

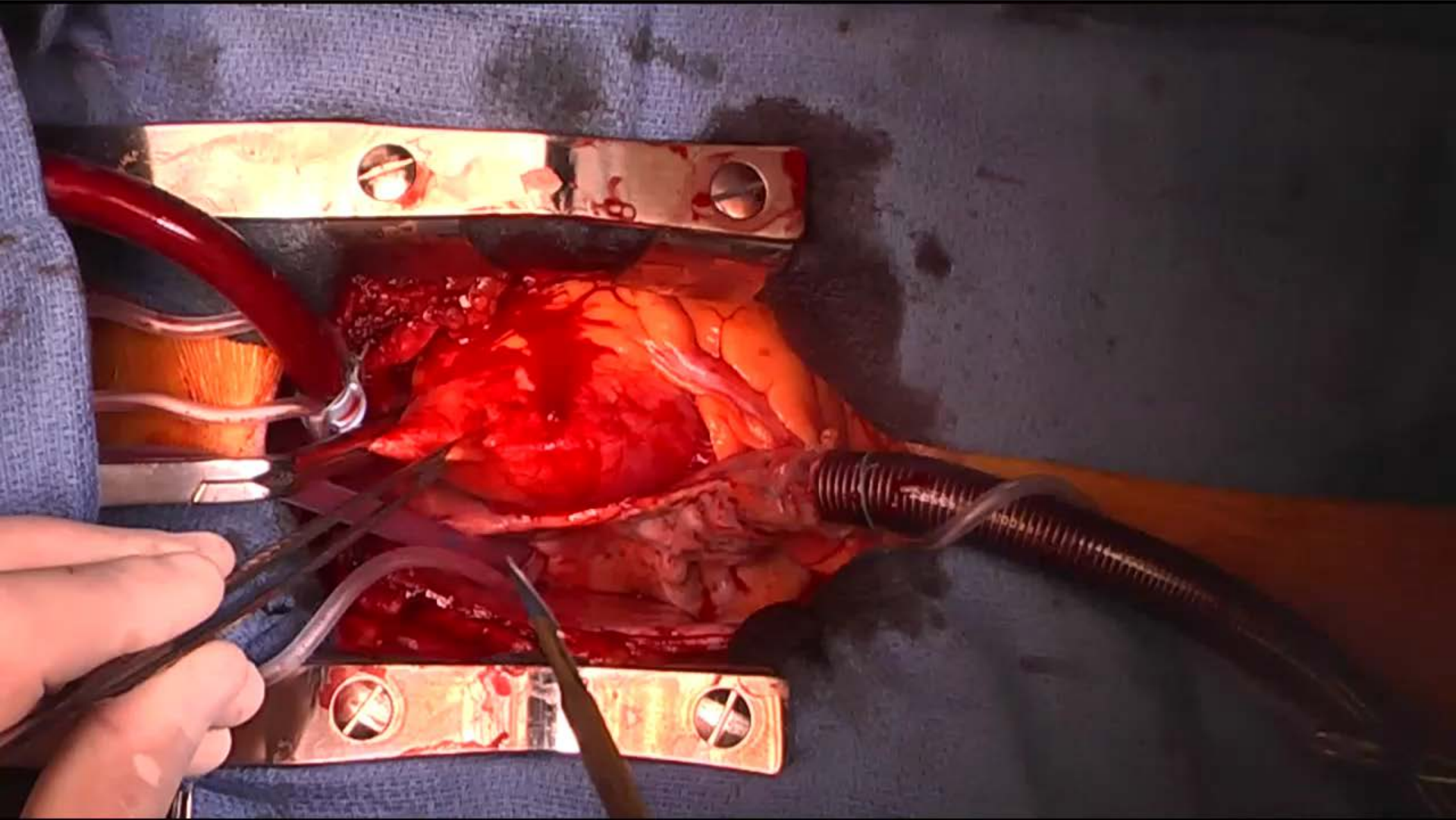
*Valve-Sparing Aortic Root  
Replacement  
Reimplantation Technique in  
Tricuspid Aortic Valve*

