



KATHOLIEKE UNIVERSITEIT
LEUVEN

Surgery for Infective Endocarditis

Prof. Dr. P. Herijgers
Cardiac Surgery – K.U.Leuven

SBIMC-BVIKM 10/05/2007





Practice guidelines

- AHA, IDSA: Infective Endocarditis. Diagnosis, antimicrobial therapy, and management of complications. *Circulation* 2005; 111: e394-e434.
- ESC: Guidelines of prevention, diagnosis and treatment of infective endocarditis. *European Heart Journal* 2004; 25: 267-276.
- BCS, RCP: Prophylaxis and treatment of infective endocarditis in adults: a concise guide. *Clinical Medicine*: 2004; 4: 545-550.



Role of the surgeon

- 35-60% of IE patients eventually require surgery (early or late)
- BCS, RCP: *In haemodynamically stable patients, early consultation with a cardiac surgeon is recommended in case surgery is suddenly required*

Middlemost JACC 1991

Moon Prog Cardiovasc Dis 1997

Jubair JTCVS 1992

Vlessis Ann Thorac Surg 1996

Castillo Heart 2000



Indications

- Hemodynamic
- Infectious
- Prevention of complications

Always a patient-centered decision making process

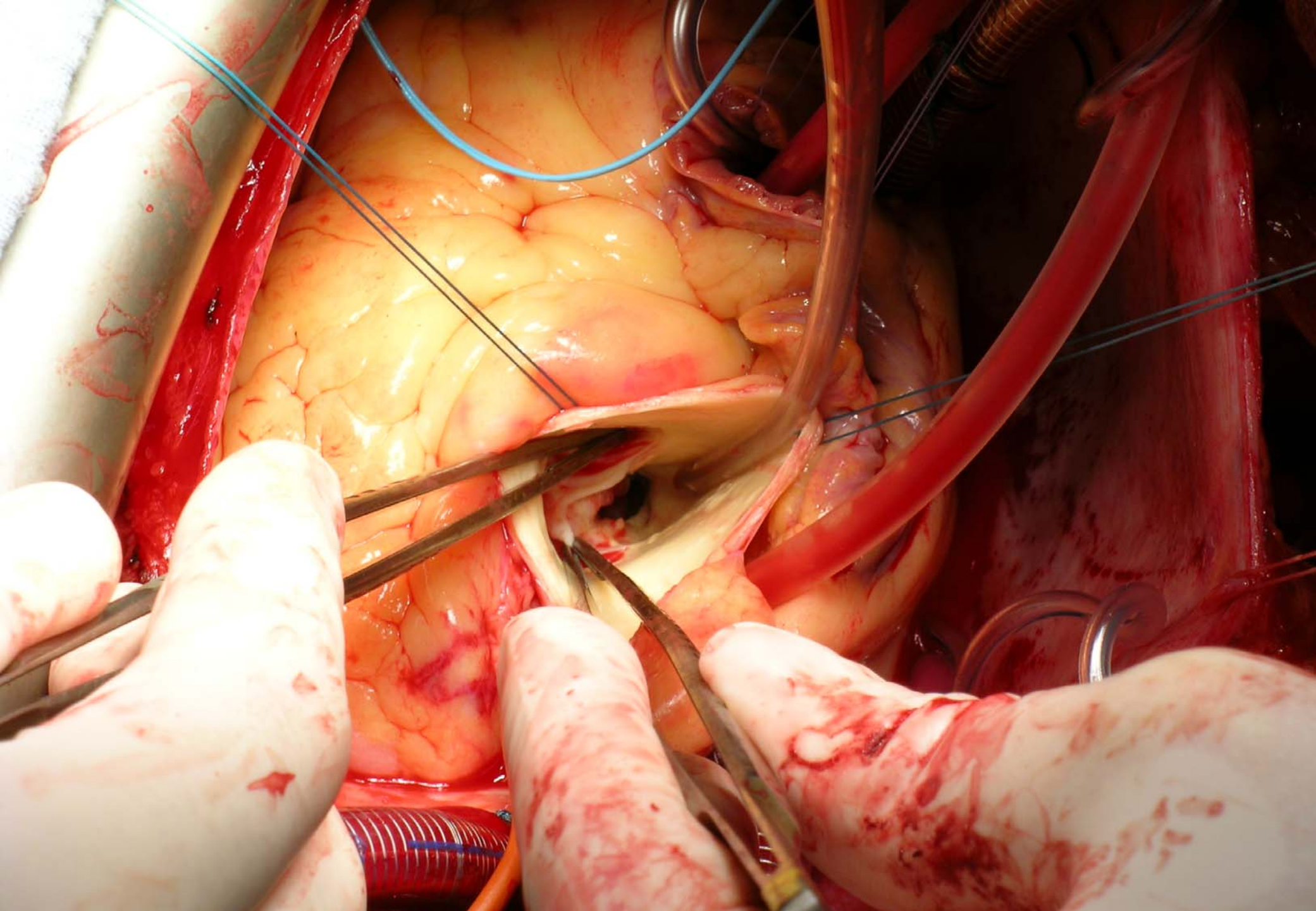


Indication for EMERGENCY surgery

- Acute heart failure requires IMMEDIATE surgery!!!
- Mainly:
 - Acute Aortic Valve Regurgitation
 - PVE (valve dehiscence)
 - Intracardiac fistulae
 - Pre-existing severe cardiac lesions
- Class I, level B



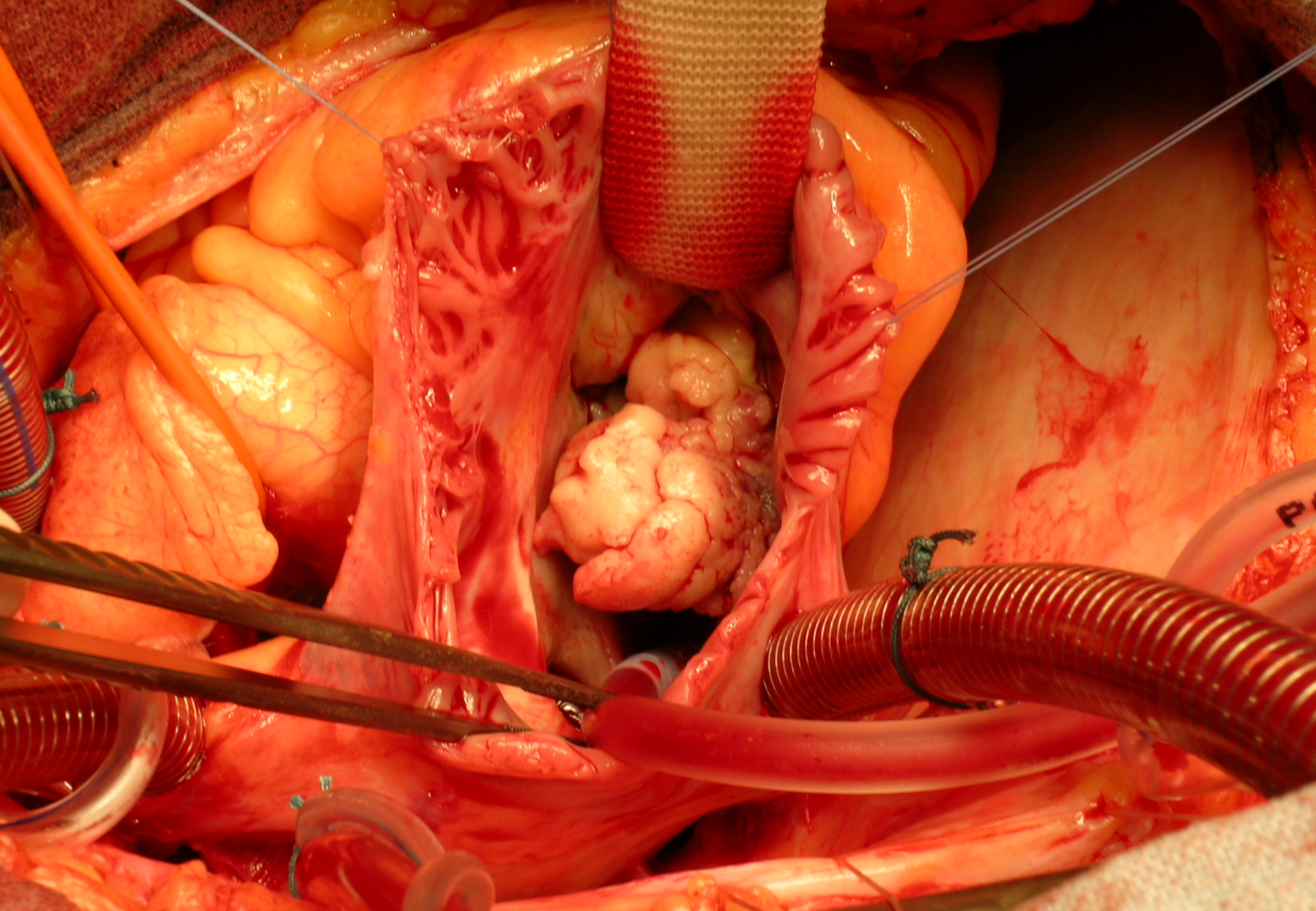
Handwritten text on the white object, possibly a name tag or label, including the letters 'K', 'Y', 'A', 'B', 'M', 'S', and 'D', arranged in a vertical column.

