

# Smart Diaspora 2023

DIASPORA ÎN ÎNVĂȚĂMÂNT SUPERIOR,  
ȘTIINȚĂ, INOVARE ȘI ANTREPRENORIAL

10-13 aprilie 2023, Timișoara



## Tendinte actuale in chirurgia cardiaca robotica

Adrian Ursulescu, Robert Bosch Hospital, Stuttgart, Germany



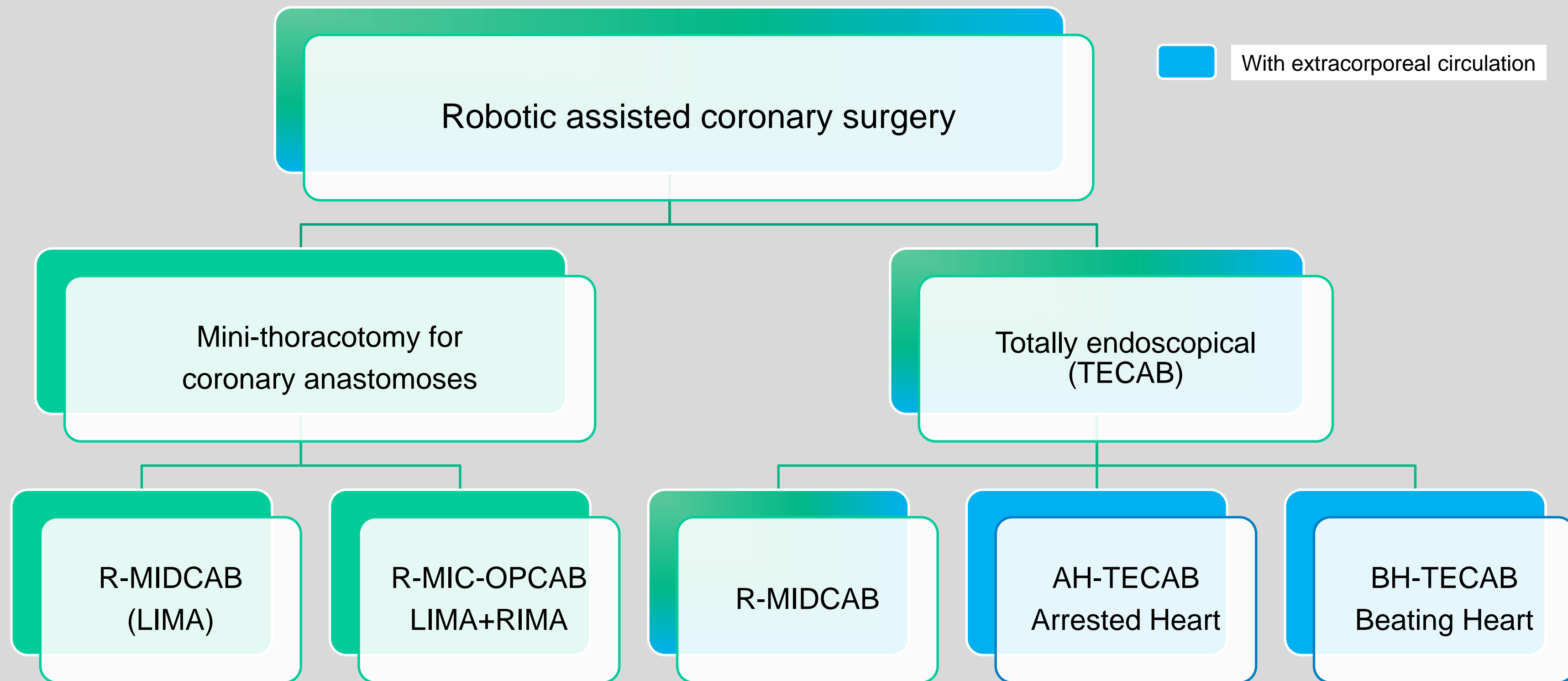
# Why robotic surgery ?

