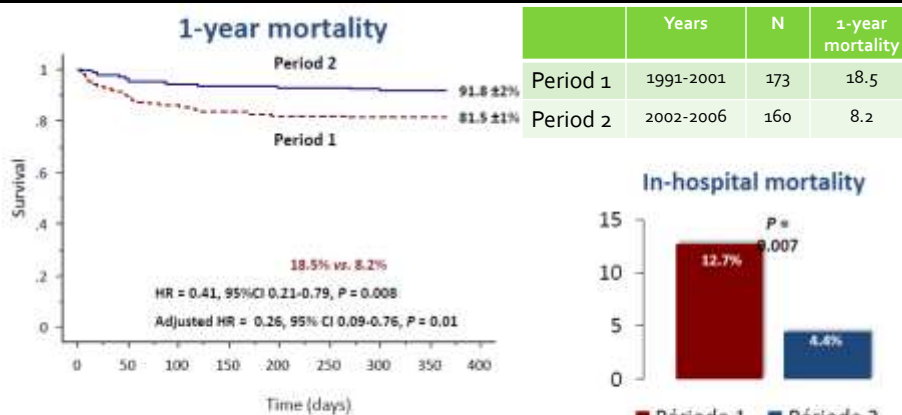


Prof. Mohamed M El-Fiky
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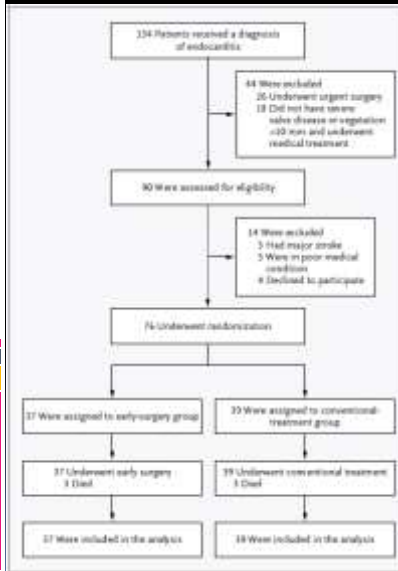
SURGICAL TREATMENT OF RHEUMATIC VALVE ENDOCARDITIS

Influence of the heart team approach



Botelho-Neves E, et al. Arch Intern Med 2009;169:1290-1298
Thuny F, et al. Arch Intern Med 2009;139:211-217

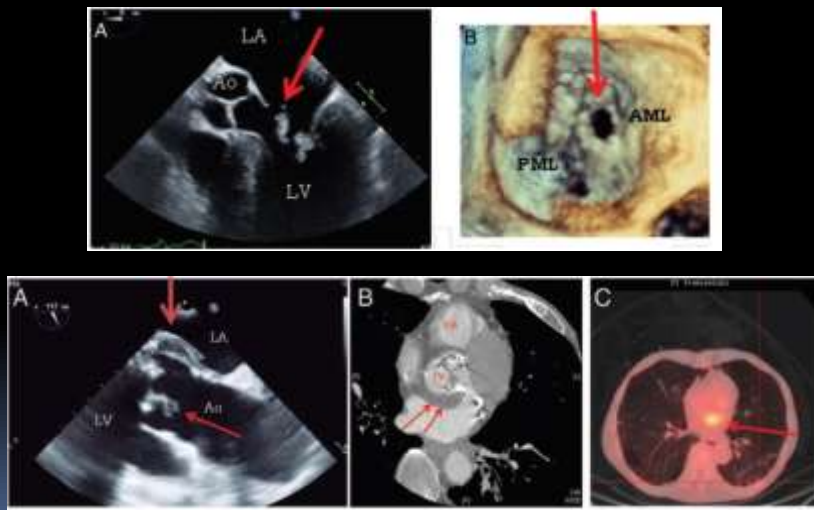
Early Surgery versus Conventional Treatment for Infective Endocarditis First randomized trial



