



ΧΕΙΡΟΥΡΓΙΚΗ ΘΕΡΑΠΕΙΑ ΕΝΔΟΚΑΡΔΙΤΙΔΑΣ



Μεταπτυχιακό Πρόγραμμα
ΚΛΙΝΙΚΗΣ ΛΟΙΜΩΞΕΩΝ

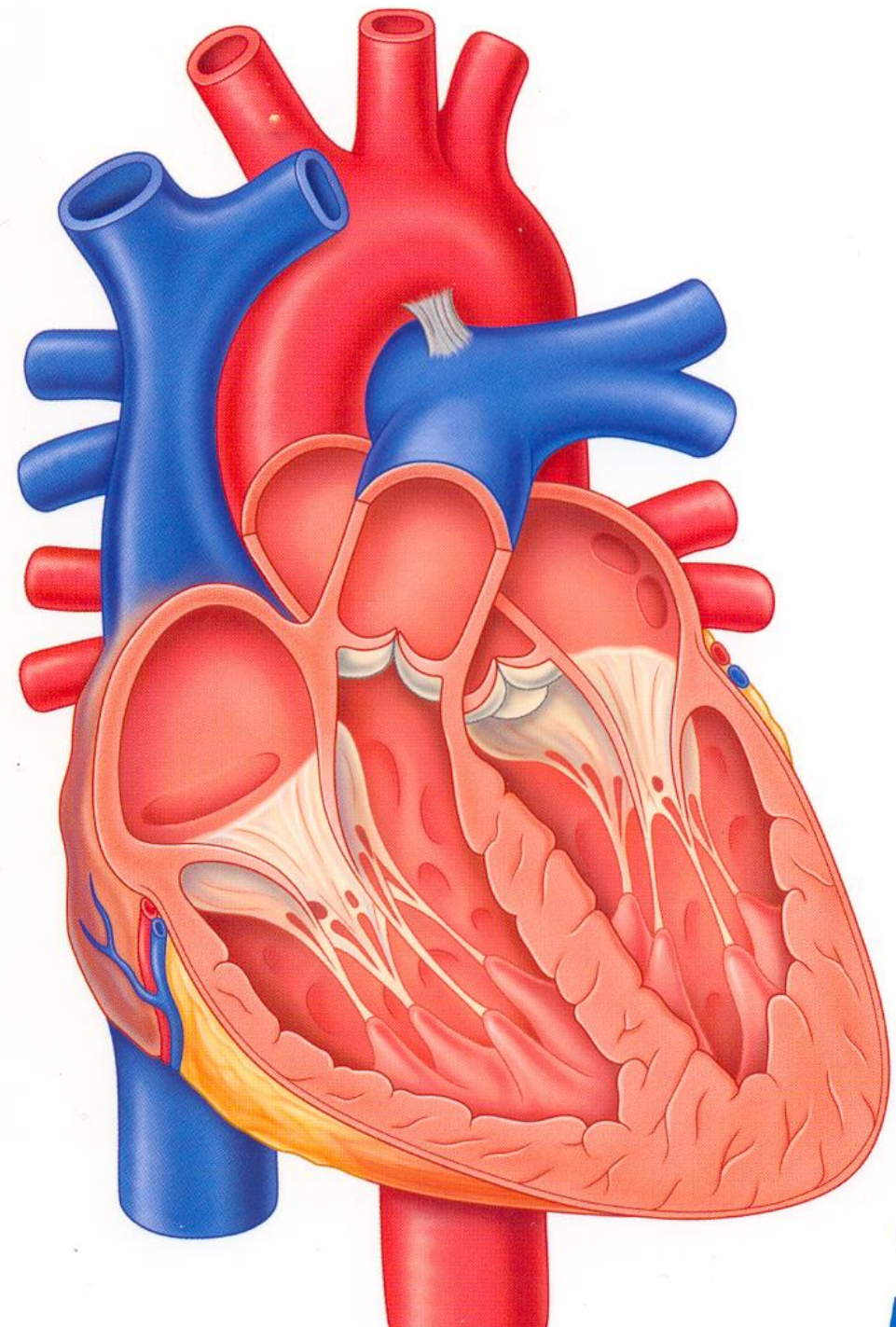
Δημήτριος Δουγένης
ddougen@med.uoa.gr
29/11/2019



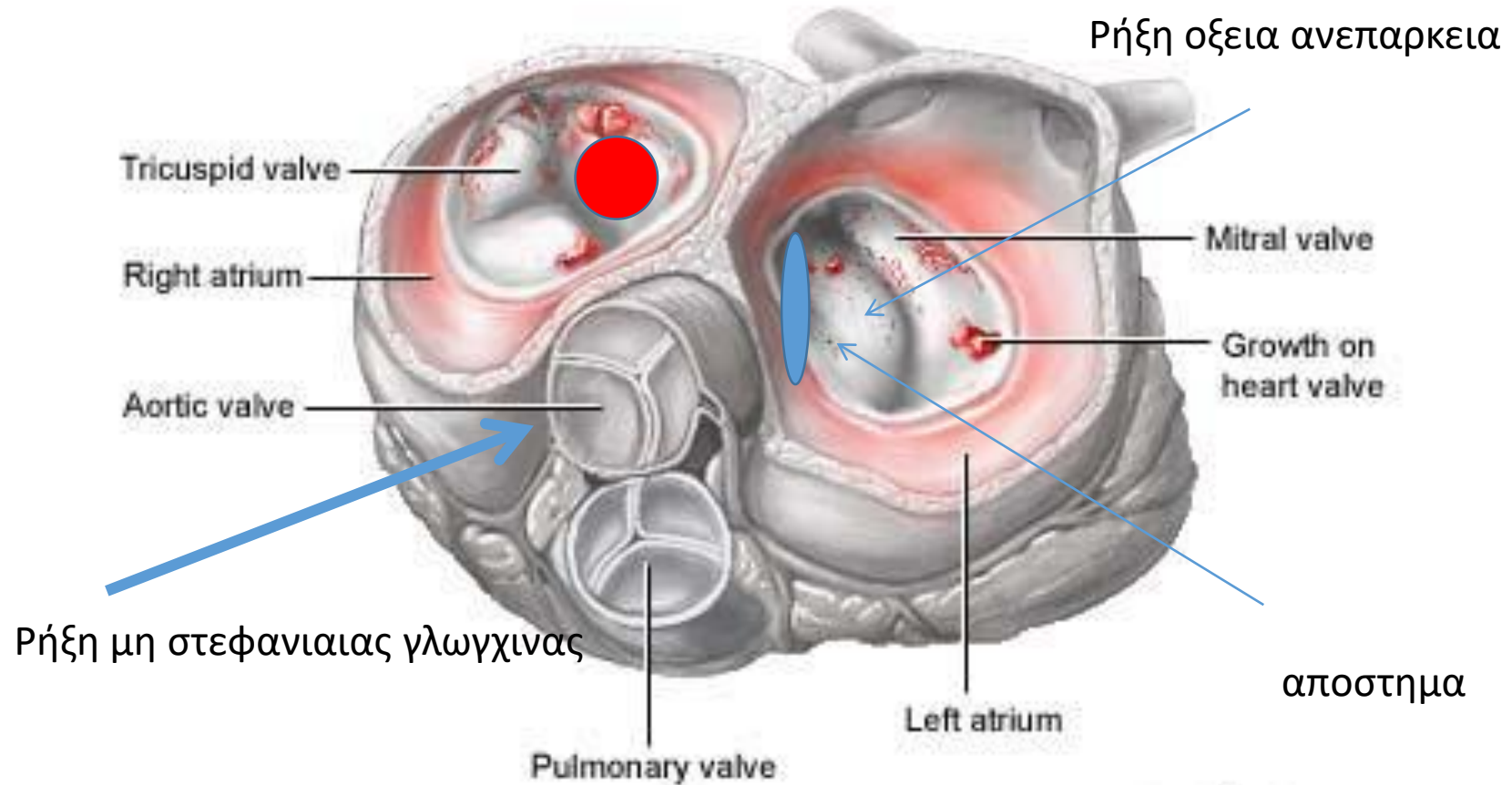
**Earliest Human
Heart in Art?**

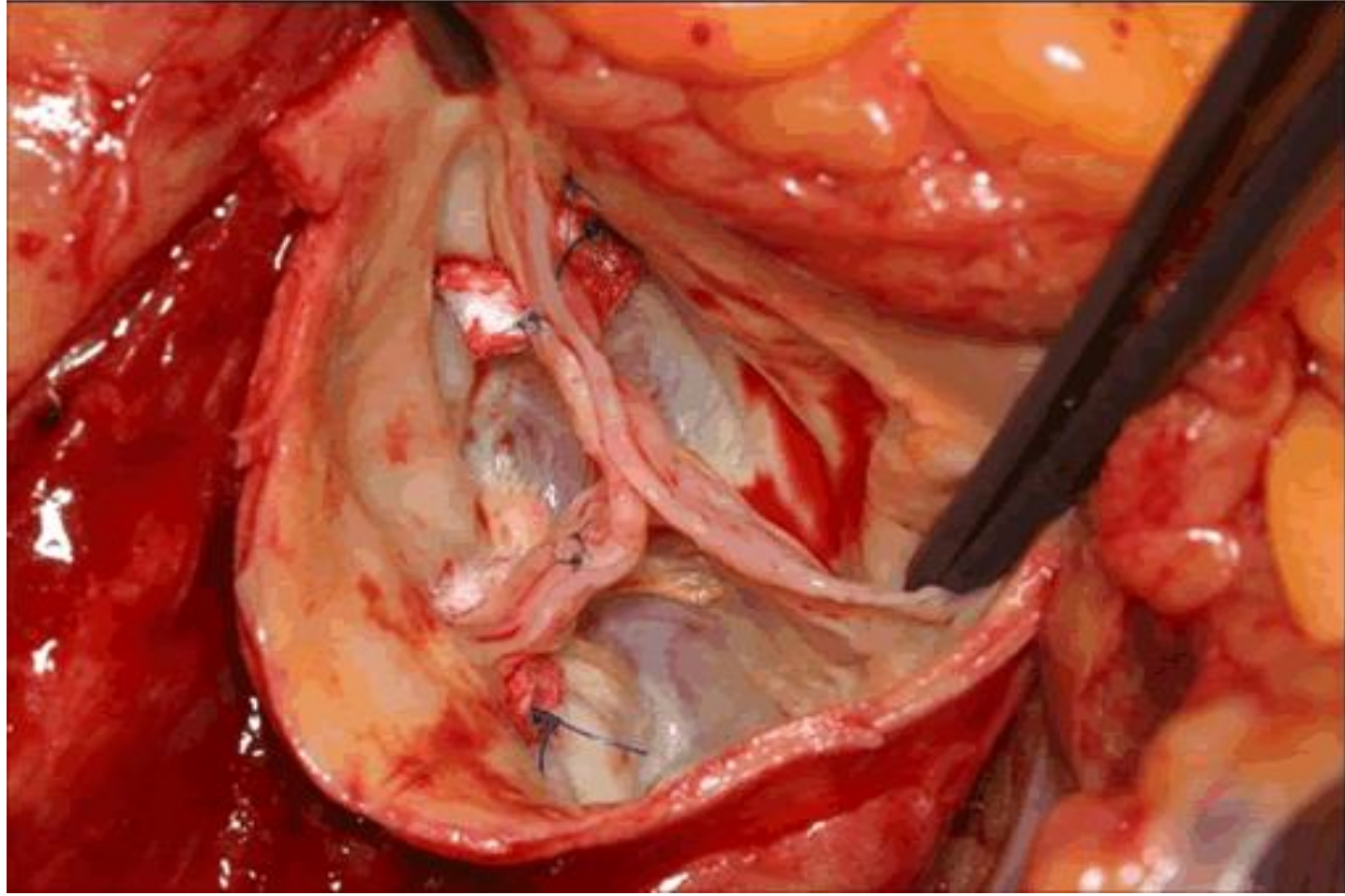


Earliest Human Heart in Art?



ΑΝΑΤΟΜΙΚΗ ΣΧΕΣΗ ΒΑΛΒΙΔΩΝ









European Heart Journal (2015) **36**, 3075–3123
doi:10.1093/eurheartj/ehv319

ESC GUIDELINES

2015 ESC Guidelines for the management of infective endocarditis

**The Task Force for the Management of Infective Endocarditis of the
European Society of Cardiology (ESC)**

**Endorsed by: European Association for Cardio-Thoracic Surgery
(EACTS), the European Association of Nuclear Medicine (EANM)**

Table 8 Characteristics of the 'Endocarditis Team'


When to refer a patient with IE to an 'Endocarditis Team' in a reference centre




1. Patients with complicated IE (i.e. endocarditis with HF, abscess, or embolic or neurological complication or CHD), should be referred early and managed in a reference centre with immediate surgical facilities.
2. Patients with non-complicated IE can be initially managed in a non-reference centre, but with regular communication with the reference centre, consultations with the multidisciplinary 'Endocarditis Team', and, when needed, with external visit to the reference centre.

Characteristics of the reference centre

1. Immediate access to diagnostic procedures should be possible, including TTE, TOE, multislice CT, MRI, and nuclear imaging.
2. Immediate access to cardiac surgery should be possible during the early stage of the disease, particularly in case of complicated IE (HF, abscess, large vegetation, neurological, and embolic complications).
3. Several specialists should be present on site (the 'Endocarditis Team'), including at least cardiac surgeons, cardiologists, anaesthesiologists, ID specialists, microbiologists and, when available, specialists in valve diseases, CHD, pacemaker extraction, echocardiography and other cardiac imaging techniques, neurologists, and facilities for neurosurgery and interventional neuroradiology .

Role of the 'Endocarditis Team'



1. The 'Endocarditis Team' should have meetings on a regular basis in order to discuss cases, take surgical decisions, and define the type of follow-up.
2. The 'Endocarditis Team' chooses the type, duration,  and mode of follow up of antibiotic therapy, according to a standardized protocol, following the current guidelines.
3. The 'Endocarditis Team'  should participate in national or international registries, publicly report the mortality and morbidity of their centre, and be involved in a quality improvement programme, as well as in a patient education programme. 
4. The follow-up should be organized on an outpatient visit basis at a frequency depending on the patient's clinical status (ideally at 1, 3, 6, and 12 months after hospital discharge, since the majority of events occur during this period⁵⁷).

EDITOR'S CHOICE

Impact of Setting up an “Endocarditis Team” on the Management of Infective Endocarditis




Yvon Ruch ✉, Jean-Philippe Mazzucotelli, François Lefebvre, Aurélie Martin, Nicolas Lefebvre, Nawal Douiri, Philippe Riegel, Tam Hoang Minh, Hélène Petit-Eisenmann, Yves Hansmann ... [Show more](#)

Open Forum Infectious Diseases, Volume 6, Issue 9, September 2019, ofz308, <https://doi.org/10.1093/ofid/ofz308>



Results

We analyzed 391 episodes of IE. In the post-ET period, there was a nonsignificant decrease in **in-hospital mortality (20.3% vs 14.7%,** respectively; $P = .27$) and sequelae, along with a significant reduction in time to surgery (16.4 vs 10.3 days, respectively; $P = .049$), duration of antibiotic therapy (55.2 vs 47.2 days, respectively; $P < .001$), and length  in-hospital stay (40.6 vs 31.9 days, respectively; $P < .01$). In a multivariate analysis, the post-ET period **was positively associated** with survival (odds ratio, 0.45; 95% confidence interval, 0.20–0.96;

EDITOR'S CHOICE

Impact of Setting up an “Endocarditis Team” on the Management of Infective Endocarditis



Yvon Ruch ✉, Jean-Philippe Mazzucotelli, François Lefebvre, Aurélie Martin, Nicolas Lefebvre, Nawal Douiri, Philippe Riegel, Tam Hoang Minh, Hélène Petit-Eisenmann, Yves Hansmann ... Show more

Open Forum Infectious Diseases, Volume 6, Issue 9, September 2019, ofz308, <https://doi.org/10.1093/ofid/ofz308>

Results

We analyzed 391 episodes of IE. In the post-ET period, there was a nonsignificant decrease in in-hospital mortality (20.3% vs 14.7%,

Conclusions

This multidisciplinary approach exerted a positive impact on the management of IE and should be considered in all hospitals managing IE.