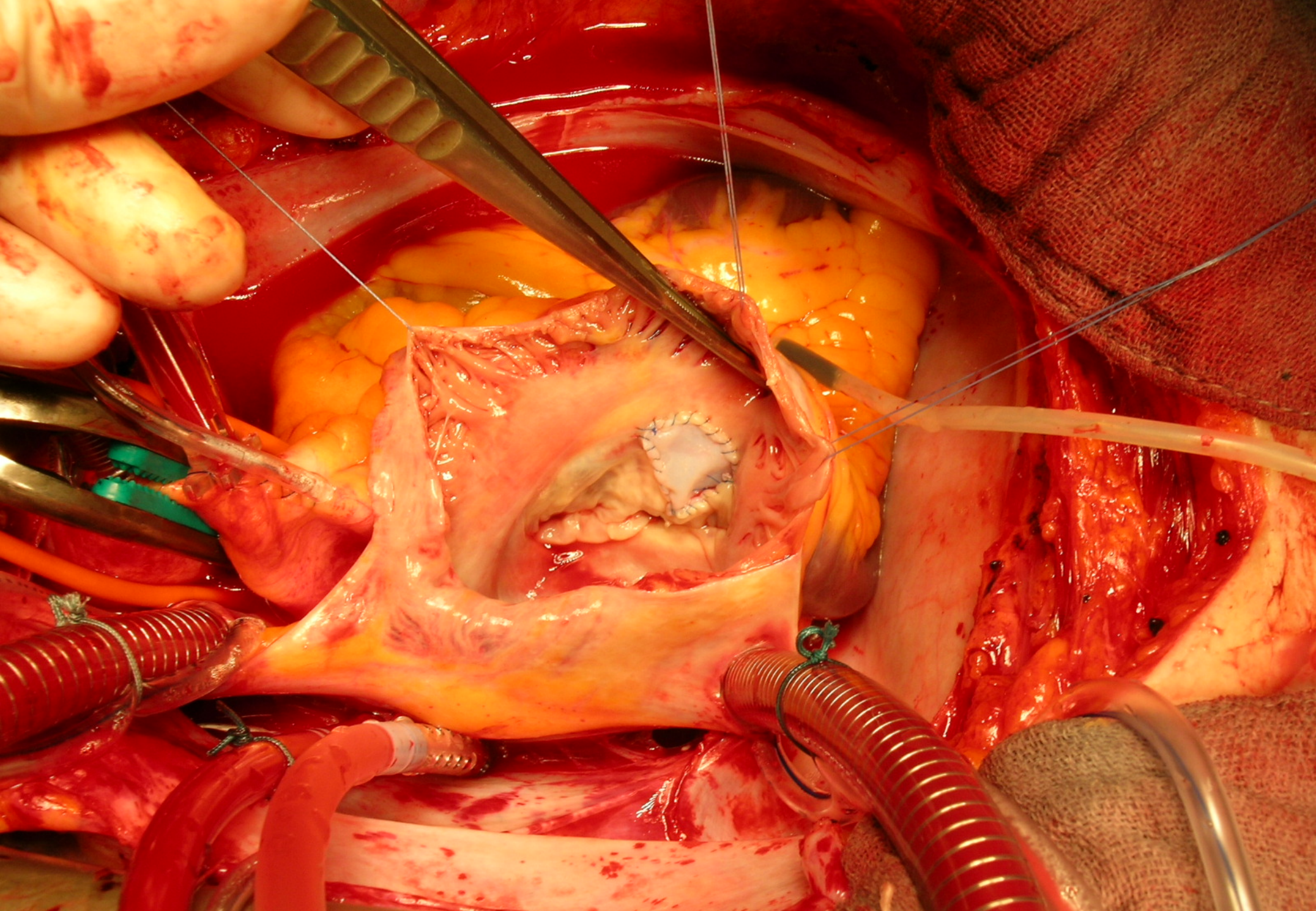




Indications for EARLY surgery

- Fungal endocarditis (difficult to treat, high risk of embolisation)
- Macro-embolisation under adequate AB with residual vegetation present (cerebral emboli no contra-indication if IC bleeding excluded by CT immediately preop and <48-72 hrs after embolus)

