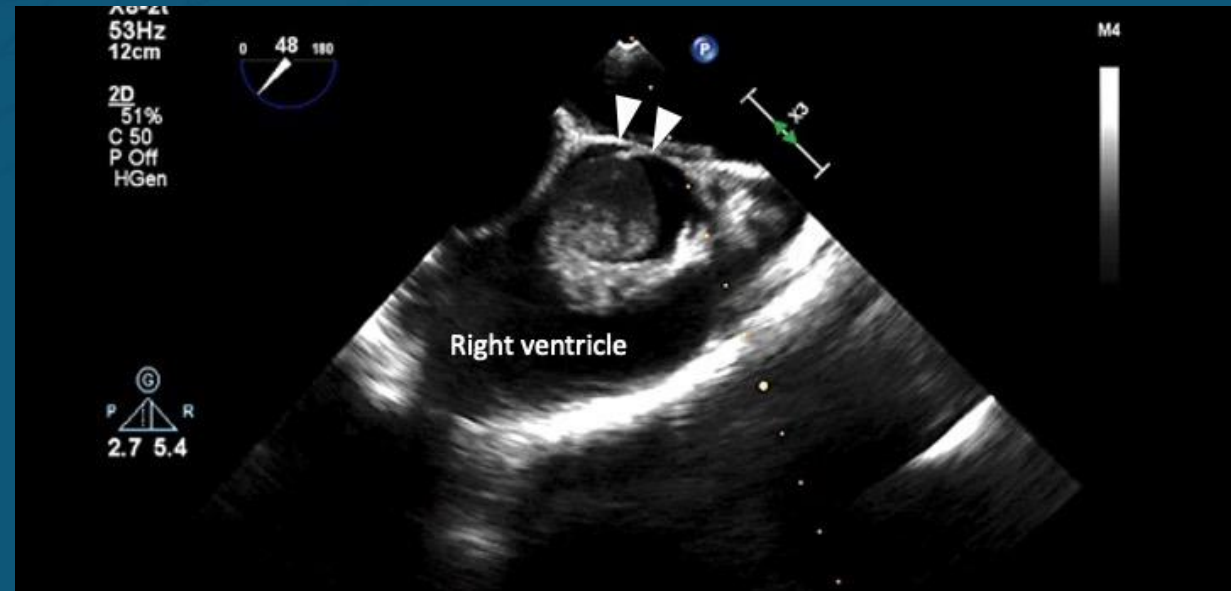
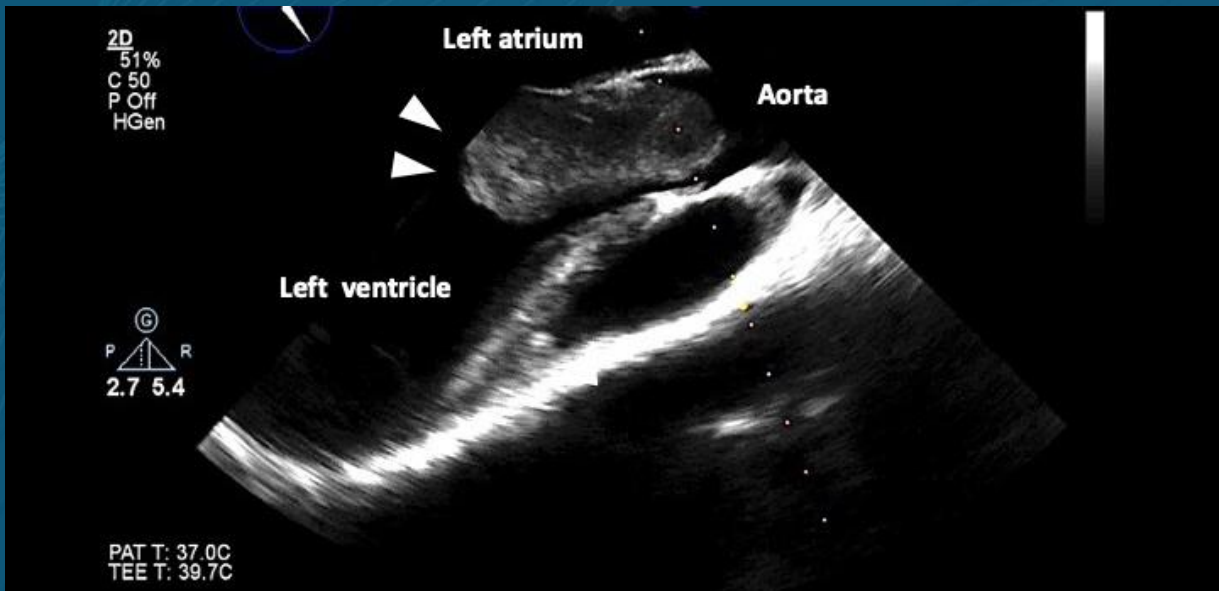


- *Aortic X-clamp time 78 (67-92) minutes for isolated AVR*
- *Median operation time 175 (150-194) minutes*
- *30day mortality occurred in 1 (0.5%)*
- *2 patients (0.9%) were converted to sternotomy*
- *Stroke occurred in 3 (1.4%)*

Endoscopic AVR can safely address concomitant valve disease.



*Fukumoto, Hosoba,
Eur J Cardiothorac
Surg
2020*



Conclusions

- Variable repair techniques can be utilized in 3 port-3D endoscopic mitral repair.
- Detailed and tailored repair can be achieved with clear and precise 3D image.
- Coexisting structural heart diseases can be addressed simultaneously.

Thank you!