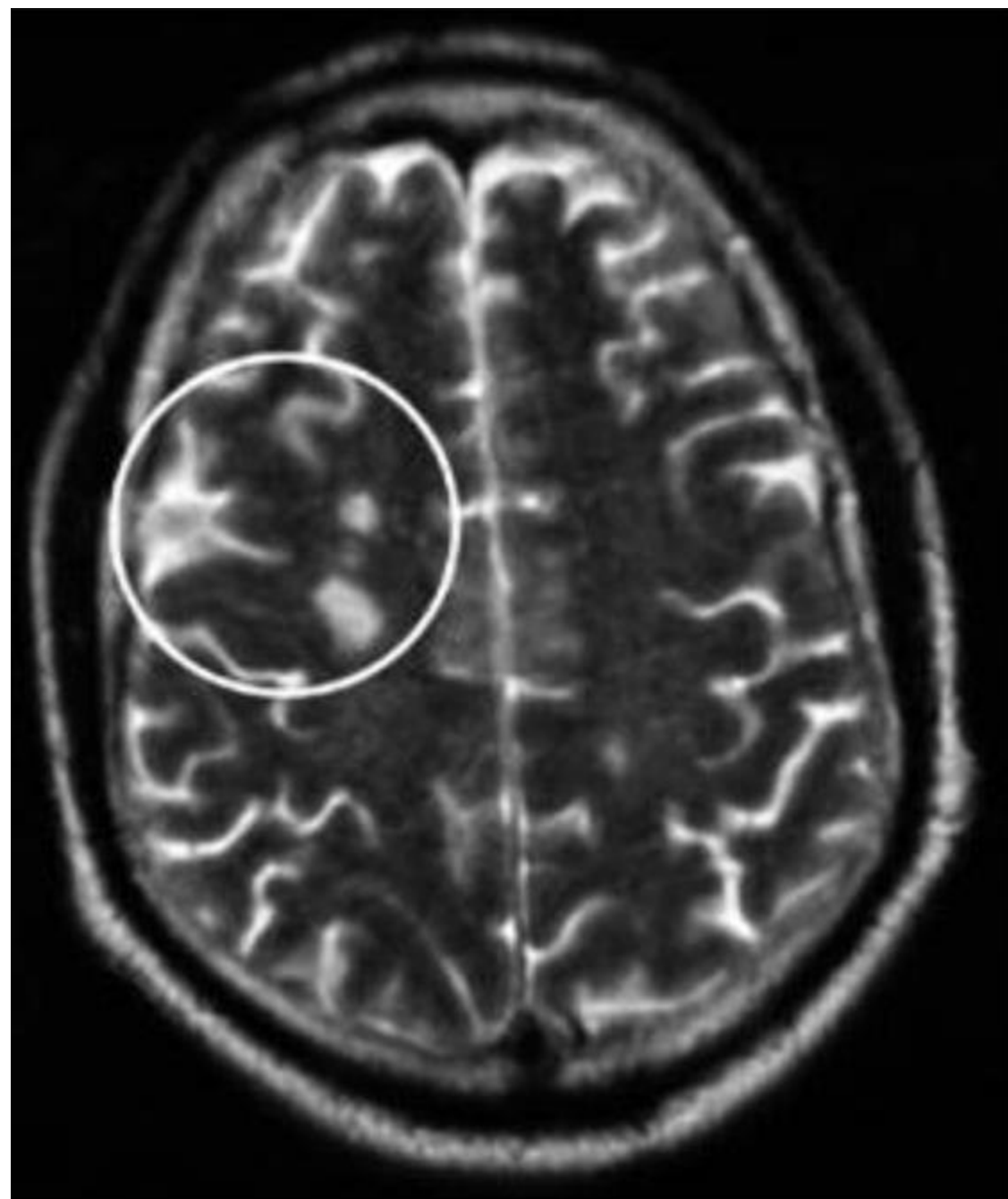
Indications for surgery	Timing ^a	Class ^b	Level ^c
1. Heart failure			
Aortic or mitral NVE or PVE with severe acute regurgitation, obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B
Aortic or mitral NVE or PVE with severe regurgitation or obstruction causing symptoms of HF or echocardiographic signs of poor haemodynamic tolerance	Urgent	I	B
2. Uncontrolled infection			
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B
Infection caused by fungi or multiresistant organisms	Urgent/ elective	I	C
Persisting positive blood cultures despite appropriate antibiotic therapy and adequate control of septic metastatic foci	Urgent	IIa	B
PVE caused by staphylococci or non-HACEK gram-negative bacteria	Urgent/ elective	IIa	C

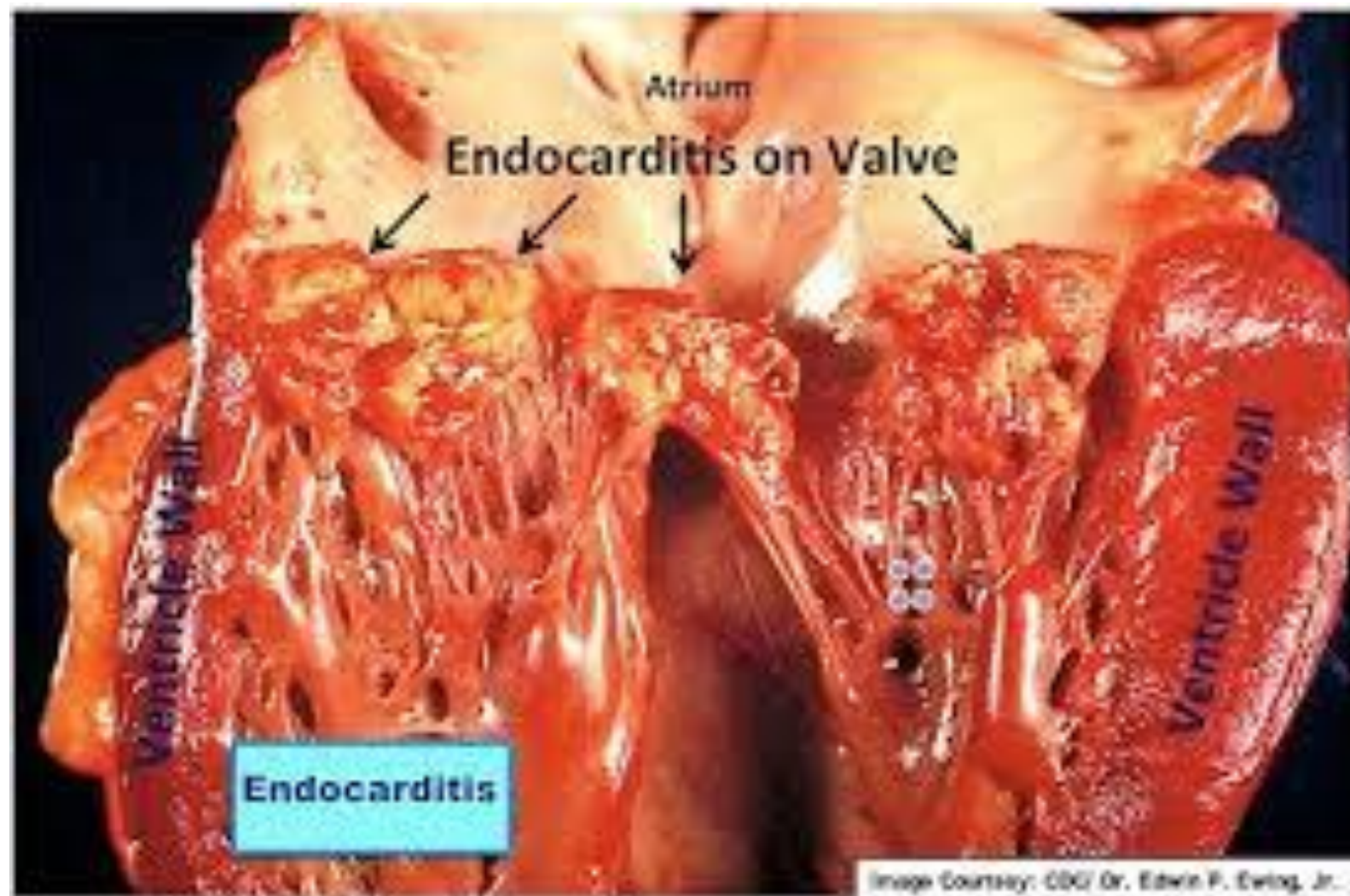


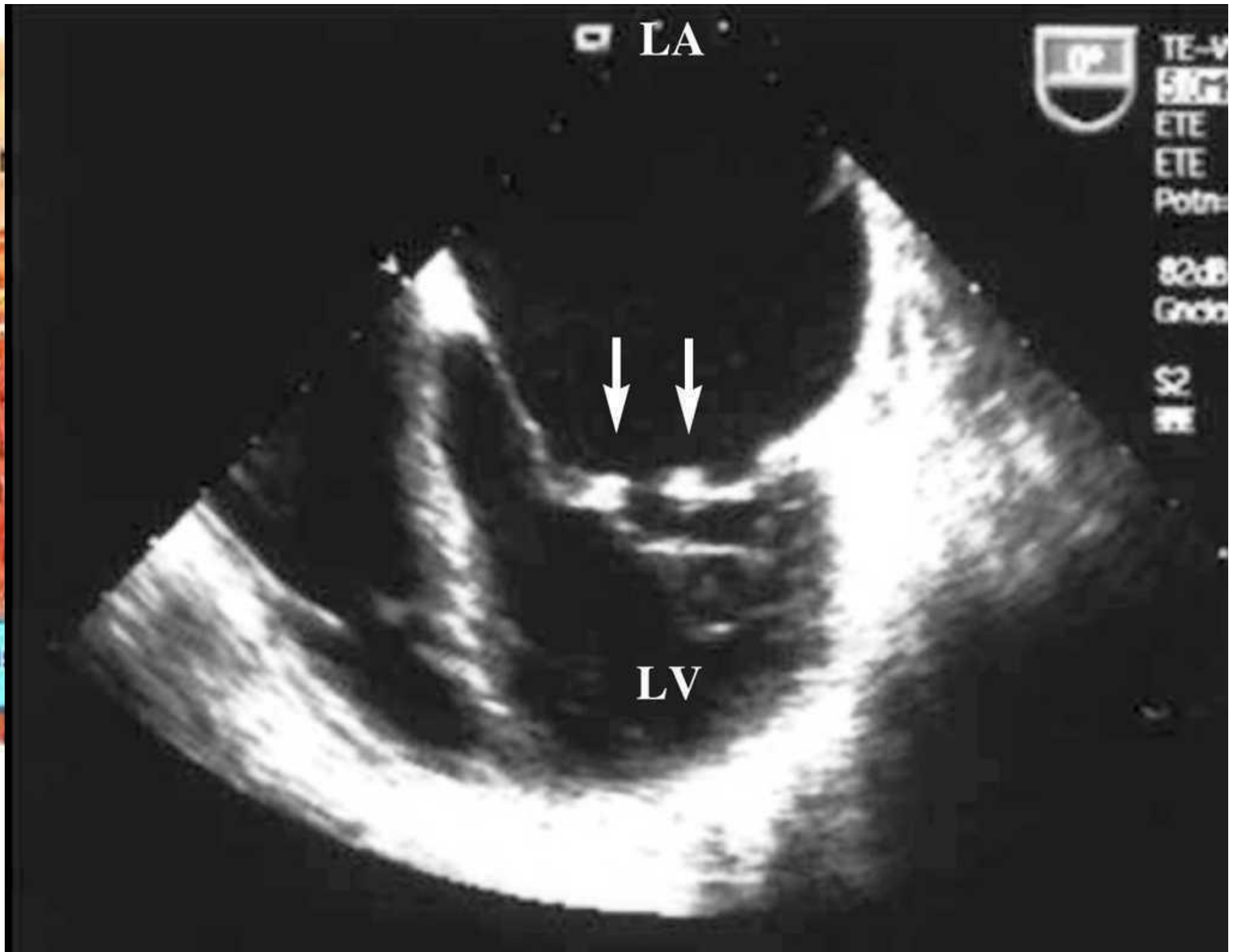
3. Prevention of embolism

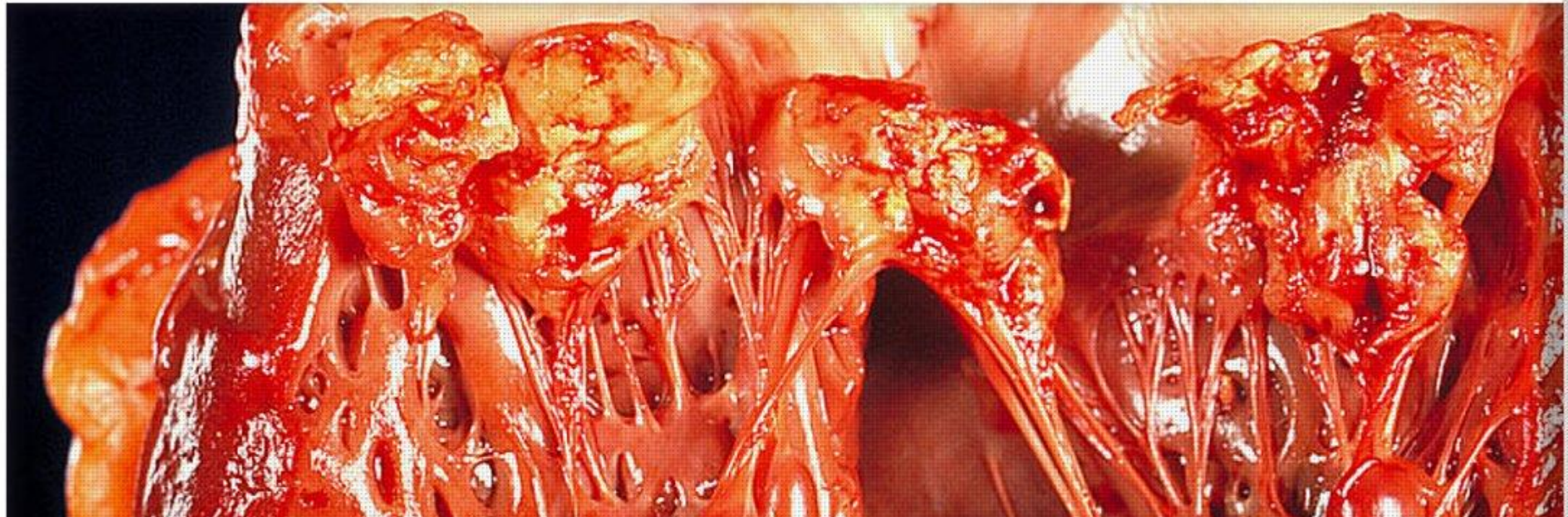
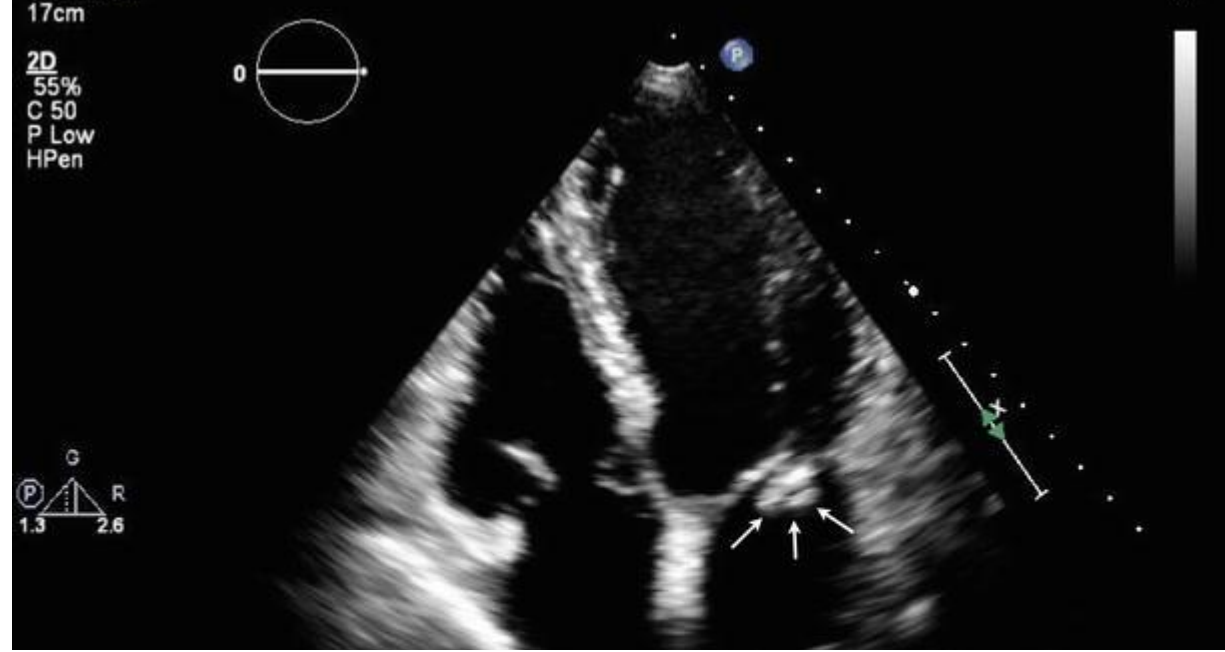
Aortic or mitral NVE or PVE with persistent vegetations > 10 mm after one or more embolic episode despite appropriate antibiotic therapy	Urgent	I	B
Aortic or mitral NVE with vegetations > 10 mm, associated with severe valve stenosis or regurgitation, and low operative risk	Urgent	IIa	B
Aortic or mitral NVE or PVE with isolated very large vegetations (> 30 mm)	Urgent	IIa	B
Aortic or mitral NVE or PVE with isolated large vegetations (> 15 mm) and no other indication for surgery ^e	Urgent	IIb	C