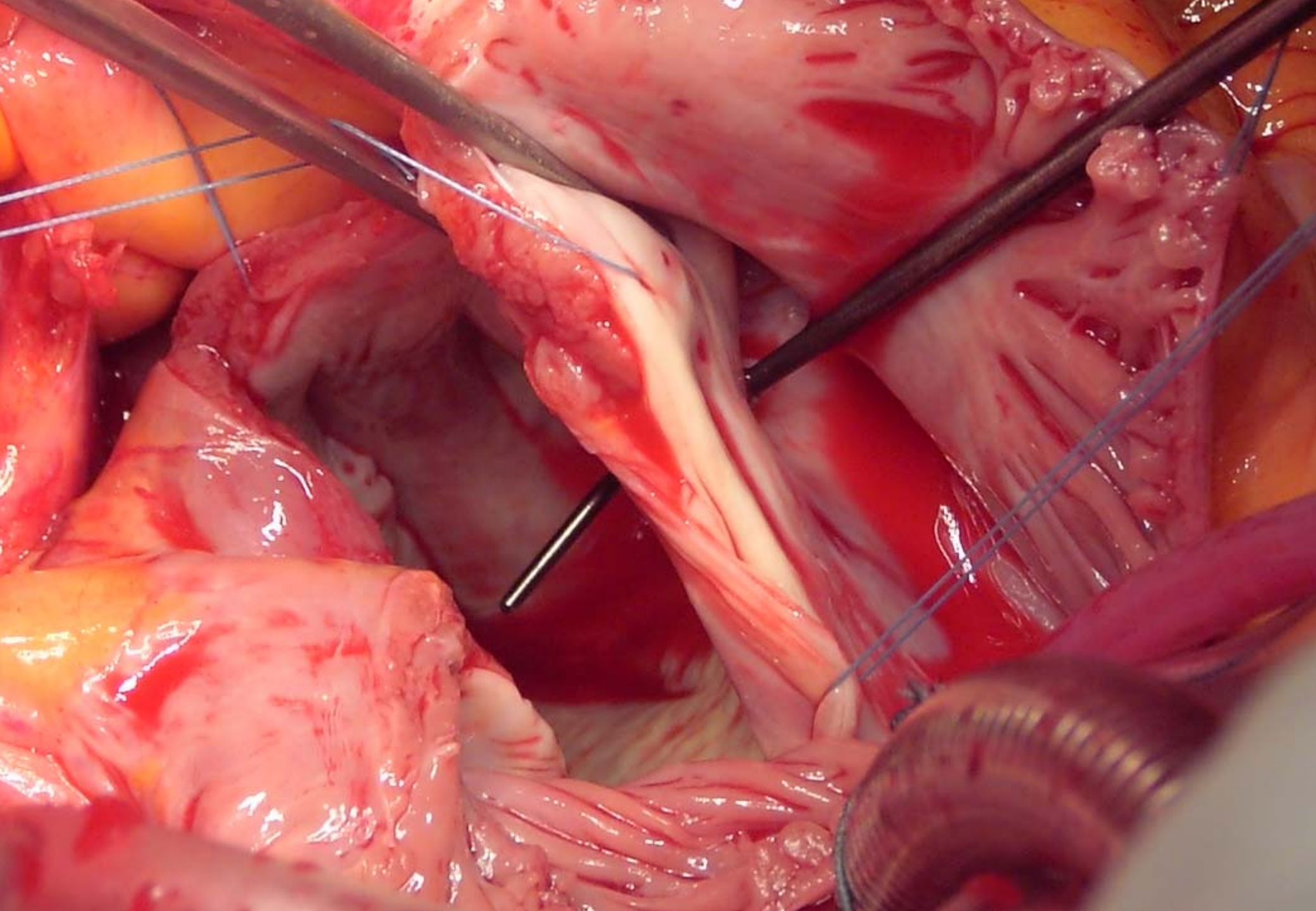






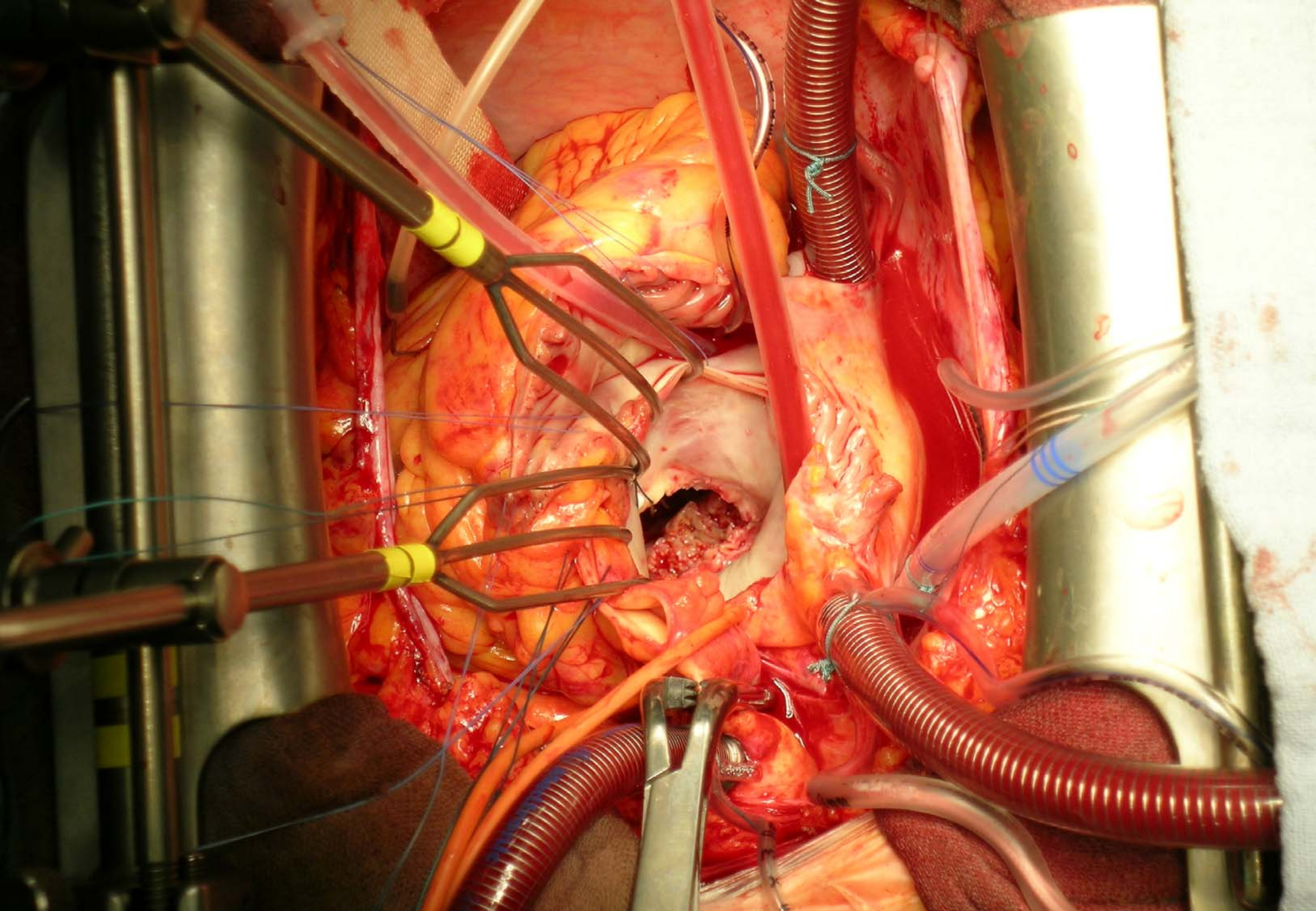
Indications for EARLY surgery

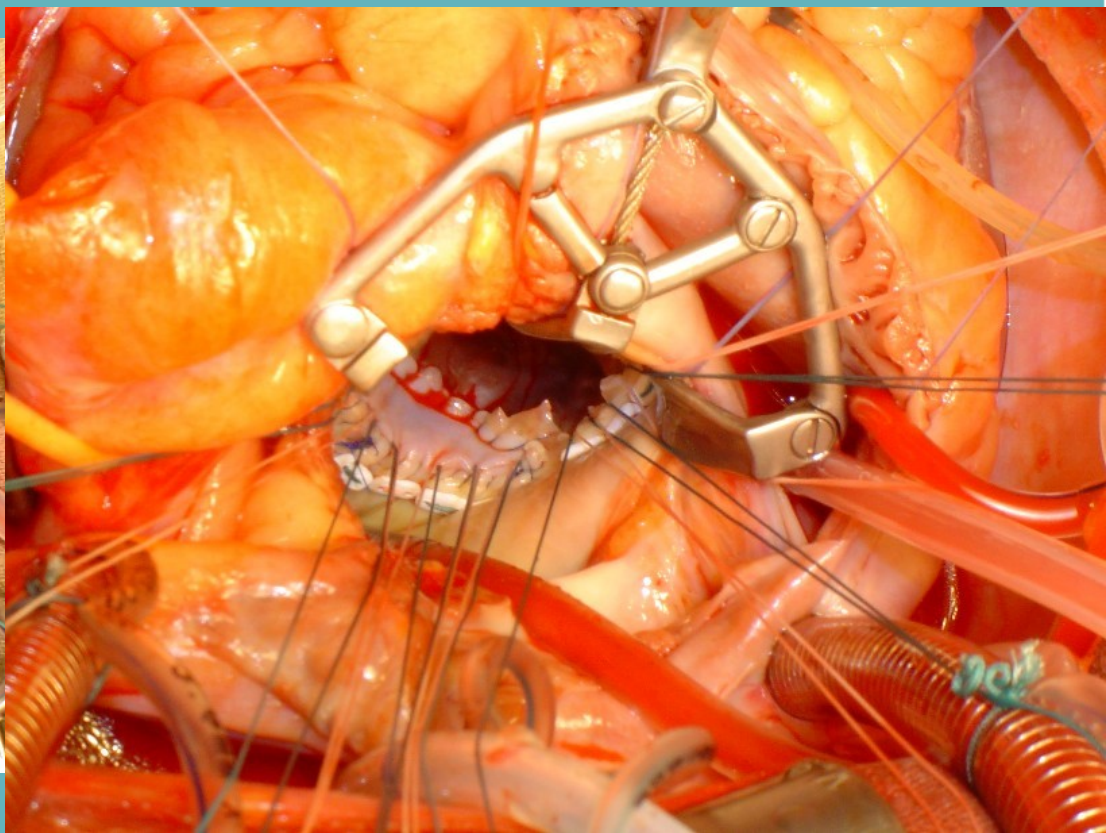
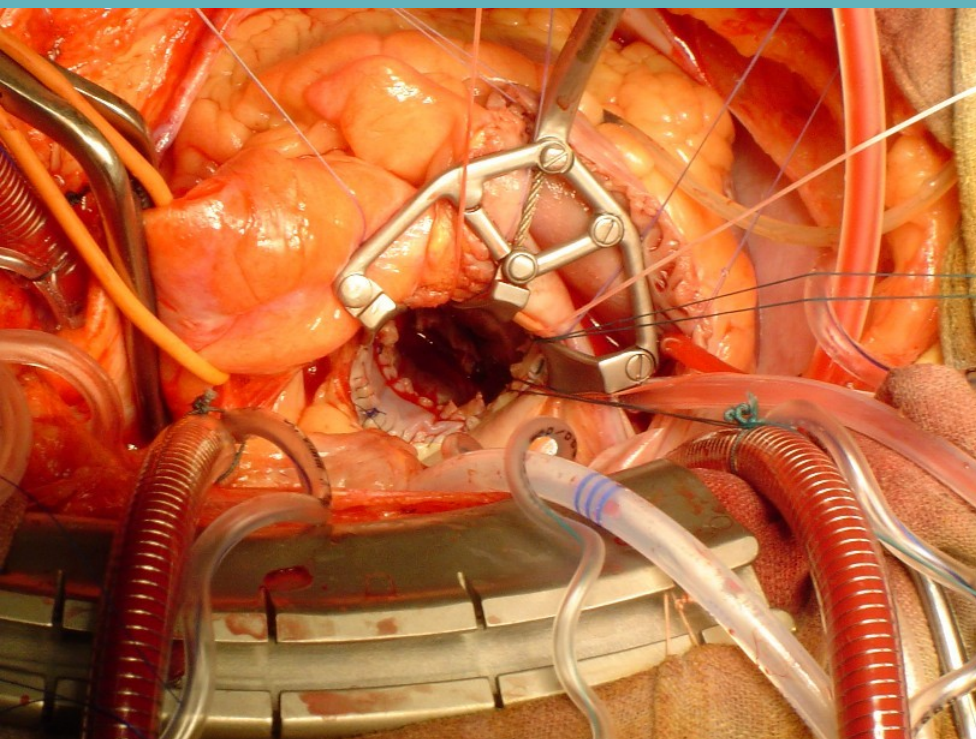
- Destruction of the cardiac skeleton
 - Abscess, VSD, fistulae (Ao-RA)
 - New 3°AVB
- Persistent septic-infectious symptoms or increase in vegetation size after 7 d of adequate AB (especially for PVE)
- PVE *S. aureus* (?)



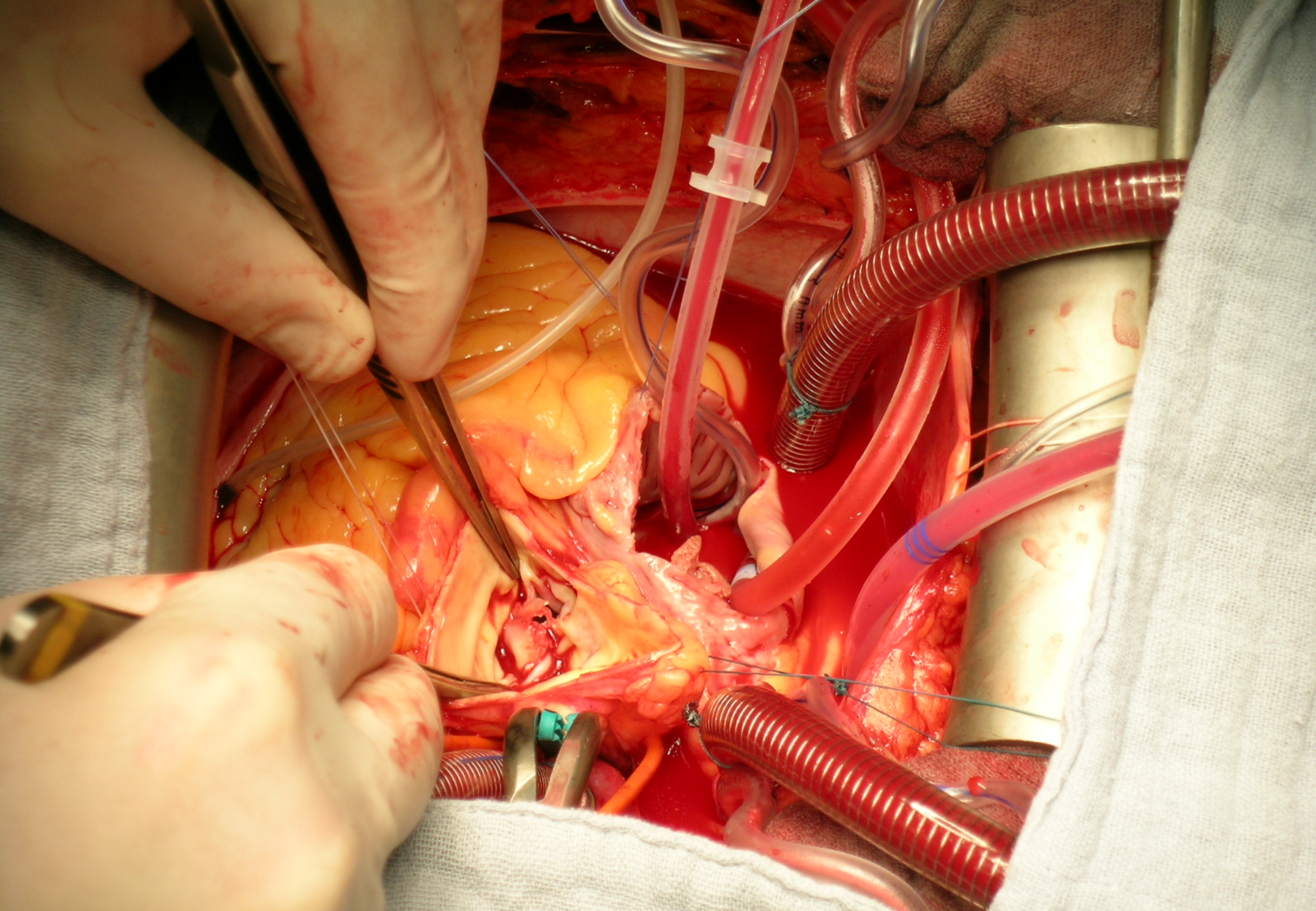


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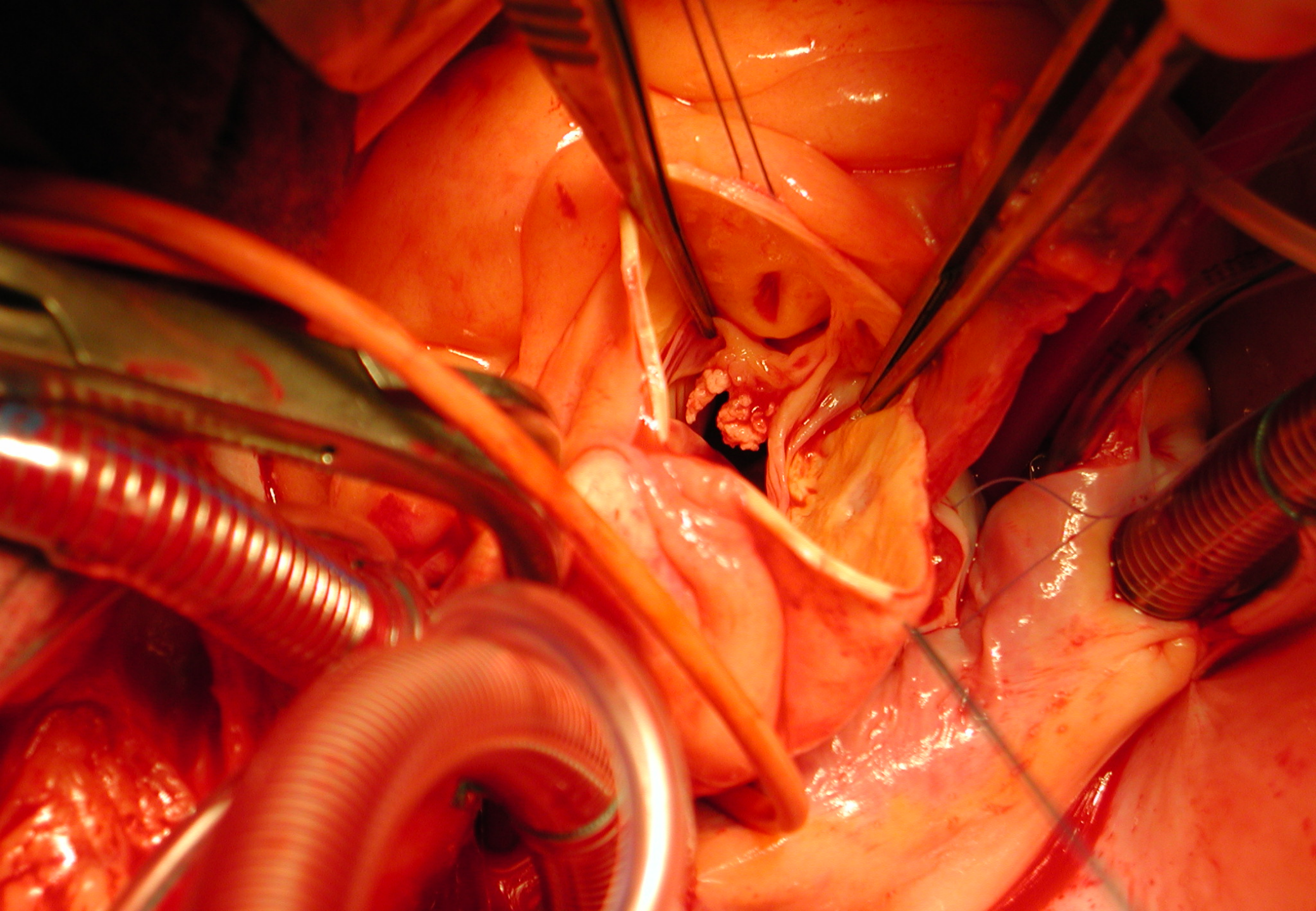
Relative surgical indications

