



Challenging the experts:

Managing complications after valve surgery due to endocarditis

Vlatka Reskovic Luksic, MD, PhD
Department for Cardiovascular Diseases
University Hospital Center Zagreb, Croatia



Nothing to declare.

Case report:

- 43y-old male, previously healthy
- 12/1/24 – fall due to alcohol consumption – nose fracture
- 15/1/24 – fever (39C), chills
- 17/1/20 – palmar and plantar petechiae (?)
- Infectious disease Clinic:
 - Tx: clindamycin + vancomycin
 - BC: S. aureus (MSSA) → flucloxacillin
 - Persistent fever -- TTE

Major criteria

(i) Blood cultures positive for IE

- (a) Typical microorganisms consistent with IE from two separate blood cultures:
Oral streptococci, *Streptococcus gallolyticus* (formerly *S. bovis*), HACEK group, *S. aureus*, *E. faecalis*
- (b) Microorganisms consistent with IE from continuously positive blood cultures:
 - ≥ 2 positive blood cultures of blood samples drawn >12 h apart.
 - All of 3 or a majority of ≥ 4 separate cultures of blood (with first and last samples drawn ≥ 1 h apart).
- (c) Single positive blood culture for *C. burnetii* or phase I IgG antibody titre $>1:800$.

(ii) Imaging positive for IE:

Valvular, perivalvular/periprosthetic and foreign material anatomic and metabolic lesions characteristic of IE detected by any of the following imaging techniques:

- Echocardiography (TTE and TOE).
- Cardiac CT.
- [18F]-FDG-PET/CT(A).
- WBC SPECT/CT.

Minor criteria

(i) **Predisposing conditions (i.e. predisposing heart condition at high or intermediate risk of IE or PWIDs)***

(ii) **Fever defined as temperature $>38^{\circ}\text{C}$**

(iii) **Embotic vascular dissemination (including those asymptomatic detected by imaging only):**

- Major systemic and pulmonary emboli/infarcts and abscesses.
- Haematogenous osteoarticular septic complications (i.e. spondylodiscitis).
- Mycotic aneurysms.
- Intracranial ischaemic/haemorrhagic lesions.
- Conjunctival haemorrhages.
- Janeway's lesions.

(IV) **Immunological phenomena:**

- Glomerulonephritis.
- Osler nodes and Roth spots.
- Rheumatoid factor.

(V) **Microbiological evidence:**

- Positive blood culture but does not meet a major criterion as noted above.
- Serological evidence of active infection with organism consistent with IE.

Definite:

- 2 major criteria.
- 1 major criterion and at least 3 minor criteria.
- 5 minor criteria.

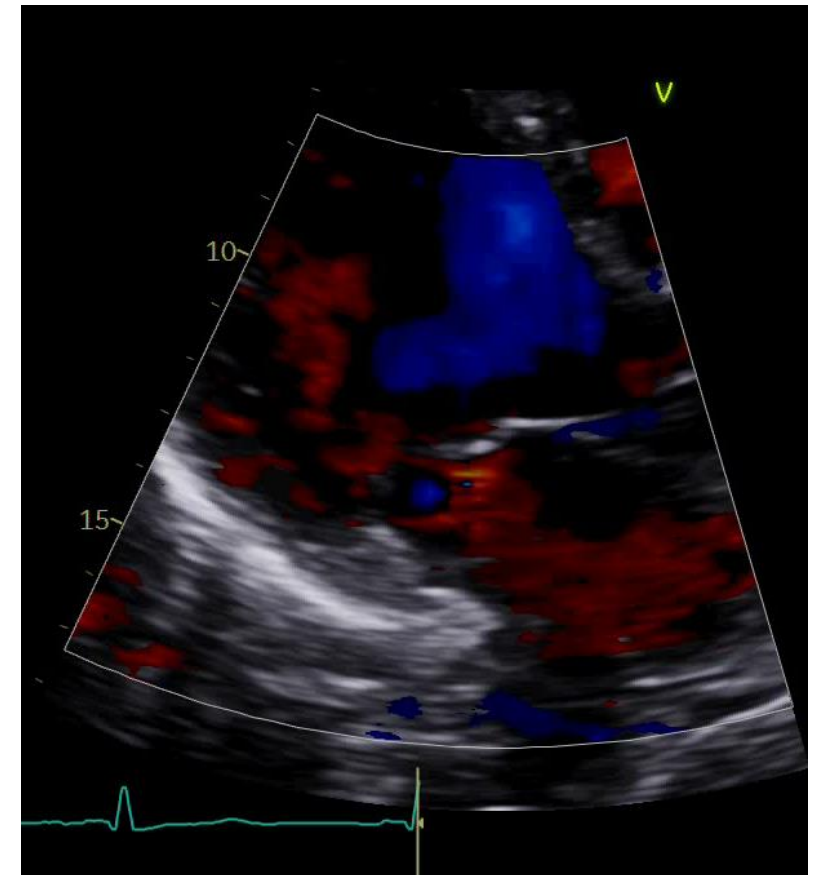
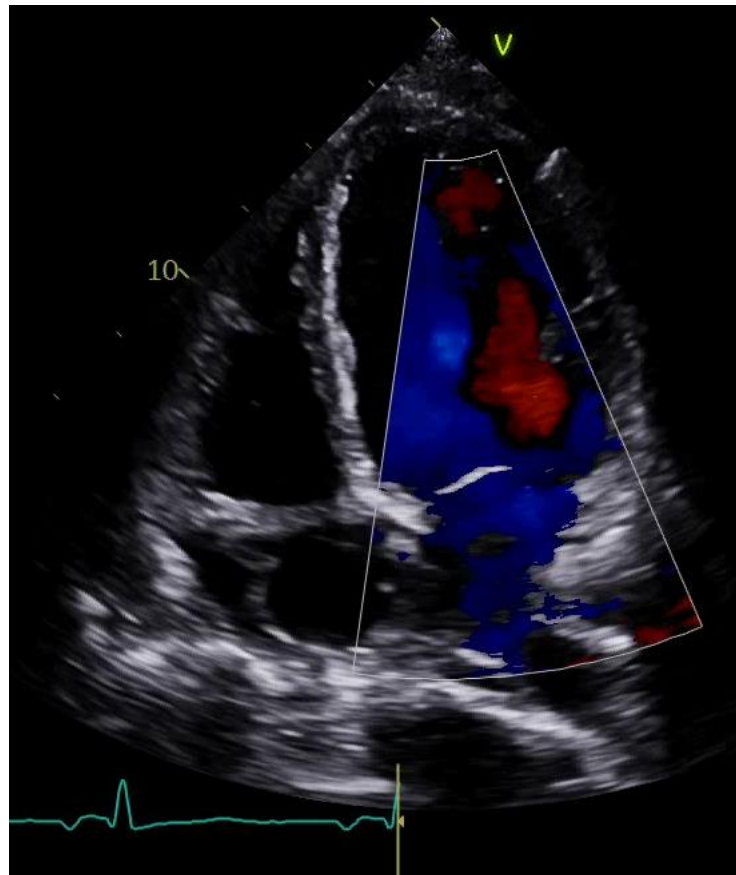
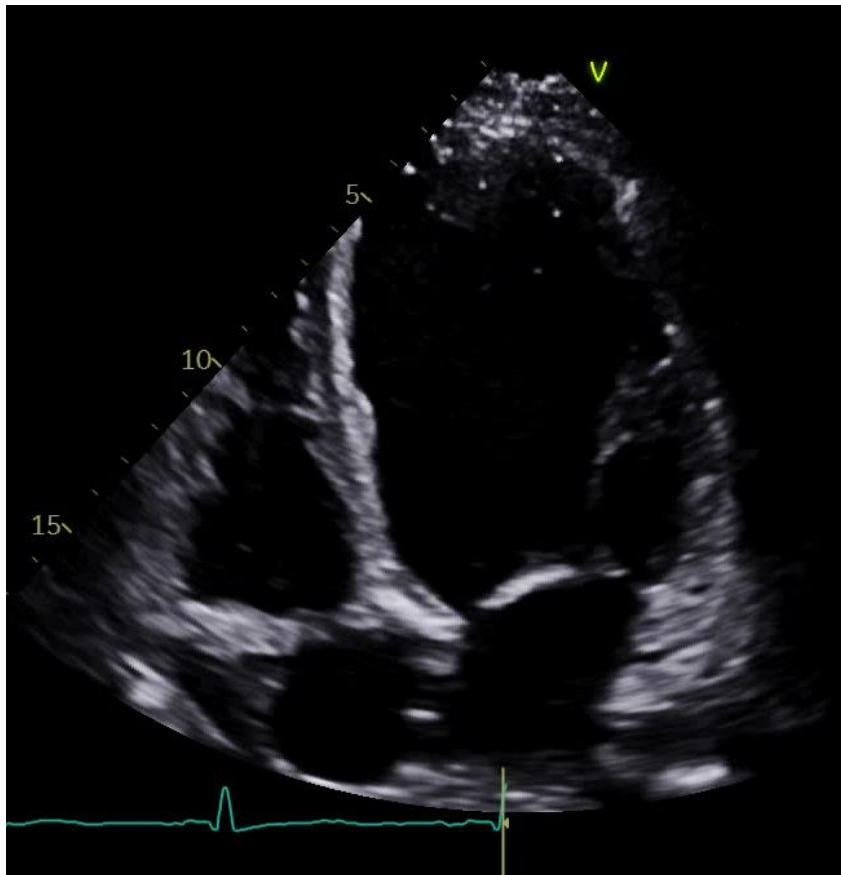
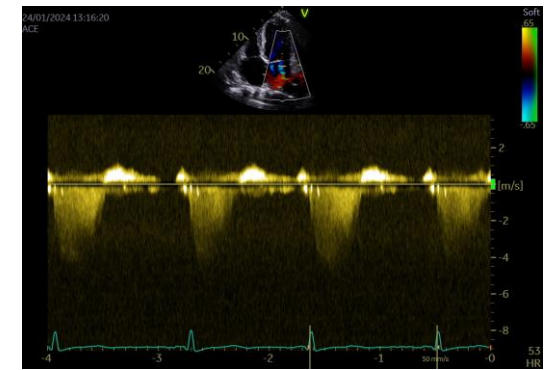
Possible:

- 1 major criterion and 1 or 2 minor criteria.
- 3–4 minor criteria.

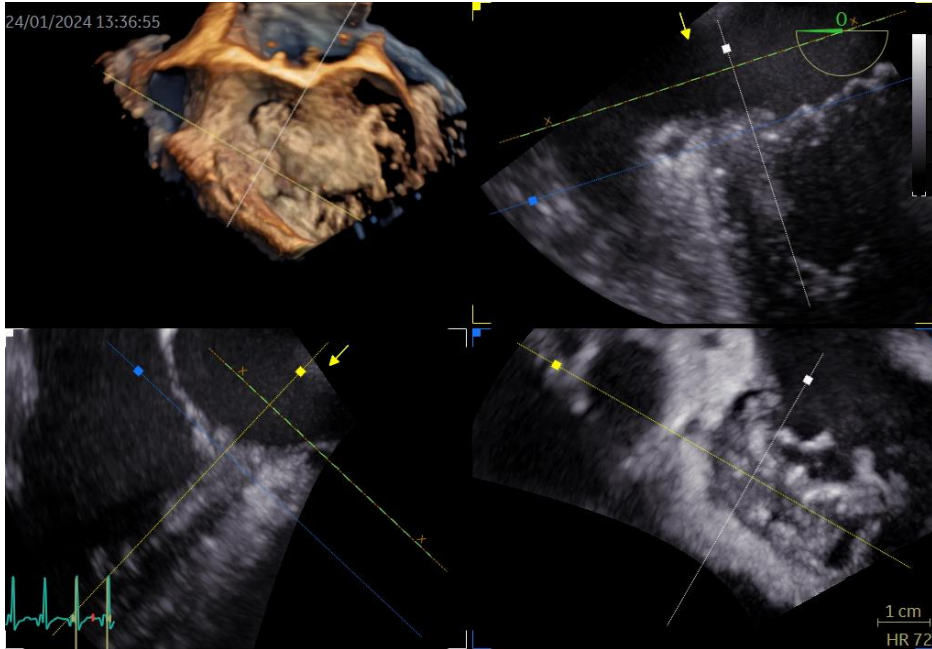
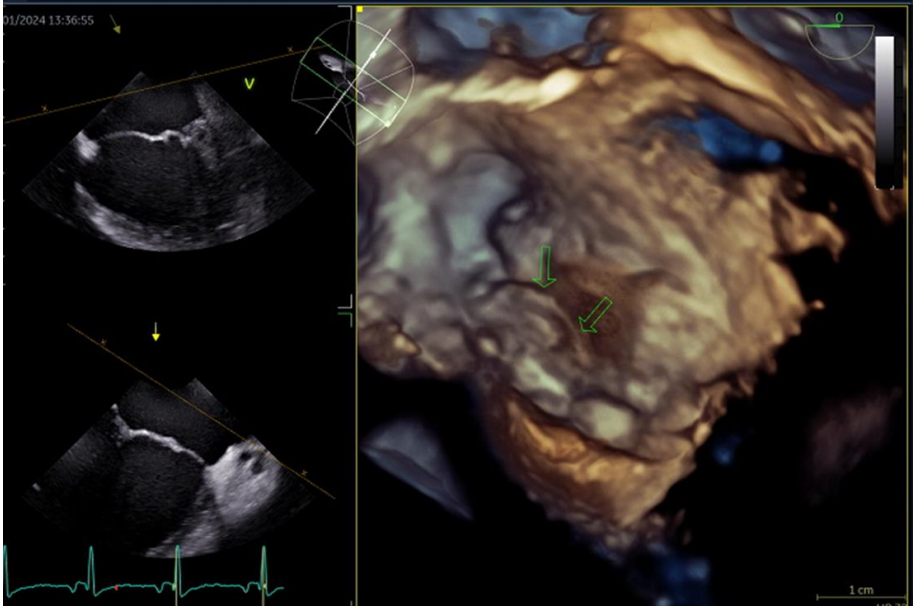
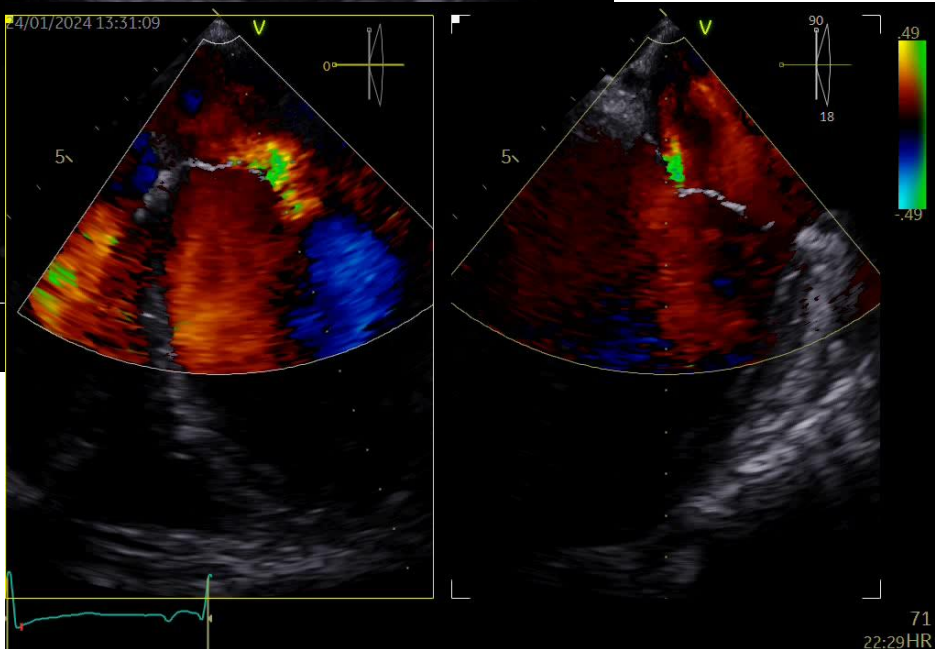
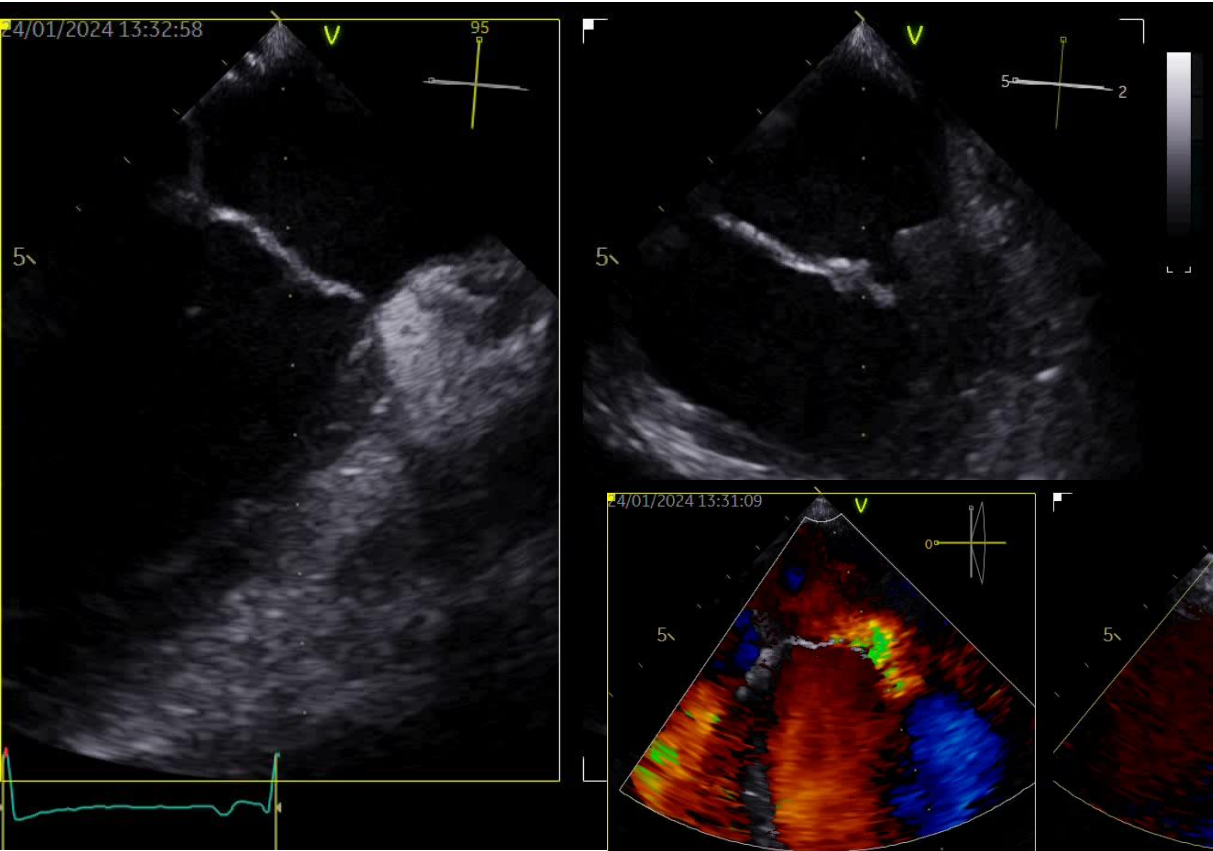
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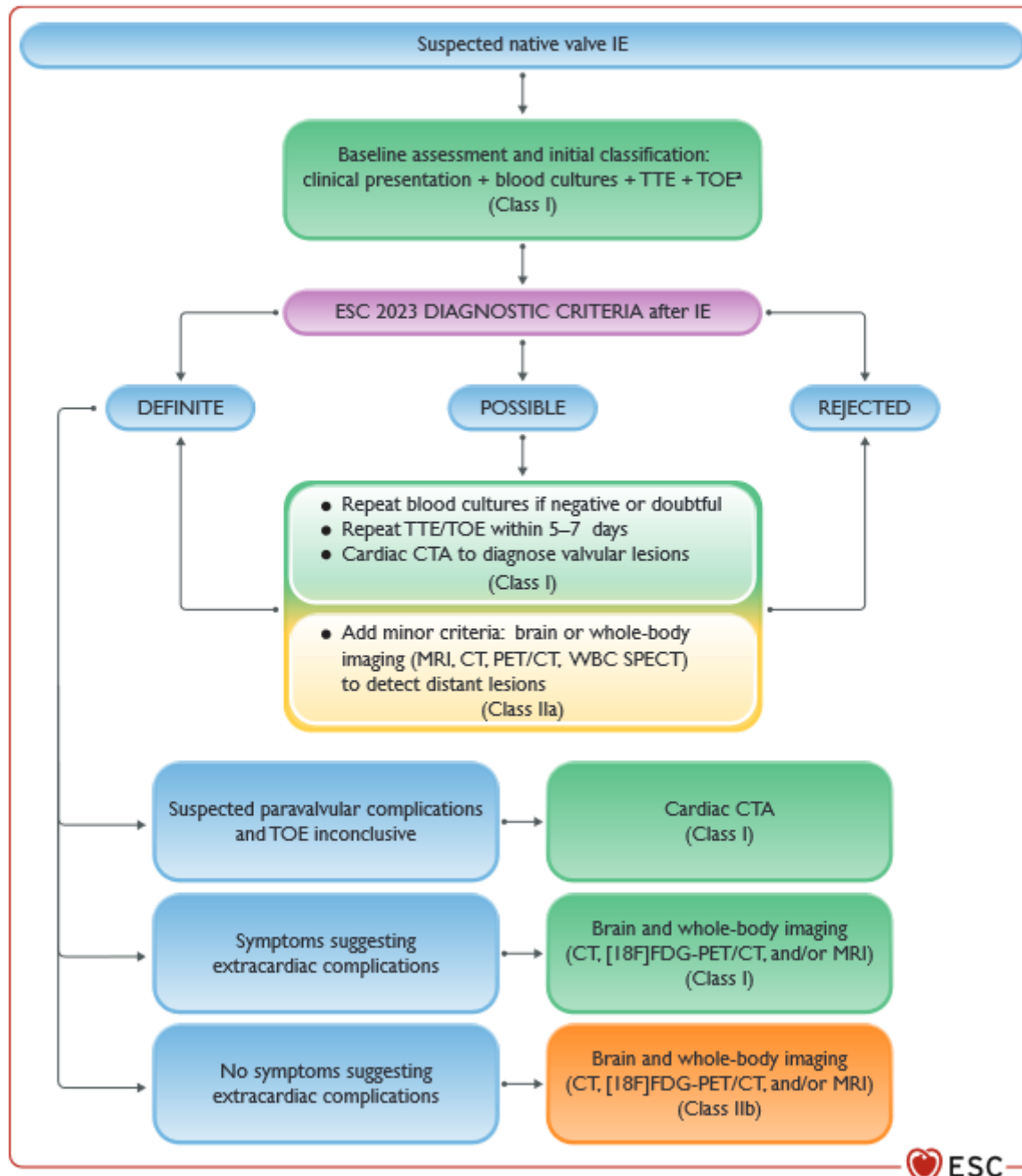
- Does not meet criteria for definite or possible at admission with or without a firm alternative diagnosis.