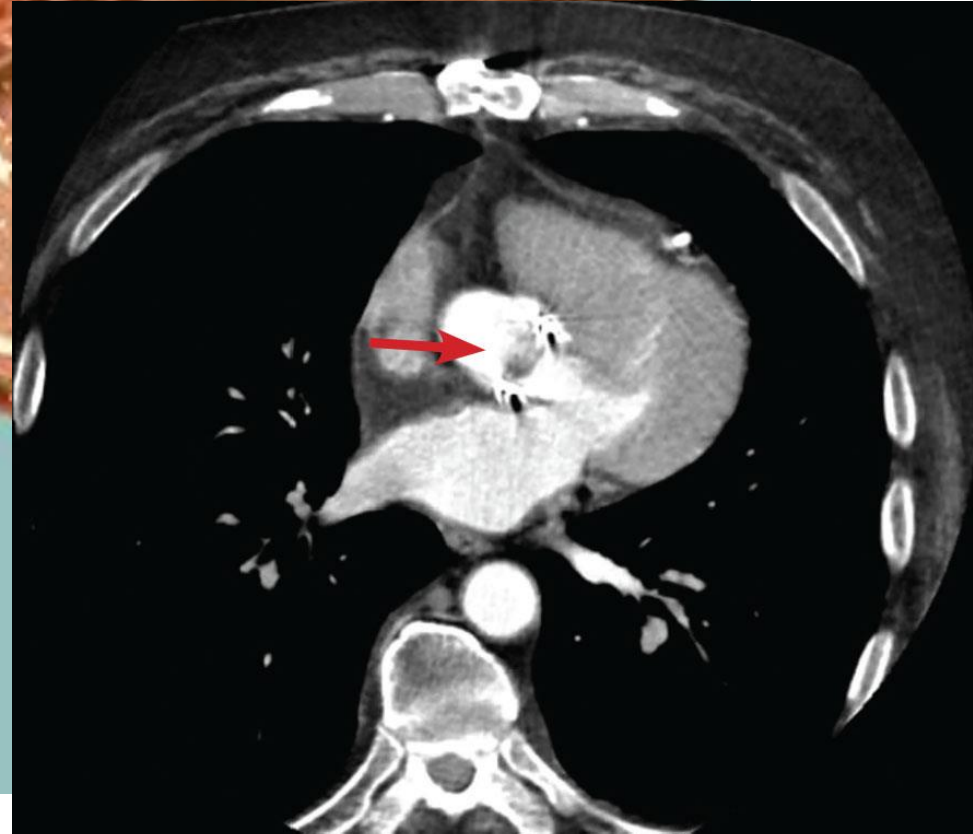
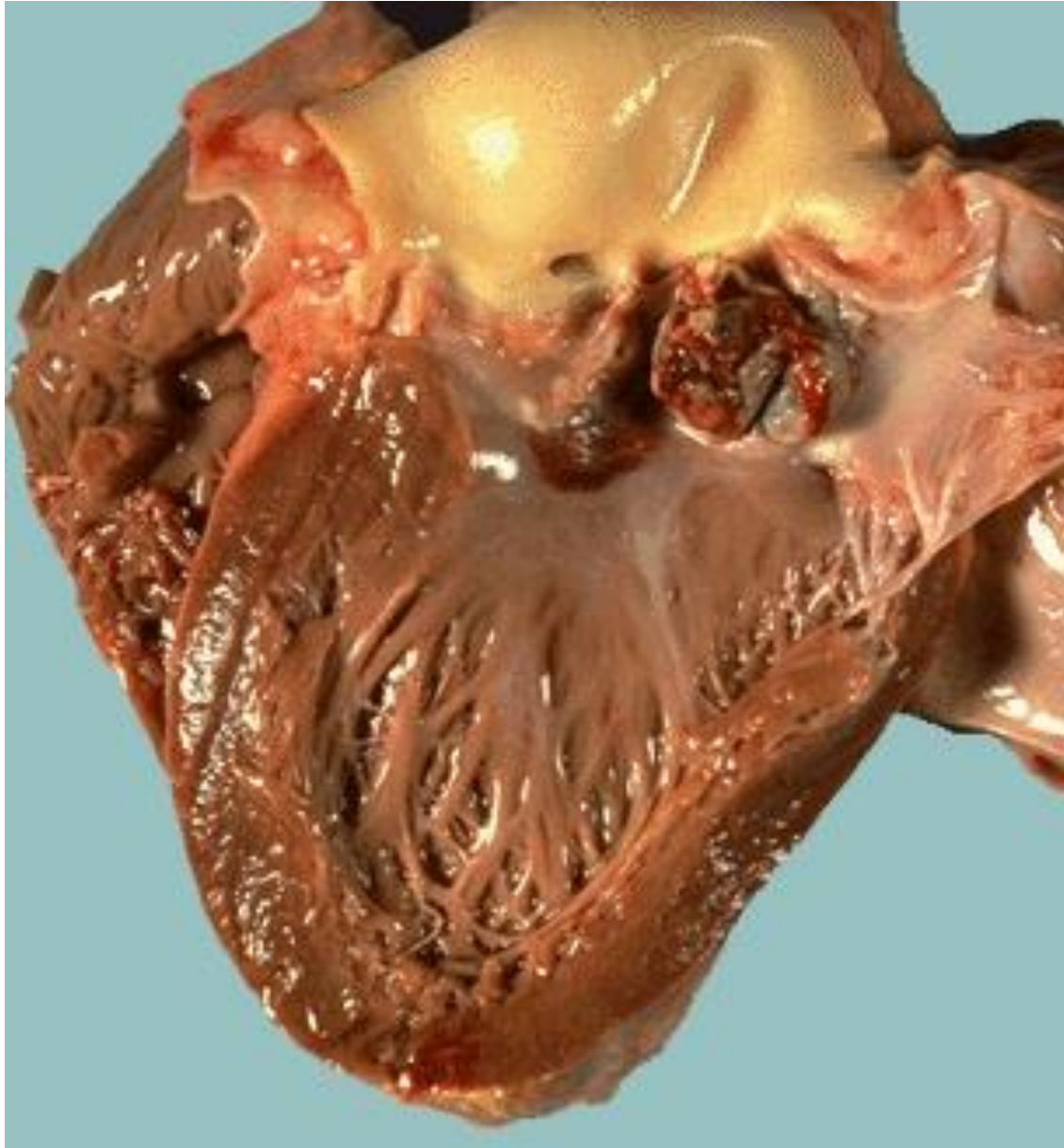
In summary, HF is the most frequent and among the most severe complications of IE. Unless severe co-morbidity exists, the presence of HF is an indication for early surgery in NVE and PVE, even in patients with cardiogenic shock.







