CIRUGIA CARDIOVASCULAR VALDECILLA

SEICAV
Sociedad Española de Infecciones Cardiovasculares

TIEMPO QUIRÚRGICO EN ENDOCARDITIS INFECCIOSA

III CONGRESO
SOCIEDAD ESPAÑOLA DE INFECCIONES CARDIOVASCULARES

J. F. Gutiérrez Díez

Málaga, 25 de Octubre de 2014

FACTORES QUE CONDICIONAN EL PRONÓSTICO DE LA E.I.

- Virulencia del microorganismo.
- Características del paciente.
- Patología asociada.
- Retraso en el diagnóstico y tratamiento.
- Indicación quirúrgica.
- Momento de la cirugía.

PAPEL DE LA CIRUGÍA EN LA EI

- Aproximadamente el 50 % de los pacientes.

- A finales de los 60 se posiciona como una solución a los casos más complicados.

- Indicaciones.
  - –ICC. 60 %.
  - –Sepsis refractaria. 40 %.
  - –Complicaciones embólicas. 18 %
  - –Tamaño de la vegetación. 48 %

PAPEL DE LA CIRUGÍA EN LA EI

- En general se acepta que el pronóstico es mejor si la cirugía se realiza precozmente, evitando la destrucción tisular y el deterioro funcional del paciente.

- No se ha podido establecer relación alguna entre resultados y la duración o intensidad del tratamiento antibiótico previo cuando la cirugía está indicada, no teniendo sentido demorar la intervención esperando tener un “campo estéril”.

NIVEL DE EVIDENCIA

Table 1 Guidelines for intervention for left-sided native and prosthetic valve infective endocarditis: AHA/ACC14 compared with ESC 2009

Indication	Recommendation and (LOE)	
	ACC/AHA 2014	ESC 2009
Heart valve team (HVT)		
Decisions about timing of surgical intervention should be made by a multispecialty HVT of cardiology, cardiothoracic surgery and infectious disease specialists	I (A)	No formal recommendation
Heart failure		
Early surgery (defined as: during initial hospitalisation before completion of a full therapeutic course of antibiotics) is indicated in patients with IE who present with valve dysfunction resulting in symptoms of HF	I (B)	I (B) Emergency* for refractory pulmonary oedema or cardiogenic shock
Uncontrolled infection		
Early surgery is indicated in patients with IE complicated by heart block, annular or aortic abscess, or destructive penetrating lesions	I (B)	I (B) Urgent†
Early surgery for IE is indicated in patients with evidence of persistent infection as manifested by persistent bacteraemia or fevers lasting longer than 5 to 7 days after onset of appropriate antimicrobial therapy	I (B)	I (B) Urgent
Early surgery is indicated in patients with left-sided IE caused by *Staphylococcus aureus*, fungal or other highly resistant organisms	I (B)	I (B) Urgent/elective‡
Surgery is recommended for patients with prosthetic valve endocarditis (PVE) and relapsing infection (defined as recurrence of bacteraemia after a complete course of appropriate antibiotics and subsequently negative blood cultures) without other identifiable source for portal of infection	I (C)	Not addressed
Prevention of embolism		
Early surgery is reasonable in patients with IE who present with recurrent emboli and persistent vegetations despite appropriate antibiotic therapy	IIa (B)	I (B) Urgent
Early surgery may be considered in patients with NVE who exhibit mobile vegetations greater than 10 mm in length (with or without clinical evidence of embolic phenomenon)	IIb (B)	I (B) Urgent
Aortic or mitral IE with large vegetations (>10 mm) and other predictors of complicated course (heart failure, persistent infection, abscess)	Recommendations are separate for large vegetation and other predictors of complicated course	I (C) Urgent
Isolated very large vegetations (>15 mm)	Same as vegetation >10 mm	IIb (C) Urgent
Pacer and defibrillator systems§		
Complete removal of pacemaker or defibrillator systems, including all leads and the generator, is indicated as part of the early management plan in patients with IE with documented infection of the device or leads	I (B)	I (B)
Complete removal of pacemaker or defibrillator systems, including all leads and the generator, is reasonable in patients with valvular IE caused by *S aureus* or fungi, even without evidence of device or lead infection	IIa (B)	IIb (C)
Complete removal of pacemaker or defibrillator systems, including all leads and the generator, is reasonable in patients undergoing valve surgery for valvular IE	IIa (C)	IIb (C)

*Emergency (ESC/EACTS definition: performed within a few hours).
†Urgent (ESC/EACTS definition: within a few days).
‡Elective (ESC/EACTS definition: after at least 1 or 2 weeks of antibiotic therapy).
§Addressed in AHA Scientific Statement: Refs. 1 6 10.