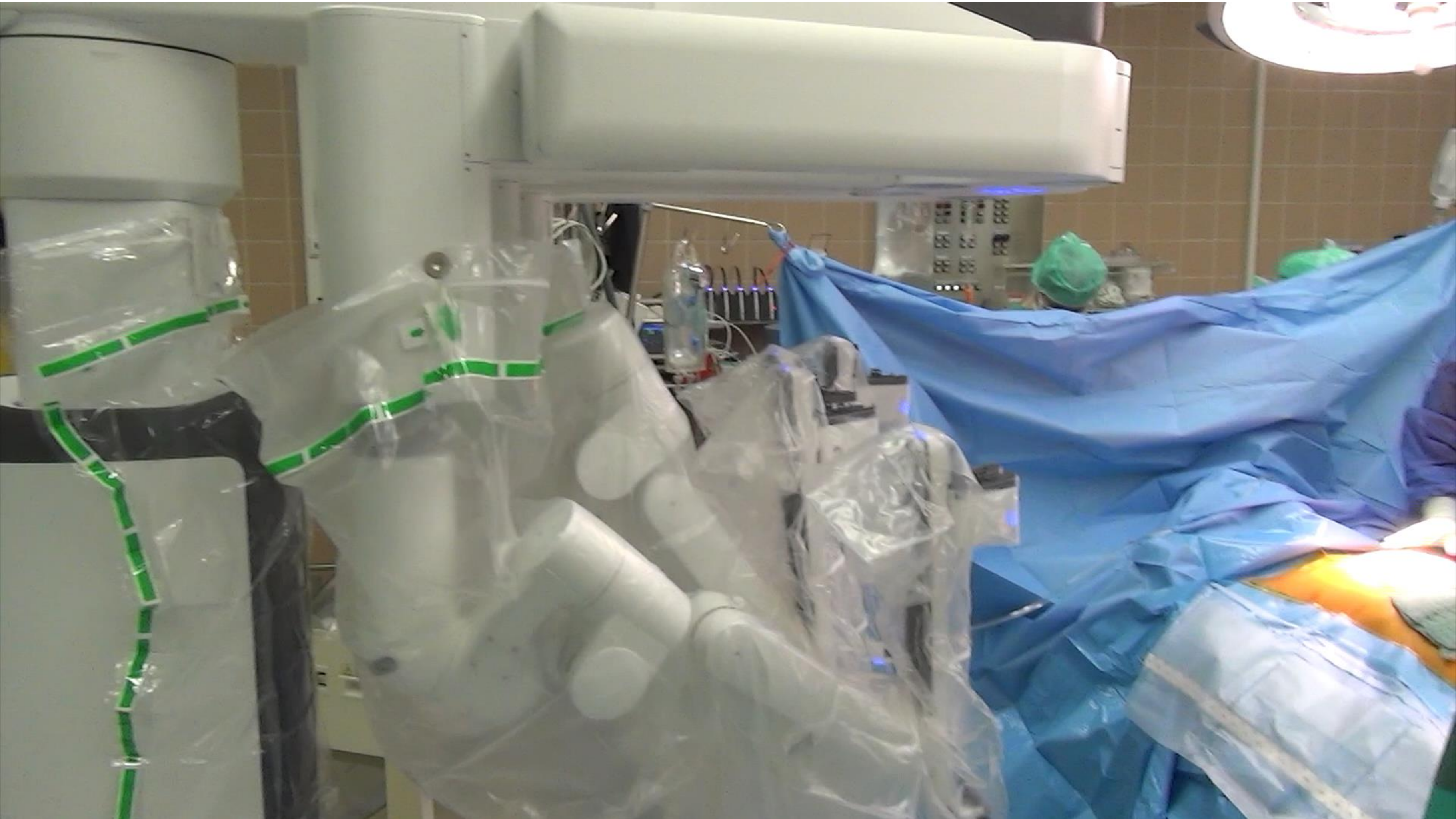


**Evolution goes on with the goals:  
Increase of safety and comfort for the patient !!! (Like everywhere)**



# Different variants of Robotic assisted coronary surgery



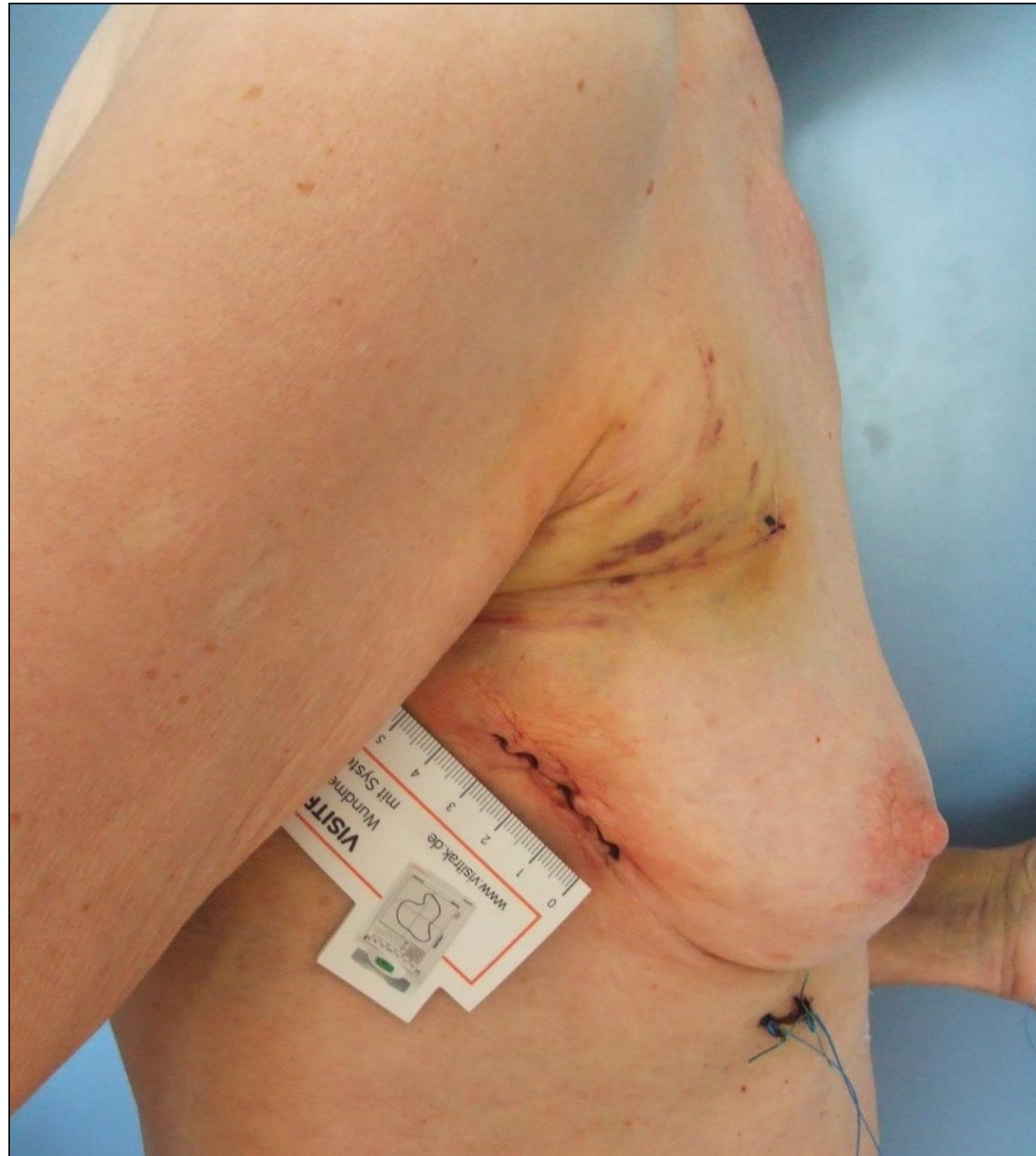


# Results of robotic assisted coronary surgery

	R-MIDCAB	R-MIC-OPCAB
Number	71	58
Age	65 ± 13	67 ± 10
Skin-to-Skin (min)	142 ± 46	245 ± 75
ICU time (h)	17 ± 19	21 ± 20
Hospital stay (d)	6 ± 3, Median: 5	6 ± 3, Median: 6
Death	0	1
Conversion	5	6