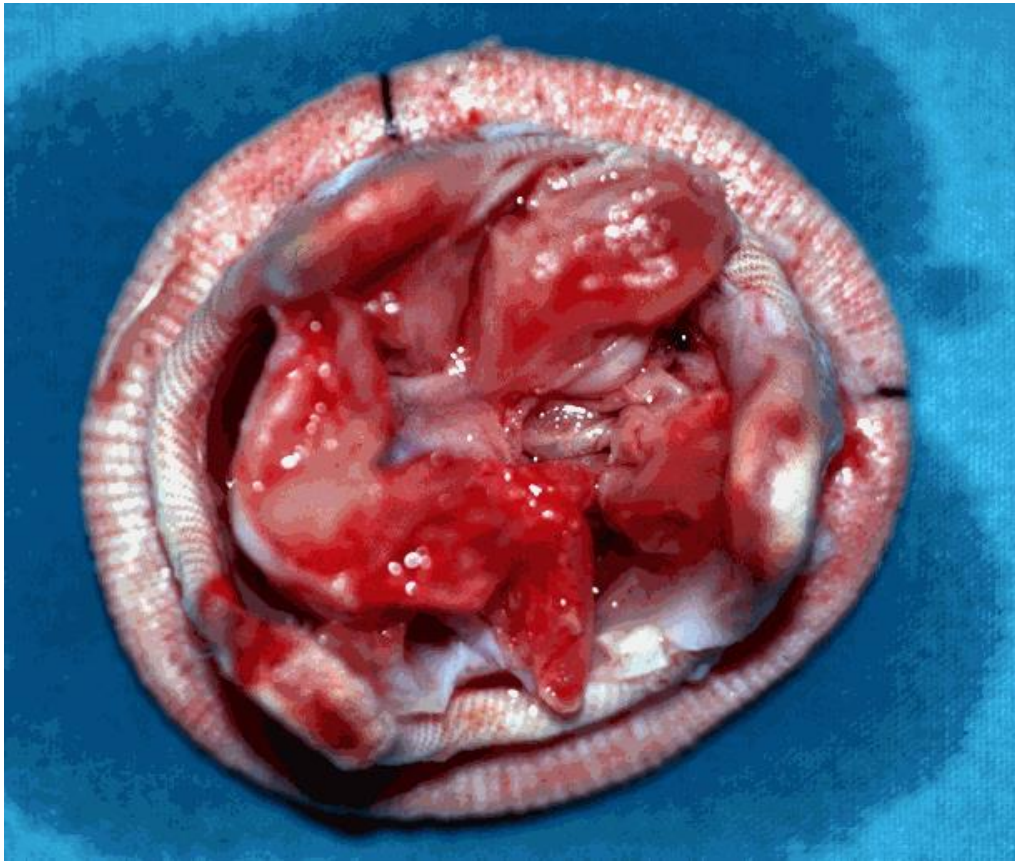


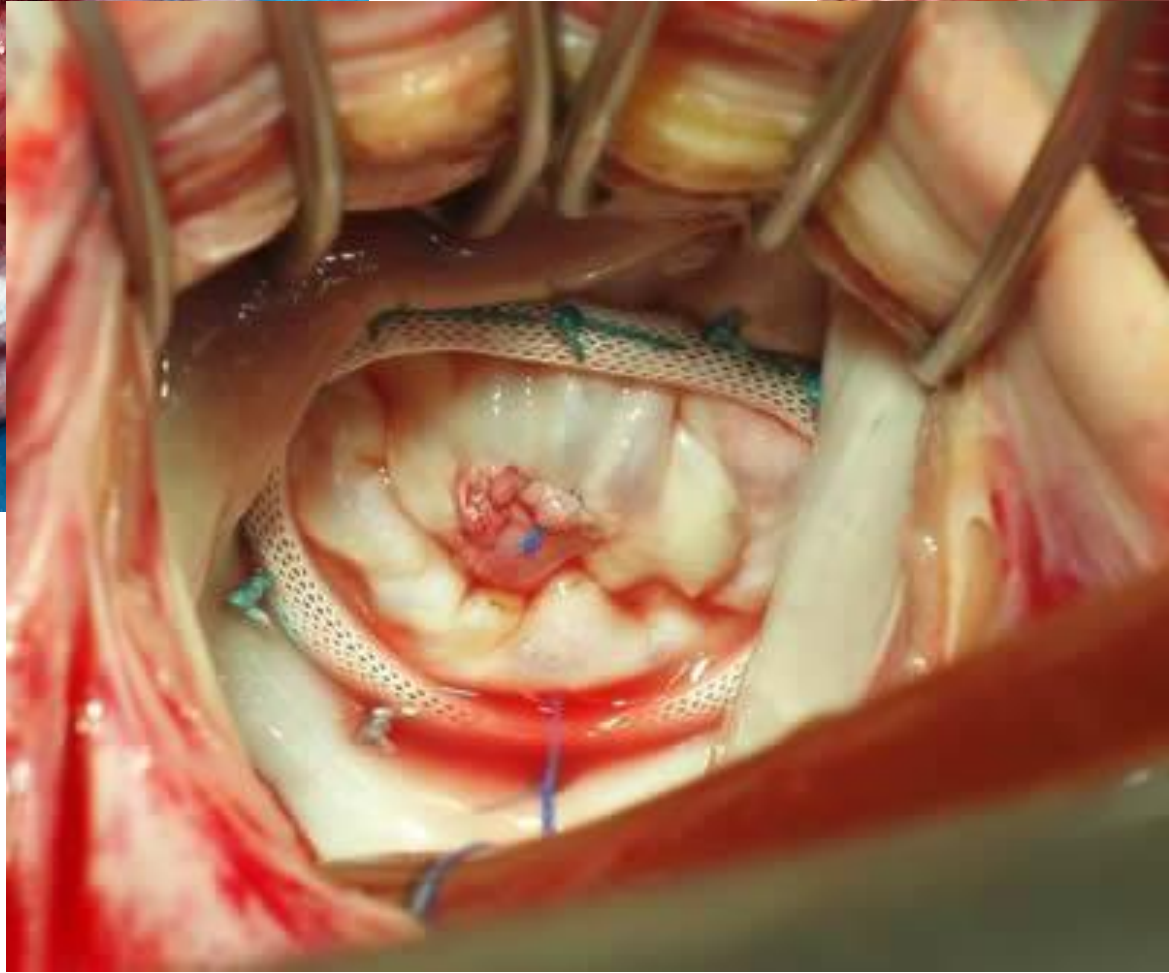
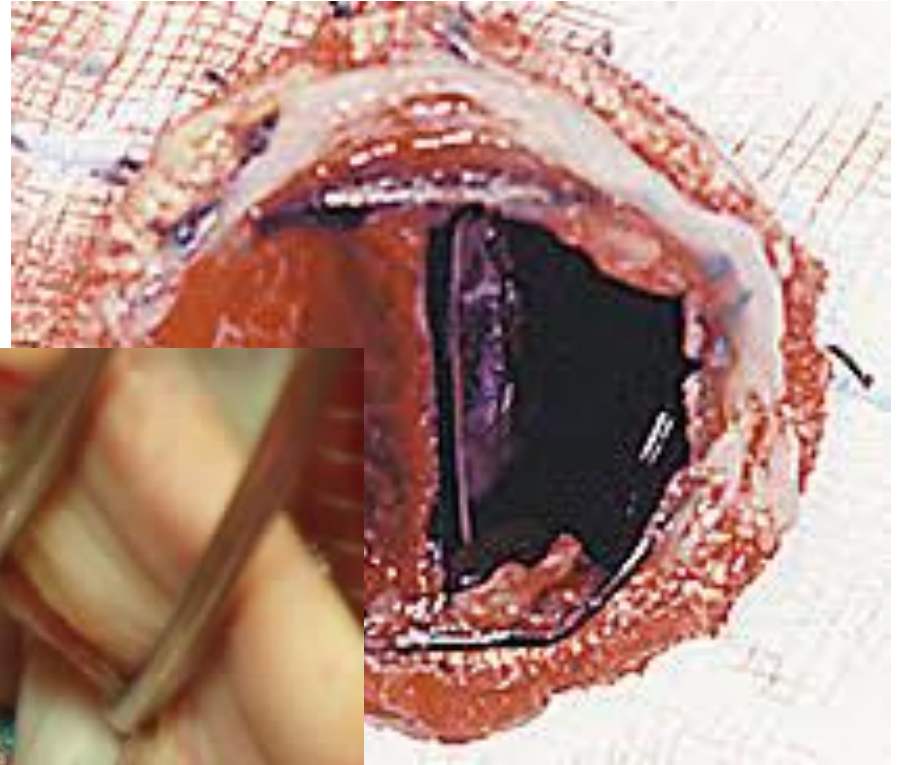
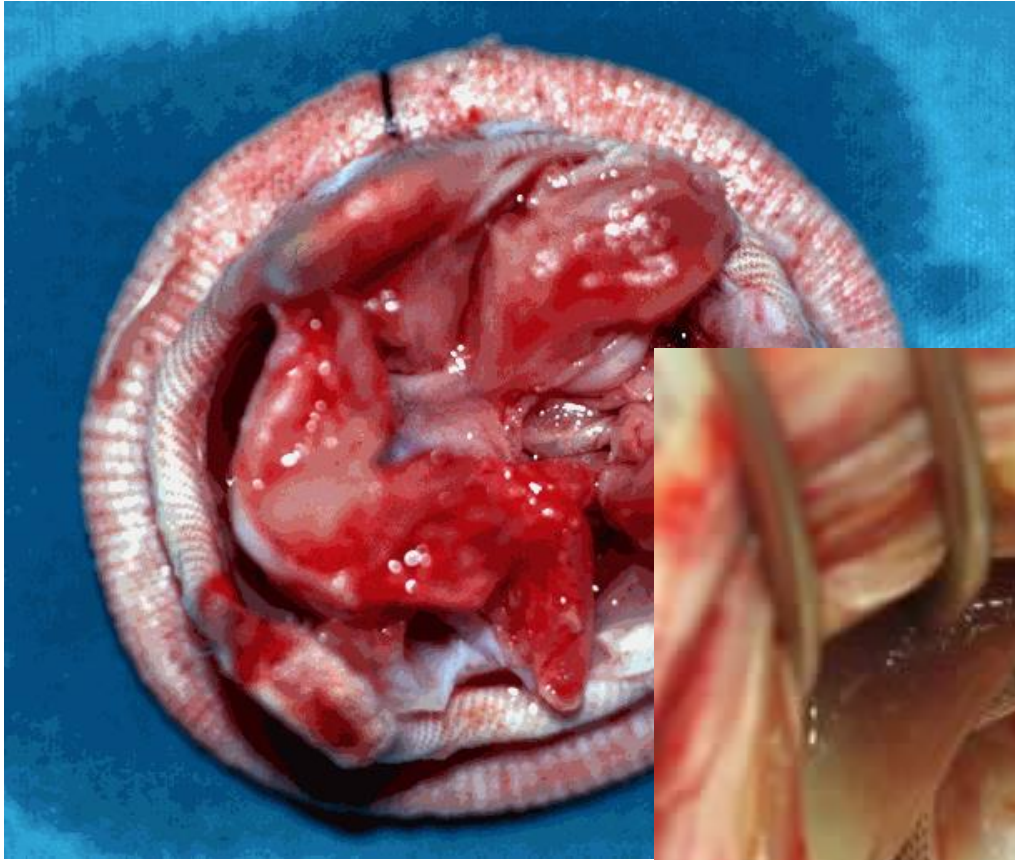


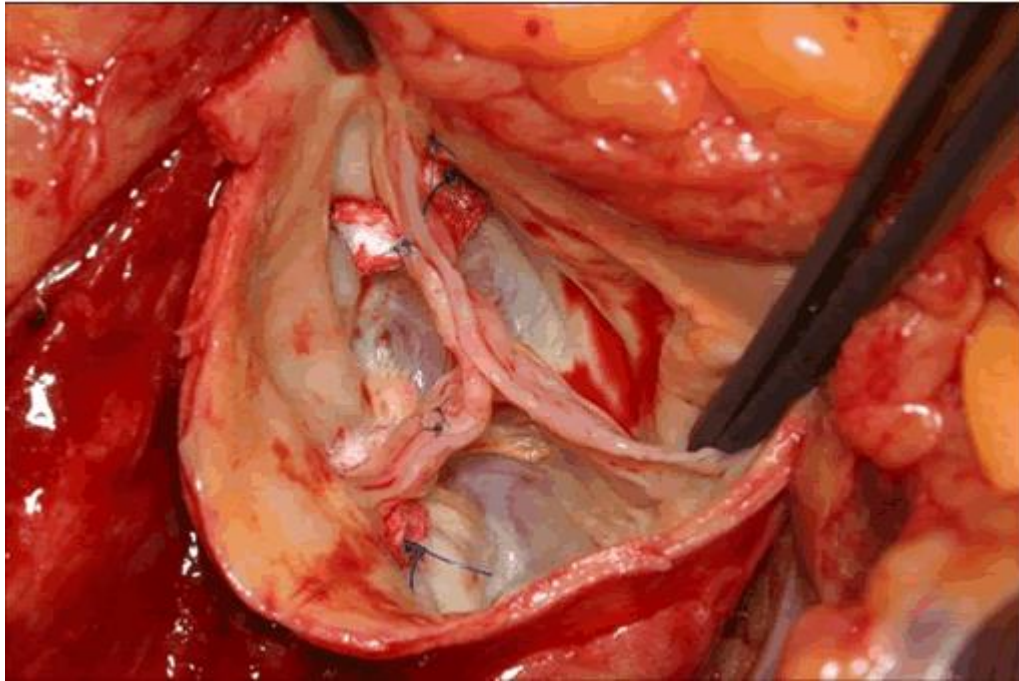




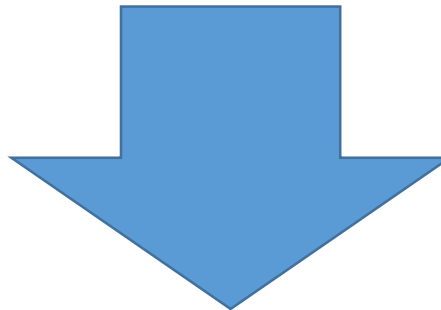
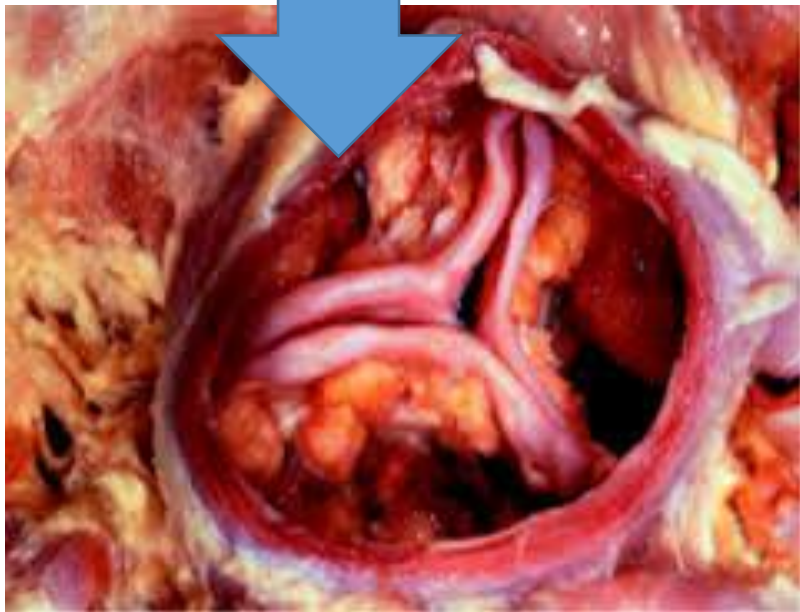


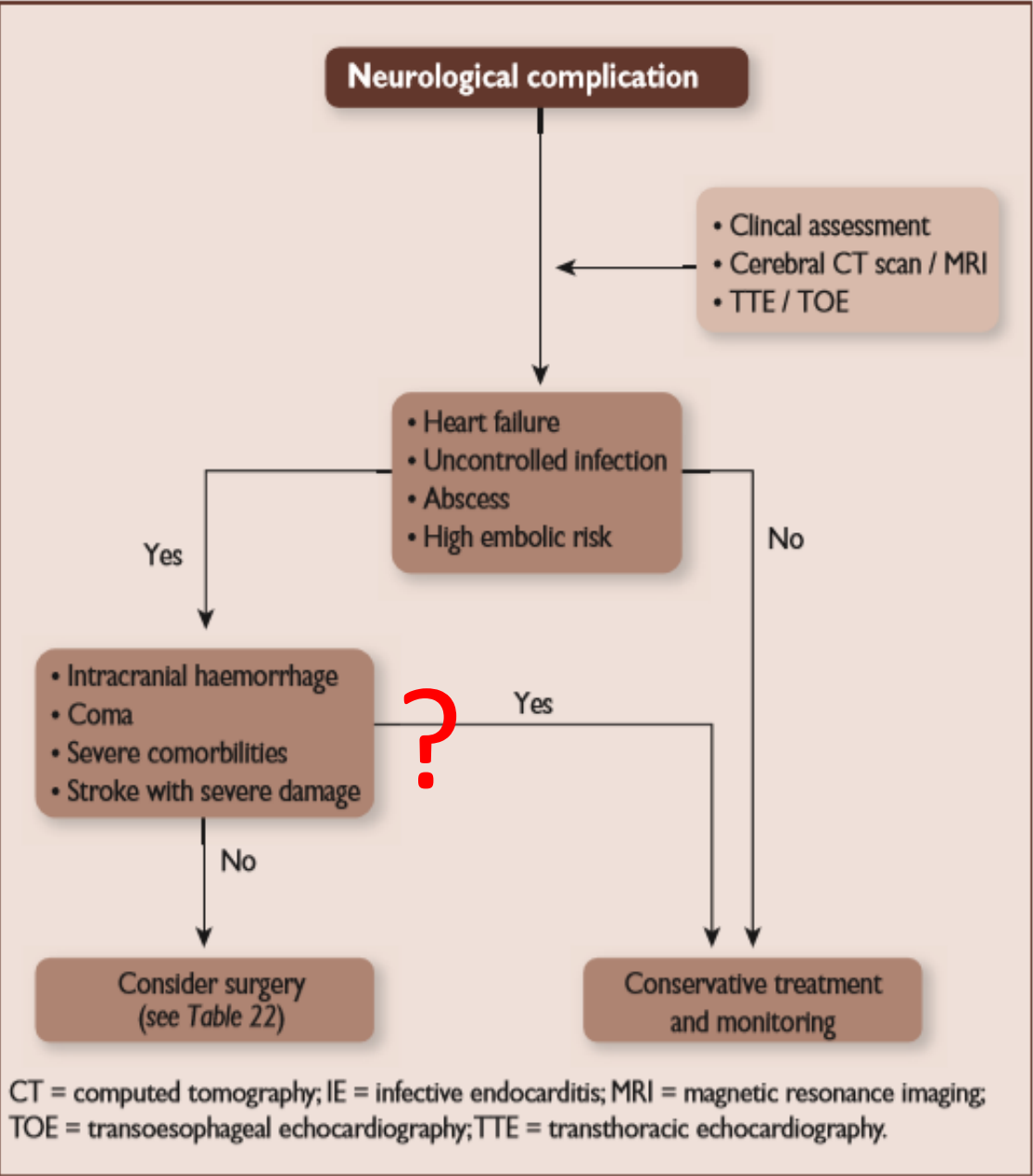


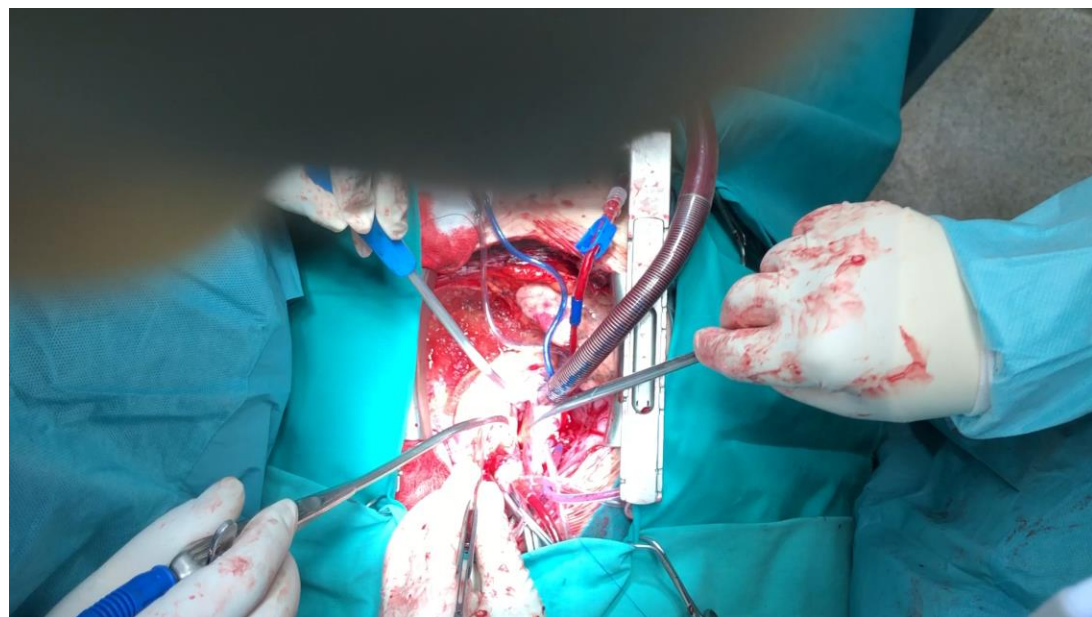
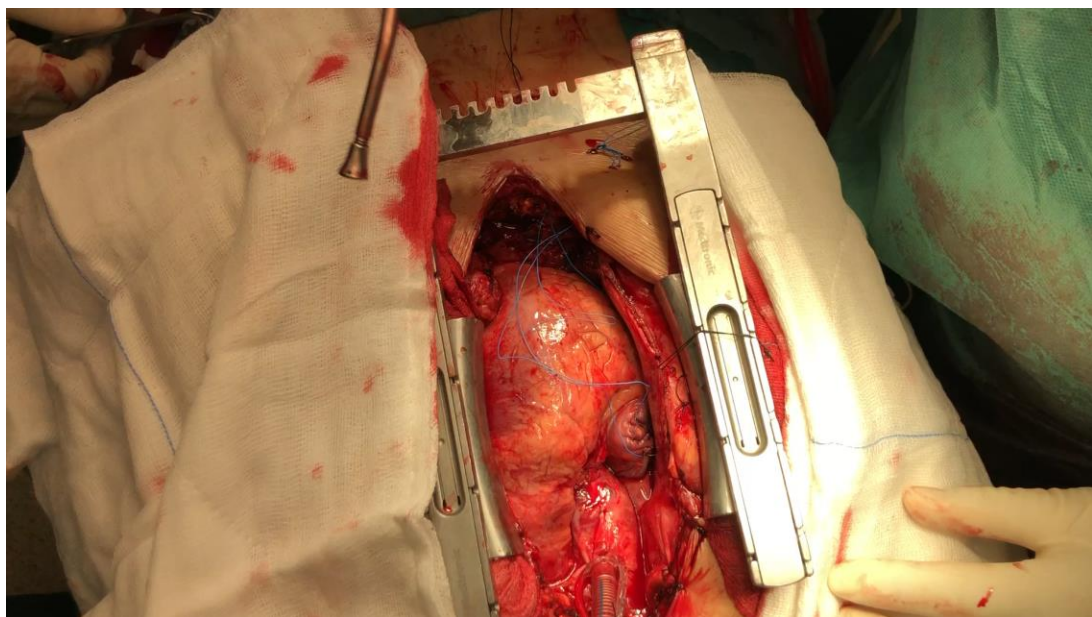