- =Surgery should be seriously considered
- Vegetation >1 cm esp. fragile, AML
 - Early (<2 m) PVE
 - New AVBlock (1° , 2° , LBBB) persisting >7 d under adequate AB
 - Renal failure



Relative surgical indications

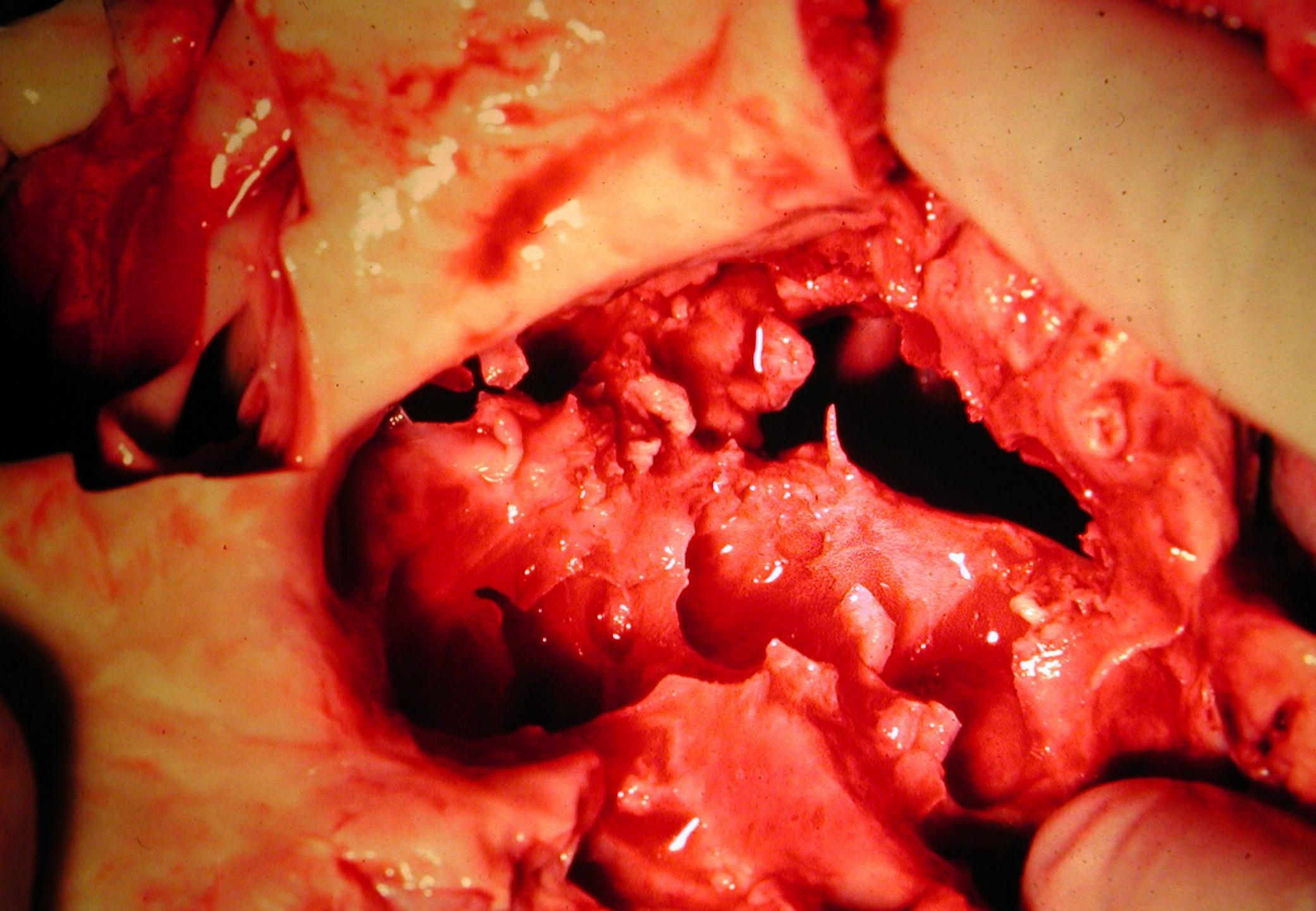
- « Kissing lesions »
- Serious hemodynamic lesion, which might lead to heart failure (increase in LV diameters, wall stress, pulmonary hypertension)

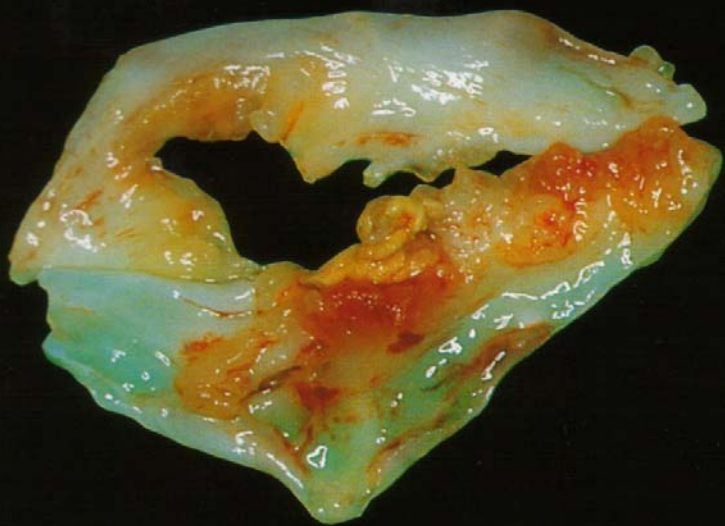
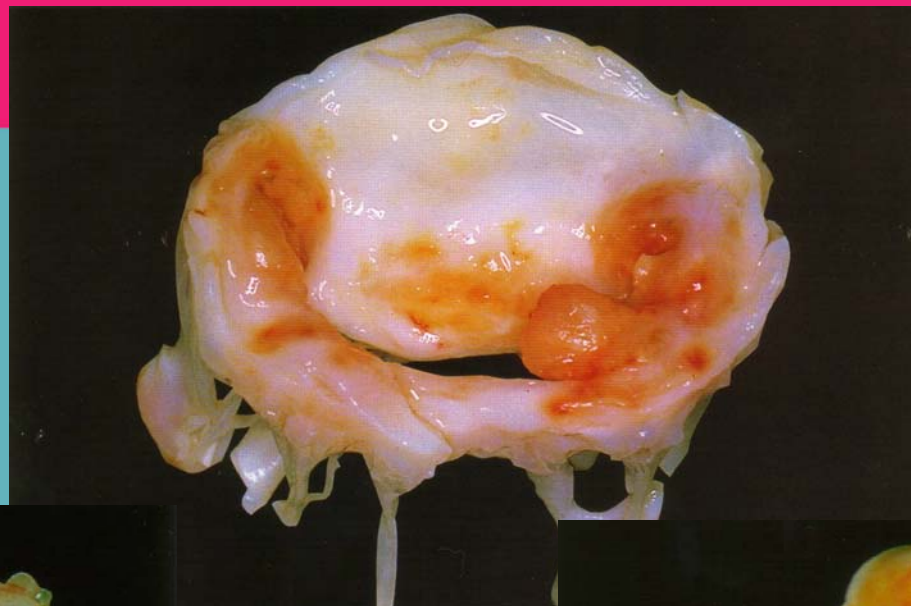