# Difference between MIMS vs. Robotic MVR



# Results of Robotically assisted MV-Repair Outcome (n=106)



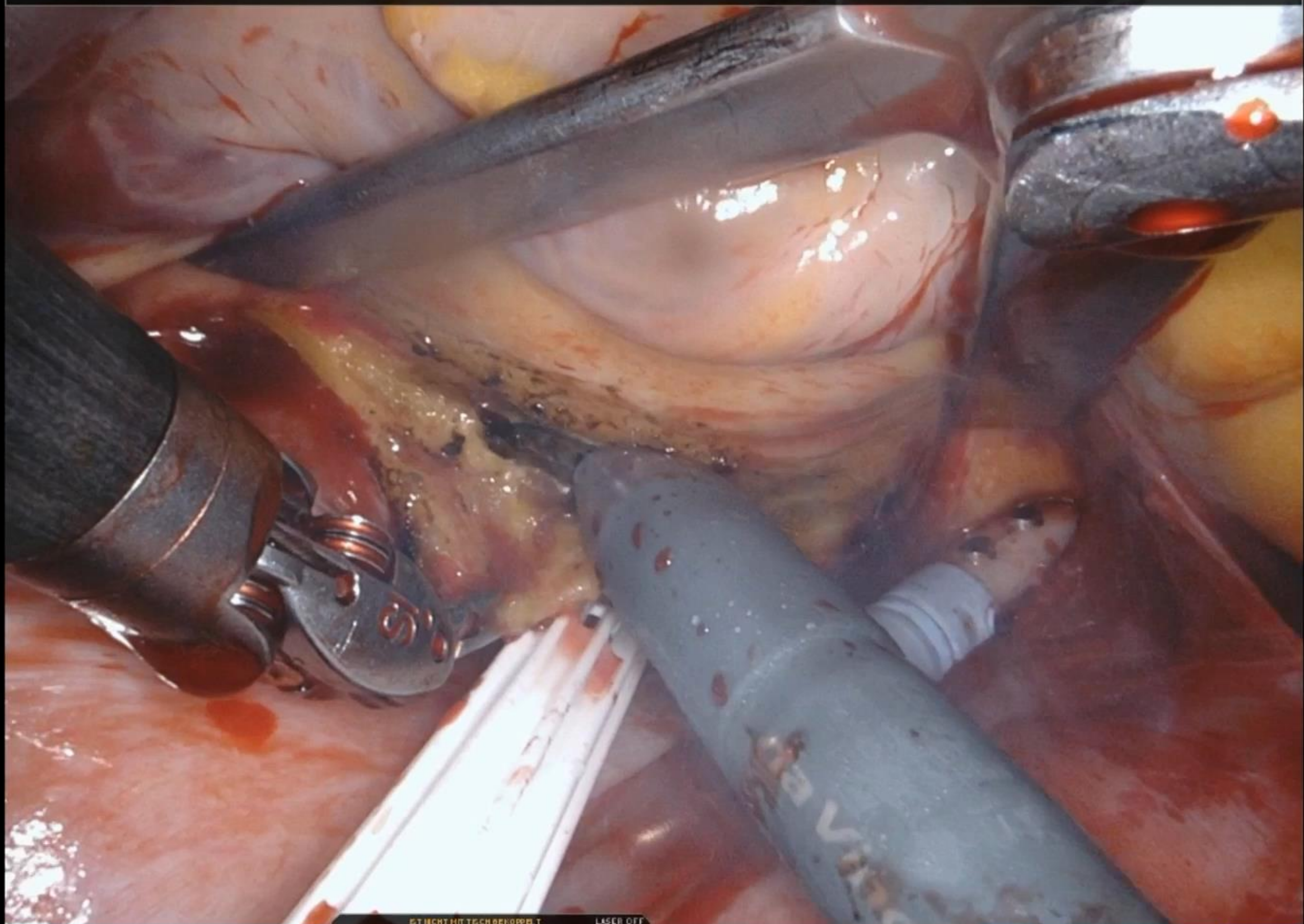
Robert-Bosch-Krankenhaus

## Complications


■ Death		n=1
■ Stroke		n=2
■ Reintervention for Bleeding		n=8
■ Conversion		n=5
• planned	1	
• Anatomy	2	
• Ventricular perforation	1	
• AI after Intraclade-dislocation	1	
■ Pulmonary Edema with ECMO		n=1
■ Liver injury		n=3



PRÜFEN SIE DIE NETZWERKVERBINDUNG. KEINE ONSITE-VERBINDUNG.