Outcome	Conventional Treatment (N=39)	Early Surgery (N=37)	P Value
Primary end point — no. (%)			
In-hospital death or embolic event at 6 wk	9 (23)	1 (3)	0.01
In-hospital death	1 (3)	1 (3)	1.00
Embolic event at 6 wk			
Any	8 (21)	0	0.025
Cerebral	5 (13)	0	
Circumary	1 (3)	0	
Popliteal	1 (3)	0	
Splenic	1 (3)	0	
Secondary end points at 6 mo — no. (%)			
Any	11 (28)	1 (3)	0.004
Death	2 (5)	1 (3)	1.00
Embolic event	8 (21)	0	0.025
Recurrence of infective endocarditis	1 (3)	0	1.00

N Engl J Med 366:26 NEJM.2470.org June 28, 2012

Cardiac imaging in infectious endocarditis



European Heart Journal (2014) 35, 624–632

Indications and timing of surgery in left-sided valve infective endocarditis (native valve endocarditis and prosthetic valve endocarditis)

Indications for surgery	Timing ^a	Class ^b	Level ^c	Ref. ^d
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	111,115, 103,116
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	111,115, 109,116, 100,121
2. Uncontrolled infection				
Locally uncontrolled infection (abscess, bile aneurysm, fistula, enlarging vegetation)	Urgent	I	B	111,116, 114
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	113
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	108,115, 111,122
Aortic or mitral NVE with vegetations >10 mm, associated with severe valve stenosis or regurgitation and low operative risk	Urgent	IIa	B	9
Aortic or mitral NVE or PVE with isolated very large vegetations (>30 mm)	Urgent	IIa	B	111
Aortic or mitral NVE or PVE with isolated large vegetations (>15 mm) and no other indication for surgery ^e	Urgent	IIb	C	

Eur Heart J: Volume 36 Issue 44; 21 November 2015

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

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Special considerations'

- Embolic complications.
- Neurologic complications.
- Replacement versus repair.
- Complex surgical procedures.

Risk calculator for 6 months embolic risk for infective endocarditis

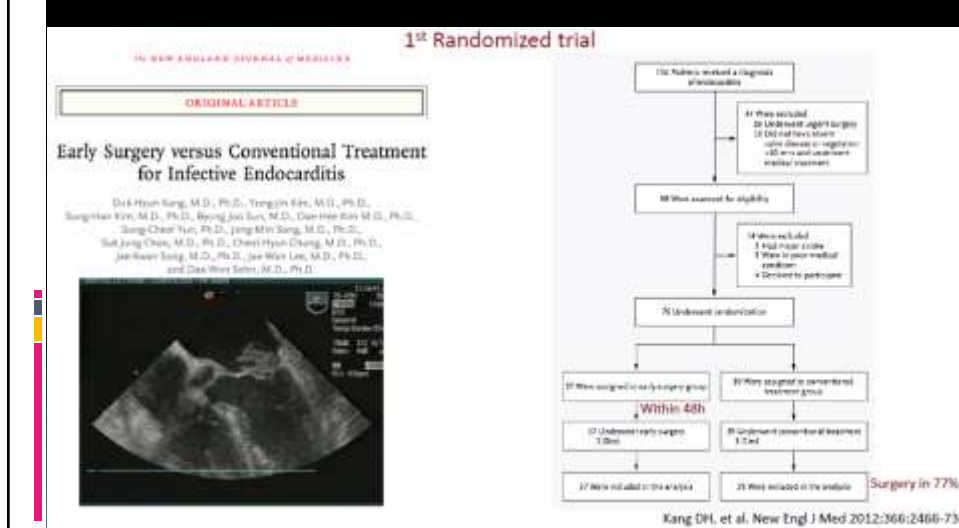
Collect the following clinical, echocardiographic, and microbiological variables at admission of patient with infective endocarditis.
Then, the predicted embolic risk is automatically calculated at different times.