2014 AHA/ACC Guideline for the Management of Patients With Valvular Heart Disease: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines
Rick A. Nishimura, Catherine M. Otto, Robert O. Bonow, Blase A. Carabello, John P. Erwin III, Robert A. Guyton, Patrick T. O'Gara, Carlos E. Ruiz, Nikolaos J. Skubas, Paul Sorajja, Thoralf M. Sundt III and James D. Thomas

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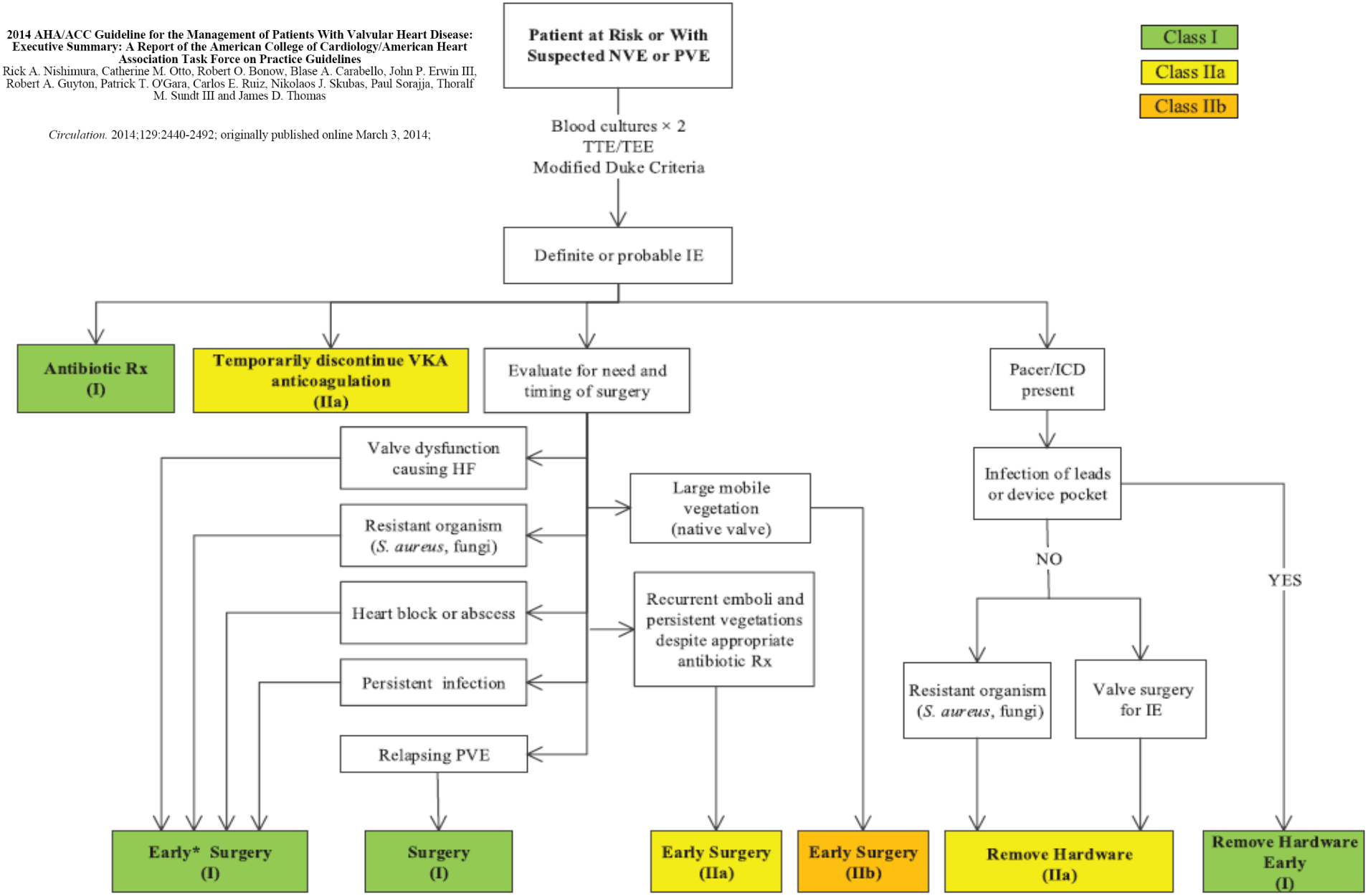

Figure 9. Diagnosis and Treatment of IE. *Early surgery defined as during initial hospitalization before completion of a full therapeutic course of antibiotics.HF indicates heart failure; ICD, implantable cardioverter-defibrillator; IE, infective endocarditis; NVE, native valve endocarditis; PVE, prosthetic valve endocarditis; Rx, therapy; *S. aureus*, *Staphylococcus aureus*; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography; and VKA, vitamin K antagonist.

	Timing*	Class	Level of evidence
Heart failure			
Aortic or mitral IE or PVE with severe acute regurgitation or valve obstruction or fistula causing refractory pulmonary oedema or cardiogenic shock	Emergency	I	B
Aortic or mitral IE with severe acute regurgitation or valve obstruction and persisting heart failure or echocardiographic signs of poor haemodynamic tolerance (early mitral closure or pulmonary hypertension)	Urgent	I	B
Aortic or mitral IE or severe prosthetic dehiscence with severe regurgitation and no heart failure	Elective	IIa	B
Right heart failure secondary to severe tricuspid regurgitation with poor response to diuretic therapy	Urgent/elective	IIa	C
Uncontrolled infection			
Locally uncontrolled infection (abscess, false aneurysm, fistula, enlarging vegetation)	Urgent	I	B
Persisting fever and positive blood cultures >7–10 days not related to an extracardiac cause	Urgent	I	B
Infection caused by fungi or multiresistant organisms	Urgent/elective	I	B
PVE caused by staphylococci or Gram-negative bacteria (most cases of early PVE)	Urgent/elective	IIa	C
Prevention of embolism			
Aortic or mitral IE or PVE with large vegetations (>10 mm) following one or more embolic episodes despite appropriate antibiotic therapy	Urgent	I	B
Aortic or mitral IE or PVE with large vegetations (>10 mm) and other predictors of complicated course (heart failure, persistent infection, abscess)	Urgent	I	C
Aortic or mitral or PVE with isolated very large vegetations (>15 mm)†	Urgent	IIb	C
Persistent tricuspid valve vegetations >20 mm after recurrent pulmonary emboli	Urgent/elective	IIa	C