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# FAA Repair

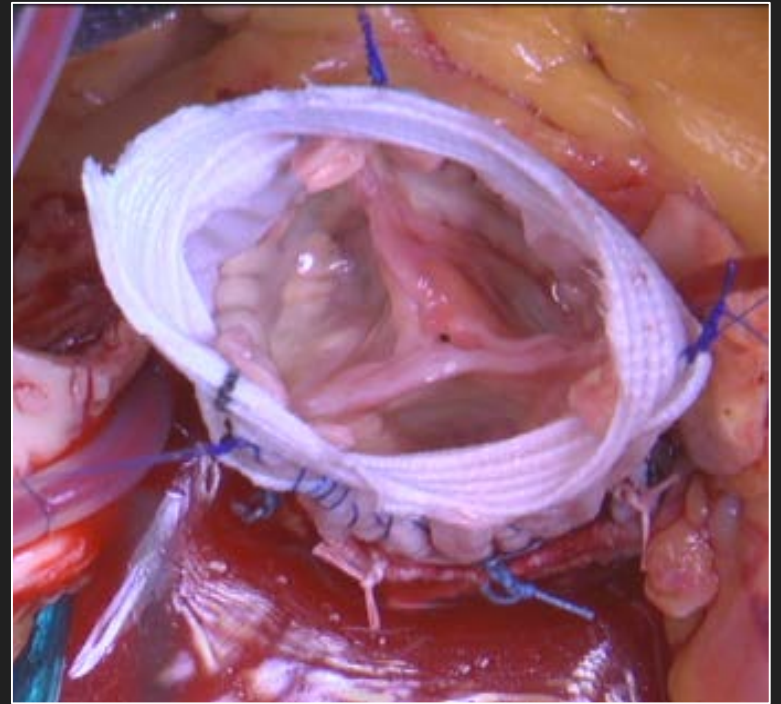
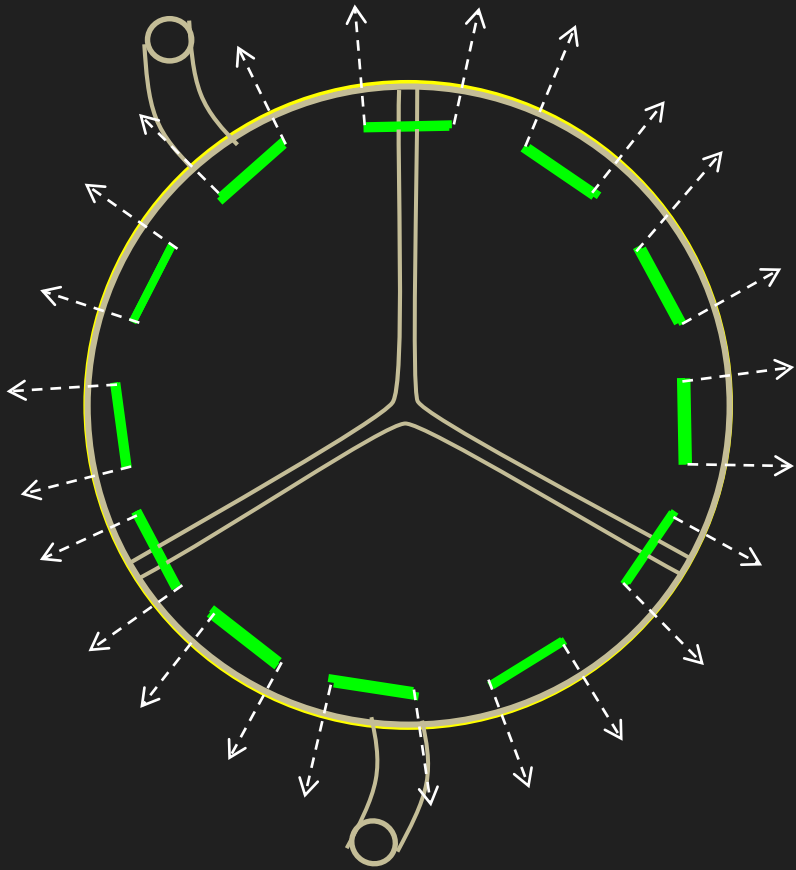
## The Reimplantation Technique

1. Root preparation ← **Cusp inspection**
2. Graft sizing ← **Cusp repair (complex repair)**
3. Proximal suture line
4. Graft trimming
5. Com. reimplantation & distal suture line
6. Coronary reimplantation ← **Cusp repair (prolapse repair)**
7. Distal anastomosis