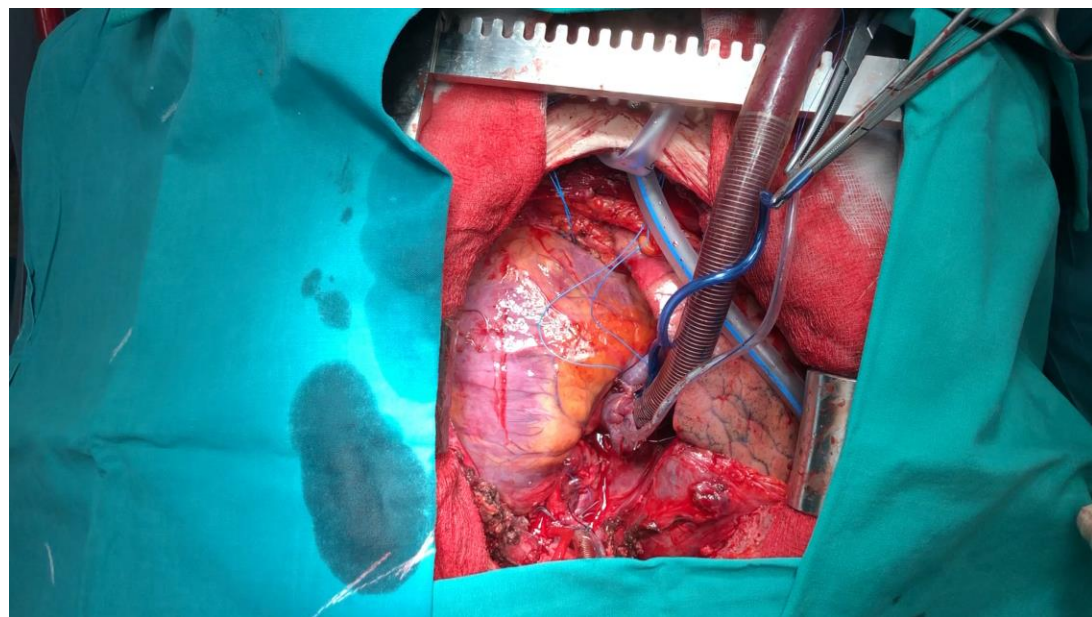
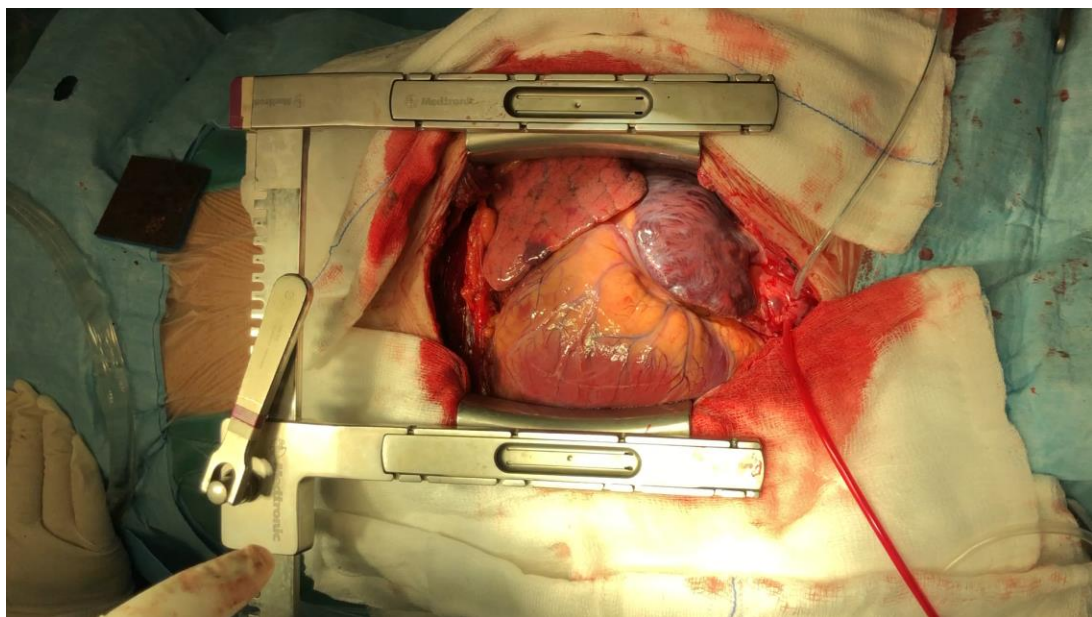


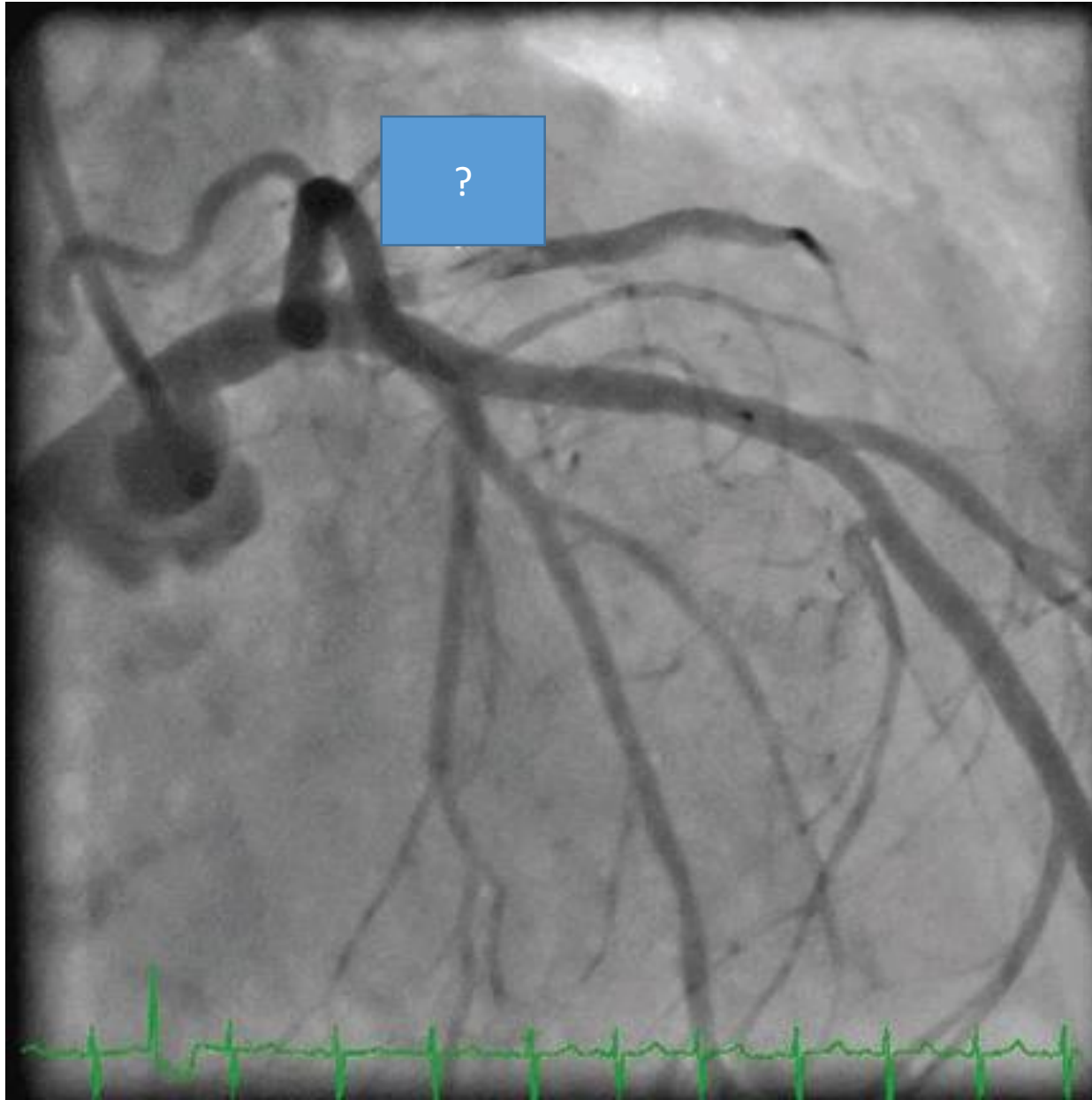
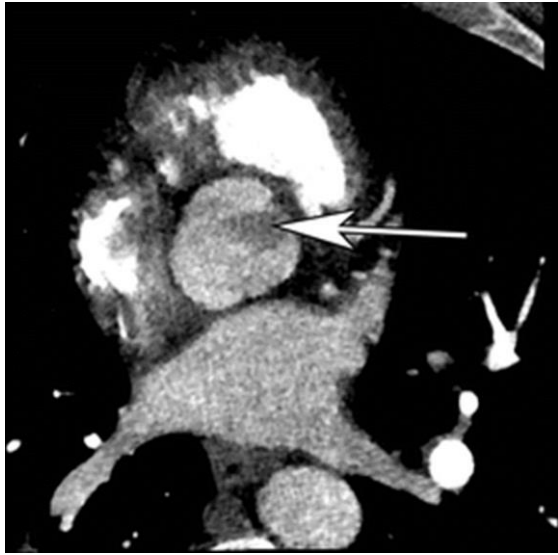
Διπτυχη ΑΟΡΤΙΚΗ ΒΑΛΒΙΔΑ ΛΙΑΝ ΕΣΤΕΝΩΜΕΝΗ
AVA 0.6, GRADIENT MAX 140MM Hg

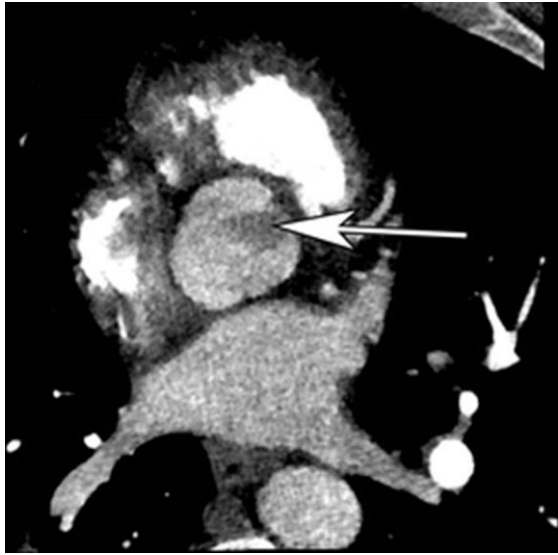












2016 The American Association for Thoracic Surgery (AATS) consensus guidelines: Surgical treatment of infective endocarditis: Executive summary.

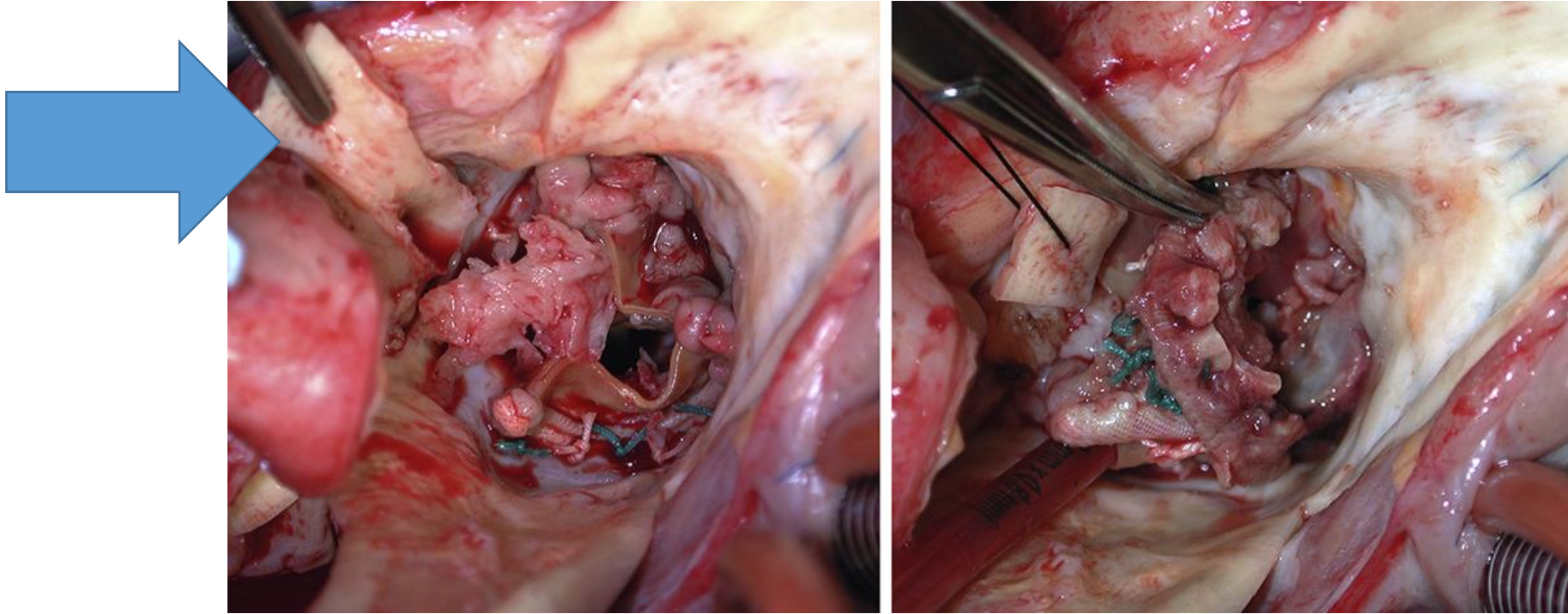
AATS Surgical Treatment of Infective Endocarditis Consensus Guidelines Writing Committee Chairs, [Pettersson GB](#)¹, [Coselli JS](#)²; Writing Committee, [Pettersson GB](#)³, [Coselli JS](#)², [Hussain ST](#)³, [Griffin B](#)⁴, [Blackstone EH](#)³, [Gordon SM](#)⁵, [LeMaire SA](#)², [Woc-Colburn LE](#)⁶.

Author information

- 1 Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio. Electronic address: petterg@ccf.org.
- 2 Division of Cardiothoracic Surgery, Baylor College of Medicine, Houston, Tex; Texas Heart Institute, Houston, Tex.
- 3 Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio.
- 4 Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio.
- 5 Department of Infectious Disease, Cleveland Clinic, Cleveland, Ohio.
- 6 Department of Infectious Diseases, Baylor College of Medicine, Houston, Tex.