IE=infective endocarditis. PVE=prosthetic valve endocarditis. Class I=evidence or general agreement, or both, that a given treatment or procedure is beneficial, useful, and effective. Class II=conflicting evidence or divergence of opinion, or both, about the usefulness or efficacy of the given treatment or procedure. Class IIa=weight of evidence or opinion is in favour of usefulness or efficacy. Class IIb=usefulness or efficacy is less well established by evidence or opinion. Class III=evidence of general agreement that the given treatment or procedure is not useful or effective, and in some cases may be harmful. Level of evidence A=data derived from multiple randomised clinical trials or meta-analyses. Level of evidence B=data derived from a single randomised clinical trial or large non-randomised studies. Level of evidence C=consensus of opinion of the experts or small studies, retrospective studies, registries. *Emergency surgery=surgery done within 24 h. Urgent surgery=surgery done within a few days. Elective surgery=surgery done after at least 1 or 2 weeks of antibiotic treatment. †Surgery might be preferred if procedure preserving the native valve is feasible.

Table 2: **Indications and timing of surgery in native valve (NVE) and prosthetic valve (PVE) infective endocarditis. Adapted from Habib and colleagues[25] with permission**

Guidelines on the prevention, diagnosis, and treatment of infective endocarditis (new version 2009)

The Task Force on the Prevention, Diagnosis, and Treatment of Infective Endocarditis of the European Society of Cardiology (ESC)

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Infective endocarditis: old problem, new guidelines and still much to learn

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Erwin JP, *et al. Heart* July 2014 Vol 100 No 13

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GUIAS CLÍNICAS

- AHA/ACC.

  Cirugía Precoz: Durante el ingreso antes de completar el tratamiento antibiótico.

- ECC.

  Emergencia: Pocas horas.
  Urgente: Pocos días.
  Electivo: Tras una o dos semanas de tratamiento antibiótico.

Management of infective endocarditis: challenges and perspectives

Franck Thuny, Dominique Grisoli, Frederic Collart, Gilbert Habib, Didier Raoult

Despite improvements in medical and surgical therapies, infective endocarditis is associated with poor prognosis and remains a therapeutic challenge. Many factors affect the outcome of this serious disease, including virulence of the microorganism, characteristics of the patients, presence of underlying disease, delays in diagnosis and treatment, surgical indications, and timing of surgery. We review the strengths and limitations of present therapeutic strategies and propose future directions for better management of endocarditis according to the most recent research. Novel perspectives on the management of endocarditis are emerging and offer hope for decreasing the rate of residual deaths by accelerating the process of diagnosis and risk stratification, reducing delays in starting antimicrobial therapy, rapid transfer of high-risk patients to specialised medico-surgical centres, development of new surgical methods, and close long-term follow-up.

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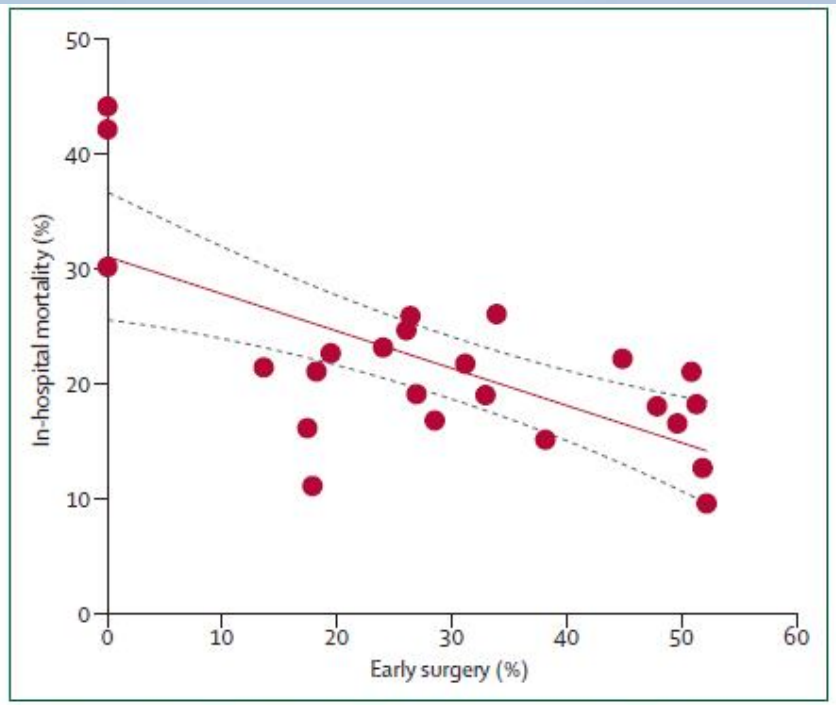

Figure 1: **In-hospital mortality as a function of the rate of early surgery**
This linear regression (R^2=0·45, p=0·0003) was done with the data from the 24 investigations (webappendix). Dotted lines represent the 95% CI. After exclusion of the four studies that differed the most from the line of regression (Anderson al 1948, Morgan et al 1959, Bishara et al 2001, Fefer et al 2002), the correlation remained significant (R^2=0·48, p=0·0008). The references of studies included are presented in the webappendix.