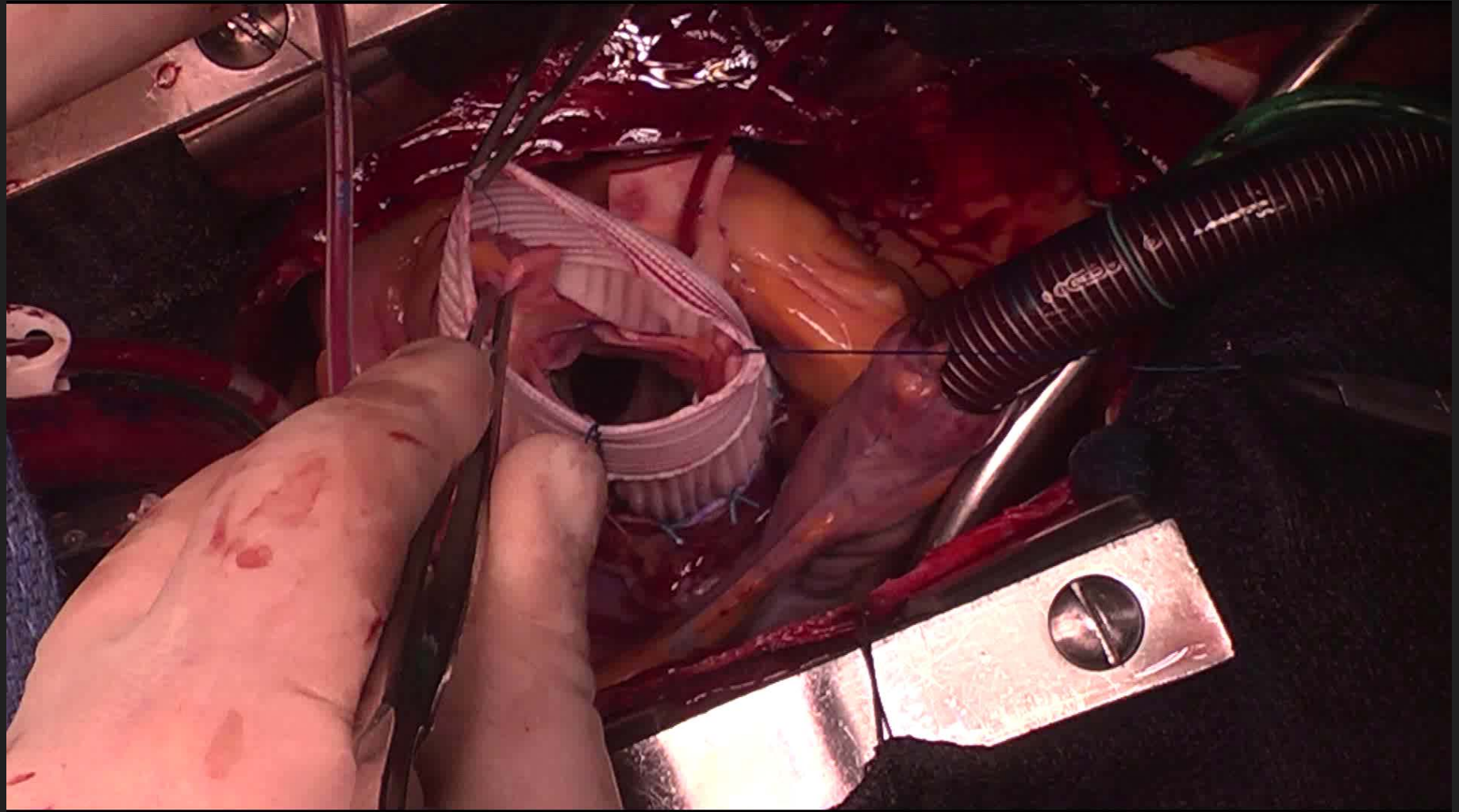
# Reimplantation Technique

## Proximal Suture Line effect on VAJ



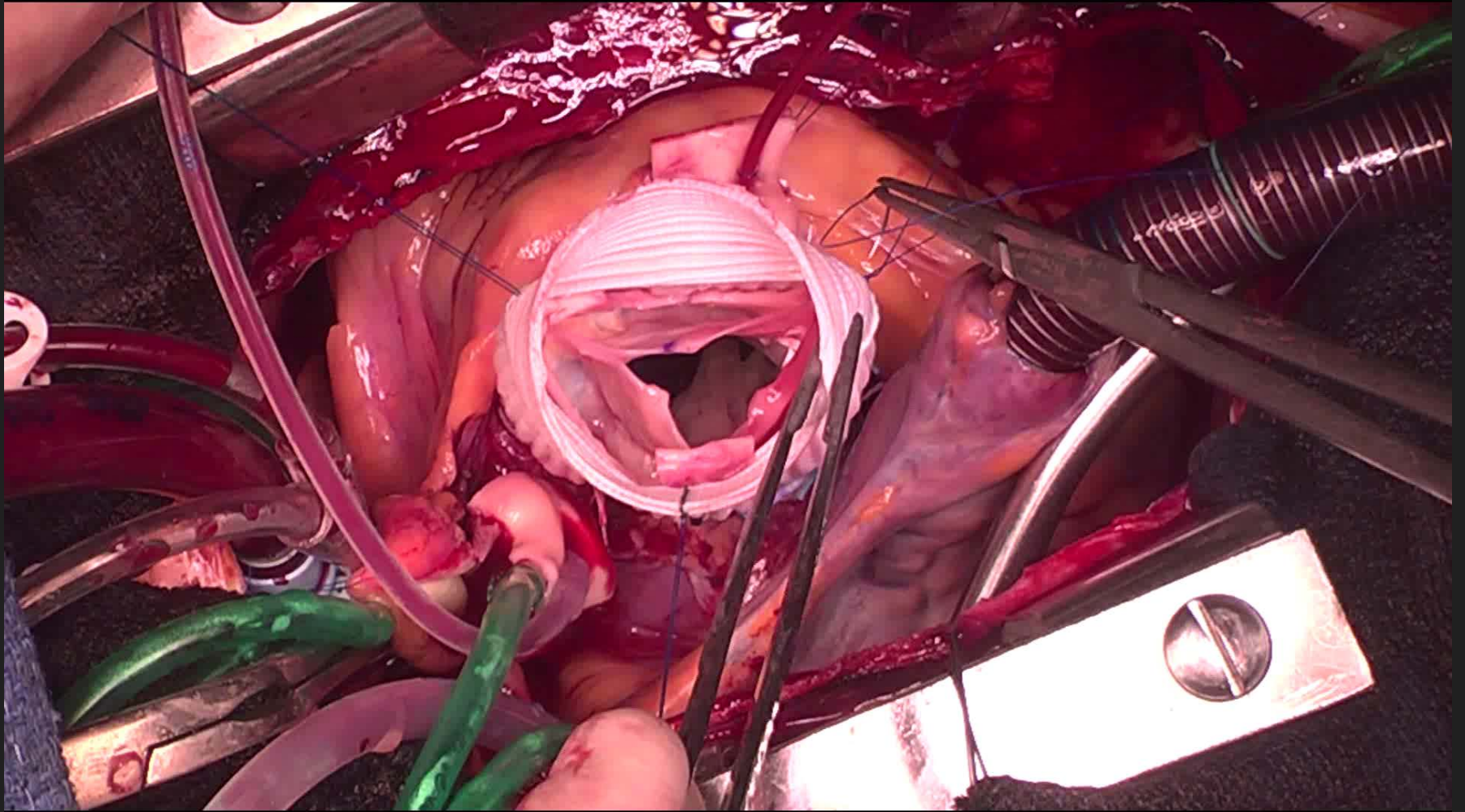
# Reimplantation Technique

Commissure reimplantation on neo-STJ



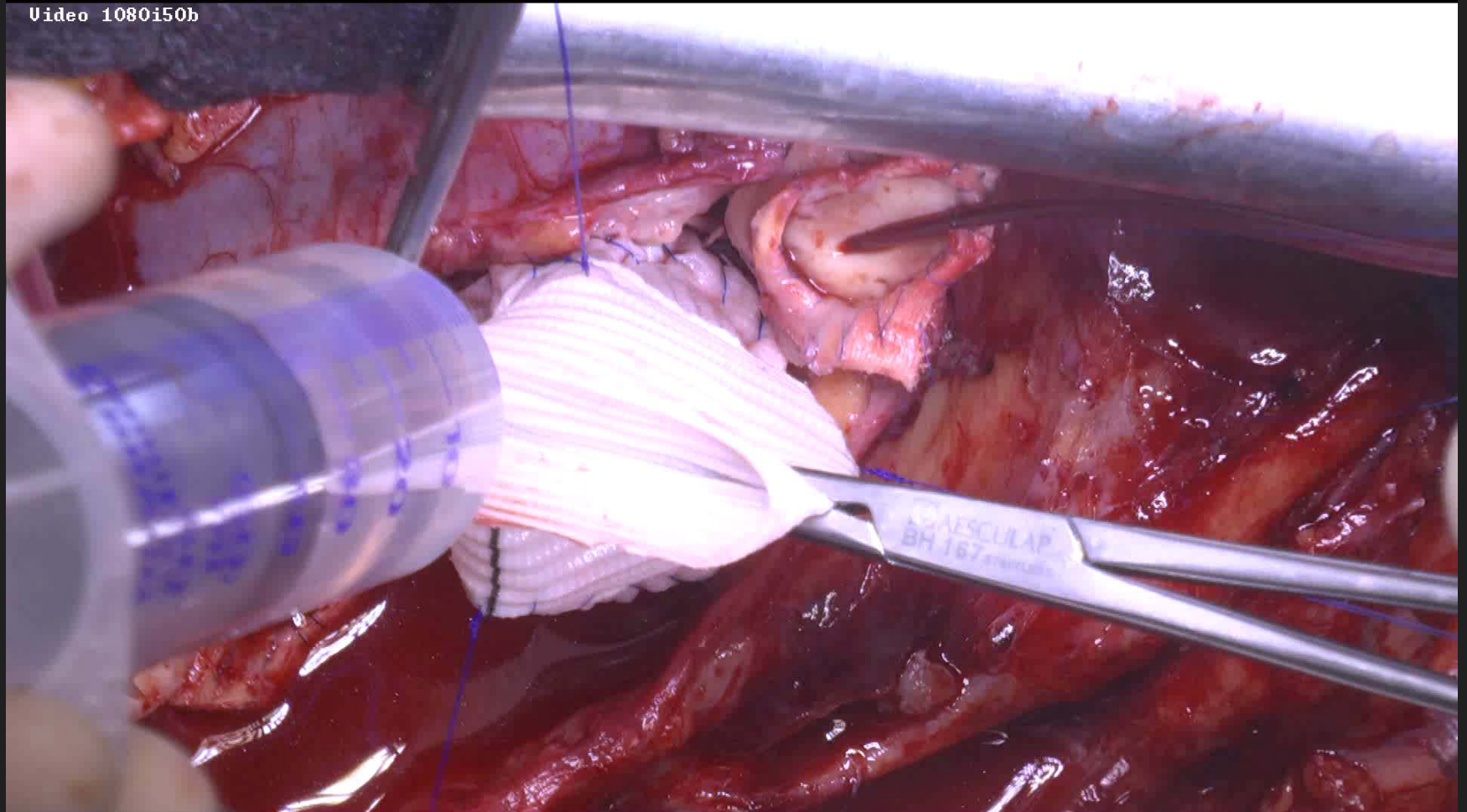
# Reimplantation Technique

## Distal Suture Line



# Reimplantation Technique

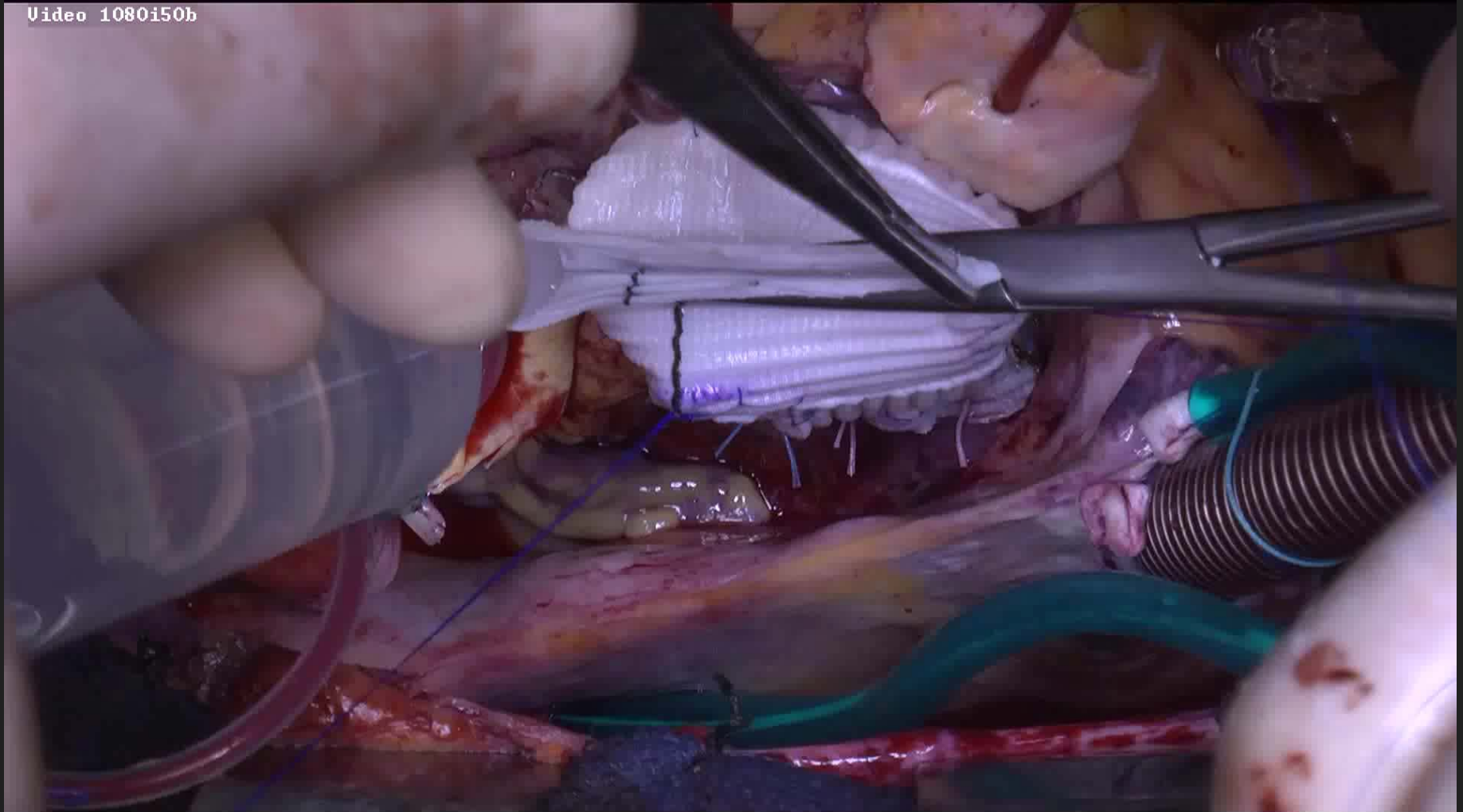
## Cusp Inspection, Prolapse Repair and Water Test



# Reimplantation Technique

## Cusp Inspection, Prolapse Repair

Video 1080i50b





# Materials and Methods

- Between 1999-2017, 923 patients underwent AV repair at St. Luc's Hospital (Brussels, Belgium); **440 patients (47.7%)** were treated with VSRR and are the Study Cohort;