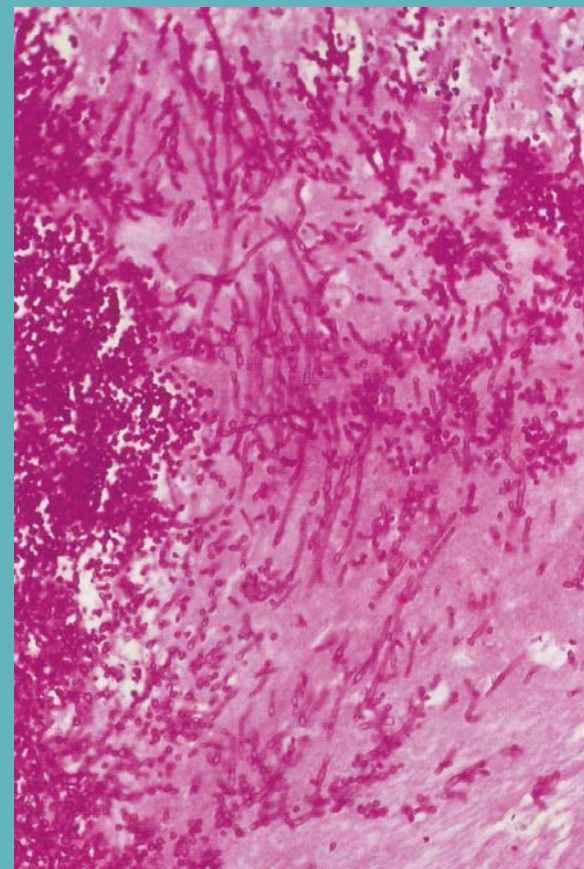
Surgical principles

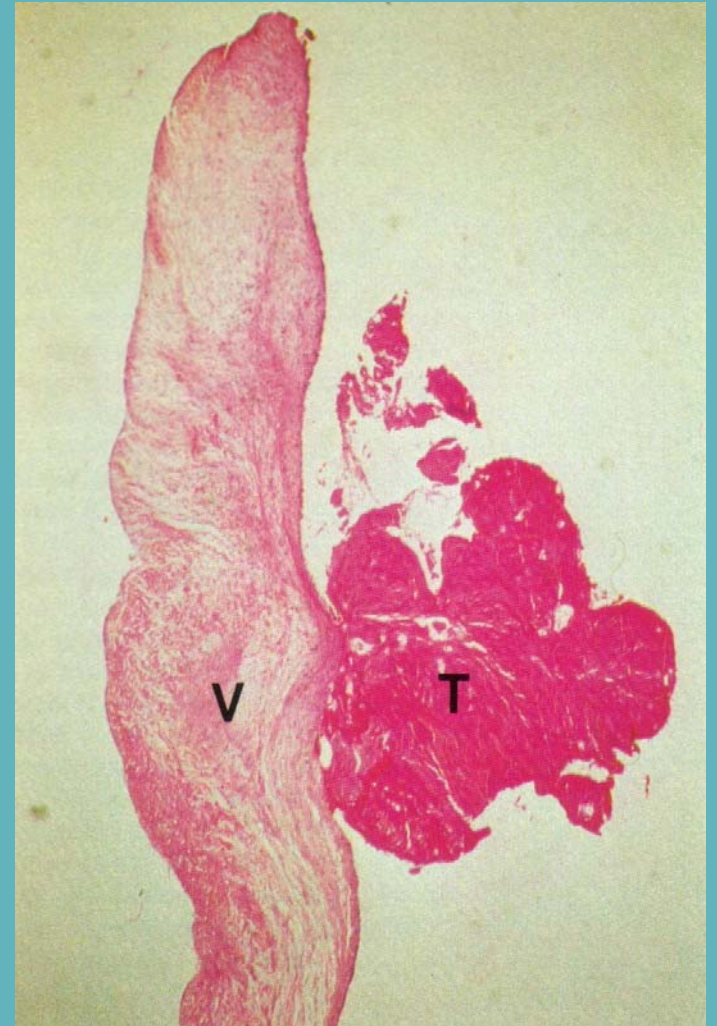
- Ubi pus, ibi evacua.
- Debridement++++
 - Culture
 - Pathology
- Extensive reconstructions
- Homografts, pericardial patches, valve reconstructions, valve replacements





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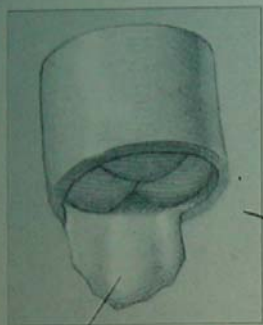




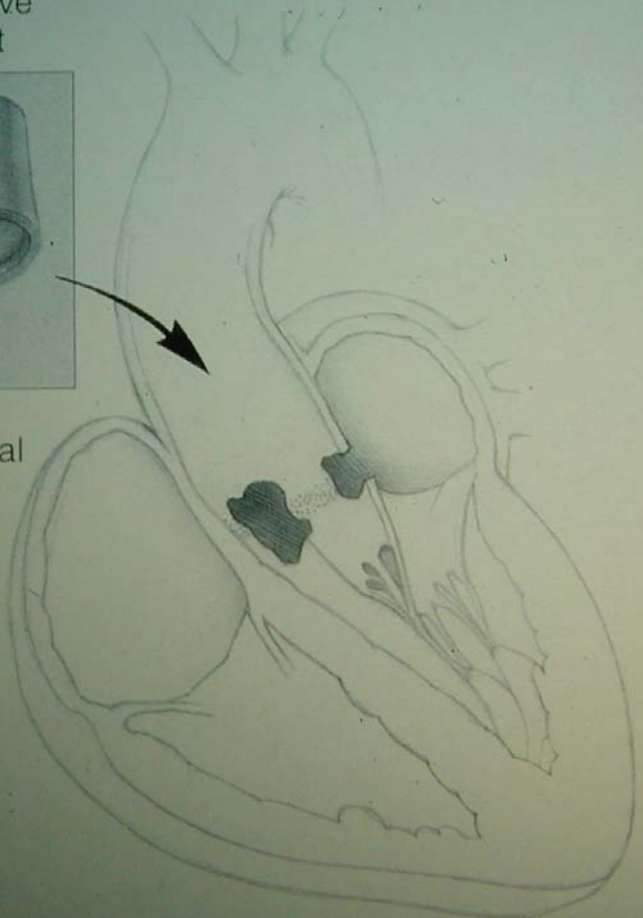
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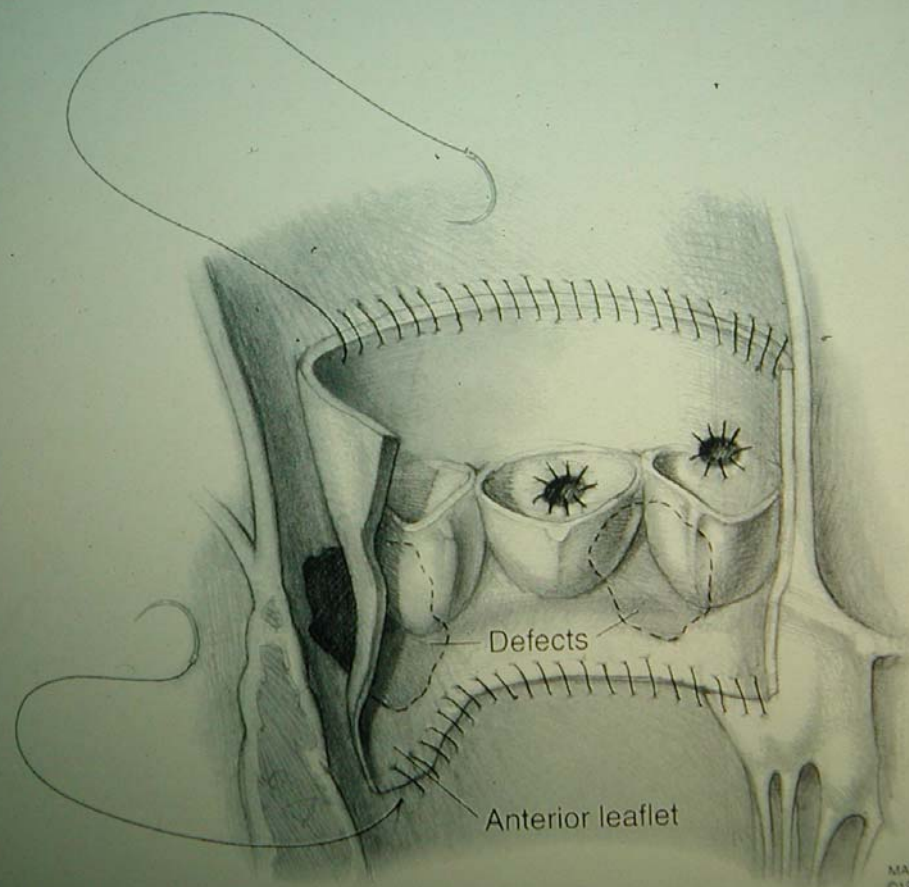
Aortic valve allograft



Anterior mitral leaflet



MAYO
©1996



MAYO
©1996



Postoperative AB, NVE

- Perop culture - : total period of AB should be 4 or 6 weeks including preoperative adequate treatment period
- Perop culture + : 4 or 6 weeks after surgery
- Monitoring therapeutic effect

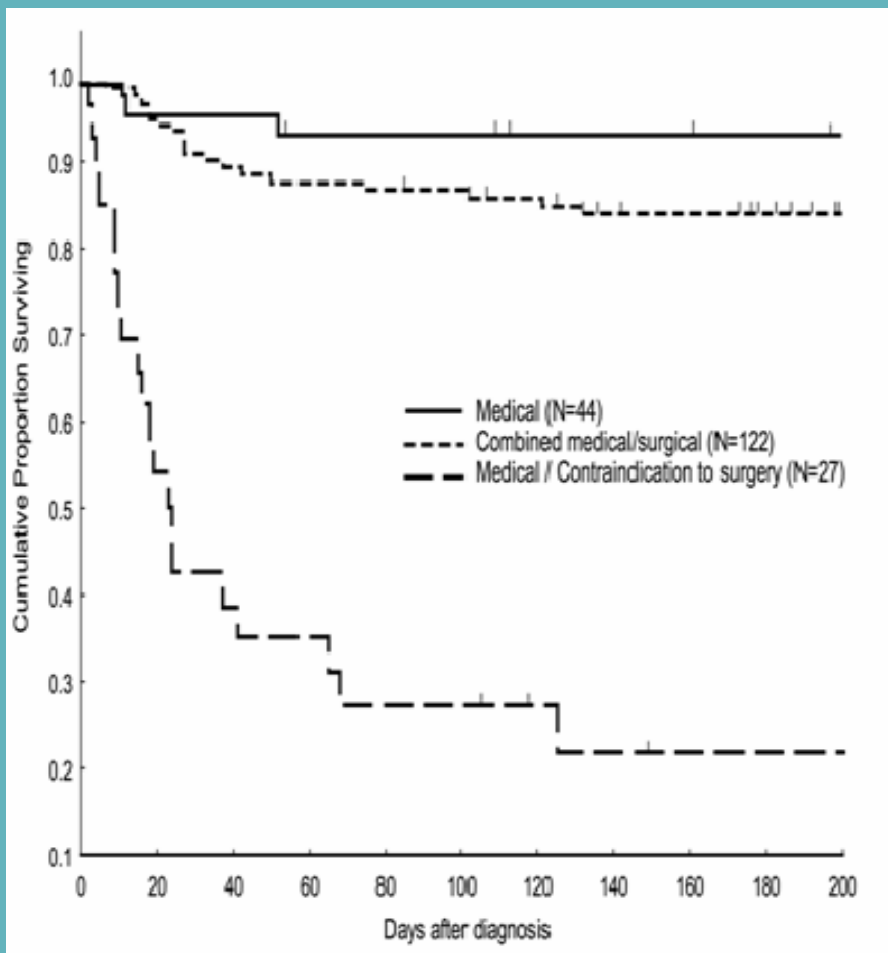


Postoperative AB, PVE

- Always 4 or 6 weeks postoperative AB
- Sometimes prolonged AB (only after multidisciplinary consult)