TTE 24/1/24



TOE 24/1/24





- Major +
 - Imaging
 - Blood cultures: *S. aureus*
- Minor +
 - Fever
 - Janeway lesions

Definite:

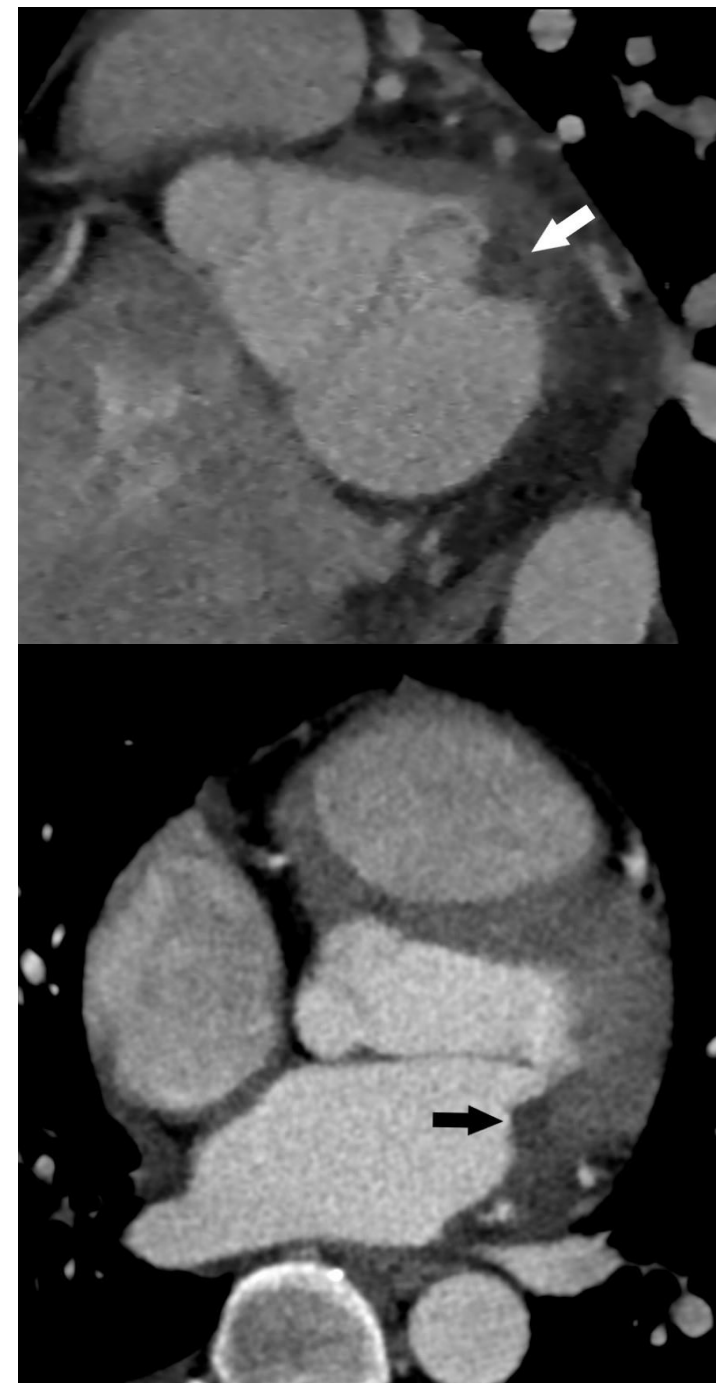
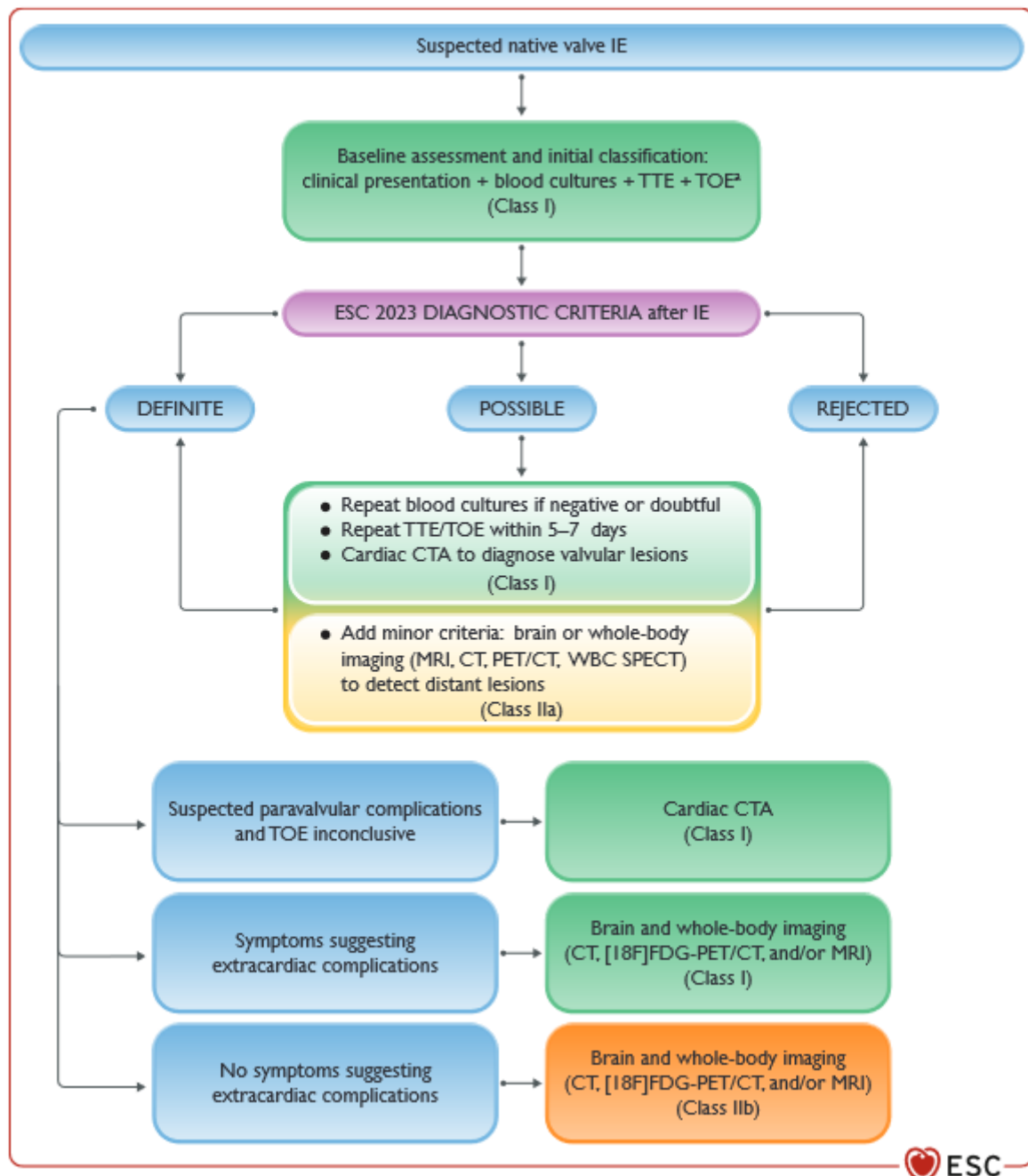
- 2 major criteria.
- 1 major criterion and at least 3 minor criteria.
- 5 minor criteria.

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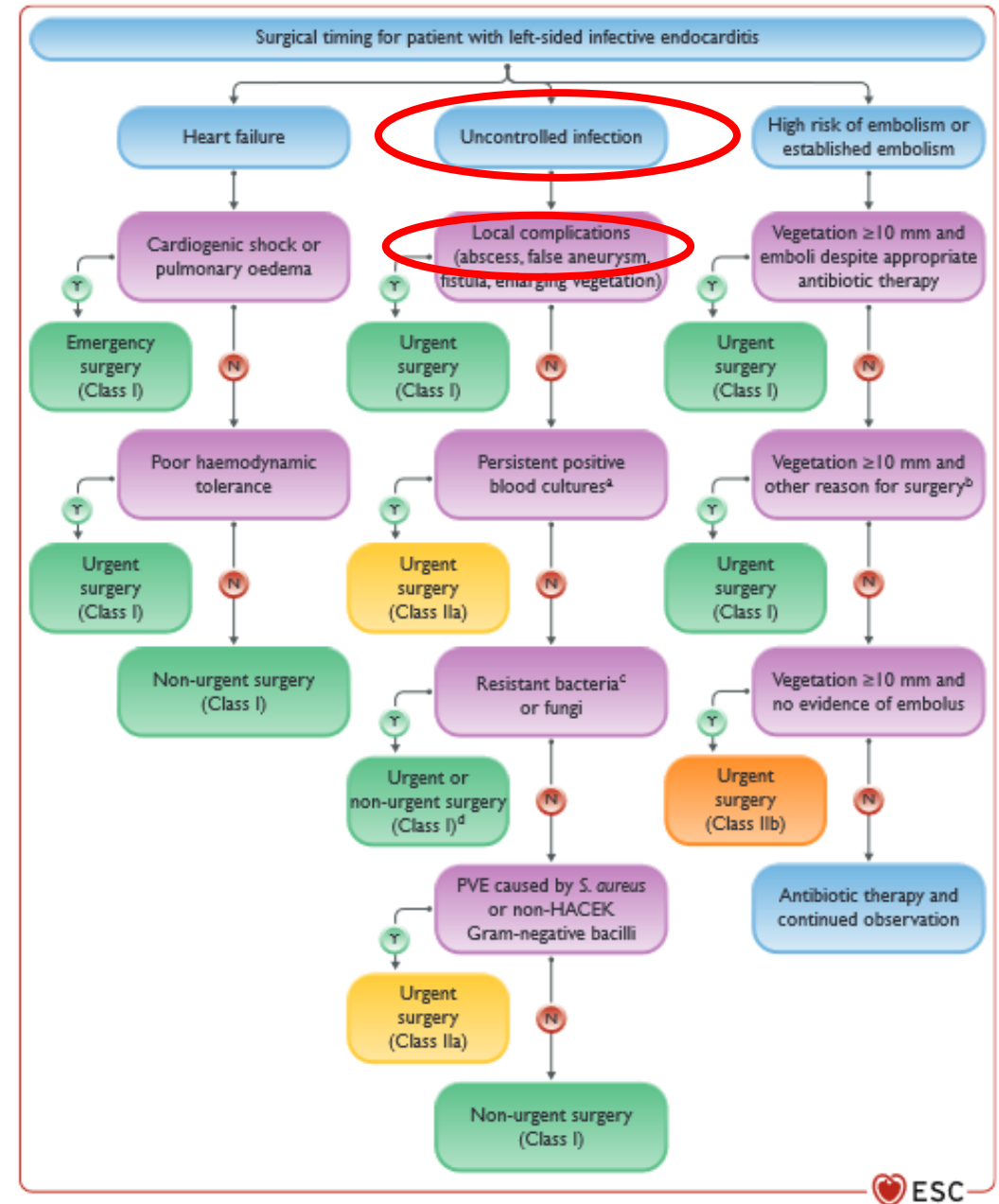