ORIGINAL ARTICLE

Early Surgery versus Conventional Treatment for Infective Endocarditis

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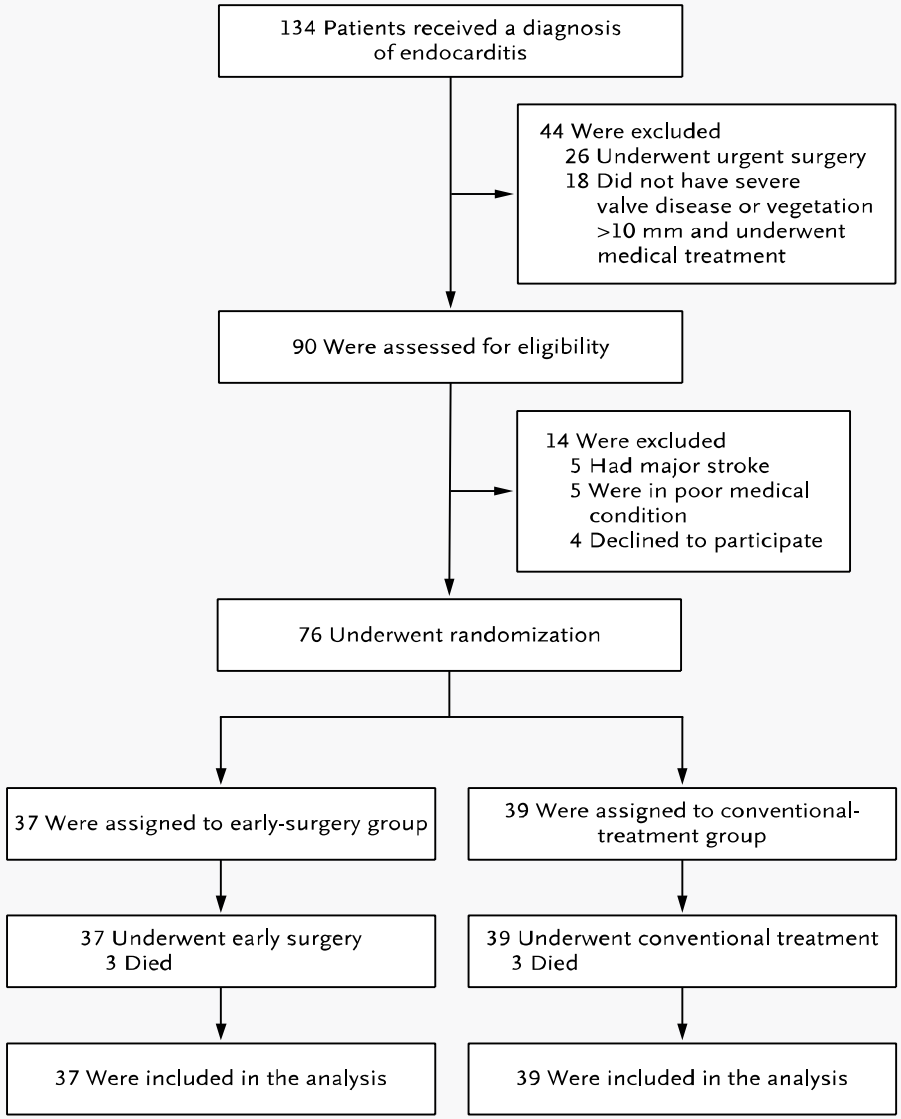

Figure 1. Study Enrollment.

Of the 134 patients who received a definite diagnosis of infective endocarditis, 26 required urgent surgery and 18 did not have large vegetations or severe valve disease; 90 patients were assessed for eligibility, 14 of whom were excluded. Of the 76 patients who underwent randomization, 37 were assigned to the early-surgery group and 39 to the conventional-treatment group; all these patients were included in the intention-to-treat analysis.