- Patients were divided into 3 groups according to the indication for surgery:
  - Root aneurysm without AR (**Conventional Indication**)  
Group 1 = 139 patients (31.6%)
  - Root aneurysm with significant AR ("**debated**" indication)  
Group 2 = 212 patients (48.2%)
  - Isolated AR (**non-conventional indication**)  
Group 3 = 76 patients (17.3%)
  - Further 12 patients (2.7%) presented with acute type-A aortic dissection

# Demographics

	Aneurysm n=139	Aneurysm + AR n=212	Isolated AR n=76	<i>p</i>
Mean age $\pm$ SD (years)	47 $\pm$ 14	51 $\pm$ 15	42 $\pm$ 13	0.05
Male, n (%)	128 (92.1)	191 (90.1)	70 (92.1)	0.7
Bicuspid AV, n (%)	49 (35.2)	76 (55.9)	52 (68.4)	<0.001
Grade of Aortic regurgitation, n (%)				
0-1		0	0	<0.001
2	139 (100)	70 (33.0)	6 (7.9)	
3		103 (48.6)	58 (76.3)	
4		39 (18.4)	12 (15.8)	
NYHA Functional Class (%):				
I	112 (80.6)	105 (93.7)	41 (53.9)	<0.001
II	23 (16.5)	79 (37.3)	30 (39.5)	
III	3 (2.2)	28 (13.2)	5 (6.6)	
IV	1 (0.7)	0	0	
LV Ejection Fraction				
$\geq$ 50%	132 (95)	175 (82.5)	69 (90.8)	0.03
31-49	7 (5)	33 (15.6)	7 (9.2)	
$\leq$ 30	0	4 (1.9)	0	
LVEDD (mm), mean $\pm$ SD	53 $\pm$ 5	61 $\pm$ 8	63 $\pm$ 7	0.02
VAJ (mm), mean $\pm$ SD	27 $\pm$ 3*	28 $\pm$ 4	29 $\pm$ 4*	0.007*
Previous Cardiac Surgery, n (%)	3 (2.1)	4 (1.9)	5 (6.6)	0.09
Connective Tissue Disorder, n (%)	19 (13.7)	14 (6.6)	1 (1.3)	0.004