CT

Indications for surgery

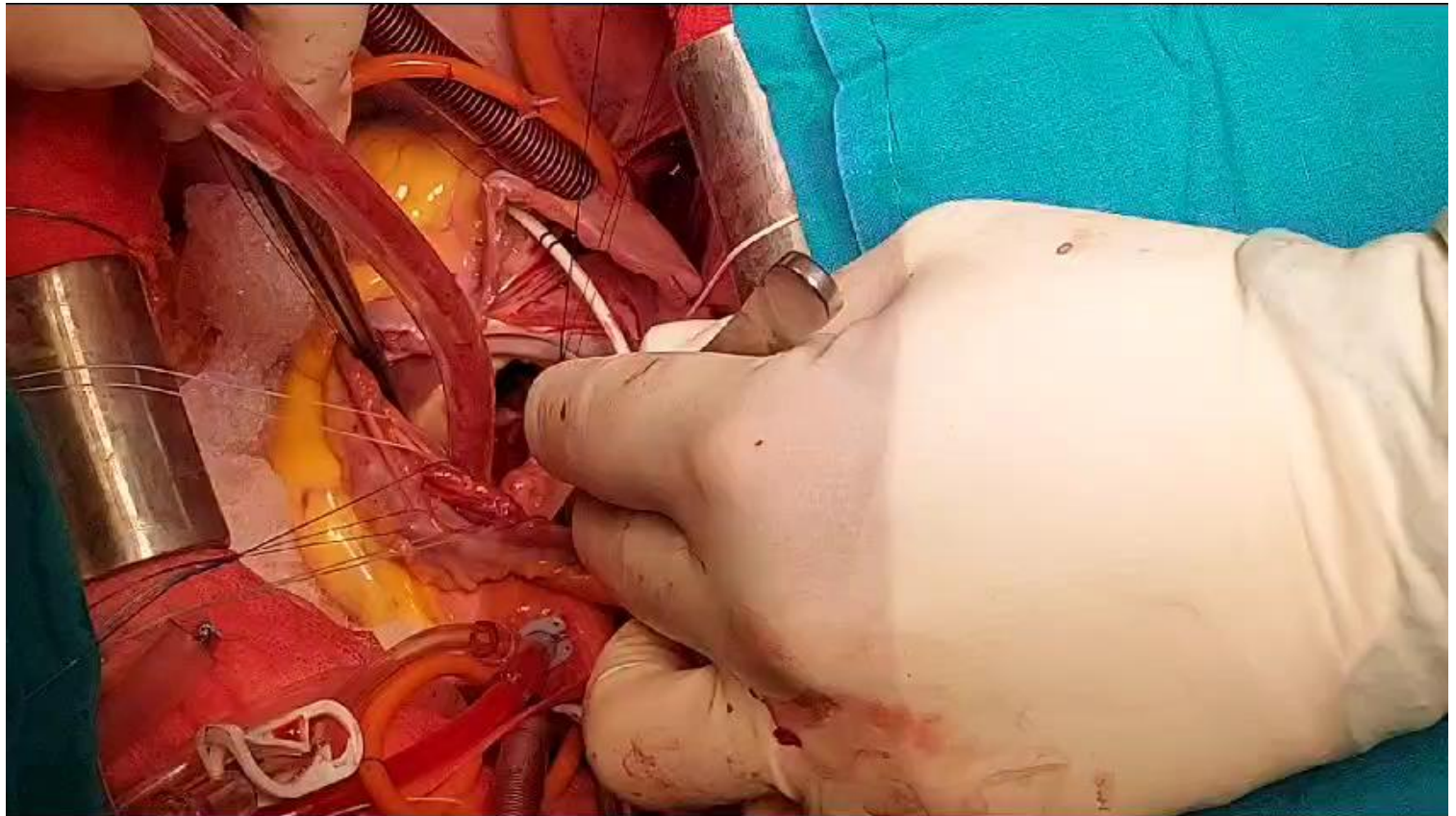
Persistent infection:

- Fever
- Positive blood cultures >7d
- Locally uncontrolled infection (abscess)
- Virulent or resistant organism (*S. aureus*)



- Uncontrolled infection → urgent surgery

- Vegetation+abscess P1/P2 with infiltration of the annulus
- Autologus pericard - reconstruction of the annulus and P1/P2
- Neocorde on P2
- Free-edge remodelling P1-P2
- Closing A1/P2 commisure



Challenges for the surgeon

- Not the same morphology as in degenerative MR
- Lesions: leaflet perforation, vegetation, leaflet damage, chordal rupture, annular/paravalvular abscess

Repair? - extensiveness of the infection

Valve repair	Valve replacement
Preferred in MV IE	Indicated in AV IE
Preservation of native valve (residual infective tissue?)	Complete eradication of infected tissue
Lower infection recurrence	In severely damaged valves and recurrent infections
Technically challenging	Mechanical - longer durability
Not always possible	Bioprosthetic –no OAC

Choice of valve prosthesis - guidelines

Valve selection in IE is influenced by:

- presence of recent stroke
- risk of bleeding
- complexity of expected postoperative course
- ability of the patient to participate in decision-making

Table 12 Features favouring a non-mechanical valve substitute in the setting of surgery for acute infective endocarditis

Early surgery after a recent ischaemic stroke

Evidence of intracranial bleeding

Woman of childbearing age

High likelihood of prolonged mechanical circulatory support

Advanced age or frailty

Poor or unknown medical compliance

Expected complicated and prolonged post-operative course

Patient preference

Complications: Durability? Reinfection?

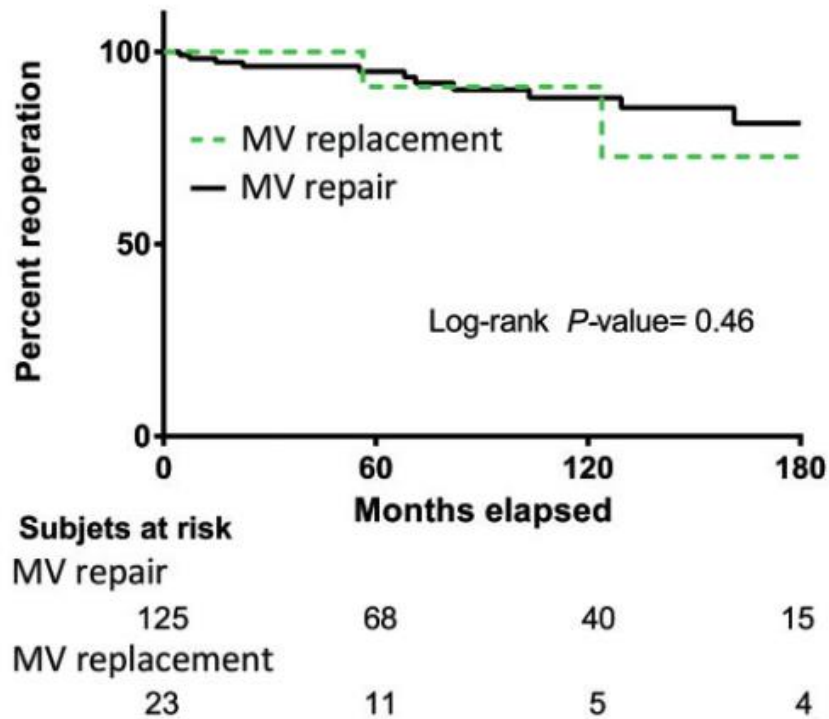


Figure 3: Kaplan-Meier curves showing freedom from reoperation in the MV repair and MV replacement groups. MV: mitral valve.

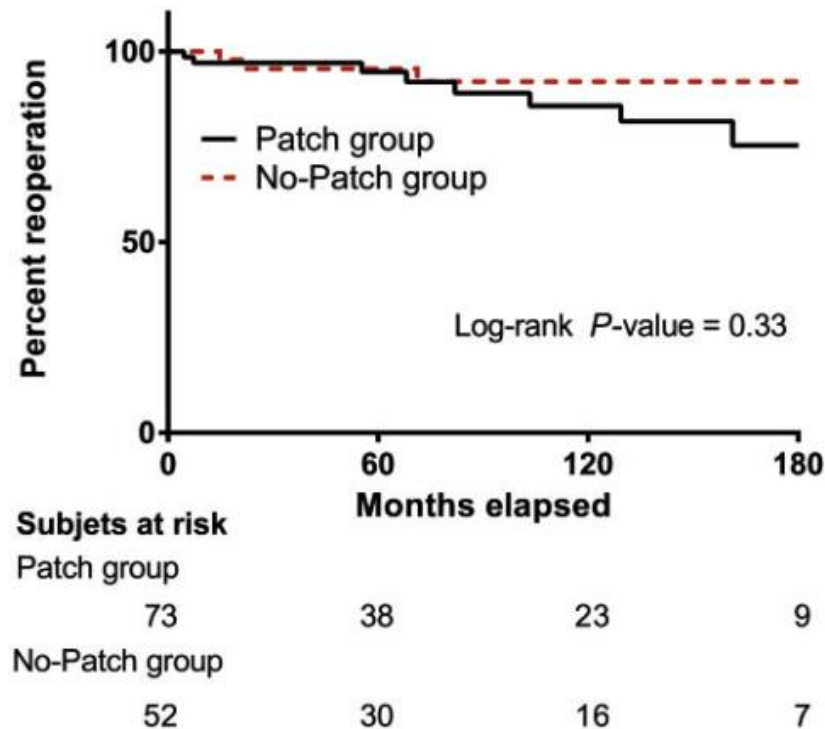


Figure 5: Kaplan-Meier curves showing freedom from reoperation in the patch and no-patch subgroups.

