Experience in heart transplant as salvage treatment for infective endocarditis

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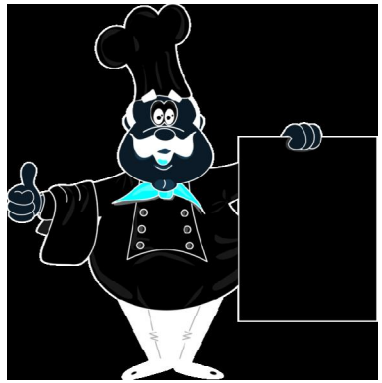
AEPEI: Association pour l'Etude et la Prévention des Endocardites Infectieuses

Menu



- **Background**
  - Heart transplant (HT) in 2017
  - HT as salvage treatment for IE: is it reasonable ?
  - Litterature review
- **International Collaboration on Endocarditis (ICE) study**
- **Conclusions**

Special article

Spanish Heart Transplantation Registry. 27th Official Report of the Spanish Society of Cardiology Working Group on Heart Failure and Heart Transplantation (1984-2015)

- 250-300 heart transplant/year
- Mean age: 45 => 50 years

Progress in survival despite

- Recipients & donors older
- Increasing proportion of HT performed as 'emergency' (50% in 2015)

  - Azathioprine/ciclosporine (1985-2000)
  - MMF/tacrolimus (2000-2015)
- 5 year-survival = 66% (improving)

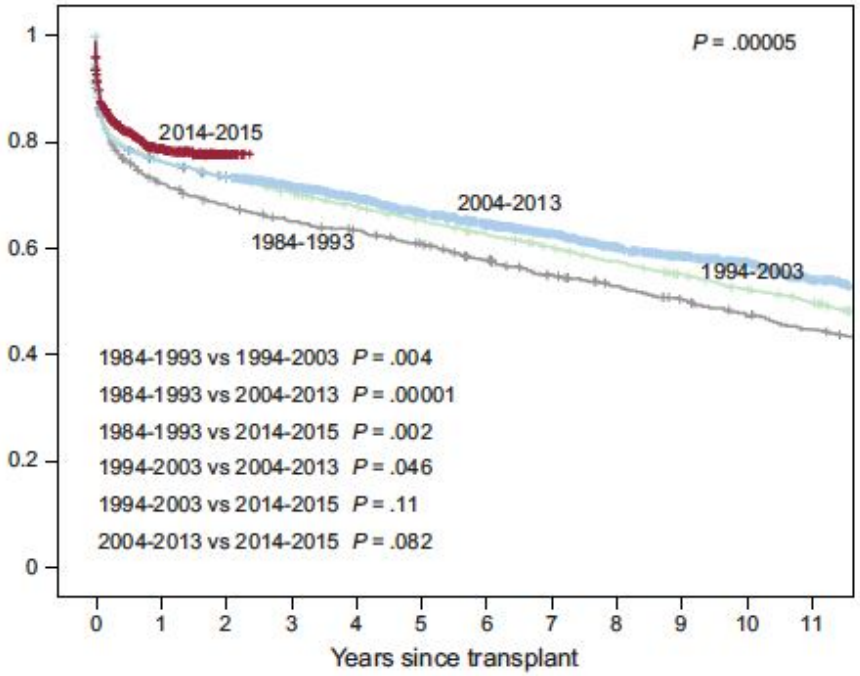


Figure 13. Overall survival curve for the whole series (1984-2015).

Gonzalez-Vilchez F et al. Rev Esp Cardiol 2016

Who can receive heart transplant ?

1. Age limit (70 years ?)
2. No comorbidity with life expectancy < 5 years
3. No disease at risk of rapid evolution with immunosuppressive drug (e.g. cancer < 5 years)
4. Predictable good adherence to medications and follow-up visits
5. **No uncontrolled systemic infection**

doi: 1

Minireview

An Update on Heart Transplantation in Human Immunodeficiency Virus–Infected Patients

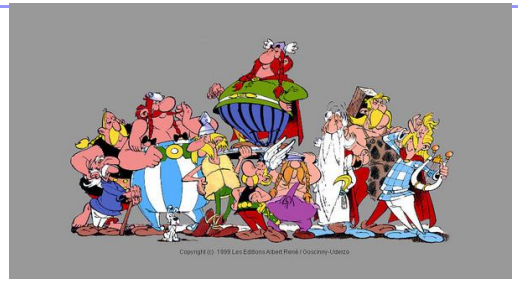
Table 1: Patient survival rates in the main cohorts of kidney, liver, heart, and LVAD recipients