DATA AT ADMISSION		
Clinical Data		
Age (years)		75
Diabetes (2 mo : 1 year)		1
Previous embolism (2 mo : 1 year)		1
Atrial fibrillation (2 mo : 1 year)		0
Echocardiography		
Vegetation > 10 mm (2 mo : 1 year)		0
Vegetation > 10 mm (2 mo : 1 year)		1
Microorganisms		
Staphylococcus aureus (2 mo : 1 year)		1

PREDICTED EMBOLIC RISK CALCULATION		
Time (Days)	Predicted Embolic Risk	
1		3%
2		6%
3		10%
4		13%
5		16%
6		19%
7		22%
10		26%
11		28%
12		30%
13		32%
14		34%
15		36%
16		38%
17		40%
18		42%
19		44%
20		46%
21		48%
22		50%
23		52%
24		54%
25		56%
26		58%
27		60%
28		62%
29		64%
30		66%
31		68%
32		70%
33		72%
34		74%
35		76%
36		78%
37		80%
38		82%
39		84%
40		86%
41		88%
42		90%
43		92%
44		94%
45		96%
46		98%
47		100%
48		100%
49		100%
50		100%
51		100%
52		100%
53		100%
54		100%
55		100%
56		100%
57		100%
58		100%
59		100%
60		100%

Hubert et al
JACC vol 62, No. 15, October 8, 2013:1384-92

Very Early Surgery to Prevent Embolism and Death



Very Early Surgery to Prevent Embolism and Death

Table 3. Clinical End Points.

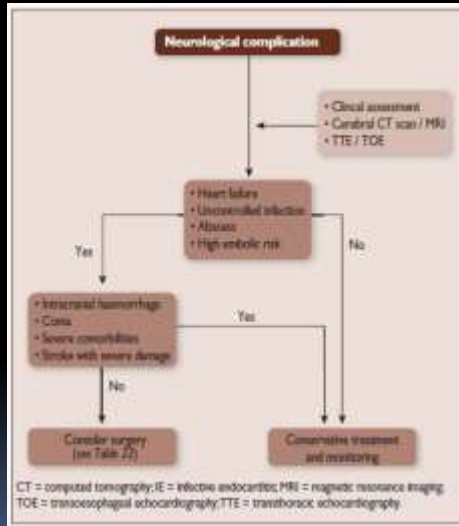
Outcome	Conventional Treatment (N=39)	Early Surgery (N=37)	P Value
Primary end point — no. (%)			
In-hospital death or embolic event at 6 wk	9 (23)	1 (3)	0.01
In-hospital death	1 (3)	1 (3)	1.00
Embolic event at 6 wk			
Any	8 (21)	0	0.005
Cerebral	5 (13)	0	
Coronary	1 (3)	0	
Popliteal	1 (3)	0	
Splenic	1 (3)	0	
Secondary end points at 6 mo — no. (%)			
Any	11 (28)	1 (3)	0.003
Death	2 (5)	1 (3)	1.00
Embolic events	8 (21)	0	0.005
Recurrence of infective endocarditis	1 (3)	0	1.00

But

- exclusion of patients with high comorbidities
- Vegetation length is not the only predictor of embolism

Management of neurological complications of infective endocarditis

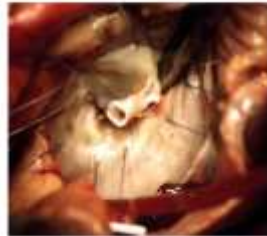
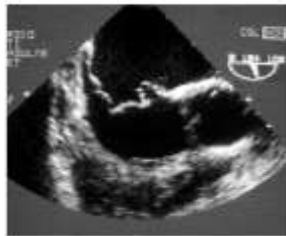
Recommendations	Class ^a	Level ^b	Ref ^c
After a silent embolism or transient ischaemic attack, cardiac surgery, if indicated, is recommended without delay.	I	B	105, 262
Neurosurgery or endovascular therapy is recommended for very large, enlarging or ruptured intracranial infectious aneurysms.	I	C	
Following intracranial haemorrhage, surgery should generally be postponed for ≥1 month.	IIa	B	264-265
After a stroke, surgery indicated for HF, uncontrolled infection, abscess, or persistent high embolic risk should be considered without any delay as long as coma is absent and the presence of cerebral haemorrhage has been excluded by cranial CT or MRI.	IIa	B	1262
Intracranial infectious aneurysms should be looked for in patients with IE and neurological symptoms. CT or MR angiography should be considered for diagnosis. If non-invasive techniques are negative and the suspicion of intracranial aneurysm remains, conventional angiography should be considered.	IIa	B	267, 268



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Mitral valve repair versus replacement in infective endocarditis

Healed IE → Easy repair



Active IE → More complex



Mitral valve repair versus replacement in infective endocarditis

68 mitral endocarditis. → 34 repair
→ 34 replacement.