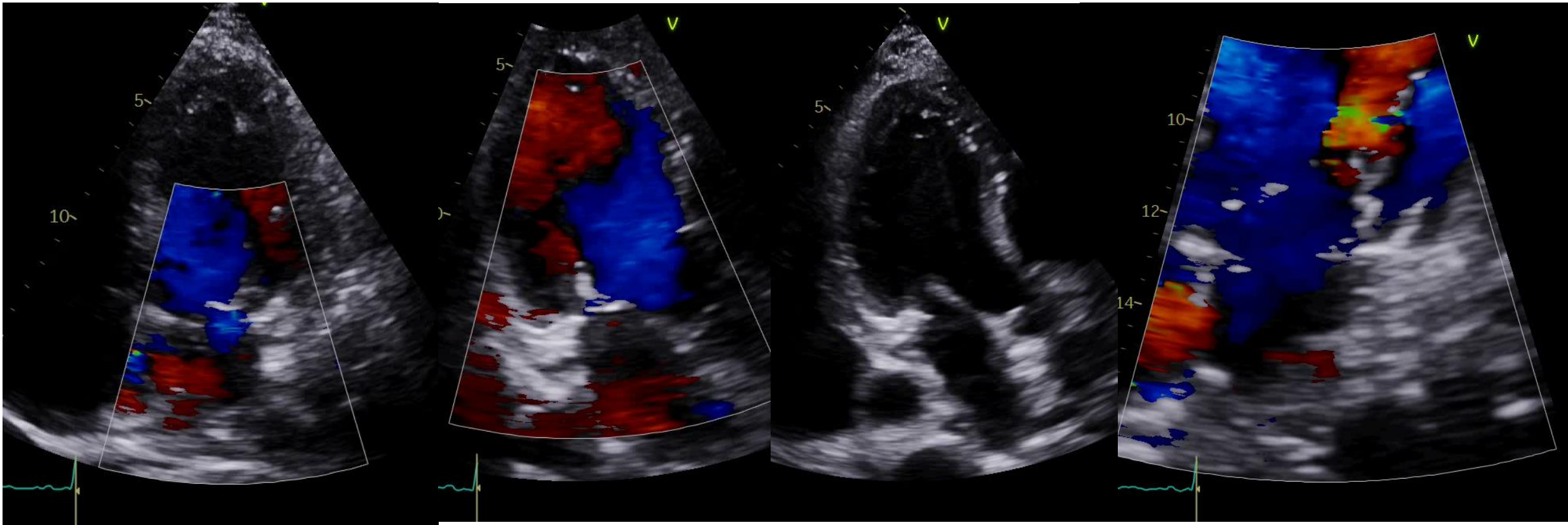
Table 2: Primary indications to surgery and agents of infection

	Repair (n = 155)	Replacement (n = 37)	P-value
Echographic findings, n (%)			
Vegetation(s) >1 cm	87 (55.4)	19 (51.4)	0.6
Abscess	44 (28.0)	8 (21.6)	0.41
MR 2 - 3/4	87 (55.4)	36 (97.3)	<0.05
Embolic complications, n (%)	76 (34.4)	20 (24.3)	0.58
Antimicrobial drug resistance, n (%)	31 (19.7)	7 (18.9)	0.88
Heart failure, n (%)	35 (22.3)	16 (43.2)	<0.05
Infectious agent, n (%)			
<i>Streptococcus</i> spp.	58 (37.4)	7 (18.9)	<0.05
<i>Staphylococcus aureus</i>	36 (23.2)	16 (43.2)	<0.05
<i>Enterococcus faecalis</i>	19 (12.3)	3 (8.1)	0.48
Other <i>Staphylococcus</i> groups, n (%)	27 (17.4)	6 (16.2)	0.86
<i>Escherichia coli</i>			
<i>Candida albicans</i>			
<i>Actinobacillus</i>			
<i>Haemophilus influenzae</i>			
Other			
Negative culture IE, n (%)	11 (7.1)	4 (10.8)	0.45
Unknown, n (%)	4 (2.6)	1 (2.7)	0.97

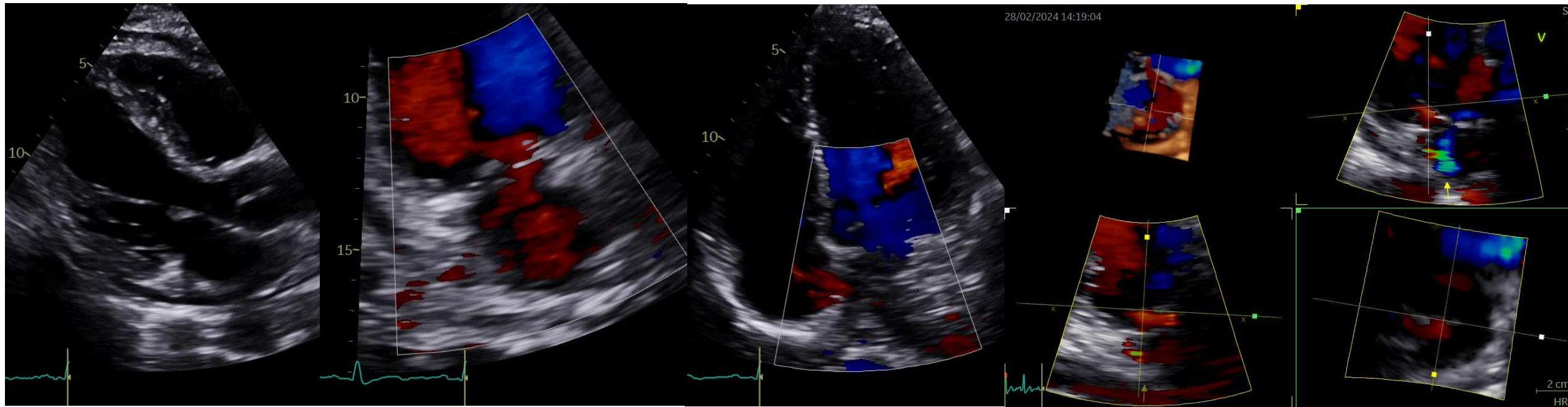
IE: infective endocarditis; MR: mitral regurgitation.