Team approach to patients with IE

Recommendations	COR	LOE	P
1. Who should care for and operate on patients with IE?			
Patients with suspected IE should ideally be cared for at centers with access to a complete team, including cardiology, infectious disease, cardiac surgery, and other services needed to handle IE complications	I	B	4,
Surgeons operating on patients with IE should be well-trained, experienced valve surgeons who are well versed in the different reconstruction techniques needed by patients with advanced disease	I	C	4,
2. Diagnosis of IE: What does the surgeon need to know?			
At the time of surgery the patient should be on an effective antimicrobial regimen (correct dosage and route of administration) to which the causative microorganism is sensitive, or be broadly covered when organism and sensitivity are unknown	I	B	3
For surgery planning, the surgeon should have the best possible understanding of the pathology. This will usually require advanced imaging techniques, such as TEE	I	B	3
Use of imaging modalities other than echocardiography may also be appropriate in selected cases	IIb	C	3



ΚΑΛΗ ΠΡΟΕΓΧΕΙΡΗΤΙΚΗ ΜΕΛΕΤΗ



management of patients with IE and the need for prophylaxis

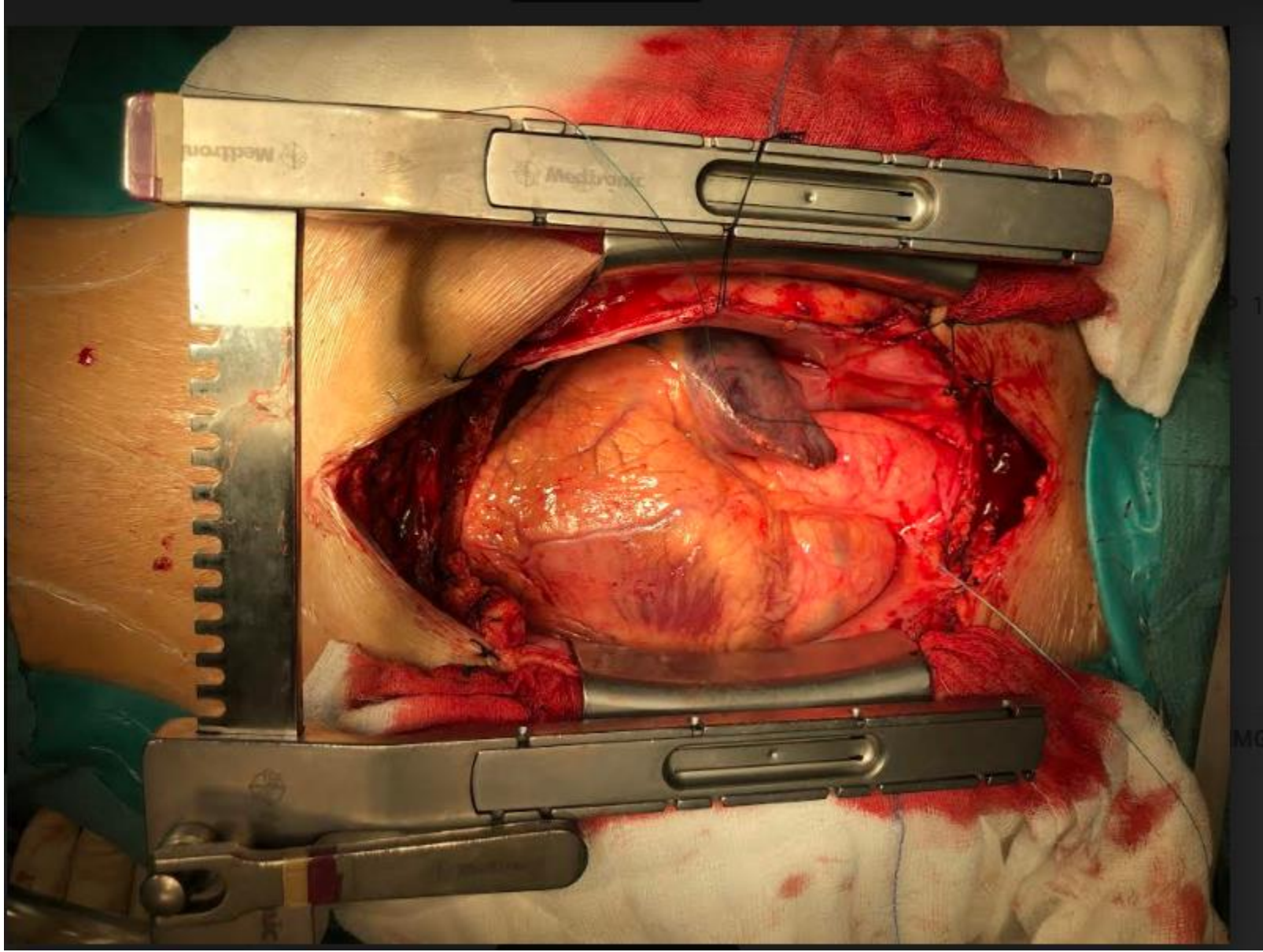
3. Should surgical treatment be offered to injection drug users with IE?

Normal indications for surgery are reasonable to apply to patients who are intravenous drug users. Decision-making must take the addiction into account, and management must include treatment of the addiction

IIa

C

4. Should surgical treatment be offered to patients with IE on dialysis?



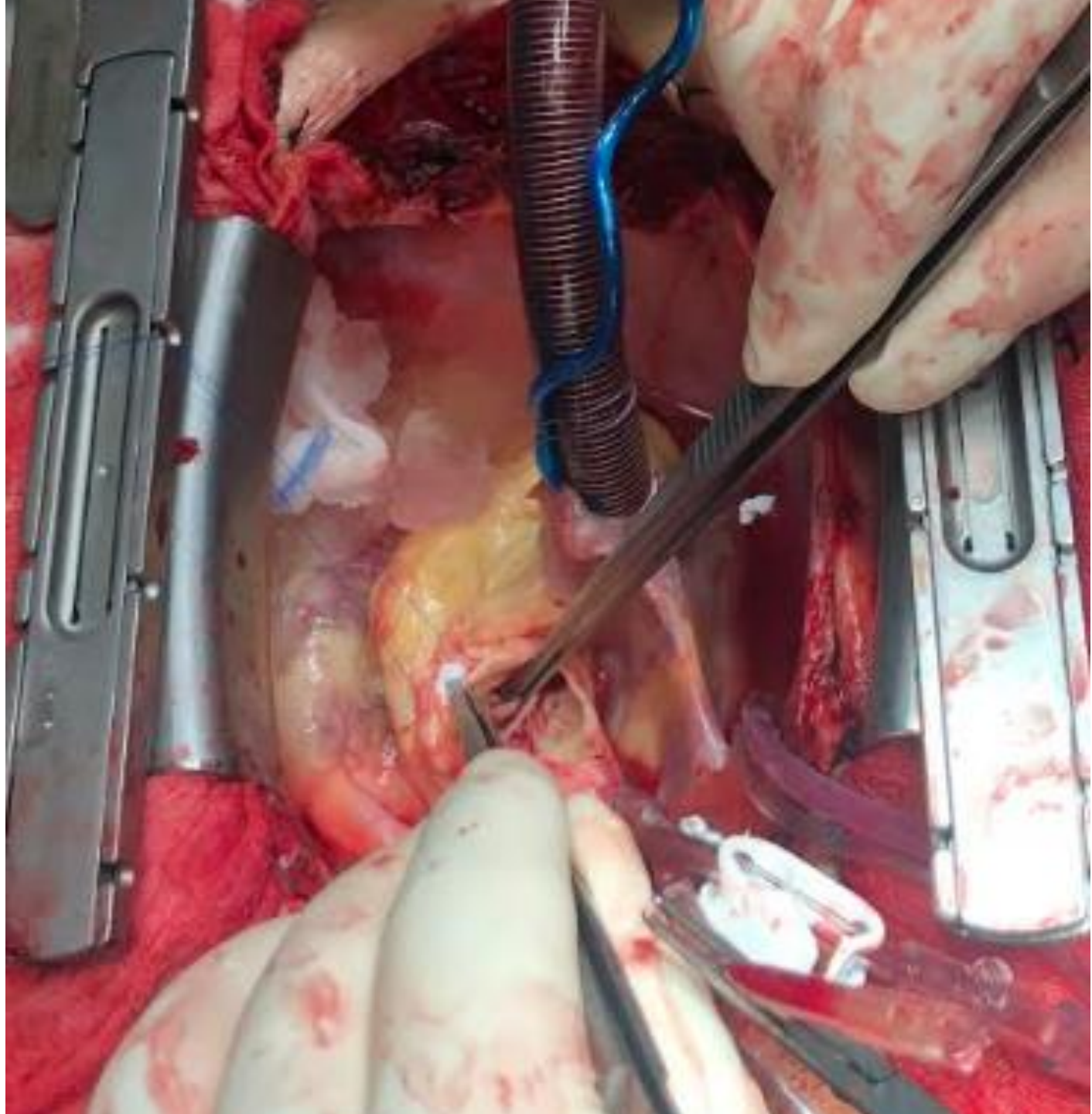
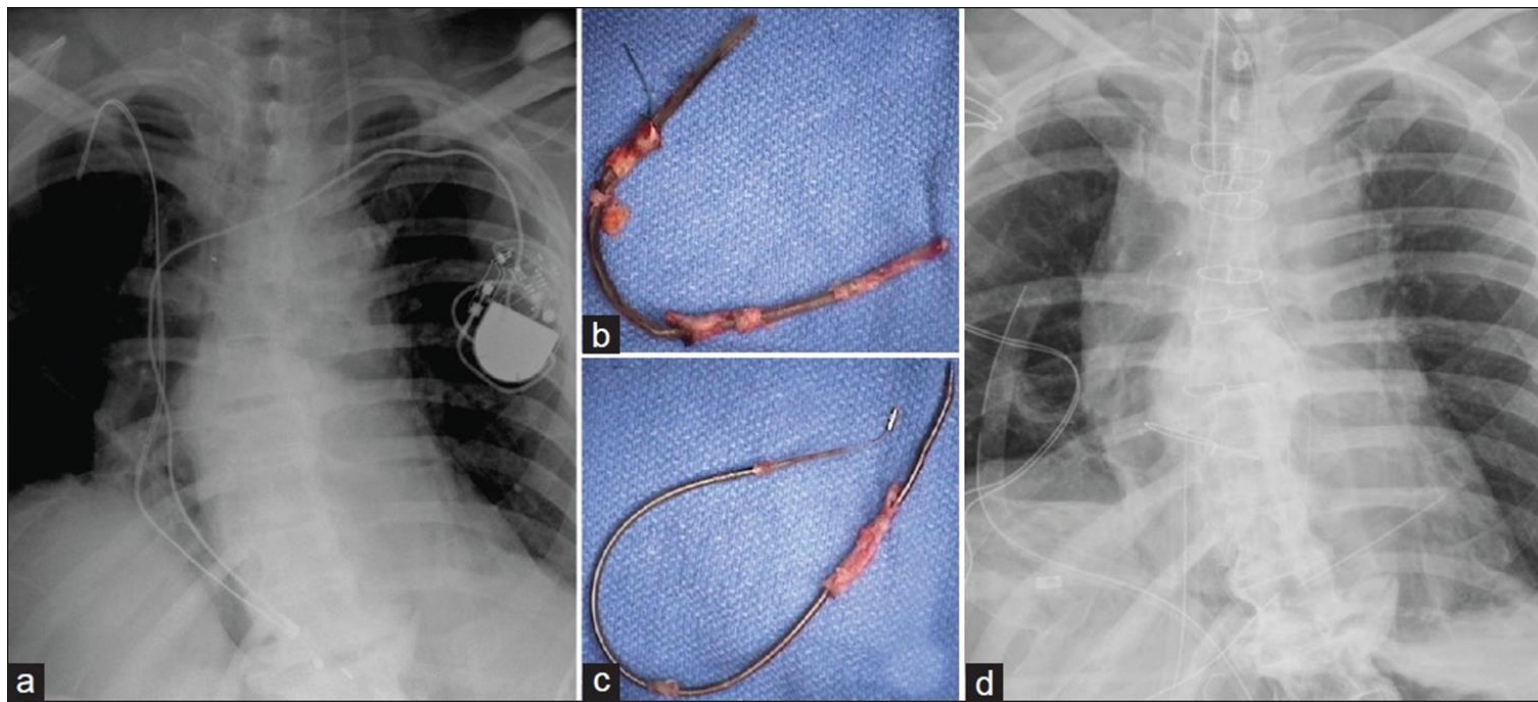




Table 26 Indications for surgical treatment of right-sided infective endocarditis

Recommendation	Class ^a	Level ^b
<p>Surgical treatment should be considered in the following scenarios:</p> <ul style="list-style-type: none">• Microorganisms difficult to eradicate (e.g. persistent fungi) or bacteraemia for > 7 days (e.g. <i>S. aureus</i>, <i>P. aeruginosa</i>) despite adequate antimicrobial therapy or• Persistent tricuspid valve vegetations > 20 mm after recurrent pulmonary emboli with or without concomitant right heart failure or• Right HF secondary to severe tricuspid regurgitation with poor response to diuretic therapy	IIa	C



Recommendations	Class ^a	Level ^b
A. Diagnosis		
1. Three or more sets of blood cultures are recommended before prompt initiation of antimicrobial therapy for CIED infection	I	C
2. Lead-tip culture is indicated when the CIED is explanted	I	C
3. TOE is recommended in patients with suspected CDRIE with positive or negative blood cultures, independent of the results of TTE, to evaluate lead-related endocarditis and heart valve infection	I	C