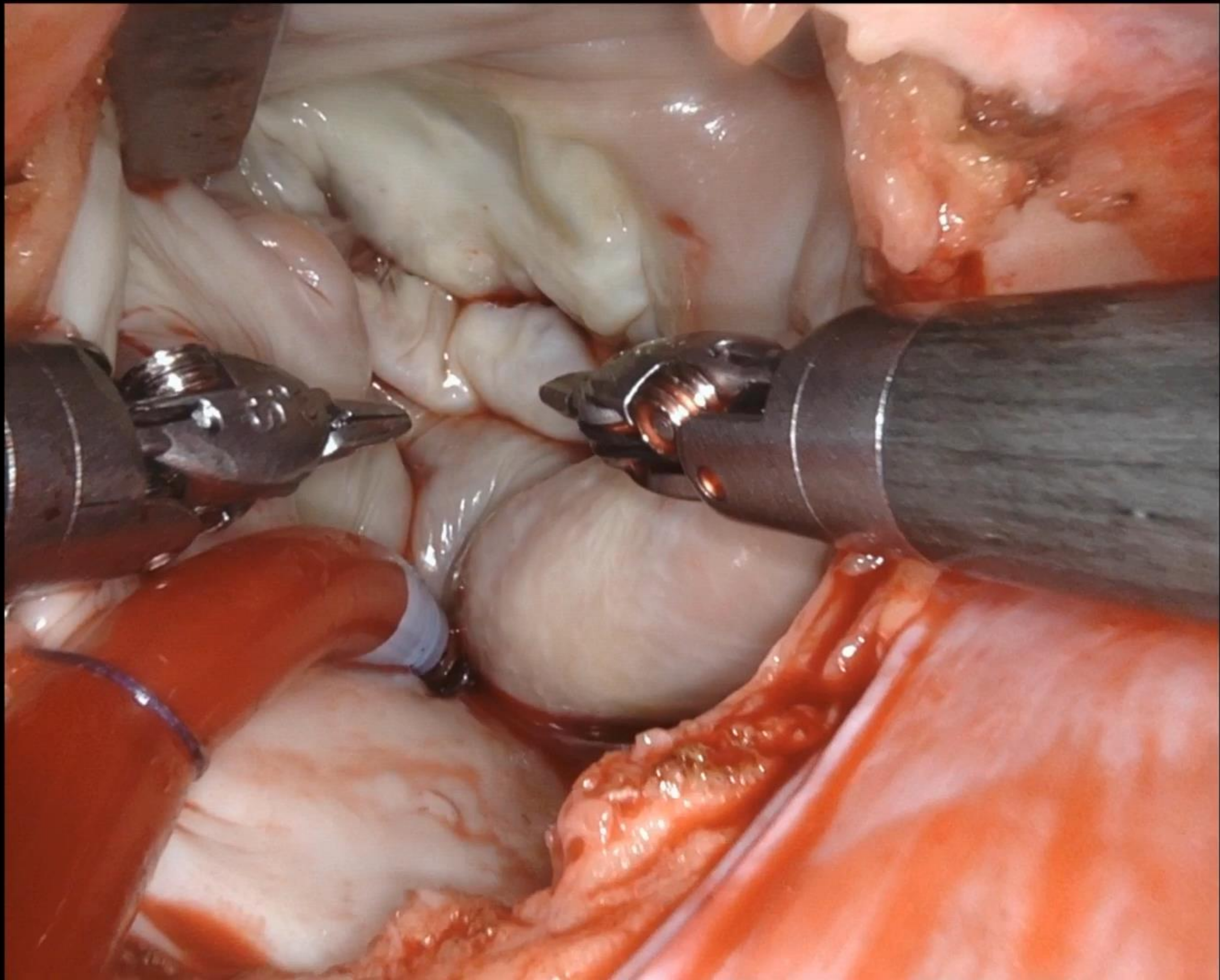
1 DEBAKEY FORCEPS

2  ES NICHT MIT TECH BEKOPPELT LASER OFF  
1x 0°

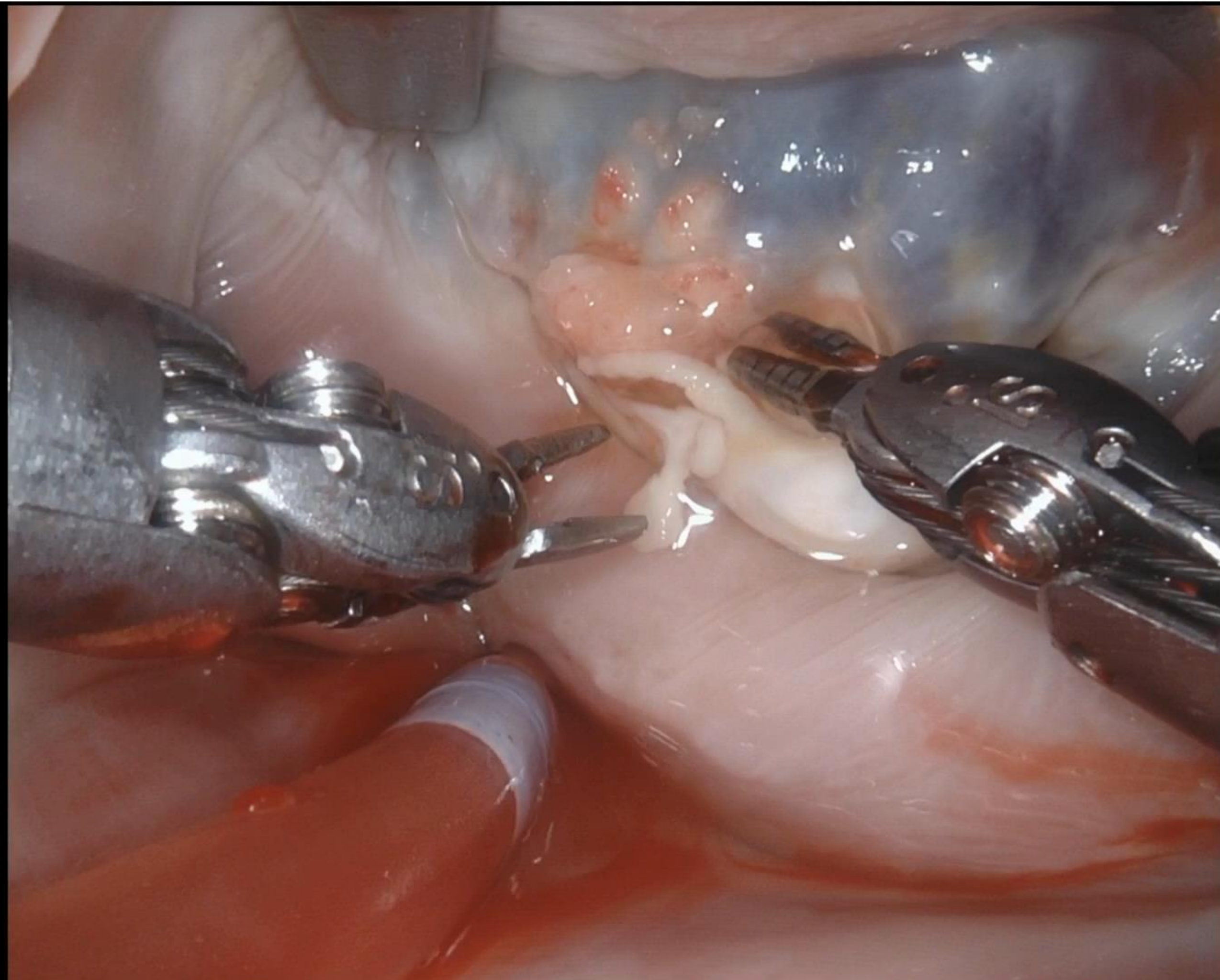
3 DUAL BLADE RETRACTOR

4 MONOPOLAR CURVED SCISSORS











# Challenges for robotic access



Robotic access is particularly advantageous for

- Difficult mitral pathologies
- Pectus excavatum