Reparability
50%

	Mitral valve repair (n = 34)	Mitral valve replacement (n = 34)	P value
Age, y	51.5 ± 17.0*	53.2 ± 13.1	.840
Male sex	22 (64.7%)	17 (50.0%)	.383
Obesity, BMI ≥30 kg/m ²	3 (8.8%)	4 (11.8%)	.721
Diabetes	6 (17.6%)	6 (17.6%)	.954
Chronic obstructive pulmonary disease	6 (17.6%)	5 (14.7%)	.701
Impaired renal function (creatinine >2 mg/dL)	10 (29.4%)	12 (35.3%)	.479
Preoperative kidney failure	6 (17.6%)	3 (8.8%)	.476
Ejection fraction	49% ± 12%	53% ± 12%	.197
NYHA stage (mean)	2.80 ± 0.87	2.76 ± 0.55	.968
NYHA stage IV (%)	7 (20.6%)	2 (5.9%)	.121
Previous septic embolization	15 (44.2%)	6 (17.6%)	.027
Preexisting degenerative valvular disease	15 (44.2%)	12 (35.3%)	.840
EuroSCORE (mean)	9.8 ± 4.2	9.7 ± 3.8	.760
Main indication for surgical intervention			
Persistent sepsis	17 (50%)	6 (26.1%)	.005
Proceeded or imminent septic embolism	10 (29.4%)	15 (44.1%)	.2
Congestive heart failure	7 (20.6%)	13 (38.2%)	.11

« Mitral Valve Repair Provides improved Outcome over Replacement in active IE. E Rutmann et al. JTCVS 2005 ; 130 : 765-71 - Innsbruck, Austria. »

Mitral valve repair versus replacement in infective endocarditis

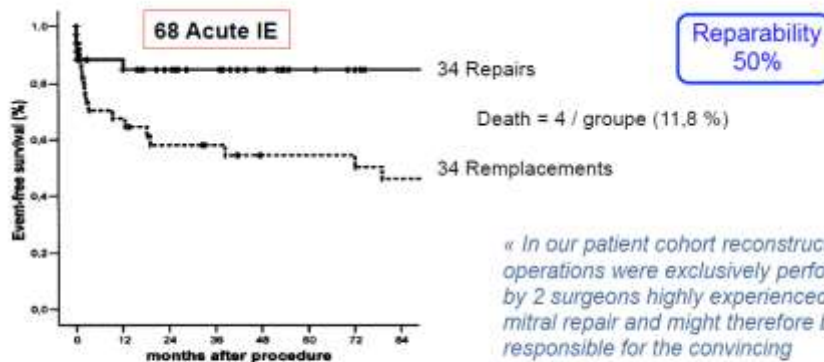
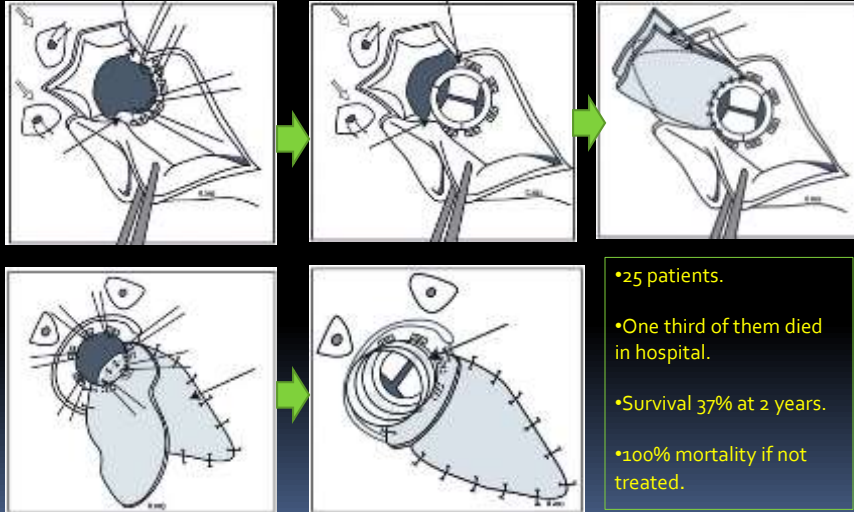


Figure 1. Kaplan-Meier event-free survival (freedom from death, valvular reoperation, and/or recurrence of endocarditis) for patients undergoing either mitral repair (solid line) or replacement (dashed line) for acute mitral endocarditis ($P = .015$, log-rank test).