SUPINE



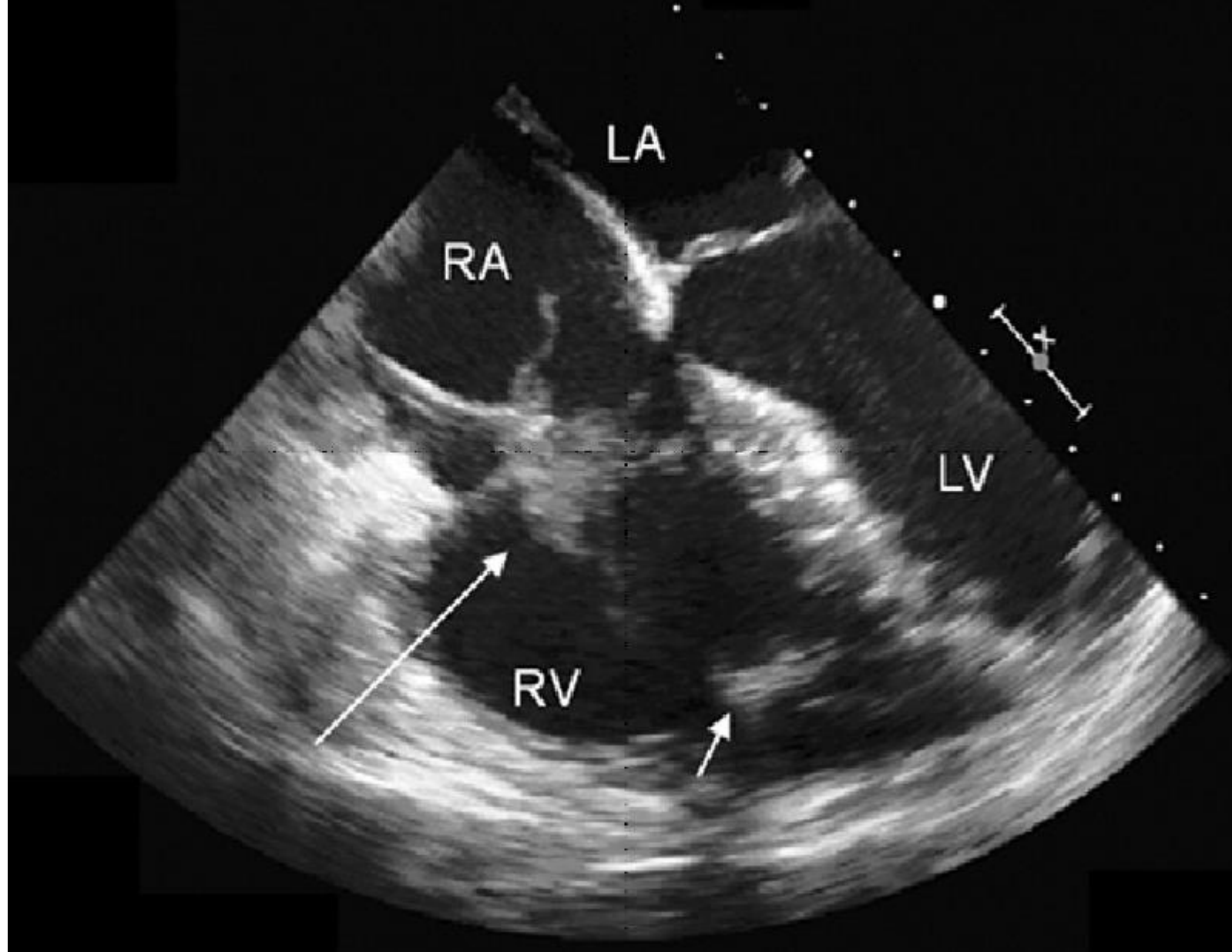
JPG

ΕΝΔΟΚΑΡΔΙΤΙΔΑ ΑΠΟ ΗΛΕΚΤΡΟΔΙΑ ΒΗΜΑΤΟΔΟΤΗ
ΠΡΟ 20 ΕΤΩΝ
ΥΠΟ ΕΞΩΣΩΜΑΤΙΚΗ ΚΥΚΛΟΦΟΡΙΑ ΜΕ ΠΑΛΛΟΜΕΝΗ ΚΑΡΔΙΑ
ΑΦΑΙΡΕΣΗ

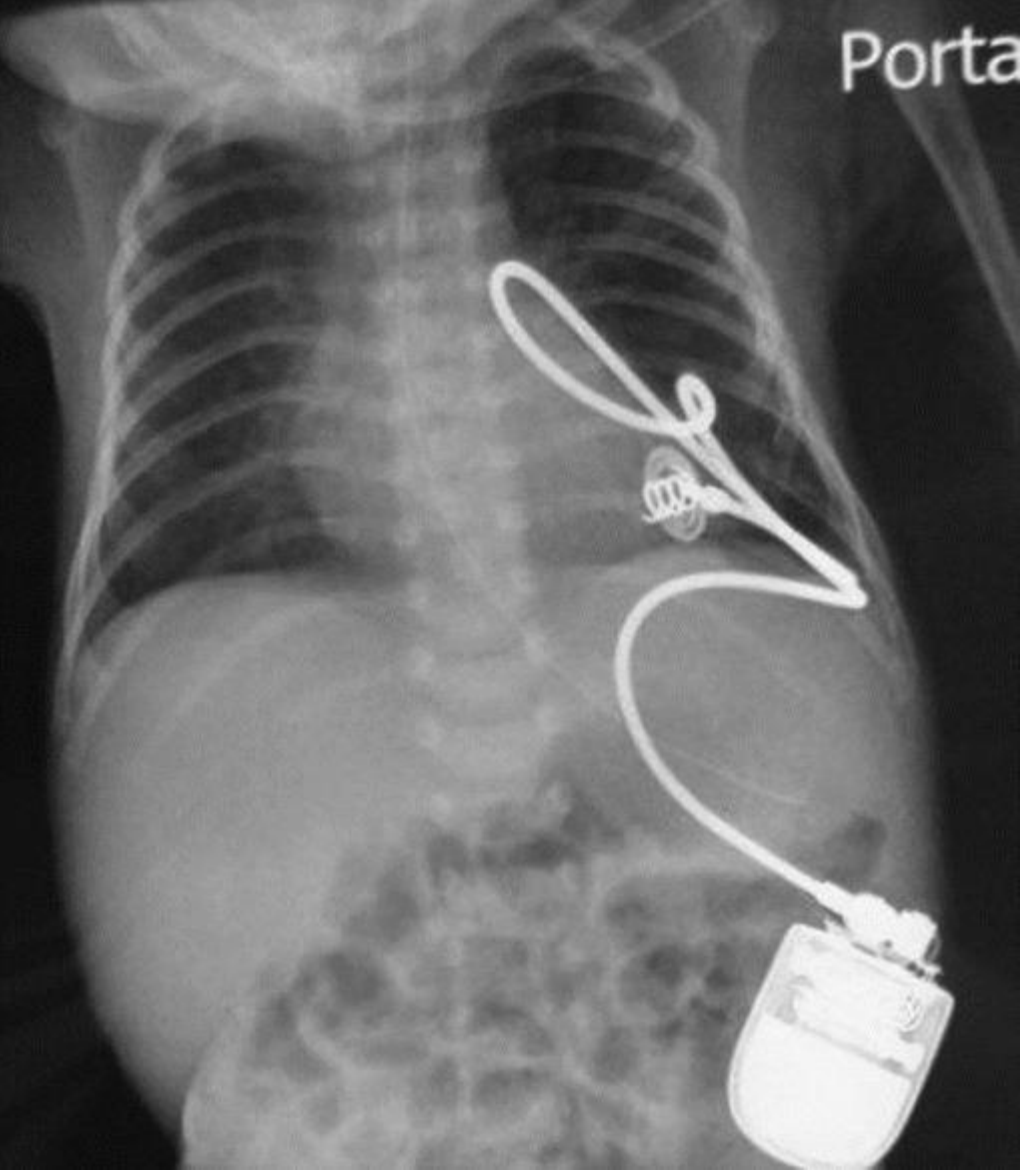


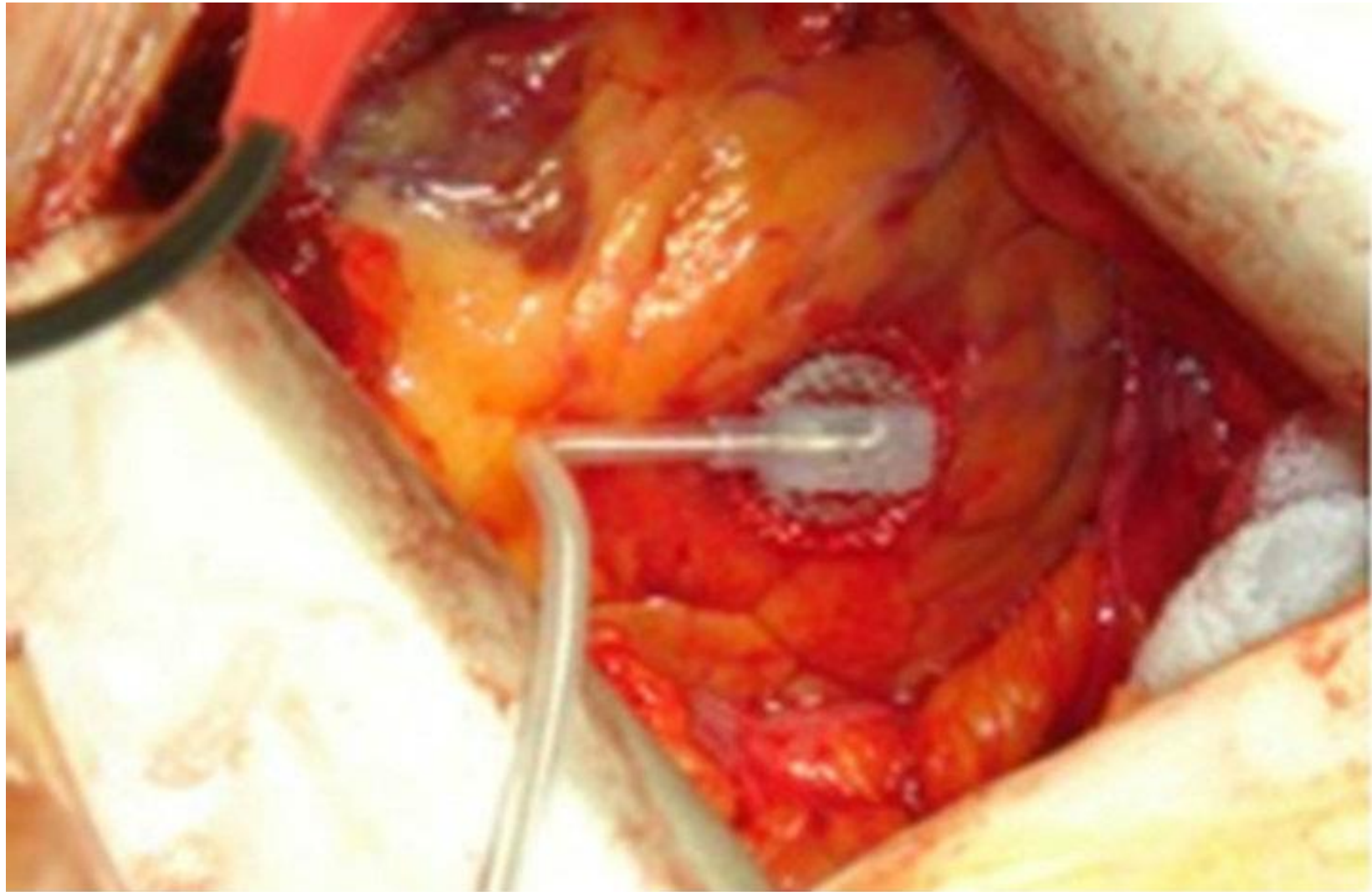
~~ΚΑΡΑΤΣΟΥΛΑΣ ΓΕΩΡΓΙΟΣ~~ , 78XP

29/7/2015









Simple Scoring System to Predict In-Hospital Mortality After Surgery for Infective Endocarditis

Giuseppe Gatti, MD; Andrea Perrotti, MD; Jean-François Obadia, MD, PhD; Xavier Duval, MD, PhD; Bernard Jung, MD; François Alla, MD, PhD; Catherine Chirouze, MD, PhD; Christine Selton-Suty, MD, PhD; Bruno Hoen, MD, PhD; Gianfranco Sinagra, MD, FESC; François Delahaye, MD; Pierre Tattevin, MD; Vincent Le Moing, MD; Aniello Pappalardo, MD; Sidney Chocron, MD, PhD; on behalf of The Association for the Study and Prevention of Infective Endocarditis Study Group—Association pour l'Étude et la Prévention de l'Endocardite Infectieuse (AEPEI)*

Background—Aspecific scoring systems are used to predict the risk of death postsurgery in patients with infective endocarditis (IE). The purpose of the present study was both to analyze the risk factors for in-hospital death, which complicates surgery for IE, and to create a mortality risk score based on the results of this analysis.

Methods and Results—Outcomes of 361 consecutive patients (mean age, 59.1 ± 15.4 years) who had undergone surgery for IE in 8 European centers of cardiac surgery were recorded prospectively, and a risk factor analysis (multivariable logistic regression) for in-hospital death was performed. The discriminatory power of a new predictive scoring system was assessed with the receiver operating characteristic curve analysis. Score validation procedures were carried out. Fifty-six (15.5%) patients died postsurgery. BMI >27 kg/m² (odds ratio [OR], 1.79; $P=0.049$), estimated glomerular filtration rate <50 mL/min (OR, 3.52; $P<0.0001$), New York Heart Association class IV (OR, 2.11; $P=0.024$), systolic pulmonary artery pressure >55 mm Hg (OR, 1.78; $P=0.032$), and critical state (OR, 2.37; $P=0.017$) were independent predictors of in-hospital death. A scoring system was devised to predict in-hospital death postsurgery for IE (area under the receiver operating characteristic curve, 0.780; 95% CI, 0.734–0.822). The score

Complication	n=361
In-hospital death	56 (15.5)
30-day death	42 (11.6)
Stroke	9 (2.5)
Prolonged (>48 hours) invasive ventilation	482 (22.7)
Pneumonia	50 (8.3)
Atrial fibrillation, new onset	38/358 [†] (10.6)
MI ¹⁹	2 (0.6)
Immediate reoperation for acute prosthetic failure	9 (2.5)
Low cardiac output [‡]	32 (8.9)
Intraoperative and postoperative use of IABP	9 (2.5)
Use of ECMO	6 (1.7)
Acute kidney injury ²⁰	67 (18.6)
Renal replacement therapy	23 (6.4)
Bleeding peptic disease	4 (1.1)
Mesenteric ischemia	7 (1.9)
Acute pancreatitis	2 (0.6)
Multiorgan failure (3 or more organs)	11 (3.0)
Sepsis	22 (6.1)
Mediastinal re-exploration [§]	38 (10.5)
Deep sternal wound infection ²¹	10 (2.8)
Length of the postoperative hospital stay, days	23.9 [12.7–42.4]

Variable	A	Bias	SE	95% CI	P Value
Age >70 years	0.16	<0.001	0.47	−0.81 to 1.05	0.7
BMI >27 kg/m ^{2†}	0.65	0.04	0.41	−0.13 to 1.55	0.08
eGFR <50 mL/min ^{‡,§}	1.16	0.14	0.41	0.49 to 2.13	<0.01
Dialysis	0.38	−0.08	1.66	−1.68 to 2.18	0.66
NYHA class IV	0.73	0.06	0.41	−0.004 to 1.66	0.05
CCS class 4	0.18	−0.01	0.74	−1.40 to 1.53	0.8
Left ventricular ejection fraction, 30% to 50% [§]	0.25	−0.01	0.47	−0.75 to 1.14	0.54
Coronary artery disease	0.38	−6.50	10.1	−20.2 to 3.13	0.44
Previous cardiac surgery	0.26	0.01	0.57	−0.82 to 1.44	0.6
Critical state [§]	0.91	0.08	0.53	−0.07 to 2.07	0.05
Length of the preop. hospital stay <10 days [†]	0.06	0.05	0.44	−0.76 to 0.99	0.89
Urgent surgical priority [§]	0.59	−0.01	0.44	−0.25 to 1.42	0.14
Combined CABG	0.23	6.51	10.1	−2.68 to 21.1	0.53
Surgery on thoracic aorta	0.94	0.01	0.76	−0.70 to 2.41	0.13
Prosthetic valve endocarditis	0.37	<0.001	0.49	−0.66 to 1.28	0.4