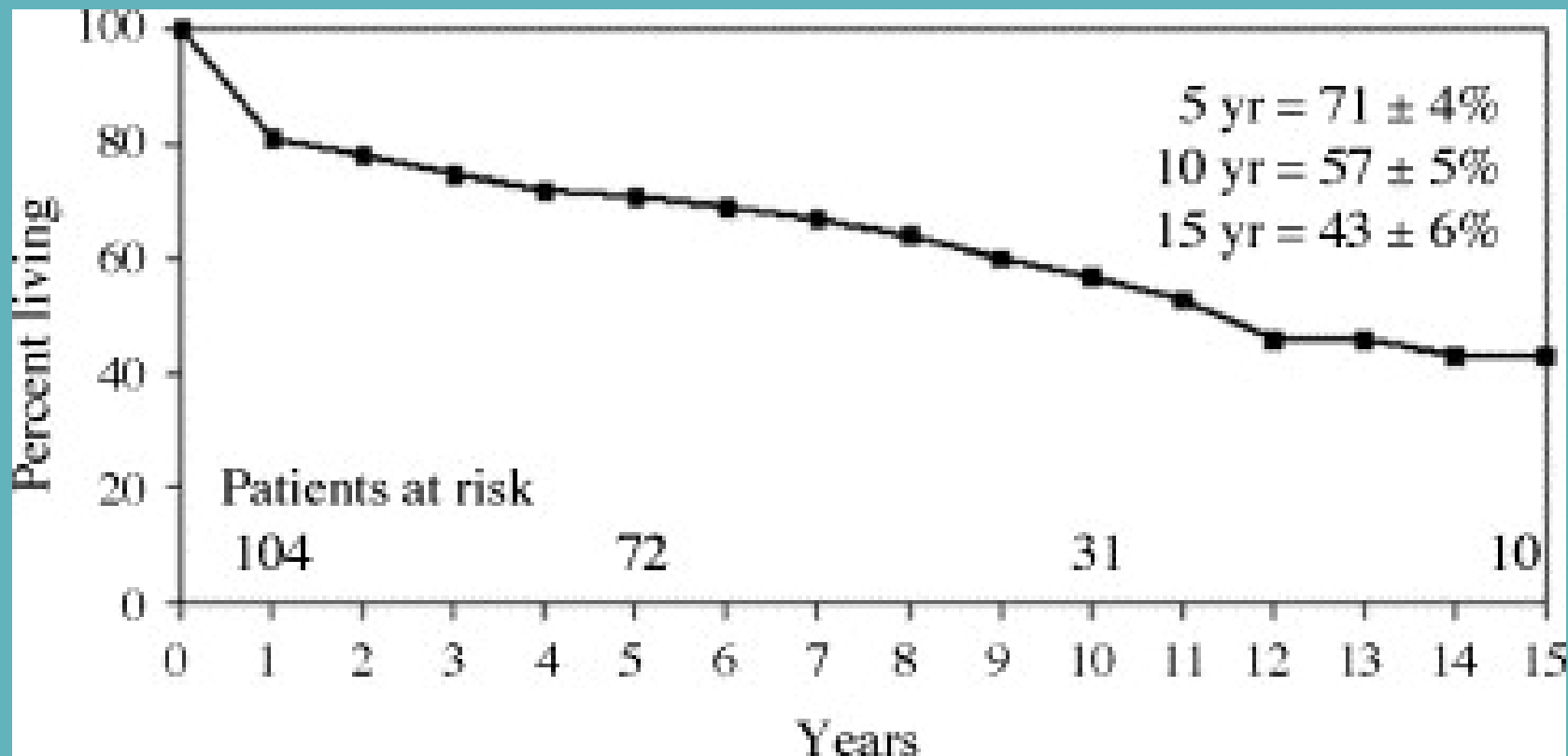
Outcome



GHB 2000-2004,
Hill et al, Eur Heart J 2007

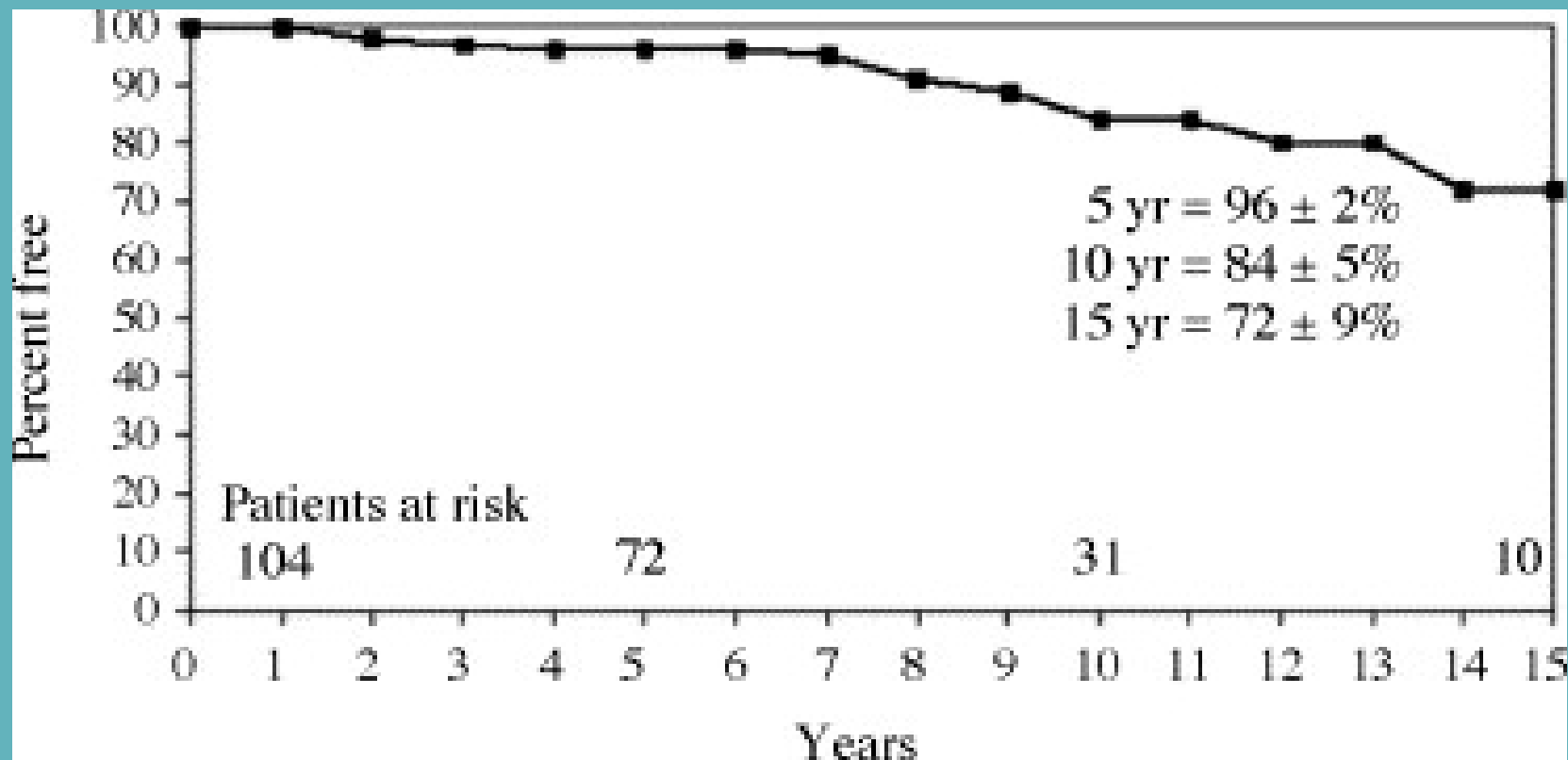


Survival abscess surgery



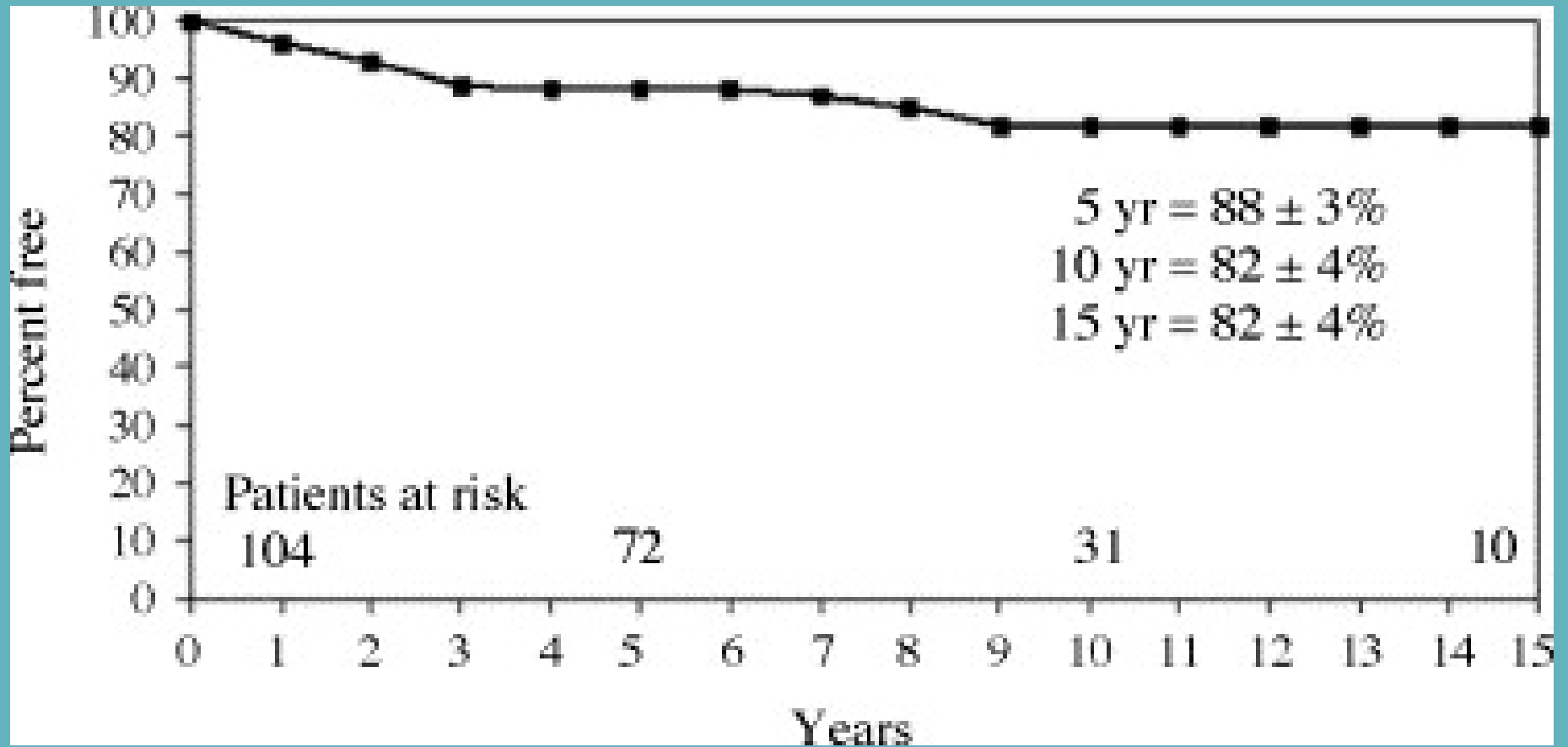


Reoperation free after abscess surgery





Recurrence free after abscess surgery





Outcome – multivariable analysis

KUL 2000-2004 (n=203)

Predictors 6 month mortality

- Age
- Causative micro-organism (staphylococcal and enterococcal IE worse)
- Treatment group (perforce conservative worse)



Outcome – multivariable analysis

New Haven 1990-2000 (n=513)

Predictors 6 month mortality

- Valve surgery adjusted HR 0.35 [0.23-0.54]
- Adjusted for:
 - Hospital site, comorbidity, congestive heart failure, microbial etiology, immunocompromised state, abnormal mental status, refractory infection.