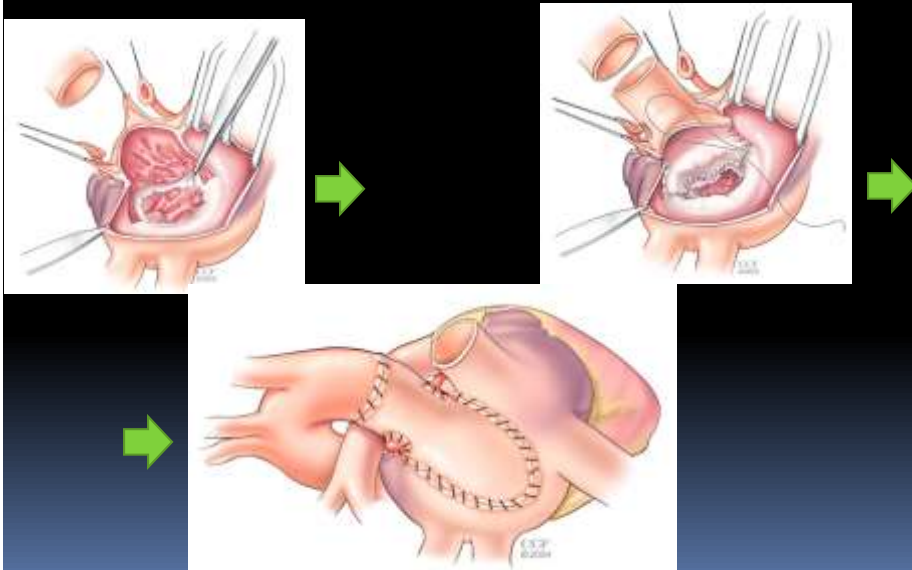
« Mitral Valve Repair Provides improved Outcome over Replacement in active IE. E Rutmann et al. JTCVS 2005 ; 130 : 765-71 »

Double valve replacement and reconstruction of the intervalvular fibrous body in patients with active infective endocarditis
(the Leipzig experience)



European Journal of Cardio-Thoracic Surgery 45 (2014) 146–152

The Hemi-Commando Arrives: A New Technique for Double-Valve Endocarditis
(Cleveland clinic)



Causes of relapse after

• Inadequate antibiotic treatment (agent, dose, duration)
• Resistant microorganisms, i.e. <i>Brucella spp.</i> , <i>Legionella spp.</i> , <i>Chlamydia spp.</i> , <i>Mycoplasma spp.</i> , <i>Mycobacterium spp.</i> , <i>Bartonella spp.</i> , <i>Coxiella Burnetii</i> , fungi
• Polymicrobial infection in an IVDA
• Empirical antimicrobial therapy for BCNIE
• Periannular extension
• Prosthetic valve IE
• Persistent metastatic foci of infection (abscesses)
• Resistance to conventional antibiotic regimens
• Positive valve culture
• Persistence of fever at the seventh postoperative day
• Chronic dialysis

BCNIE = blood culture-negative infective endocarditis; IE = infective endocarditis
IVDA = intravenous drug abuser.

Conclusions

- Heart-team approach saves lives as beforehand often we had:
 - Diagnosis too late
 - Decisions were untimely
 - Treatment inadequate
 - Big insufficiencies in prognostic assessment
- Valve repair give better long-term results but must be done by experts in repair.
- The kind of valve to be inserted depends on the patient's characteristics.
- Extensive resection and surgery can save nearly one third of the patients after 2 years (group with no prospect of survival)
- Proper timing for surgical intervention is crucial and early surgery pays off.
- These are high risk and costly patients and proper management by timely intervention and proper antibiotic coverage are mandatory.