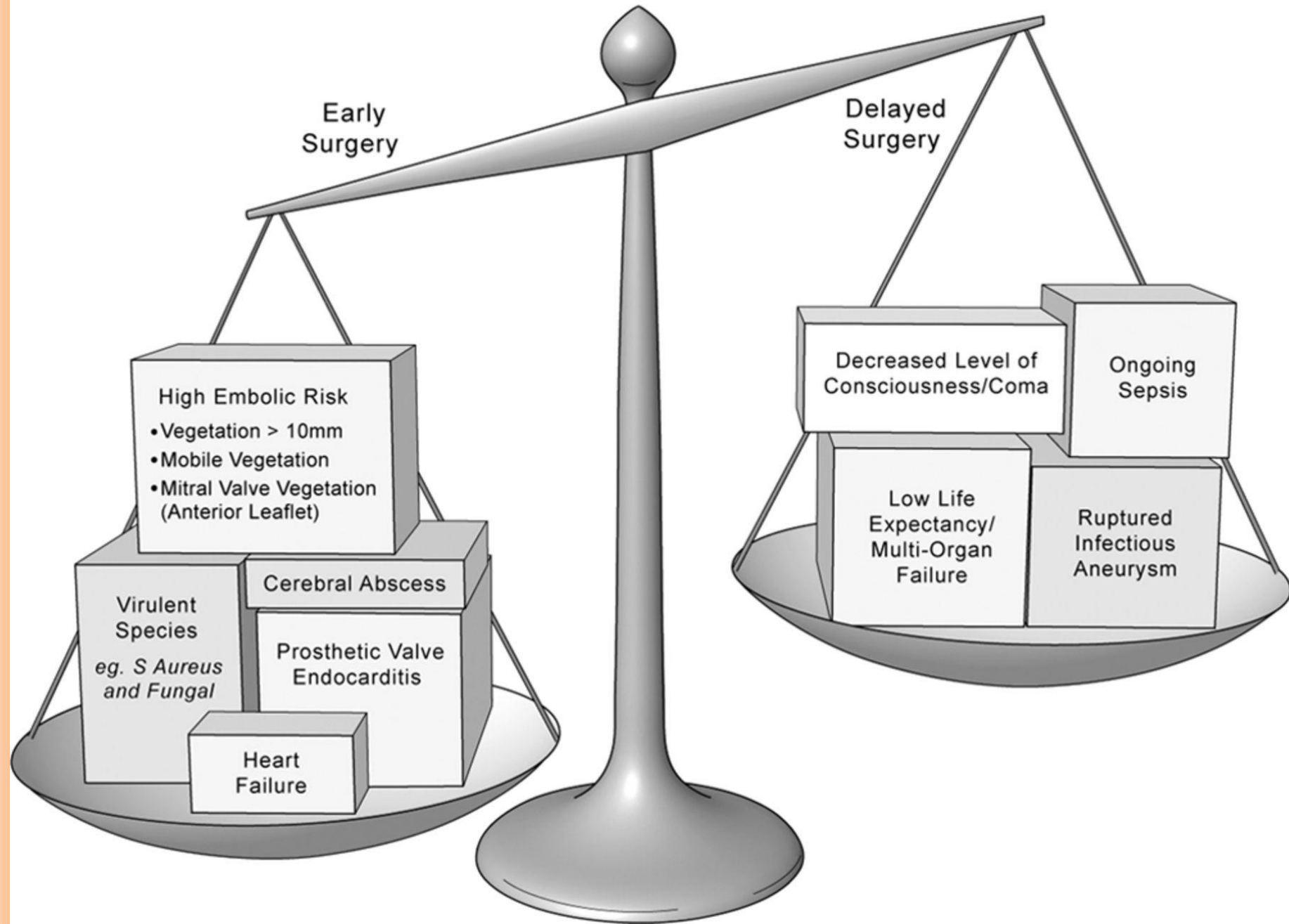
ΕΜΠΕΙΡΙΑ / ΑΠΟΤΕΛΕΣΜΑΤΑ

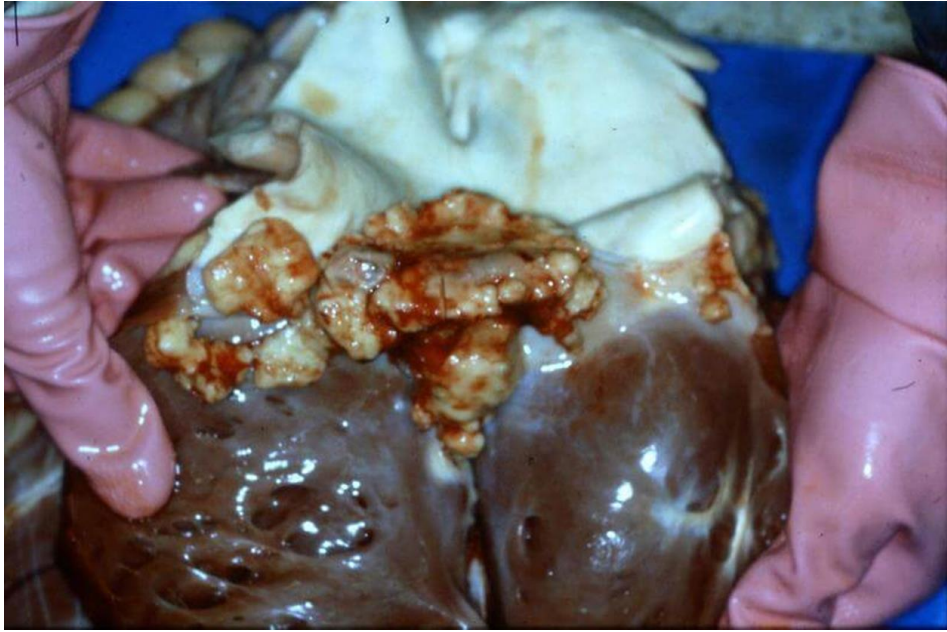
- ΣΥΝΟΛΟ 23
- ΑΟΡΤΙΚΗ 14
- ΜΙΤΡΟΕΙΔΗΣ 7
- ΜΙΚΤΗ 2
- ΧΡΗΣΤΕΣ (ΗΙΥ/ΗΠΑΤ Β/Σ) 8
- ΘΝΗΤΟΤΗΤΑ 5/23 21,7%

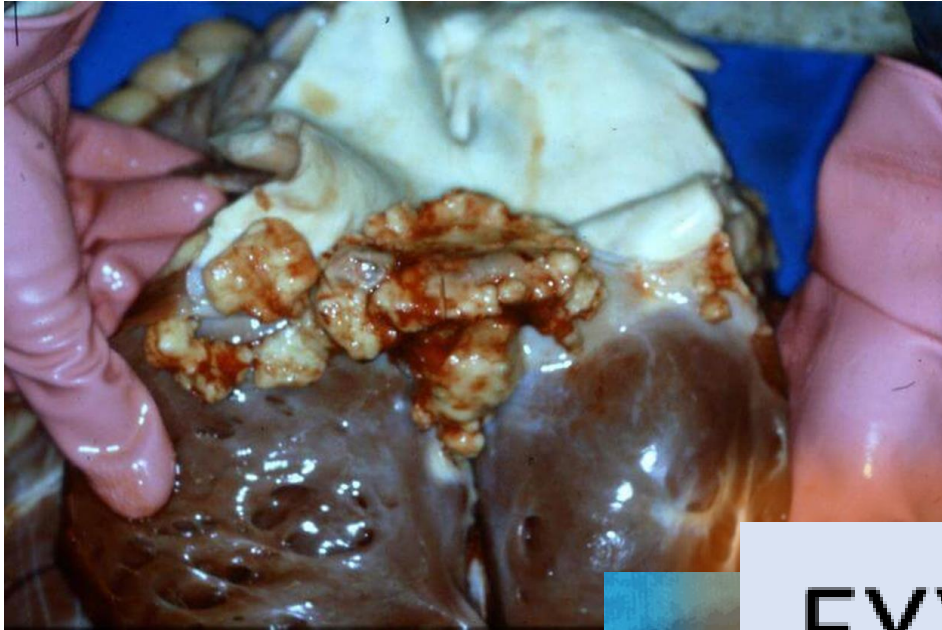
- ΣΥΝΟΛΟ 11
- ΤΡΙΓΛΩΧΙΝΑ 4 (2 ΧΡΗΣΤΕΣ)
- ΡΑΧΙΝΓ ΛΕΑΔΣ 7
- ΘΝΗΤΟΤΗΤΑ ΜΗΔΕΝ

ΣΥΝΟΛΙΚΗ ΘΝΗΤΟΤΗΤΑ 5/33 15%

Considerations for Early vs Delayed Surgery







ΕΥΧΑΡΙΣΤΩ



2016 The American Association for Thoracic Surgery (AATS) consensus guidelines: Surgical treatment of infective endocarditis: Executive summary.

AATS Surgical Treatment of Infective Endocarditis Consensus Guidelines Writing Committee Chairs, Pettersson GB¹, Coselli JS²; Writing Committee, Pettersson GB³, Coselli JS², Hussain ST³, Griffin B⁴, Blackstone EH³, Gordon SM⁵, LeMaire SA², Woc-Colburn LE⁶.

Author information

- 1 Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio. Electronic address: petterg@ccf.org.
- 2 Division of Cardiothoracic Surgery, Baylor College of Medicine, Houston, Tex; Texas Heart Institute, Houston, Tex.
- 3 Department of Thoracic and Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio.
- 4 Department of Cardiovascular Medicine, Cleveland Clinic, Cleveland, Ohio.
- 5 Department of Infectious Disease, Cleveland Clinic, Cleveland, Ohio.
- 6 Department of Infectious Diseases, Baylor College of Medicine, Houston, Tex.



management of patients with IE and the need for prophylaxis

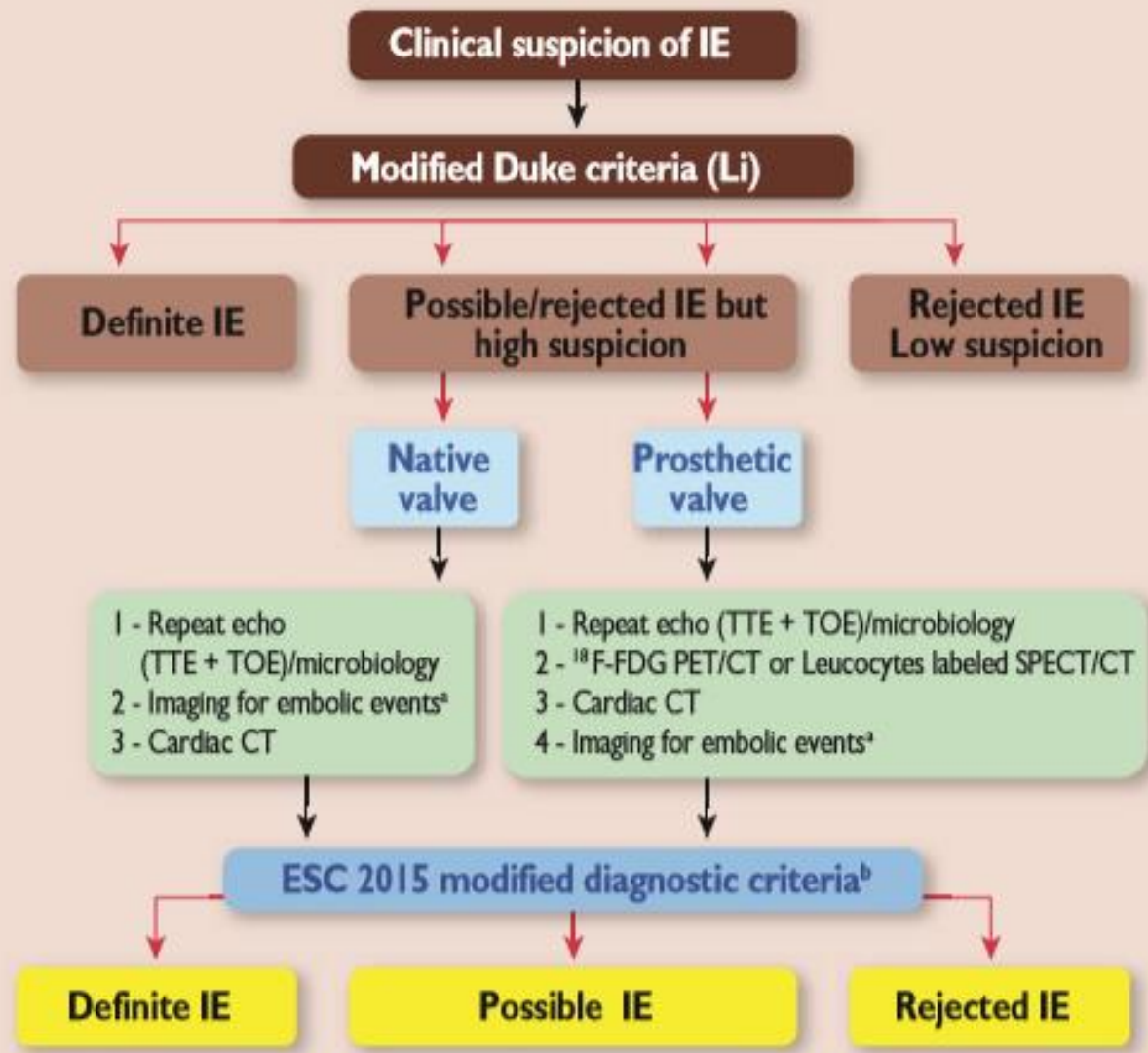
3. Should surgical treatment be offered to injection drug users with IE?

Normal indications for surgery are reasonable to apply to patients who are intravenous drug users. Decision-making must take the addiction into account, and management must include treatment of the addiction

Ila

C

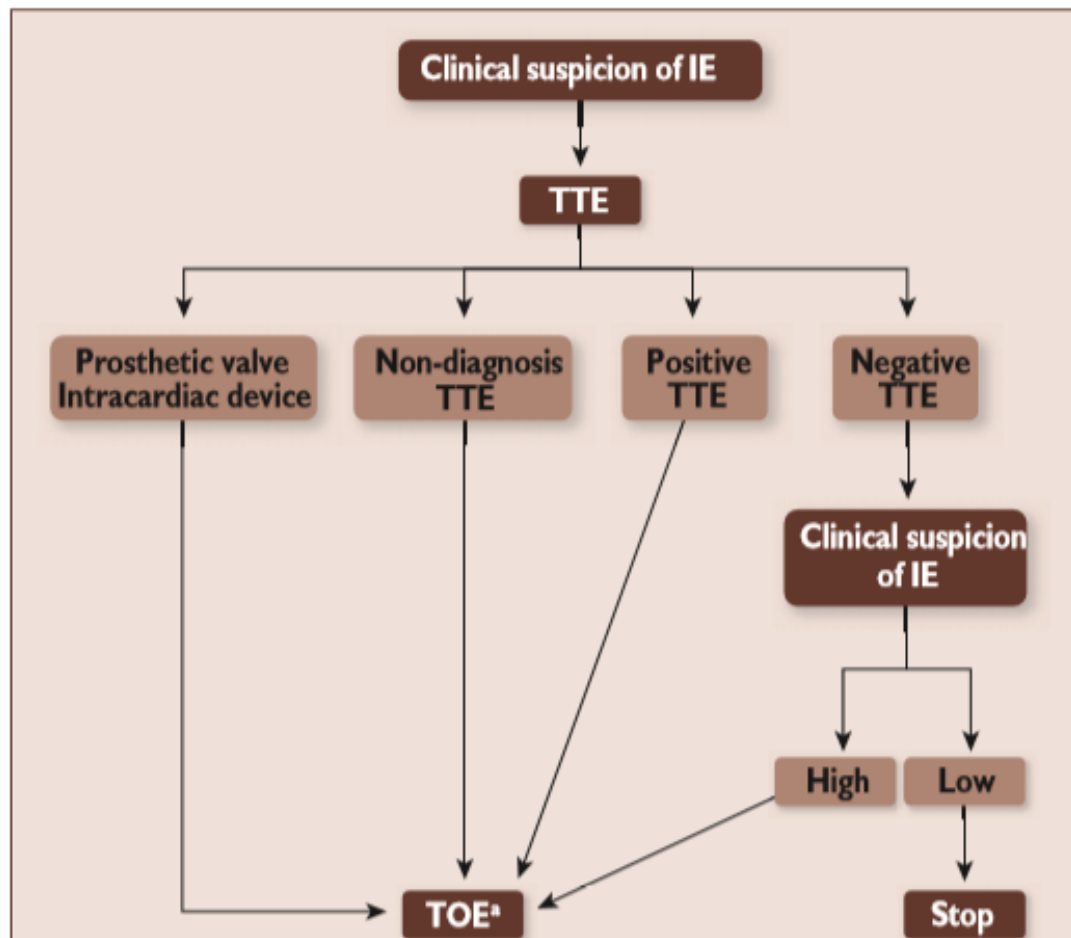
A Should surgical treatment be offered to patients with IE on dialysis?



CT = computed tomography; FDG = fluorodeoxyglucose; IE = infective endocarditis; PET = positron emission tomography; SPECT = single photon emission computerized tomography; TOE = transoesophageal echocardiography; TTE = transthoracic echocardiography.

*May include cerebral MRI, whole body CT, and/or PET/CT.

^bSee Table 14.



If initial TOE is negative but high suspicion for IE remains, repeat TTE and/or TOE within 5–7 days

IE = infective endocarditis; TOE = transoesophageal echocardiography; TTE = transthoracic echocardiography.

*TOE is not mandatory in isolated right-sided native valve IE with good quality TTE examination and unequivocal echocardiographic findings.