# Results

## Intra-Operative and Post-Operative Data

	Aneurysm n=139	Aneurysm + AR n=212	Isolated AR n=76	<i>p</i>
Graft size mm, median	30	30	30	0.3
CPB Time (min) mean $\pm$ SD)	145 $\pm$ 35	150 $\pm$ 34	151 $\pm$ 26	0.6
Concomitant Procedures, n(%):	37 (26.6)	54 (25.5)	13 (17.1)	0.2
Mitral Valve Repair	5 (5.0)	13 (6.1)	6 (7.9)	
Hemi-arch	4 (2.9)	12 (5.6)	0	
CABG	18 (0.7)	9 (4.2)	4 (5.2)	
Cusp Repair	76 (54.7)	170 (80.2)	74 (97.4)	<0.001
Patch	1 (0.7)	15 (7.1)	4 (5.2)	0.02
Re-exploration fro bleeding, n (%)	21 (15.1)	23 (10.9)	8 (10.5)	0.4
Permanent Pacemaker Insertion, n (%)	9 (6.5)	7 (3.3)	5 (6.6)	0.3
30-days death	1 (0.7)	0	0	0.3
Lost to Follow-up, n(%)	3 (2.1)	6 (2.8)	6 (7.9)	0.07
Follow-up years, Median (IQR)	4.7 (2-8.5)	5.5 (2-9.7)	3.1 (1.4-5.8)	

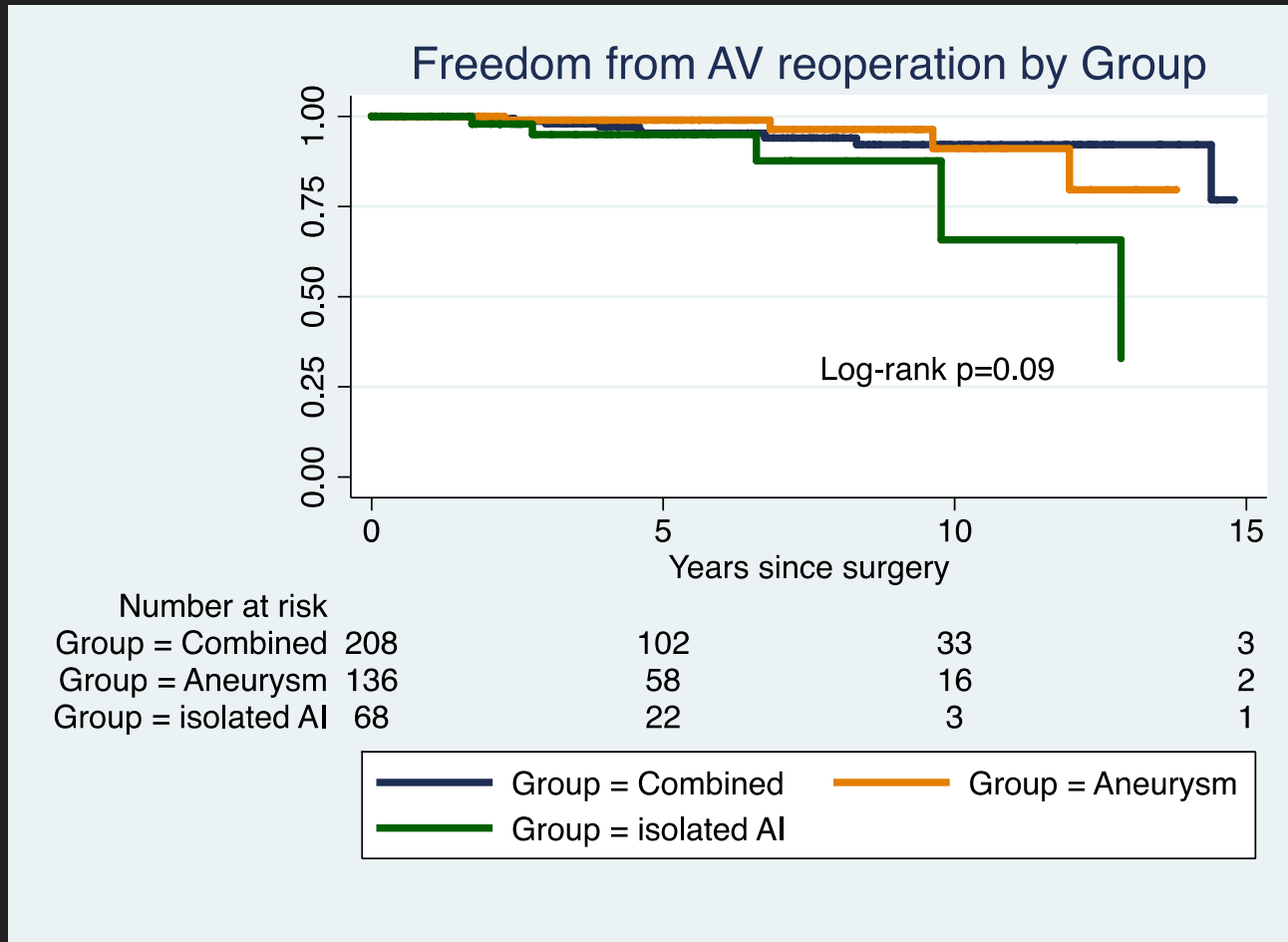
# Valve-Related Complications

- 8 patients (1.9%) experienced major bleeding for a linearized rate of 0.37% patient-year
- 10 patients (2.3%) systemic thromboembolic events for a linearized rate of 0.73% patient-year
- 5 patients (0.4%) presented Infective Endocarditis for a linearized rate of 0.2% patient-year