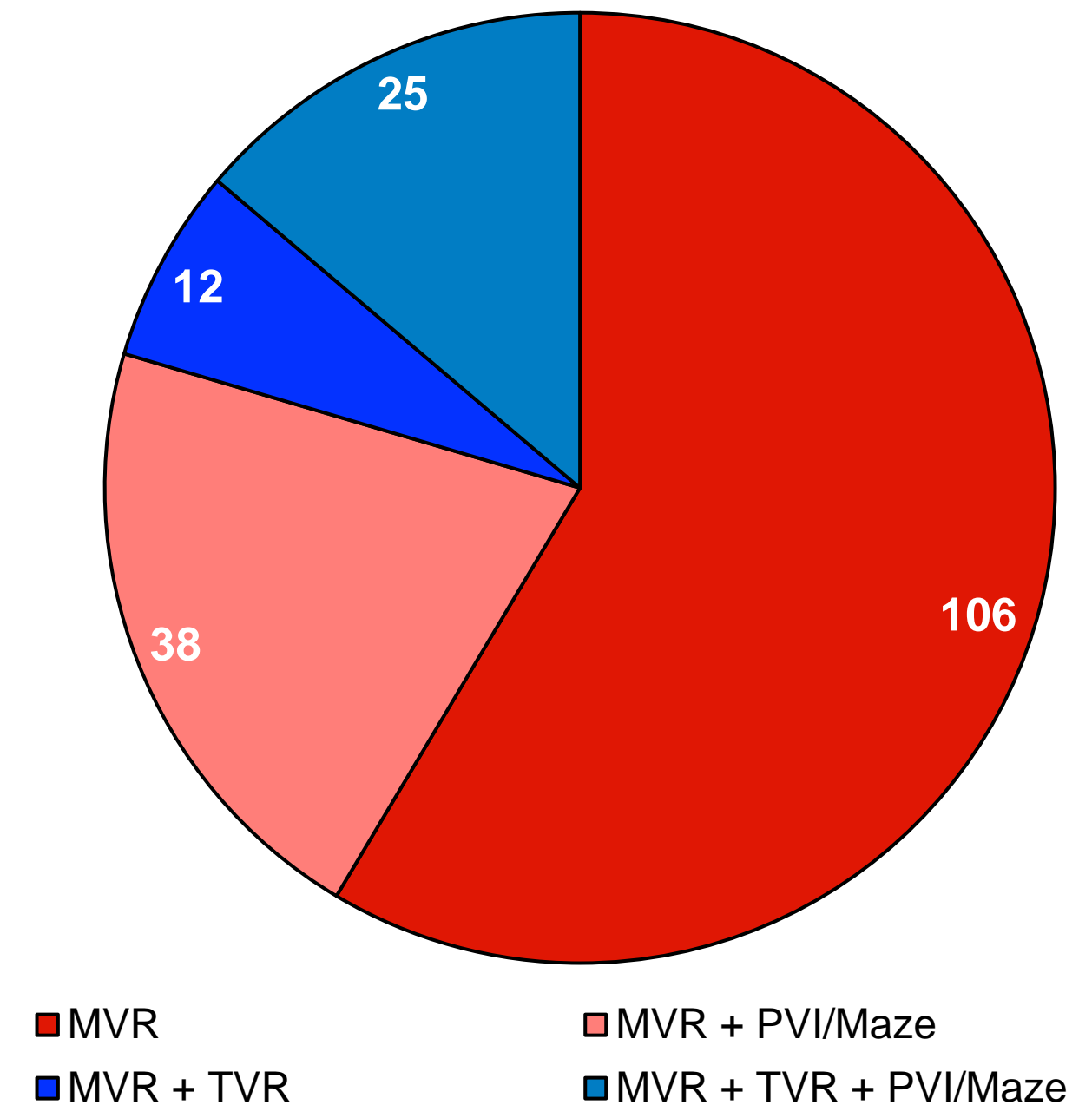


# Results of Robotically assisted MV-Repair Procedures (31.12.2021)

- N= 181 (10.07.2019 – 31.12.2021)
- MV-Repair: n= 106
- MV-Repair + Cryoablation + LAA-Closure: n= 38
- MV-Repair + TV-Repair: n= 12
- MV-Repair + TV-Repair + Cryoablation + LAA-Closure: n= 25

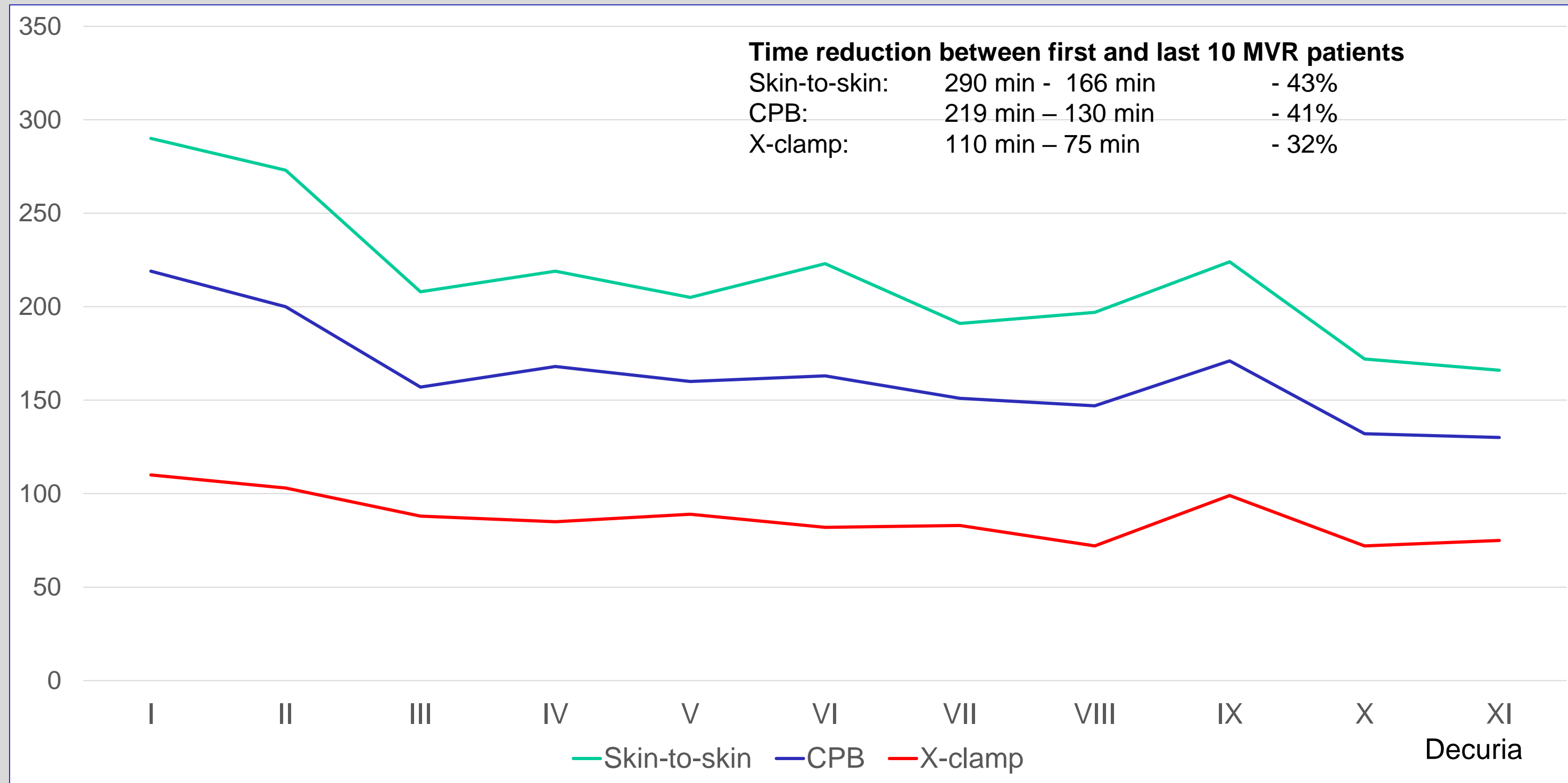
## Operative data:

- Age: 62,8 ± 11,9; 38-82
- Euroscore-II: 3,01 ± 3,95; 0,5 – 31,4
- X-Clamp: 95 ± 31 min
- ECC-Time: 180 ± 55 min
- Skin-Skin: 232 ± 63 min



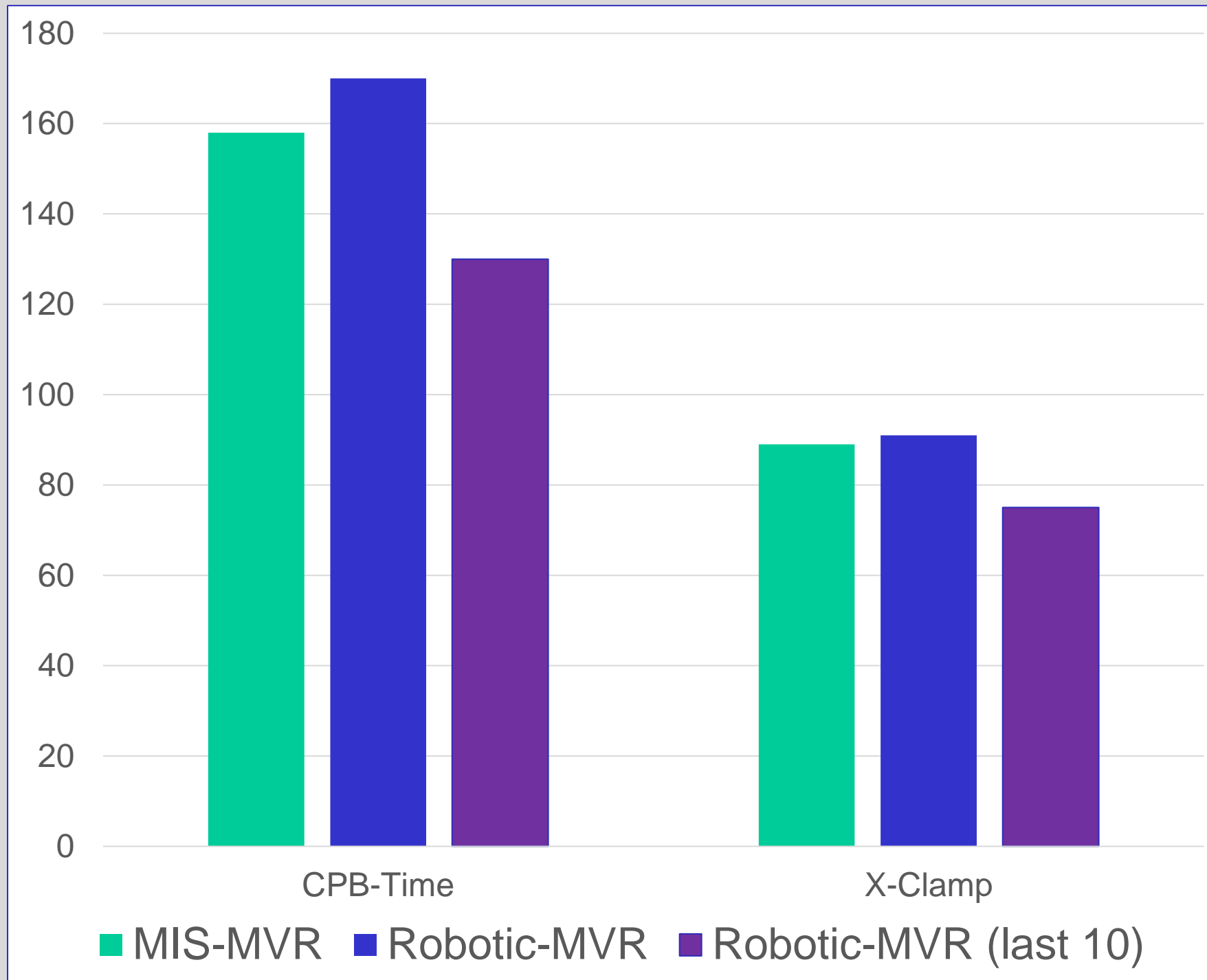


# Evolution of operative times (min) (isolated MVR only, n=106)





# Comparison of operative data (2020) MIS-MVR vs. Robotic-MVR vs. Robotic-MVR (last 10)

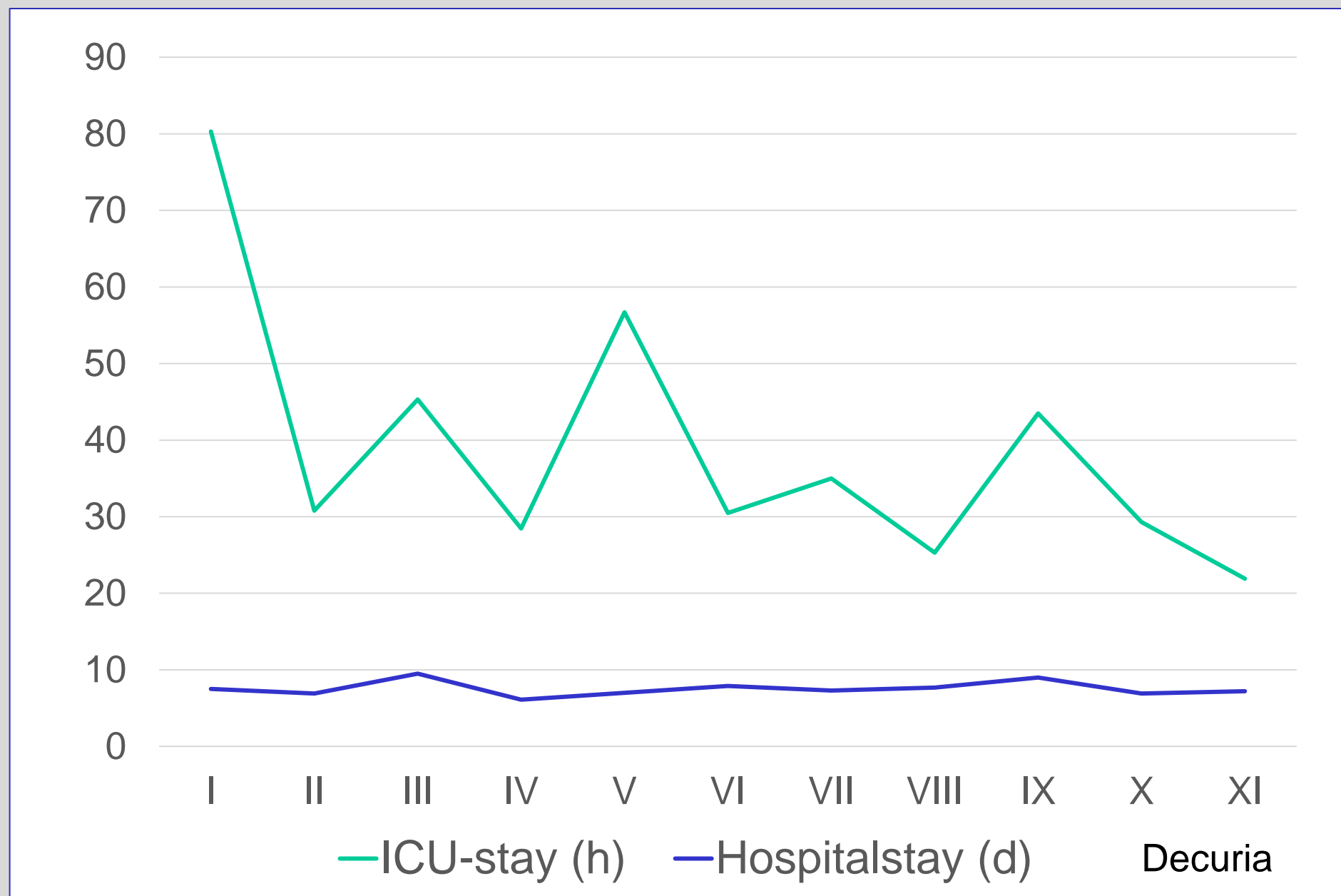


After 24 procedures two robotic mitral cases were done at the same working day, in the same operating room.

After 31 procedures one mitral and one coronary robotic case were done at the same table.



# Evolution of ICU- and postoperative Hospitalstay (MVR only, n=106)



## Comparison of hospital stay in 2020

	MIMS	Robotic MVR
n	30	57
Real VWD	12,500	9,421
MVD	12,793	13,700
Delta. VWD - MVD	-0,293	-4,279



# Comparison of real costs MIS-MVR vs. Robotic-MVR (INEK 2020)



	MIS-MVR	MIS-MVR INEK- Calculation	Delta INEK- Calc./Real Costs	Robotic MIS- MVR	Robotic MIS-MVR INEK-Calculation	Delta INEK- Calc./Real Costs