Outcome – multivariable analysis

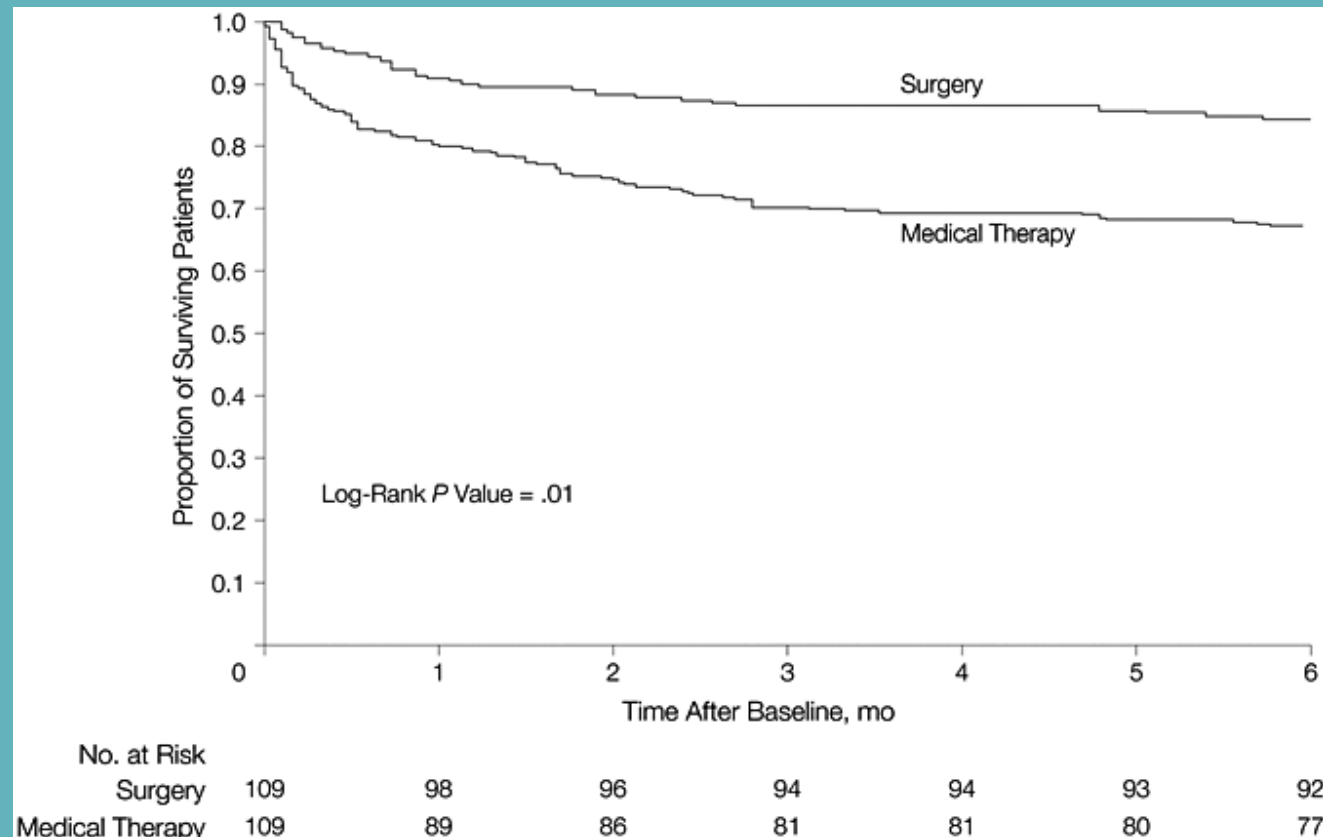
Propensity scores analysis

- Propensity that a specific patient receives the specific treatment under study
- 3 ways of integration into multivariable analysis
 - Individual matching
 - Quintiles-stratification
 - Score = independent parameter



Propensity scores adjusted

HR 0.40 [0.18-0.53]

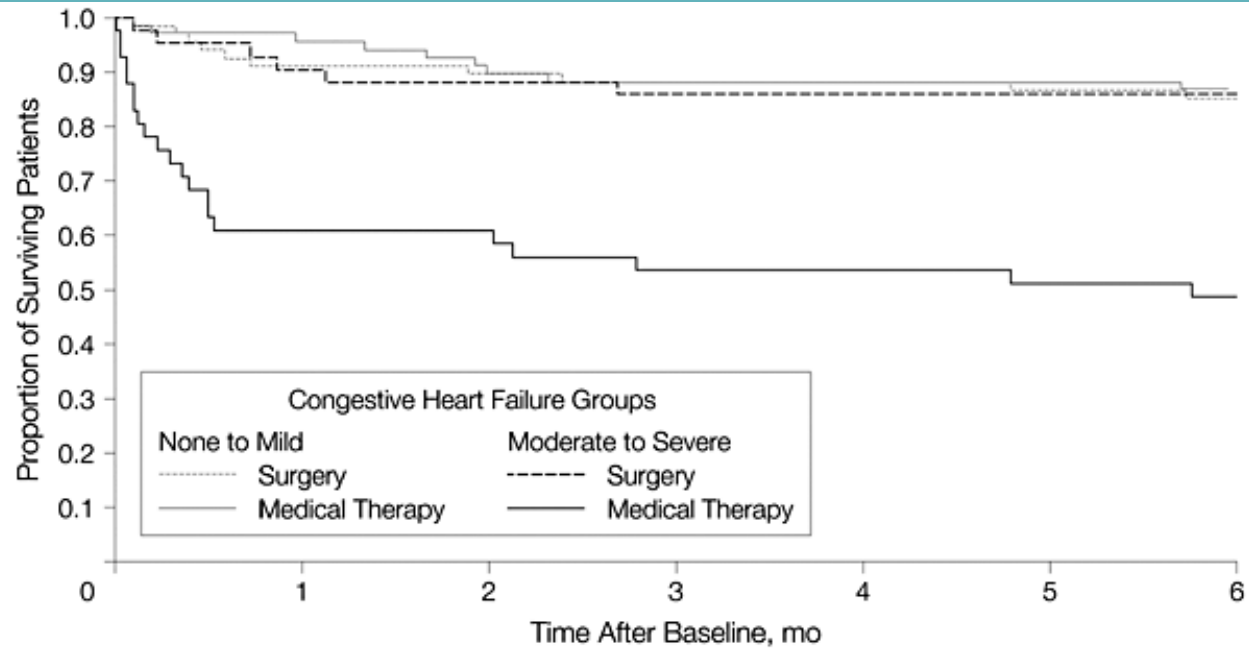


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Vikram et al, JAMA2003
N=218/513 matched patients



Propensity scores adjusted



No. at Risk							
None to Mild CHF Group							
Surgery	67	60	59	58	58	57	56
Medical Therapy	68	64	61	59	59	59	57
Moderate to Severe CHF Group							
Surgery	42	37	36	35	35	35	35
Medical Therapy	41	24	24	21	21	20	19

HR 0.22 [0.09-0.53]

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Vikram et al, JAMA2003
N=218/513 matched patients



Propensity scores adjusted

Table 5. Multivariate analysis of survival of the 102 patients with infective endocarditis (IE) within the matched cohort.

Characteristic	χ^2 test score	Hazard ratio (95% CI)
Surgery	13.01	0.27 (0.13–0.55)
Diabetes mellitus	19.80	4.81 (2.41–9.62)
Chronic indwelling central catheter	7.43	2.65 (1.31–5.33)
Paravalvular complications	4.43	2.16 (1.06–4.44)



Propensity scores adjusted

The Impact of Valve Surgery on 6-Month Mortality in Left-Sided Infective Endocarditis

Imad M. Tleyjeh, et al

Conclusions—The results of our study suggest that valve surgery in left-sided infective endocarditis is not associated with a survival benefit and could be associated with increased 6-month mortality, even after adjustment for selection and survivor biases as well as confounders. Given the disparity between the results of our study and those of other observational studies, well-designed prospective studies are needed to further evaluate the role of valve surgery in endocarditis management. (*Circulation*. 2007;115:1721-1728.)