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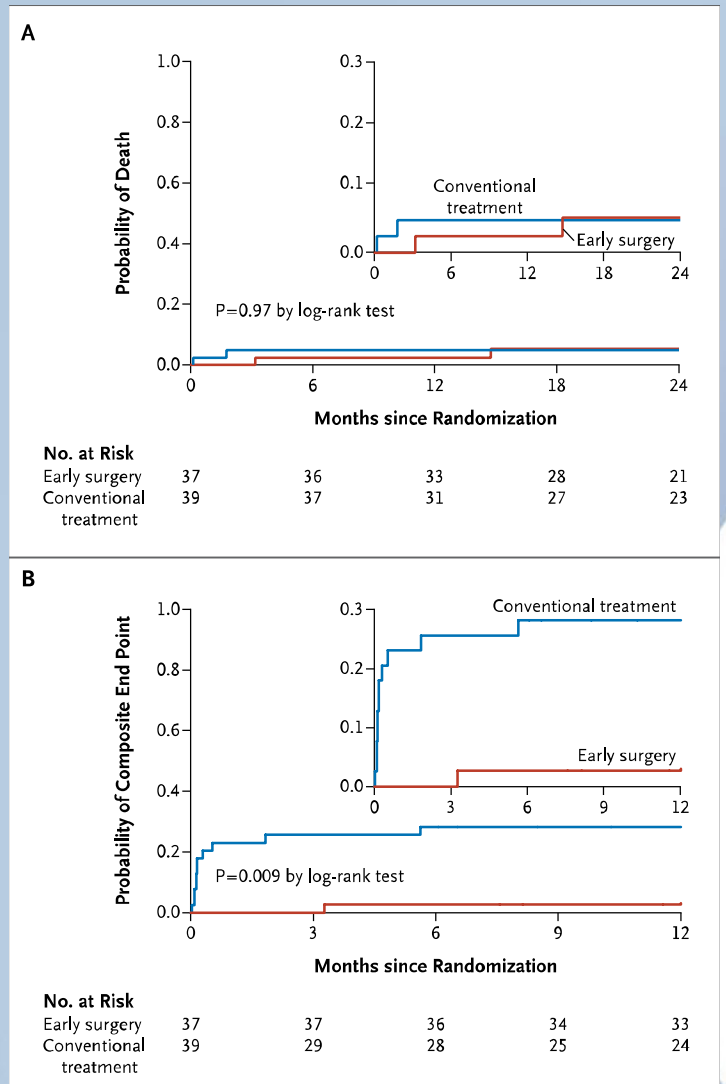

Figure 2. Kaplan–Meier Curves for the Cumulative Probabilities of Death and of the Composite End Point at 6 Months, According to Treatment Group.

There was no significant between-group difference in all-cause mortality at 6 months (Panel A). The rate of the composite end point of death from any cause, embolic events, recurrence of infective endocarditis, or repeat hospitalization due to the development of congestive heart failure was 3% in the early-surgery group versus 28% in the conventional-treatment group (hazard ratio, 0.08; 95% CI, 0.01 to 0.65; P=0.02) (Panel B).

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Outcomes for endocarditis surgery in North America: A simpli ed risk scoring system

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Objective: Operation for infective endocarditis is associated with the highest mortality of any valve disease, with overall rates of in-hospital mortality exceeding 20%. The Society of Thoracic Surgeons Adult Cardiac Surgery Database was examined to develop a simple risk scoring system and identify areas for quality improvement.

Methods: From 2002 through 2008, 19,543 operations were performed for infective endocarditis. Logistic regression analysis related baseline characteristics to both operative mortality and a composite of mortality and major morbidity within 30 days. Points were assigned to each risk factor, and estimated risk was obtained by averaging events for all patients having the same number of points.

Results: Overall unadjusted mortality was 8.2%, and complications occurred in 53%. Signi cant preoperative risk factors for mortality (associated points) were as follows: emergency, salvage status, or cardiogenic shock (17), preoperative hemodialysis, renal failure, or creatinine level less than 2.0 (12), preoperative inotropic or balloon pump support (10), active (vs treated) endocarditis (10), multiple valve involvement (9), insulin-dependent diabetes (8), arrhythmia (8), previous cardiac surgery (7), urgent status without cardiogenic shock (6), non–insulin-dependent diabetes (6), hypertension (5), and chronic lung disease (5), with a C statistic of 0.7578 (all P< .001). Risk-adjusted mortality and major morbidity were unchanged over the course of the study. In the entire data set, mortality was better if ''any valve'' was repaired (odds ratio ¼ 0.76; P ¼ .0023).

Conclusions: Operative mortality for surgically treated infective endocarditis is substantially lower than reported in-hospital mortality rates for infective endocarditis. The described risk scoring system will inform clinical decision-making in these complex patients. (J Thorac Cardiovasc Surg 2011;141:98-106)

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TABLE 3. Simplified model and point estimate for the composite end point of major morbidity and mortality

Parameter	Standard estimate	Probability	OR	CI	Points
Female gender	0.30923	< .0001	1.36237	(1.35, 1.38)	5
BSA > 1.9	0.09389	< .0001	1.09844	(1.09, 1.11)	1
Age > 60	0.26839	< .0001	1.30786	(1.30, 1.32)	4
Prior CABG	0.32403	< .0001	1.38269	(1.37, 1.40)	5
Status: urgent or emergency, no cardiogenic shock	0.40854	< .0001	1.50461	(1.49, 1.52)	6
Status: emergency, salvage, or cardiogenic shock	1.13463	< .0001	3.11004	(3.04, 3.18)	17
Preoperative IABP or inotropes	0.83191	< .0001	2.29770	(2.26, 2.34)	12
Multiple valve procedure	0.45954	< .0001	1.58334	(1.57, 1.60)	7
Prior valve surgery	0.32296	< .0001	1.38121	(1.37, 1.40)	5
IDDM	0.48610	< .0001	1.62597	(1.60, 1.65)	7
NYHA class IV	0.38932	< .0001	1.47598	(1.46, 1.49)	6
Active endocarditis	0.45781	< .0001	1.58061	(1.57, 1.60)	7
Renal failure or Cr > 2.0	0.77041	< .0001	2.16064	(2.14, 2.18)	12
Arrhythmia	0.31833	< .0001	1.37484	(1.36, 1.39)	5

C statistic = 0.72870. *OR,* Odds ratio; *CI,* confidence interval; *BSA,* body surface area; *CABG,* coronary artery bypass grafting; *IABP,* intra-aortic balloon pumping; *IDDM,* insulin-dependent diabetes mellitus; *NYHA,* New York Heart Association; *Cr,* creatinine.