Ärztlicher Dienst*	3.387	3.936	-549	3.147	4.282	-1.135
Funktionsdienst	2.660	2.392	267	2.813	2.577	237
Sachkosten	5.335	5.539	-204	7.732	6.348	1.384
Medizinische Infrastruktur**	1.731	1.459	273	2.568	1.583	985
Nichtmedizinische Infrastruktur***	3.147	3.165	-18	2.699	3.464	-764
Ø Kosten IST	16.259	16.490		18.960	18.253	
Ø Delta	-231			707		
ohne Pflegedienstkosten						

\* Kürzere Belegungsdauer  
 \*\* Sterilisation/Wartung/Abschreibung  
 \*\*\* Kürzere Belegung

**In 2020 Robotic MVR was more expensive (€ 938) compared to MIMS**



# Total RBK-Experience with Robotically assisted Cardiac Operations

- N= 336 (10.07.2019 – 31.01.2022)

## Valves (184):

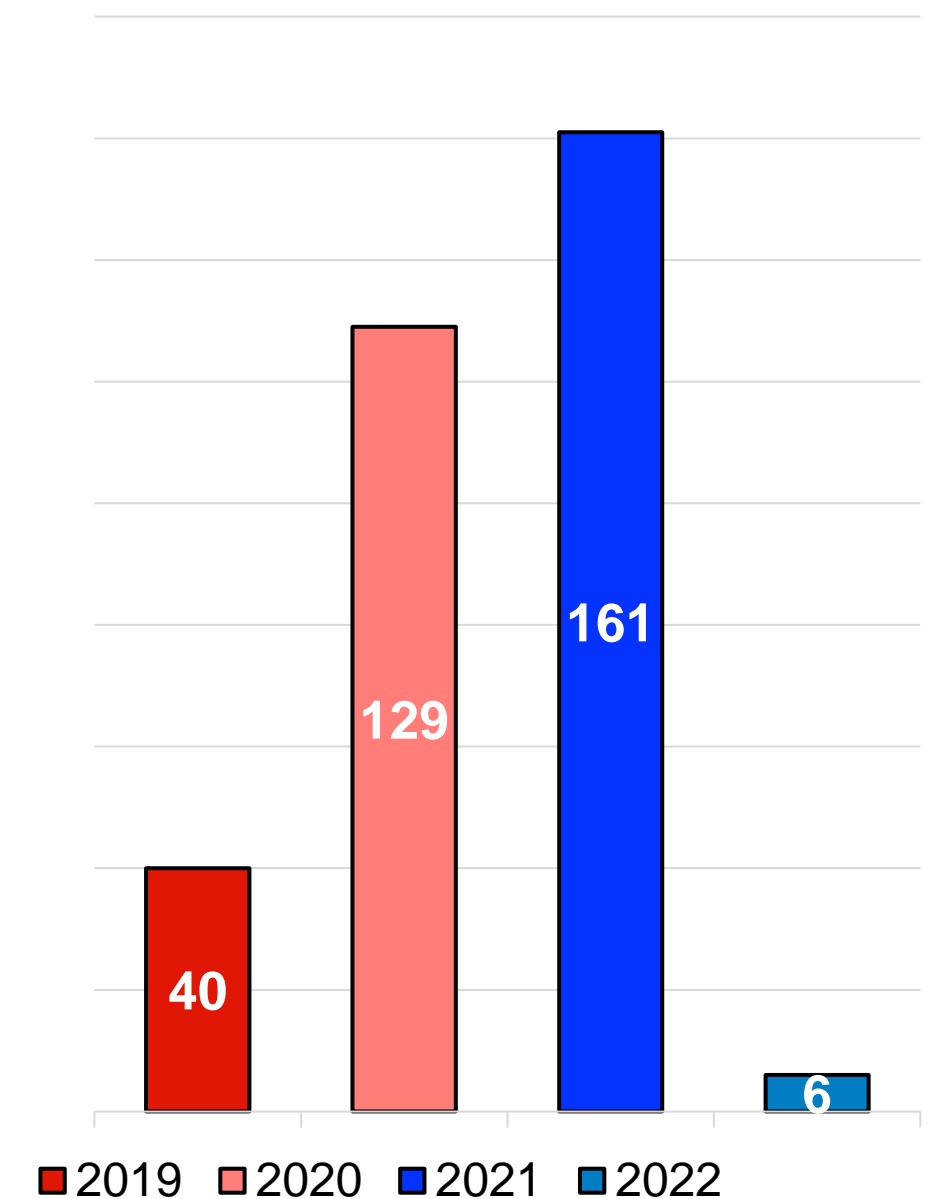
- MV-Repair (incl. PVI, MAZE-IV, LAAA) 144
- MV- + TV-Repair (incl. PVI, MAZE-IV, LAAA) 37
- TV-Repair (solo) 3