Postoperative TTE 02/02/2024

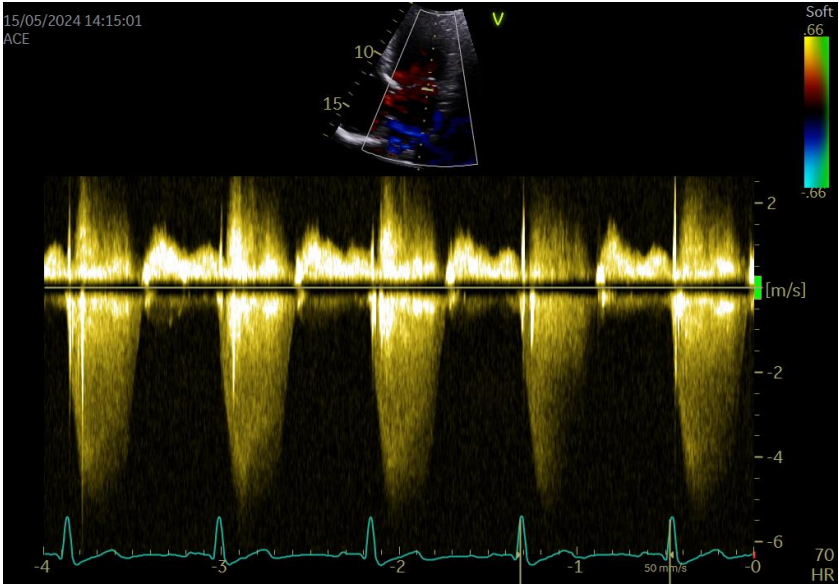
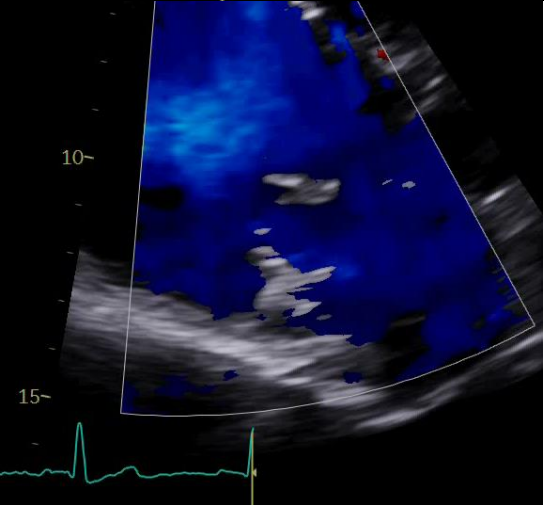
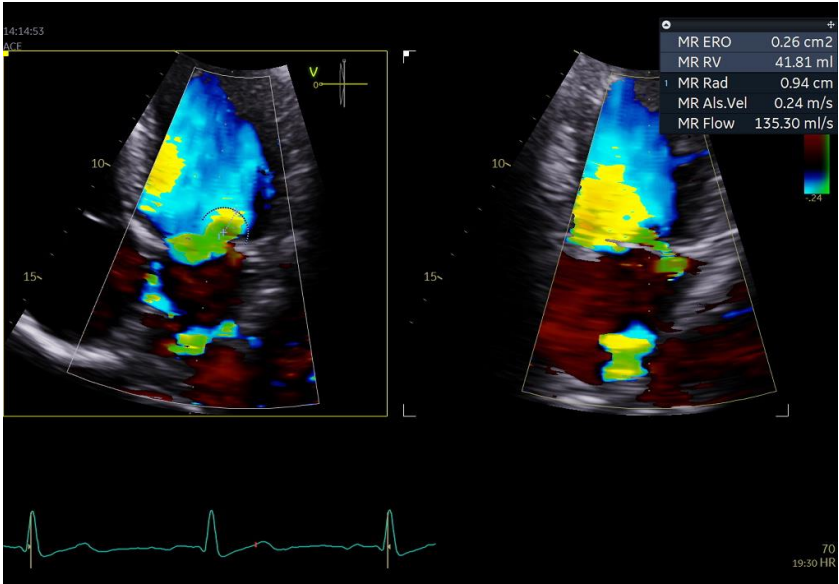
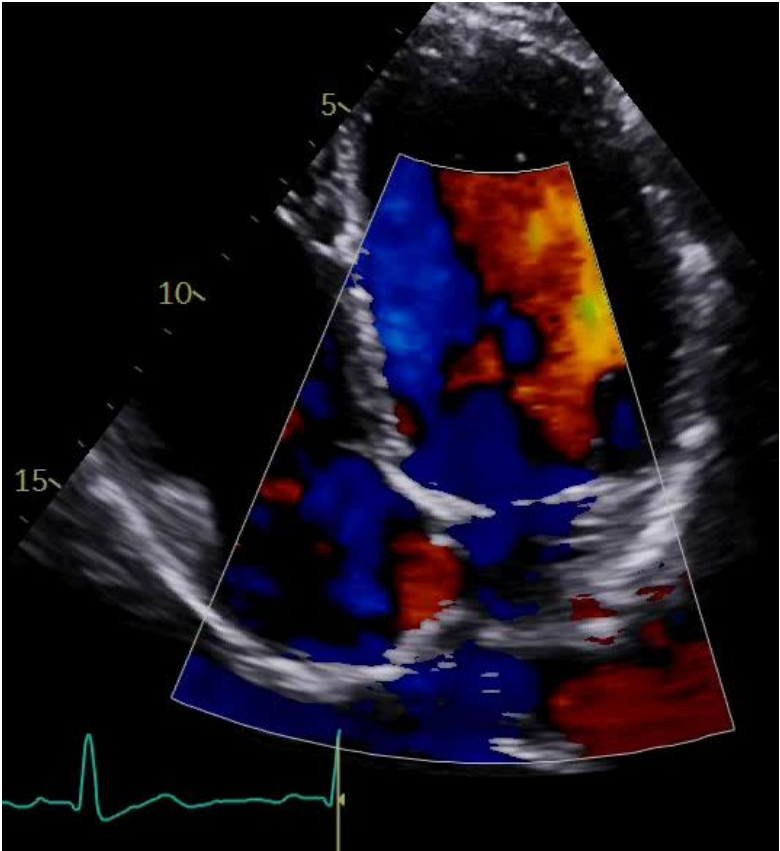
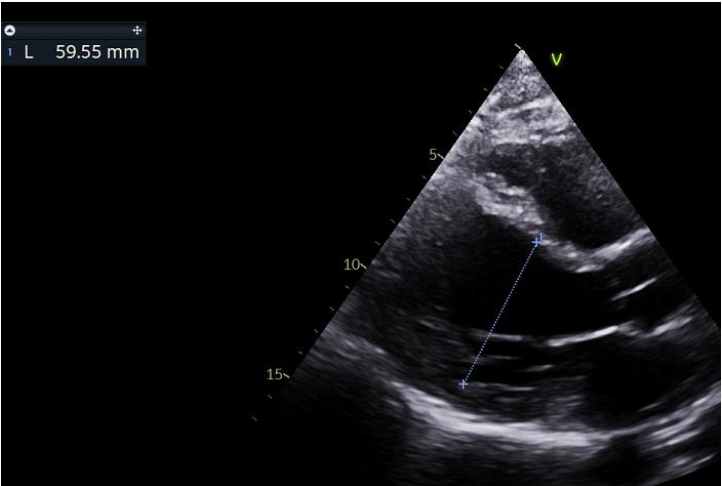
- Good result
- Transferred to Infectious Disease Clinic to complete antibiotic therapy