			Years, %						
Type of SOT/Country	Period	Number of patients	1	2	3	4	5	10	p-value
Kidney/USA (1)*	2002–2011	HIV+ (n = 362)	96	–	92	–	89	63%	0.096
		HIV− (n = 3620)	97	–	94	–	89	78%	
Liver/Spain (2)	2002–2006	HIV+/HCV+ (n = 84)	88	71	62	60	54	–	0.008
		HIV−/HCV+ (n = 252)	90	81	76	73	71	–	
Liver/USA (3)	2003–2010	HIV+/HCV+ (n = 89)	76	–	60	–	–	–	0.001
		HIV+/HCV− (n = 235)	92	–	79	–	–	–	
Liver/USA (4)	2001–2007	HIV+/HBV+ (n = 22)	85	–	85	–	85	–	0.09
		HIV−/HBV+ (n = 20)	100	–	100	–	100	–	
Heart/USA (5)	1999–2004	HIV+ (n = 20)	90	–	90	–	–	–	0.950
		HIV− (n = 9174)	86	–	79	–	–	–	
Heart/USA (6)	NR	HIV+ (n = 18)	100	100	–	–	63	–	
		HIV− (unknown)	84	81	–	–	72	–	

Aguero F et al. Am J Transplant 2016

RESEARCH NOTE

Heart transplantation as salvage treatment of intractable infective endocarditis



- **6 HT for IE in Rennes (France), 2005-2014**
  - Severe IE, but otherwise long life expectancy
  - Mean age, 45 years (range, 24-64)
  - Sepsis controlled by time of HT (per-transplant cultures sterile)
  - <2% of all HT in this site; 3.6% of patients with surgical treatment for IE

- **100% success (median follow-up, 2 years)**

  But highly selected patients…

Aymami M et al. Clin Microbiol Infect 2015

	Patient 1	Patient 2
Sex, age (y)	Male, 24	Male, 55
Comorbidity	None	Smoker
Infected valve(s)	Aortic (native)	Aortic and tricuspid (native)
Microbiology	Methicillin-susceptible *Staphylococcus aureus*	*Streptococcus pneumoniae*
Antibacterial treatment for infective endocarditis	Cloxacillin/gentamicin	Amoxicillin/gentamicin
Time (d) from initiation of IE treatment to:		
2nd cardiac surgery	25	15
3rd cardiac surgery	Not performed	Not performed
HT	55	75
Explanted heart		
Microbiology	Sterile	Sterile
Lesions	Acute necrotic myocarditis (multiple abscesses in left ventricle)	Multiple abscesses: interventricular septum, aorta, right ventricle, right atrium
	Suppurative pericarditis	
Duration of IE antibacterial treatment	6 weeks from admission (2 weeks after HT)	6 weeks after HT (mediastinitis)
Post-HT immunosuppression	Basiliximab Prednisolone Ciclosporine Mycophenolic acid	Thymoglobulin Prednisolone Ciclosporine Mycophenolic acid
Duration of follow-up after HT	9 years	3 years

HT for untractable IE: literature review (2014)

Patient	Sex, age (y)	Cardiac lesions	Microbiology
1	Female, 25	Mitral and aortic valves, prosthetic	*Mycoplasma hominis*
2	M		*Staphylococcus*,
3	Fe		*ermidis*
4	M		
5	M		
6	Female, 44	Intracardiac deformation (vegetations) Previous HT for hypertrophic cardiomyopathy	Methicillin-resistant *Staphylococcus epidermidis*
7	Male, 31	Aortic valve, prosthetic	*Brucella melitensis*
8	Male, 17	Marfan syndrome, prosthetic aortic valve	Culture-negative endocarditis
9	Male, 28	Aortic valve, native	MRSA
10	Male, 58	Mitral valve, rosthetic, pacemaker, Bentall	*Propionibacterium acnes*

100% survival

- Median F-U, 27.5 months
- Range 3 months - 18 years

Aymami M et al. Clin Microbiol Infect 2015

Project group

J Miro, P Munoz, A Moreno, C Mestres

- **International, multicenter, retrospective study**
  - Inclusion: heart transplant performed as ‘salvage’ during the acute phase of IE
  - Follow-up > 3 months

- **Methods**
  - Rio, ISCVID meeting, 2015
  - ICE participating sites (Mailing list)
  - Standardized questionnaire derived from the ICE CRF

ICE site	HT DATE
MEDELIN	12 / 04 / 1991
MADRID	16 / 11 / 1997
CHARLESTON	23/02/2004
BARCELONA	03/09/2004
LYON	03/11/2004
MADRID	02/09/2005
PARIS	29/04/2006
LYON	22/07/2008
BARCELONA	29 / 05 / 2010
MADRID	17 / 07 / 2011