## Coronaries (136):

- MIDCAB (single LITA) 79
- MIC-OPCAB (LITA + RITA) 57

## Others (13):

- ASD-Closure 3
- Myxom-Exstirpation 8
- Stand-alone MAZE-IV 2





# Total RBK-Experience with Robotically assisted Cardiac Operations



Robert-Bosch-Krankenhaus

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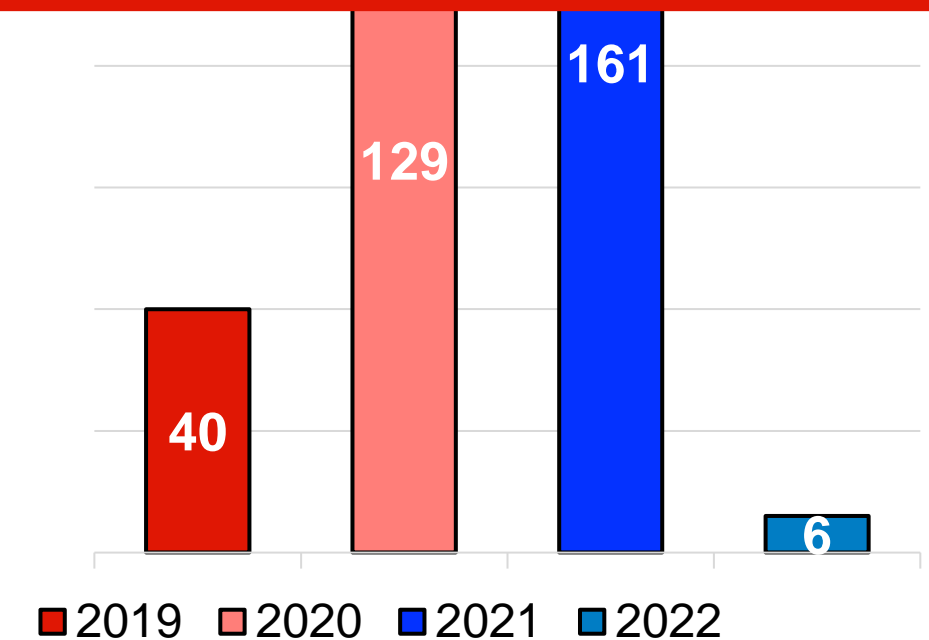
**Number 1 in Europe in 2020 and 2021**

Coronaries (136):

- MIDCAB (single LITA) 79
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Others (13):

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ROBOTIC  
CARDIAC  
SURGERY  
IN  
EUROPE  
2021



Overall:

- 24 Centers
- 12 Countries

Mitral valve surgery:

- 17 Centers
- 10 Countries



# Summary

## Advantages for the patient

- Higher precision and better handling in a very small room allows more opportunities for repair
- Significantly shorter hospital stay
- (Almost) **No Pain**
- Very small wounds, fast recovery

## Advantages for the surgeon

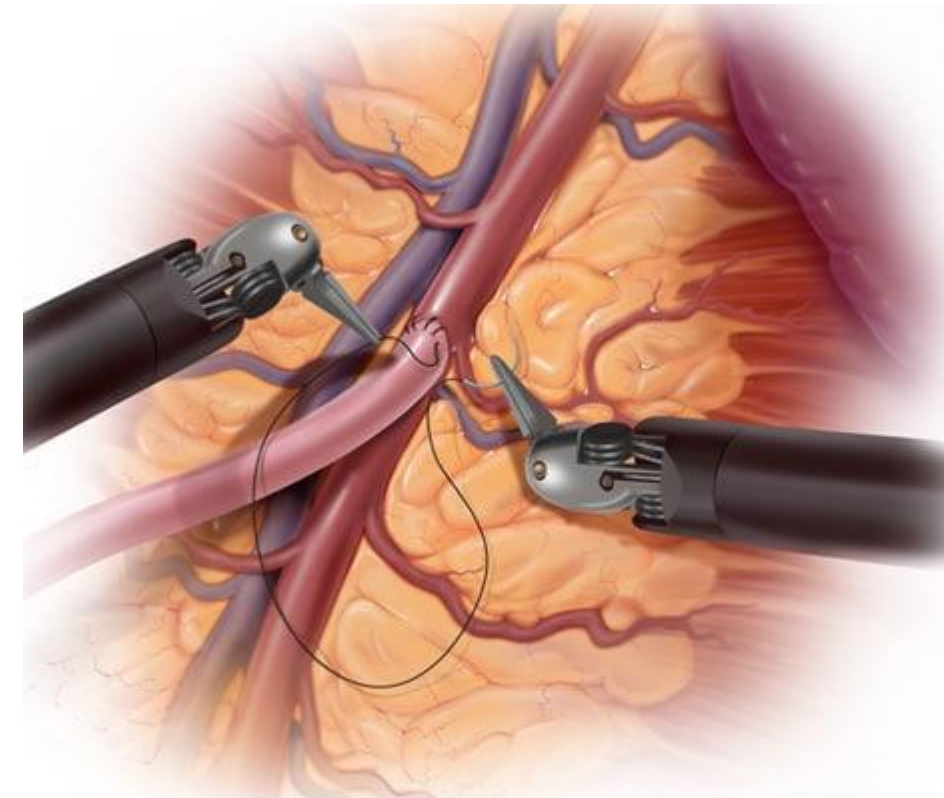
- Much better ergonomics
- Much better visualization
- 10-fold magnification, better precision

## Drawbacks

- Severe calcification not to manage
- High costs for acquisition and maintenance



**Thank you for your attention**



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