TABLE 4. Simplified model and point estimate for postoperative mortality

Parameter	Standard estimate	Probability	OR	CI	Points
Prior CABG	0.48958	<.0001	1.63163	(1.60, 1.67)	7
Status: urgent or emergency, no cardiogenic shock	0.42207	<.0001	1.52511	(1.50, 1.55)	6
Status: emergency, salvage, or cardiogenic shock	1.15279	<.0001	3.167	(3.03, 3.31)	17
Preoperative IABP or Inotropes	0.67227	<.0001	1.95869	(1.89, 2.03)	10
Multiple valve procedure	0.602	<.0001	1.82577	(1.79, 1.86)	9
Prior valve surgery	0.47119	<.0001	1.6019	(1.57, 1.64)	7
IDDM	0.54652	<.0001	1.72723	(1.68, 1.78)	8
NIDDM	0.43098	<.0001	1.53877	(1.50, 1.58)	6
Hypertension	0.342	<.0001	1.40776	(1.38, 1.43)	5
Chronic lung disease	0.34443	<.0001	1.41119	(1.38, 1.44)	5
Active endocarditis	0.69541	<.0001	2.00453	(1.97, 2.04)	10
Renal failure or Cr > 2.0	0.82723	<.0001	2.28698	(2.24, 2.33)	12
Arrhythmia	0.5043	<.0001	1.65582	(1.62, 1.69)	8

C statistic = 0.75784. *OR,* Odds ratio; *CI,* confidence interval; *CABG,* coronary artery bypass grafting; *IABP,* intra-aortic balloon pump; *IDDM,* insulin-dependent diabetes mellitus; *NIDDM,* non–insulin-dependent diabetes mellitus; *Cr,* creatinine.

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EQUIPO DE ENDOCARDITIS

IMPACT OF A MULTIDISCIPLINARY MANAGEMENT STRATEGY ON THE OUTCOME OF PATIENTS WITH NATIVE VALVE INFECTIVE ENDOCARDITIS

Chirillo F, Scotton P, Rocco F. Am J Cardiol 112: 1171-1176, 2013

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The infective endocarditis team: recommendations from an international working group

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Chris Arden,[5] Lucy Grothier,[6] Jo Wilson,[7] Brian Campbell,[8]
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Box 1 Indications for transfer to a surgical centre

- Prosthetic valve or implantable cardiac electronic device infection
- Severe regurgitation even if currently stable haemodynamically
- Abscess
- Invasive organism, for example, *Staphylococcus* aureus*
- Organisms that are hard to manage medically, for example, fungi
- Failure to respond to antibiotics
- Stroke (or other embolism) and large residual vegetation
- Recurrent emboli
- Renal failure†

*Cases of *S aureus* infective endocarditis (IE) may be respond to antibiotics therapy alone, but should trigger a discussion.

†Renal failure in IE has many and sometimes multiple origins including glomerulonephritis, renal emboli, aminoglycoside therapy and low cardiac output. It can contribute to the decision for early surgery when associated with severe valve destruction or failure to control sepsis and should therefore trigger a discussion with the surgical centre.

EQUIPO DE ENDOCARDITIS

Infective endocarditis is the cardiac disease with the highest rate of death, much higher than acute myocardial infarction and many types of cancers, which needs a combined medico-surgical therapeutic approach, which should be undertaken at medico-surgical centres.

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INSUFICIENCIA CARDIACA CONGESTIVA

- Es la más clara indicación de cirugía, presente en aporx. El 72 % de las mismas y la que más influye en el pronóstico.
- Reduce la mortalidad de un rango de 56-86 % a 11-35 %.
- Causas:
  - Insuficiencia o regurgitación valvular.
  - Obstrucción valvular por grandes vegetaciones.
  - Fístulas intracardiacas.

INSUFICIENCIA CARDIACA CONGESTIVA

- Insuficiencia aòrtica aguda.
  - Habitualmente muy mal tolerada.
  - Indicación de cirugía urgente.
    - EAP, Shock Cardiogénico o evidencia de aumento rápido de PTDVI (Cierre prematuro de la válvula mitral).
- Insuficiencia mitral aguda.
  - Habitualmente mejor tolerada.
  - Indicación de cirugía urgente.

INSUFICIENCIA CARDIACA CONGESTIVA

- Guias ACC/AHA mas liberales en su interpretación.
  - Mera presencia de EAP.
- EAC.
  - EAP o shock persistente o refractario a tratamiento médico.

INSUFICIENCIA CARDIACA CONGESTIVA

- Insuficiencia cardiaca controlada con diuréticos y vasodilatadores.
  - –En ausencia de otras indicaciones puede posponerse la cirugía para dar tiempo a los antibióticos.
  - –La insuficiencia cardiaca progresiva leve puede progresar y está relacionada con un aumento de la mortalidad operatoria.

INSUFICIENCIA CARDIACA CONGESTIVA

•En la insuficiencia valvular sin insuficiencia cardiaca y sin otras indicaciones para la cirugía se recomienda el tratamiento médico y realizar la intervención quirúrgica si está indicada una vez curada la endocarditis.