# Reoperation

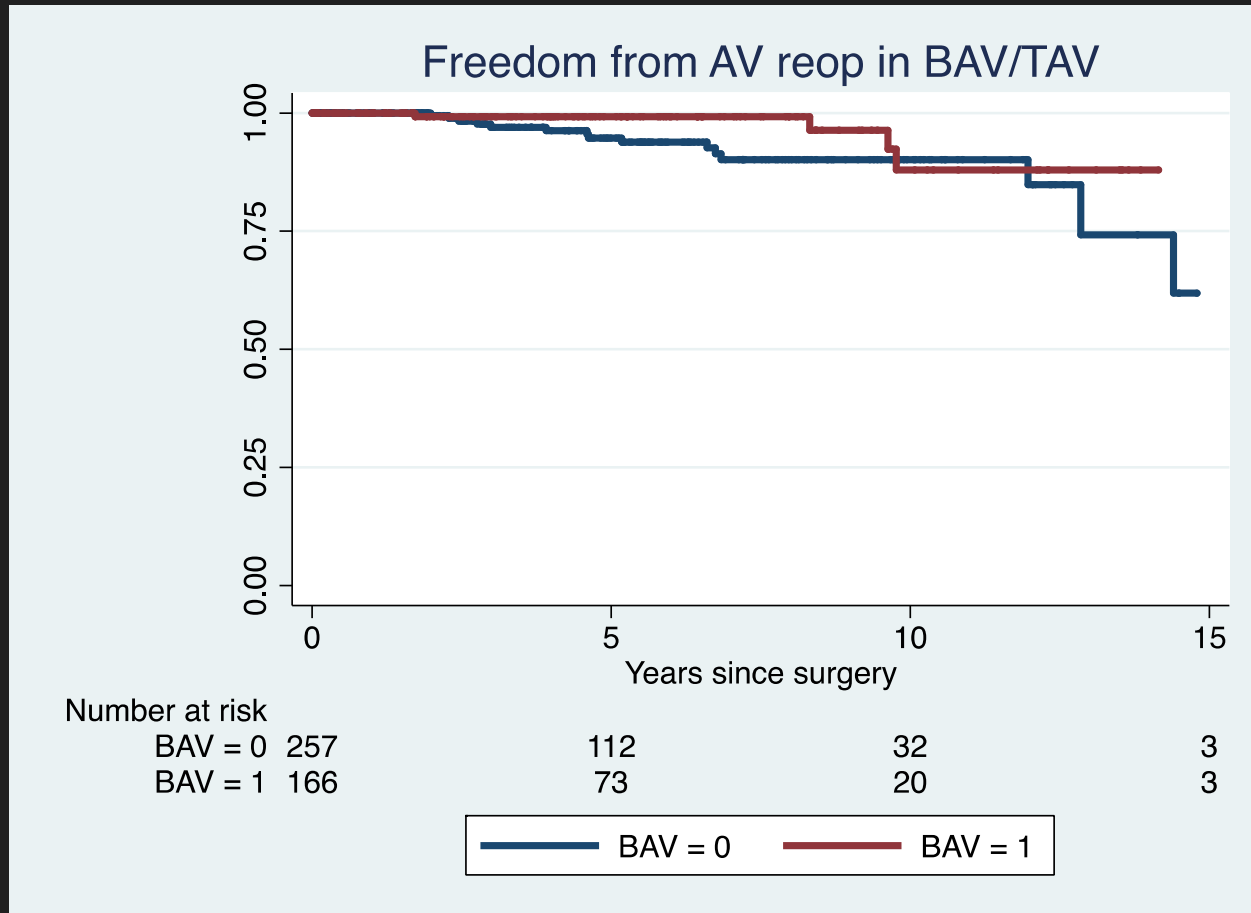
- 1 early (during the same admission) AV reoperation (underwent re-repair)
- 17 late AV reoperation (2.6%); linearized rate of 0.6% per patient-year
- Indications for re-intervention:
  - 8 recurrent Severe AI (3 AV replacement, 5 re-repair)
  - 3 severe AS (3 replacement)
  - 4 Infective Endocarditis (4 replacement)
  - 2 mixed stenosis and regurgitation (2 replacement)
- Perioperative mortality: 0%

# Results



Late AV re-operation: 4 in Group Aneurysm (3%), 9 in Group Aneurysm+AR (6.6%), 5 in Group isolated AR (7.1%)