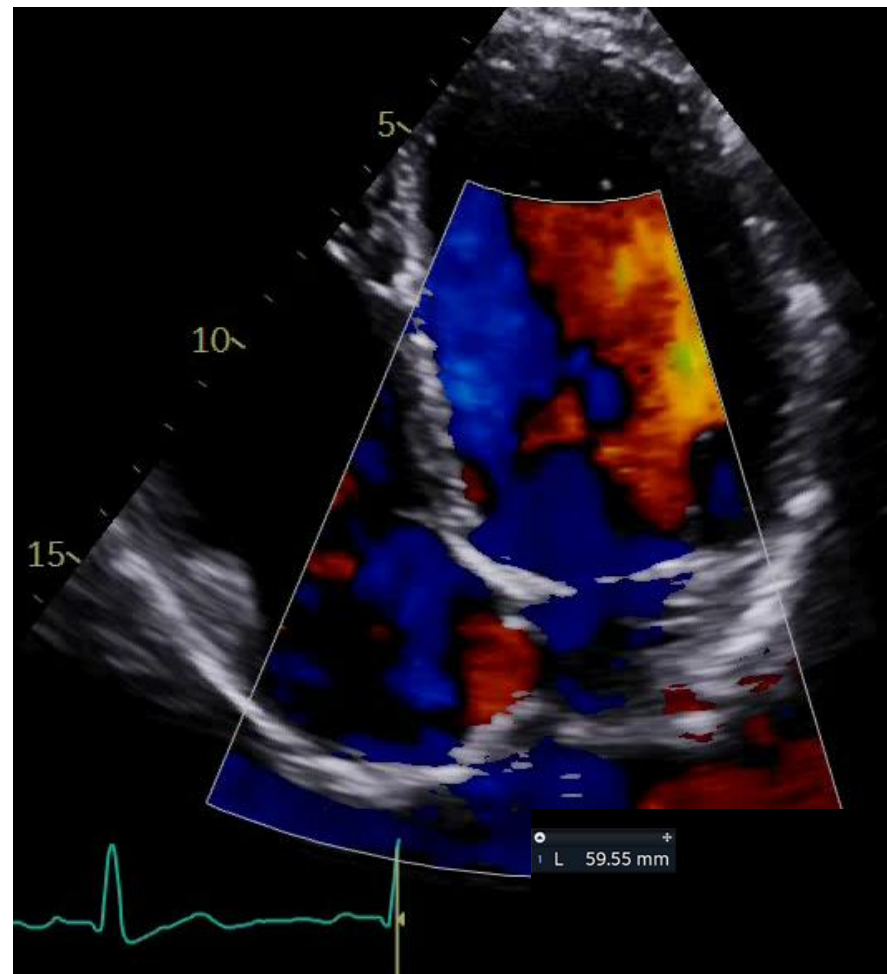


After atb Tx 28/2/2024



TTE 15/5/2024

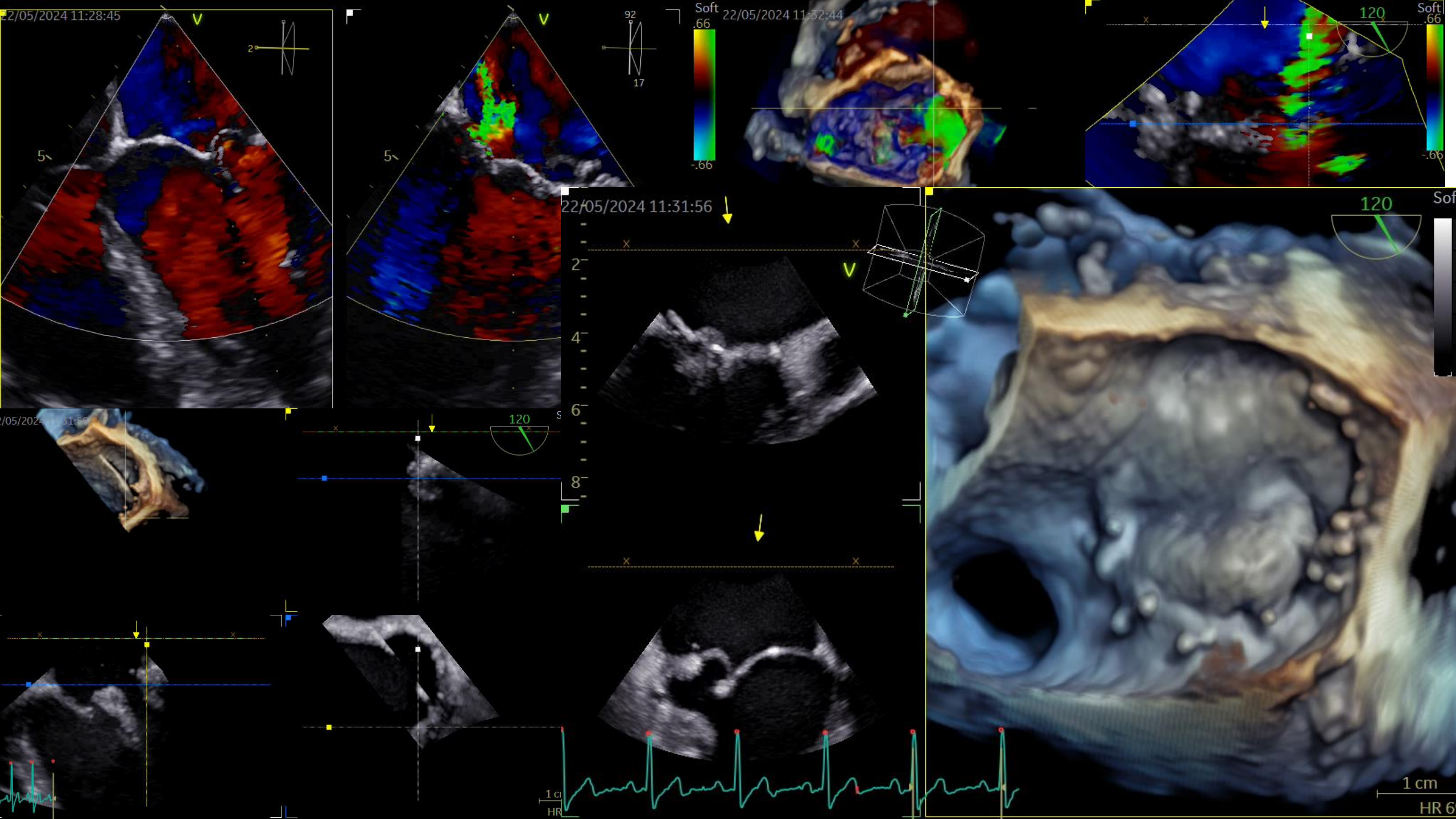




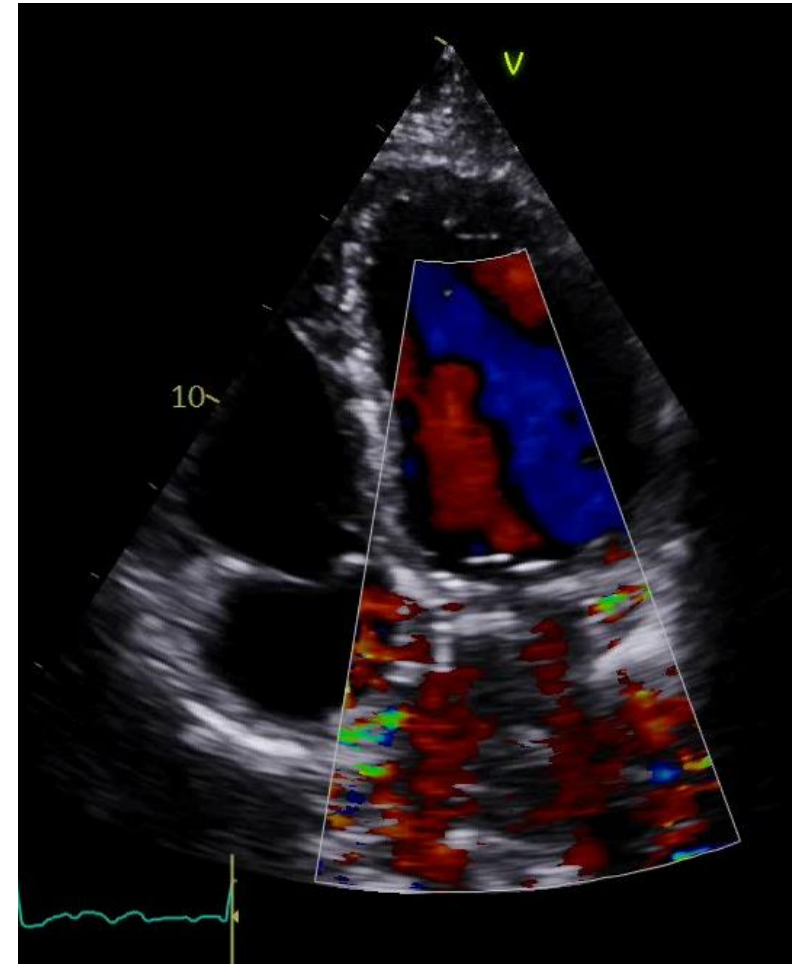
28/2/2024

15/5/2024





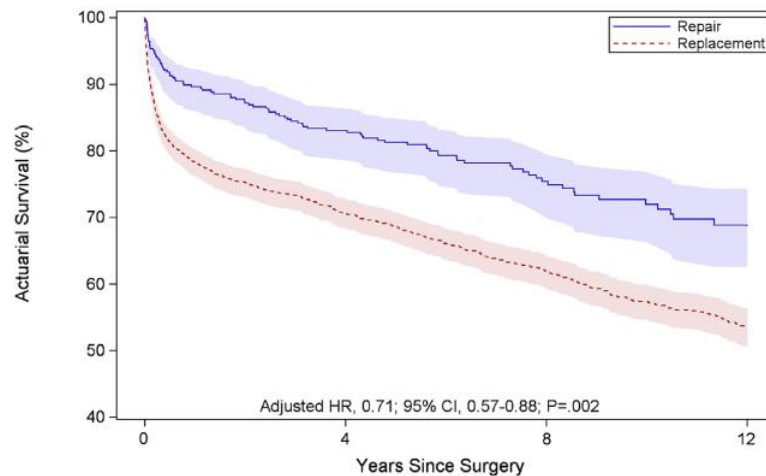
MVR mech 11/9/2025



- 1970 pts with MV IE
- primary outcome: long-term survival
- Secondary outcomes: recurrent IE and reoperation
- Median follow-up 6.6y

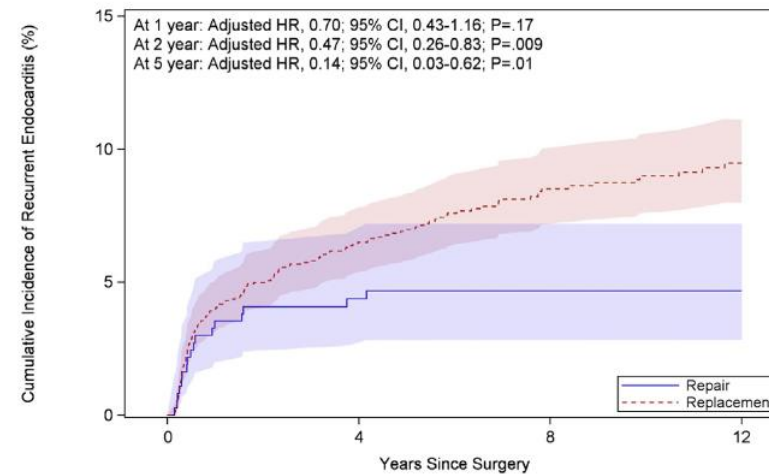
• Limitations:

- lack of information on severity of IE
- different patient group profiles
- significantly higher incidence of Staph. spp IE in the MV replacement group