EXTENSIÓN PERIANULAR

- Se asocia a umento de mortalidad y aparición de ICC.
- Aparece entre el 10 y 40 % de pacientes con El sobre válvula natural y entre 56 y 100 % sobre prótesis.
- Indicación de cirugía urgente. (Estudios años 90)

EMBOLIA SISTÉMICA

- Aparecen entre un 22 y 50 % de los pacientes.
- Un 65 % de los episodios son en el SNC.
- Se considera que hasta en un 25 % de los casos son silentes.
- Más frecuentes en el lado izdo.
- Asociadas a algunos gérmenes (Staf Aureus, Cándida, Grupo HACEK).
- La mayoría antes del diagnóstico o 2 semanas después.

EMBOLIA SISTÉMICA

- Factores que predicen complicaciones embólicas.
  - Tamaño y motilidad de las vegetaciones.
  - Válvula mitral.
  - Aumento de tamaño con tto antibiótico.
  - Microorganismos específicos.
  - Embolia previa.
  - Infección multivalvular.
  - Marcadores biológicos.

COMPLICACIONES CEREBRO-VASCULARES

- Entre 20 y 40 % de los enfermos.
- Espectro clínico.
  - Ictus isquémico o hemorrágico.
  - Accidente isquémico transitorio.
  - Embolia cerebral silente.
  - Aneurisma micótico cerebral.
  - Absceso cerebral.
  - Meningitis.
  - Encefalopatía tóxica.
  - Crisis convulsivas.

COMPLICACIONES CEREBRO-VASCULARES

✓La cirugía no debe posponerse cuando está indicada por ICC,
Infección no controlada o absceso, persistencia de un riesgo embólico elevado siempre que se haya descartado una hemorragia cerebral
y el daño neurológico no sea grave.

(Riesgo neurológico de 3-6 %).

✓En la hemorragia cerebral se aconseja posponer la cirugía un mes.

✓Una excepción puede ser la reparación de un aneurisma micótico

Influence of the Timing of Cardiac Surgery on the Outcome of Patients With Infective Endocarditis and Stroke

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CIRUGIA CARDIOVASCULAR
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RIESGO EMBOLÍGENO

ESC (Vegetaciones > 10 mm:

- Cirugía urgente.
  - Clase I: Uno o varios episodios embólicos con tratamiento antibiótico apropiado.
  - Clase II b: Vegetaciones >15 mm.

ACC/AHA.

- Cirugía precoz.
  - Clase II b.

Clinical Investigations

Outcome in Patients With Left-Sided Native-Valve Infective Endocarditis and Isolated Large Vegetations

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ABSTRACT

Background: In patients with left-sided native-valve infective endocarditis (IE), the risk of embolism is increased with a vegetation size ≥10 mm. For this reason—according to guidelines—surgery may be considered in patients with isolated large vegetations (without any other indication for surgery). However, the value of surgery in this patient subset has never been systematically studied.

Hypothesis: We hypothesized that surgery may be superior to medical therapy in terms of clinical outcome in the aforementioned patients.

Methods: All patients who presented at our institution between January 2000 and July 2012 with isolated left-sided native-valve IE and large vegetations (≥10 mm) were examined. Patients with conventional indications for surgical treatment were excluded. Follow-up for clinical events was performed according to predefined definitions.

Results: A total of 71 patients with left-sided native-valve IE and isolated large vegetations qualified for inclusion into the study cohort. Mean vegetation length was 17 ± 5 mm. A total of 59 patients underwent surgery after a mean of 5 ± 6 days following the initiation of antibiotic treatment. Mean follow-up duration was 6.0 ± 2.9 years. Surgical compared to purely medical treatment was associated with a significant increase in long-term all-cause mortality ($P = 0.03$ by log-rank test, unadjusted analysis). Upon multivariable Cox regression analysis, surgical treatment, affection of mitral valve, blood cultures positive for *Staphylococcus aureus*, and increasing age showed trends as independent predictors of long-term mortality.

Conclusions: Surgical treatment in patients with left-sided native-valve IE and isolated large vegetations without any other indication for surgery seems to be associated with excess mortality. A randomized controlled trial of surgery vs conservative treatment in this subset of patients is justified.