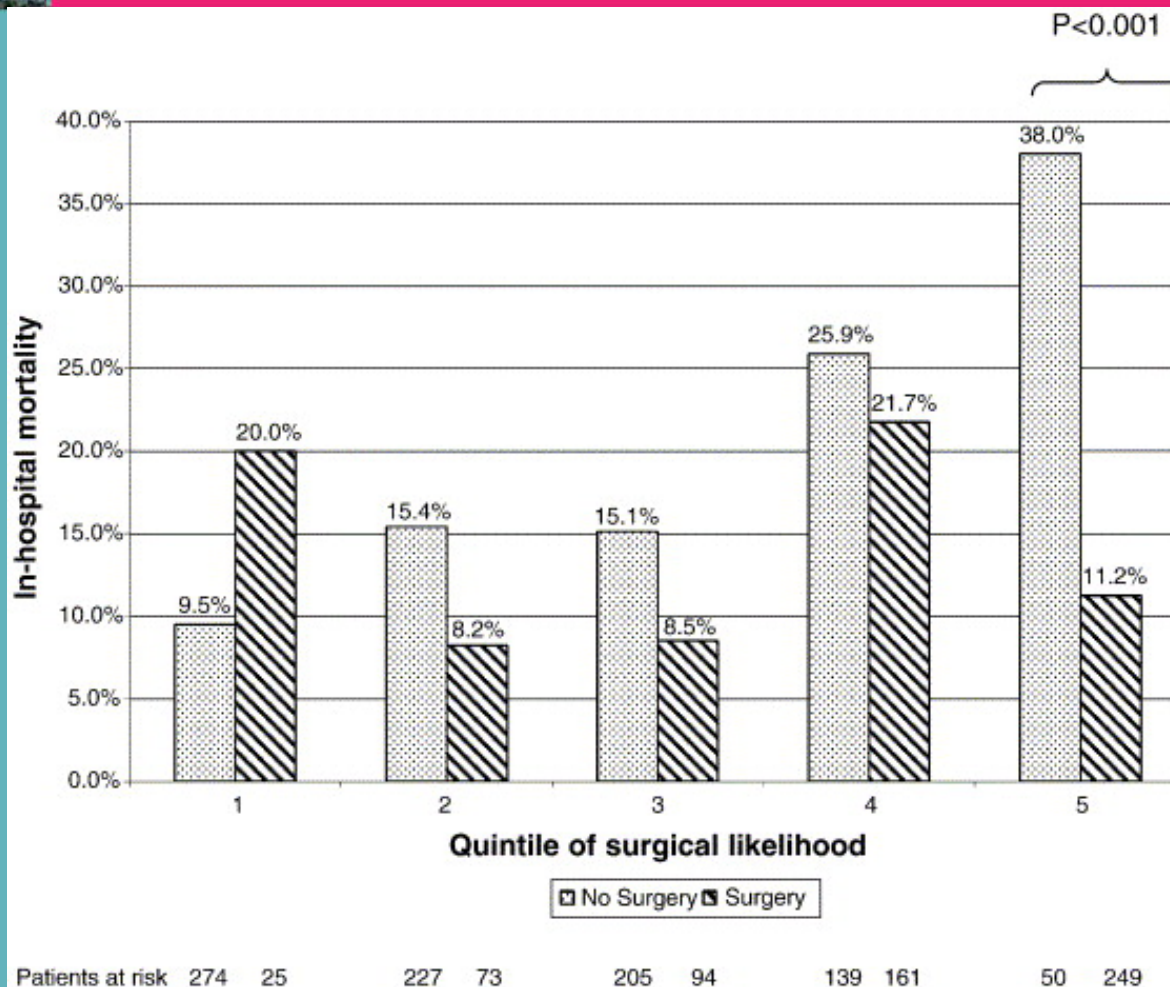


Propensity scores adjusted

- Comments:
 - N=186/546
 - 1980-1998
 - Very high operative mortality (27% in entire group, half within 7d) is the reason for worse survival. After removal of early mortality effect by partitioning, HR 0.92 [0.48-1.76]



Propensity scores adjusted



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Cabell et al, Am Heart J 2005
N=1516, quintiles



Propensity scores adjusted

Table IV. Important characteristics of patients with native valve IE by propensity group

	Propensity group				
	1 (n = 299)	2 (n = 300)	3 (n = 299)	4 (n = 300)	5 (n = 299)
Female	47.5	33.7	35.5	25.0	20.1
<i>S aureus</i>	31.4	20.0	27.1	24.3	16.1
Coagulase-negative staphylococci	2.7	5.0	5.0	9.0	12.4
Viridans group streptococci	39.1	34.3	23.1	21.0	23.4
AV vegetation	10.0	20.0	26.8	31.7	52.2
MV vegetation	32.4	33.0	38.5	37.0	26.8
TV vegetation	10.4	5.0	5.7	4.3	1.7
CHF	0.7	12.0	36.5	68.0	73.6
Abscess	0.0	0.0	0.0	6.0	43.1
Embolization, systemic	31.8	31.3	37.5	36.3	30.1

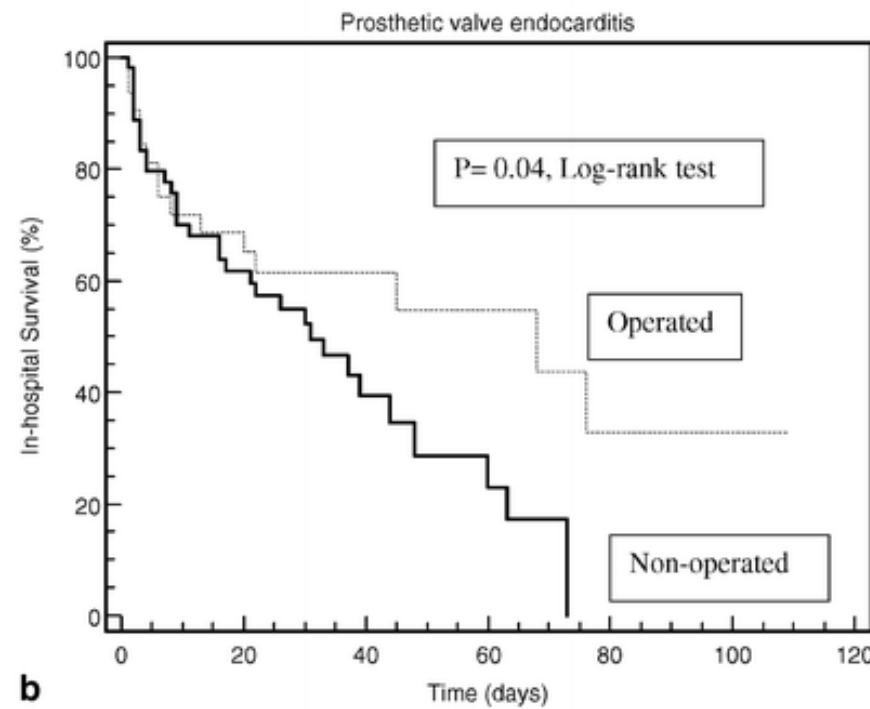
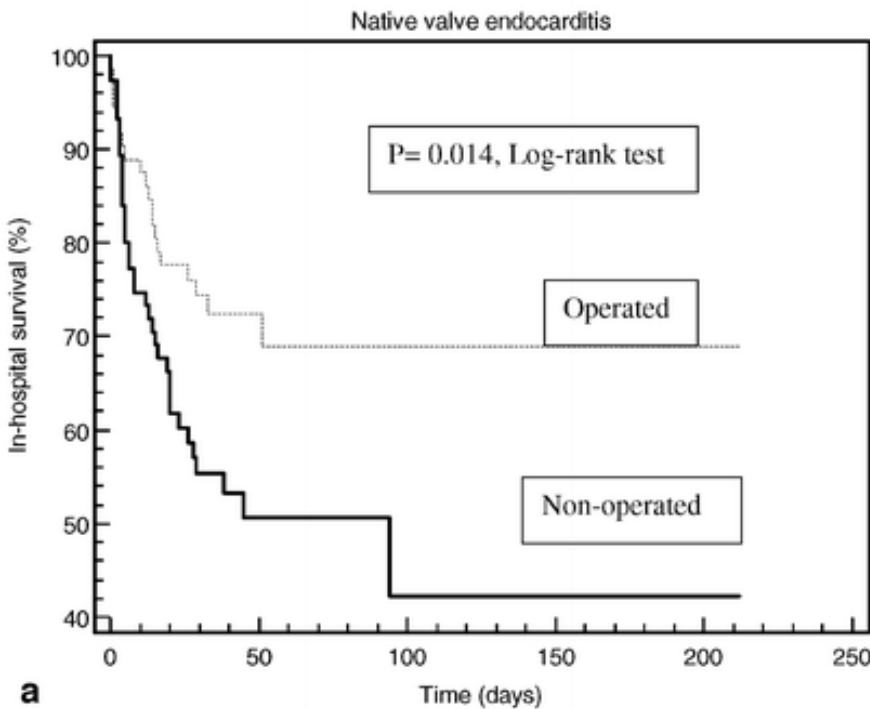
Values are presented as percentages. AV, Aortic valve; MV, mitral valve; TV, tricuspid valve; CNS, central nervous system.

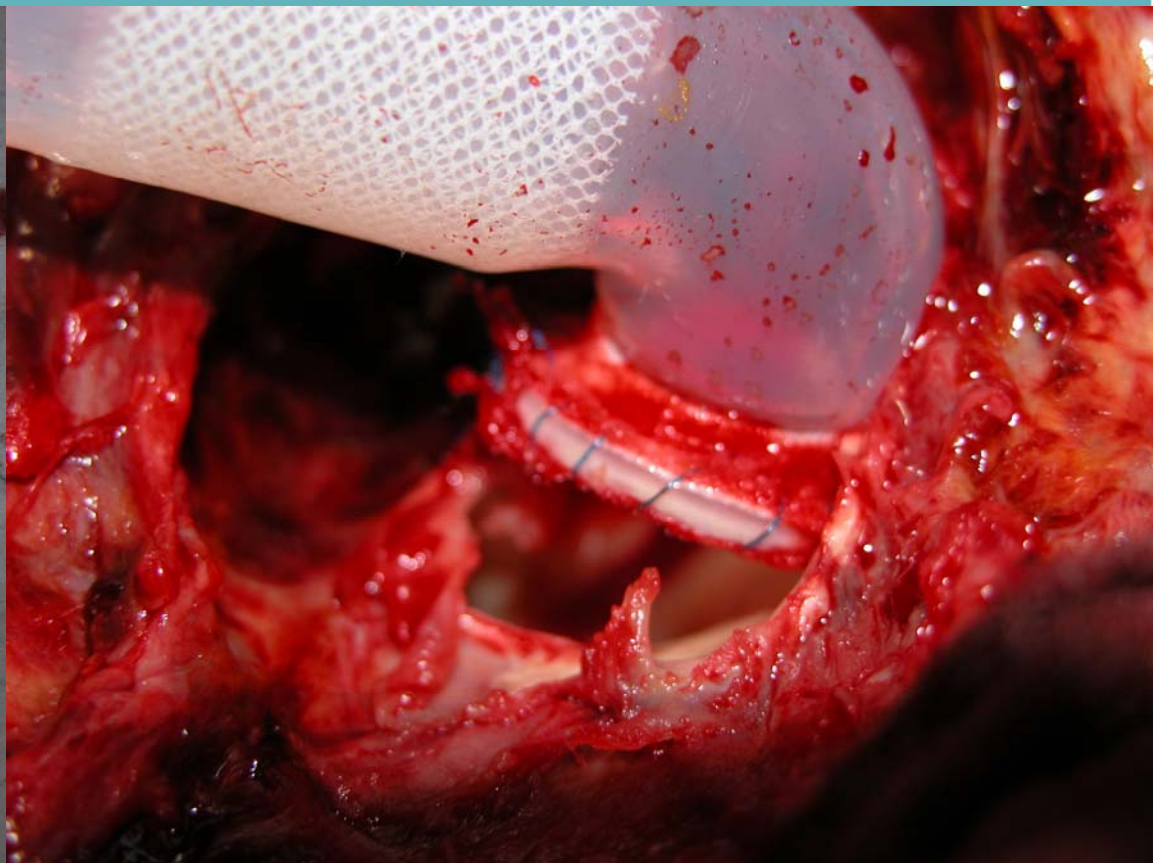


ICU endocarditis

- Surgical intervention better
- multivariate sign
 - Surgery OR 0.465
 - Shock
 - Cerebral embolism
 - Immunosuppressive therapy

Mourvillier Intensive Care Med 2004
N=228 consecutive patients





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Thanks

- Multidisciplinary working group on endocarditis
 - E. Hill
 - W. Peetermans
 - M-C. Herregods
 - P. Herijgers
 - P. Claus, H. Bollen
- All physicians from internal medicine, cardiology, laboratory medicine, cardiac surgery, intensive care: S. Vanderschueren, J. Verhaegen, E. Van Wijngaerden, P. De Munter, et al.