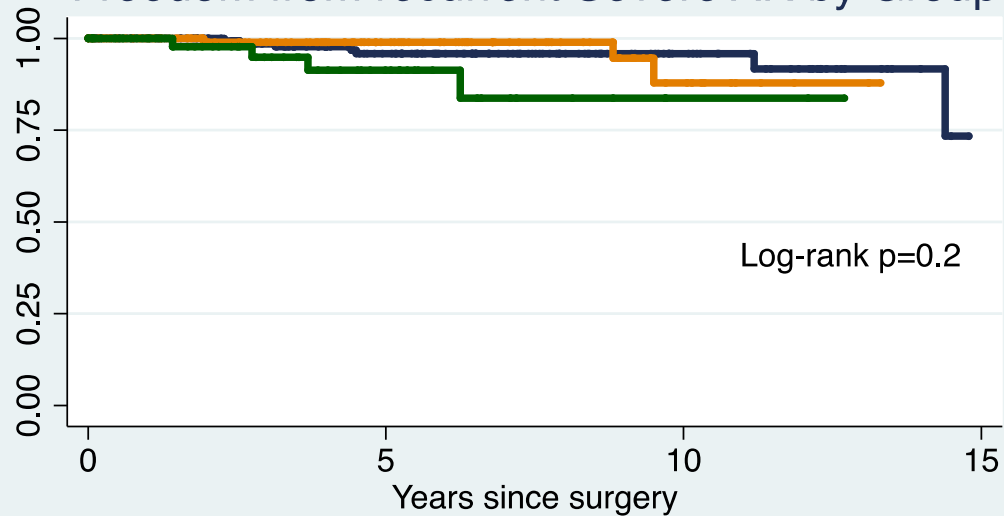
# Results



Late AV re-operation: 4 in BAV (2.2%), 15 in TAV (5.7%)




# Results

Freedom from recurrent Severe AR by Group



Number at risk				
Group = Combined	196	99	30	2
Group = Aneurysm	125	55	12	2
Group = isolated AI	68	19	3	1

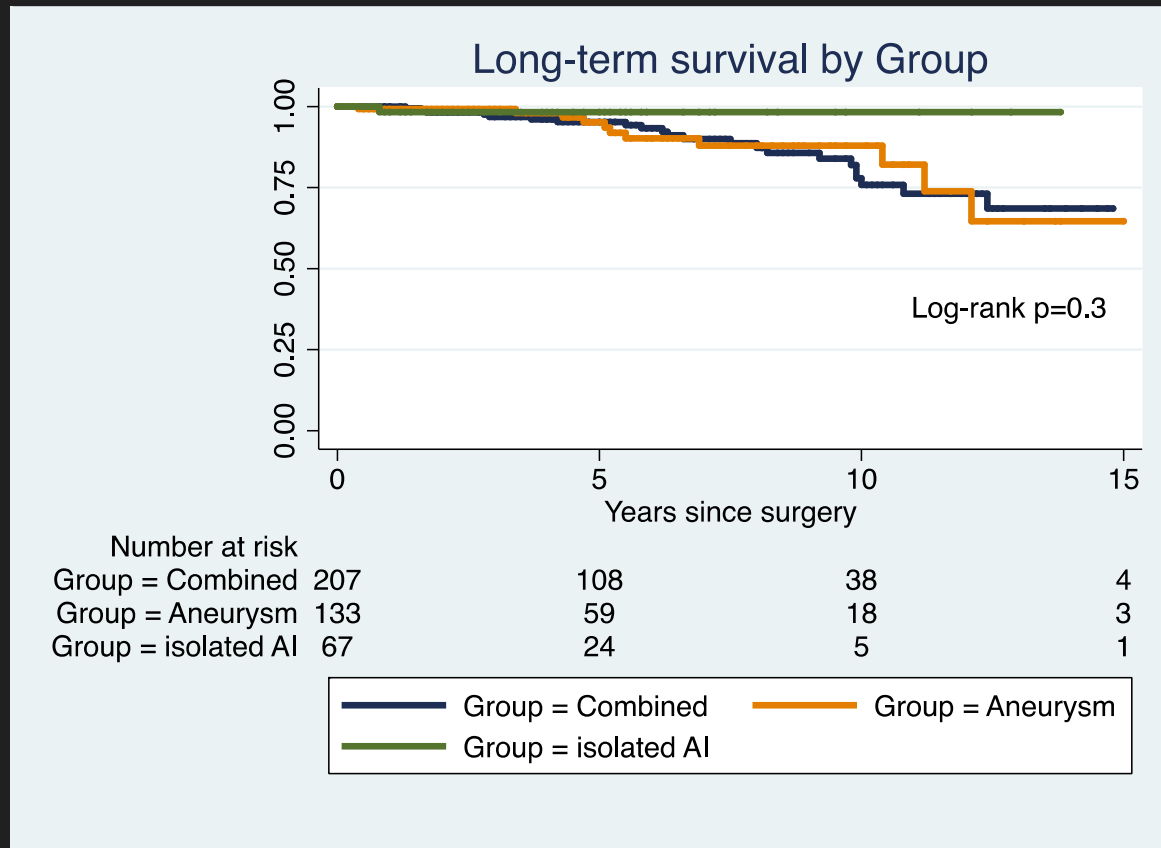
  

	Group = Combined		Group = Aneurysm
	Group = isolated AI		



# Long-term Survival

- 36 late deaths (8.5%); linearized mortality rate of 1.6% per patient-year
  - Overall survival at 10-year: 81% (95% CI: 72.8-87.0)
  - 10 cardiac-related
  - 26 non-cardiac causes



# Conclusions

- The VSRR-reimplantation technique is associated with low perioperative morbidity and mortality, also in patients with isolated AR
- VSRR is further associated with a very low incidence of major bleeding, thromboembolic or endocarditis events in the long-term
- The AV repair has shown excellent durability and a low risk of AI recurrence and reoperation over time particularly in patients with BAV and regardless of the indication for surgery
- Longer follow-up to confirm if valve function remains stable past 10 years



Thank you.