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CIRUGIA CARDIOVASCULAR
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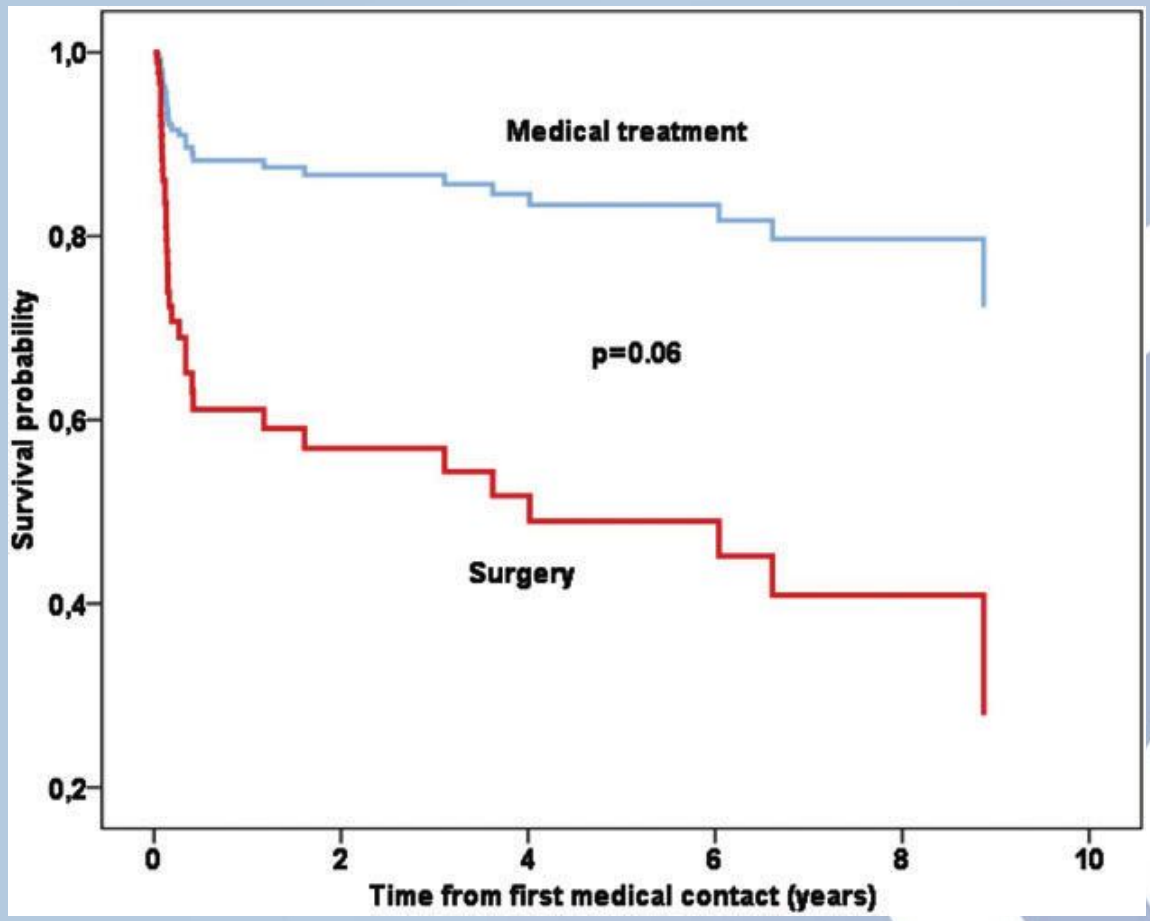

Figure 2. Survival plot from multivariate Cox regression analysis estimating the cumulative probability of long-term death according to medically and surgically managed patients.

SEPSIS PERSISTENTE

- ✓ Persistencia de fiebre o hemocultivos positivos tras 7 días de tratamiento antibiótico adecuado y ausencia de un foco extracardiaco.

- ✓Fiebre recurrente tras evolución favorable.
  Descartar foco alternativo de infección y comprobar sensibilidad antibiótica.
  Más frecuente en EI no estreptocócica y protésica.

MICROORGANISMOS DIFÍCILES

- S. Aureus. Intervención temprana en EI protésica y en la mayoría de las nativas izdas si no se consigue una rápido control.
- Ps Aeruginosa. Tto antibiótico raramente efectivo en el lado izquierdo.
- Coxiela Burnetti.
- Brucella.
- Staf. Lugdunensis.
- EI Fúngica.
- Gérmenes multiresistentes.

ENDOCARDITIS PROTÉSICA

- Supone un 10-20 % de los casos con una incidencia de un 0-1 a 2,3 % paciente y año.
- Infección precoz: Coagulasa negativos o Staf Aureus.
- La cirugía mejora la supervivencia inmediata y a largo plazo, y disminuye las recurrencias y necesidad de nueva intervención quirúrgica.
- Es preferible la intervención temprana.
- Endocarditis tardía.

ENDOCARDITIS DERECHA.

- Fiebre de más de tres semanas con tratamiento antibiótico adecuado en ausencia de abscesos pulmonares.

- Endocarditis asociadas a dispositivos.

RESUMEN

Table 3. Timing of Surgery

- Emergency surgery (within 24 hours)
  - Native (aortic or mitral) or prosthetic valve endocarditis and severe congestive heart failure or cardiogenic shock caused by:
    - Acute valvular regurgitation
    - Severe prosthetic dysfunction (dehiscence or obstruction)
    - Fistula into a cardiac chamber or the pericardial space
- Urgent surgery (within days)
  - Native valve endocarditis with persisting congestive heart failure, signs of poor hemodynamic tolerance, or abscess
  - Prosthetic valve endocarditis with persisting congestive heart failure, signs of poor hemodynamic tolerance, or abscess
  - Prosthetic valve endocarditis caused by staphylococci or Gram-negative organisms
  - Large vegetation (>10 mm) with an embolic event
  - Large vegetation (>10 mm) with other predictors of a complicated course
  - Very large vegetation (>15 mm), especially if conservative surgery is available
  - Large abscess and/or periannular involvement with uncontrolled infection
- Early elective surgery (during the in-hospital stay)
  - Severe aortic or mitral regurgitation with congestive heart failure and good response to medical therapy
  - Prosthetic valve endocarditis with valvular dehiscence or congestive heart failure and good response to medical therapy
  - Presence of abscess or periannular extension
  - Persisting infection when extracardiac focus has been excluded
  - Fungal or other infections resistant to medical cure

MUCHAS GRACIAS