- high probability of selection bias

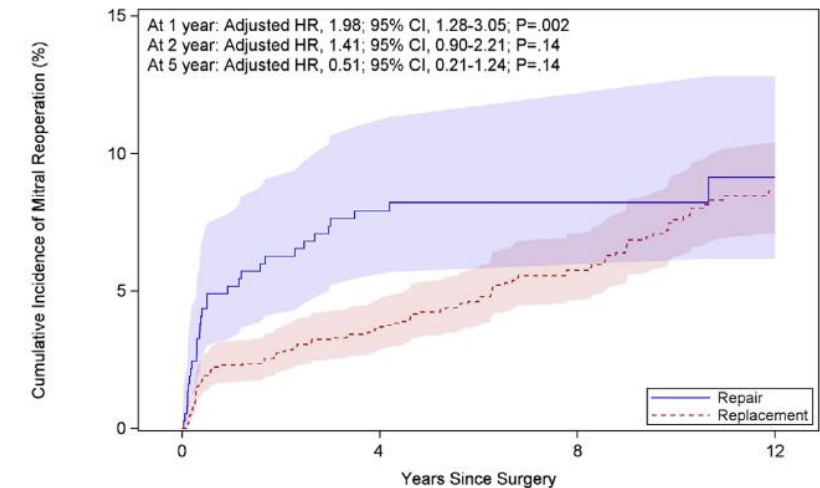


Repair 367
Replacement 1603

286 153 61
1079 635 296



Repair 367 276 136 58
Replacement 1603 1023 577 250



Repair 367 265 128 53
Replacement 237

Valve preservation in acute IE should only be attempted if a **durable** repair is anticipated and **complete eradication** of infected tissue can be achieved



- Question for the surgeon?
 - **Type of initial and re-do surgery?**

- Question for the cardiologist?
 - **Timing of re-do surgery?**



Thank You!