Spain, n=9
France, n=6

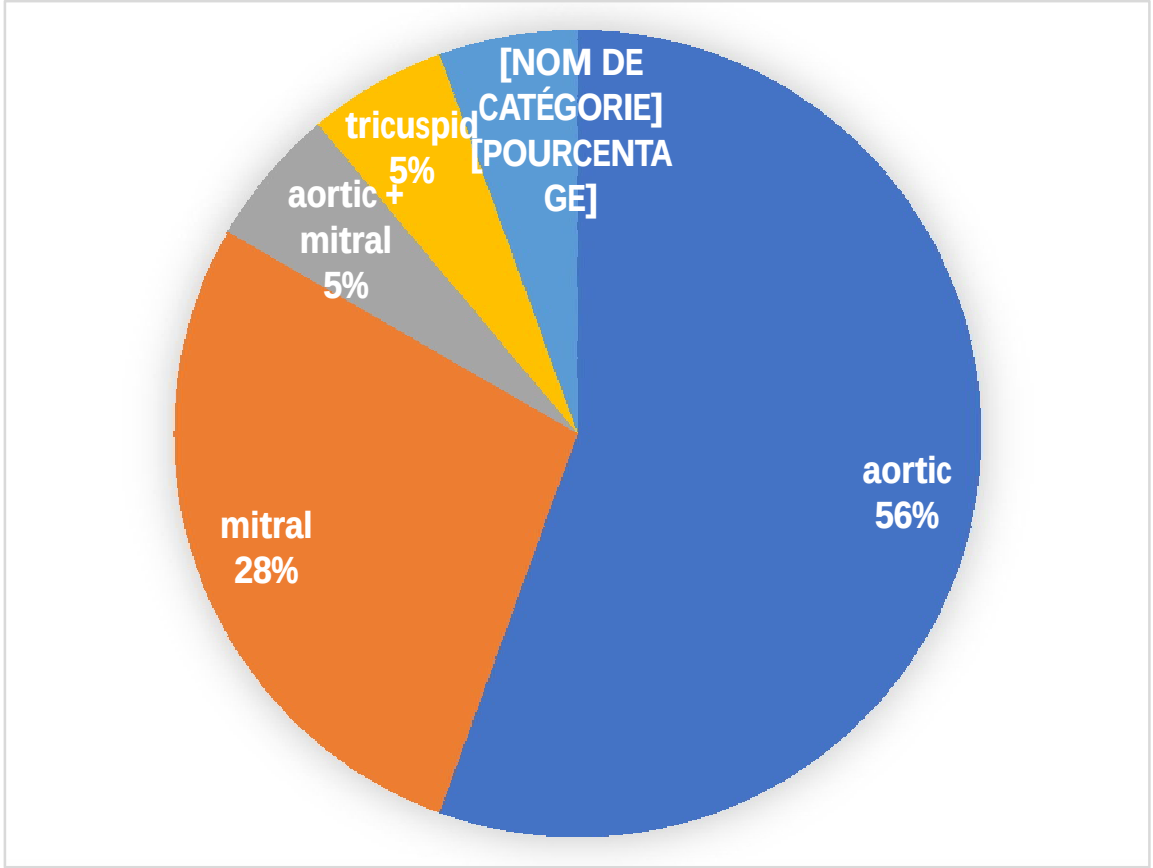
device, Rheumatic Heart Disease (n=1)

IE characteristics

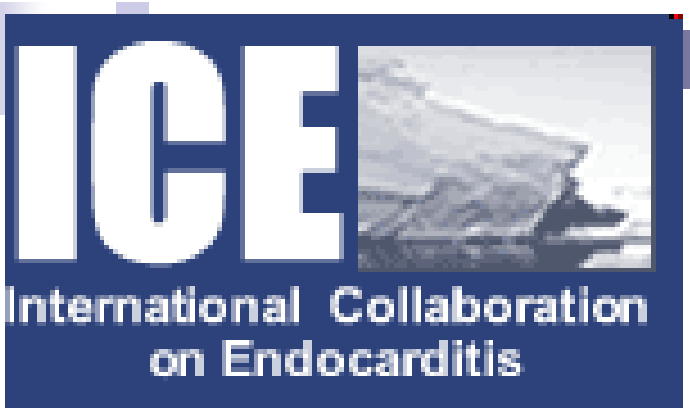
- Mostly acute

(symptoms <1 month, n=16)

- Native valve IE, n=9
- Prosthetic valve, n=10



International Collaboration on Endocarditis

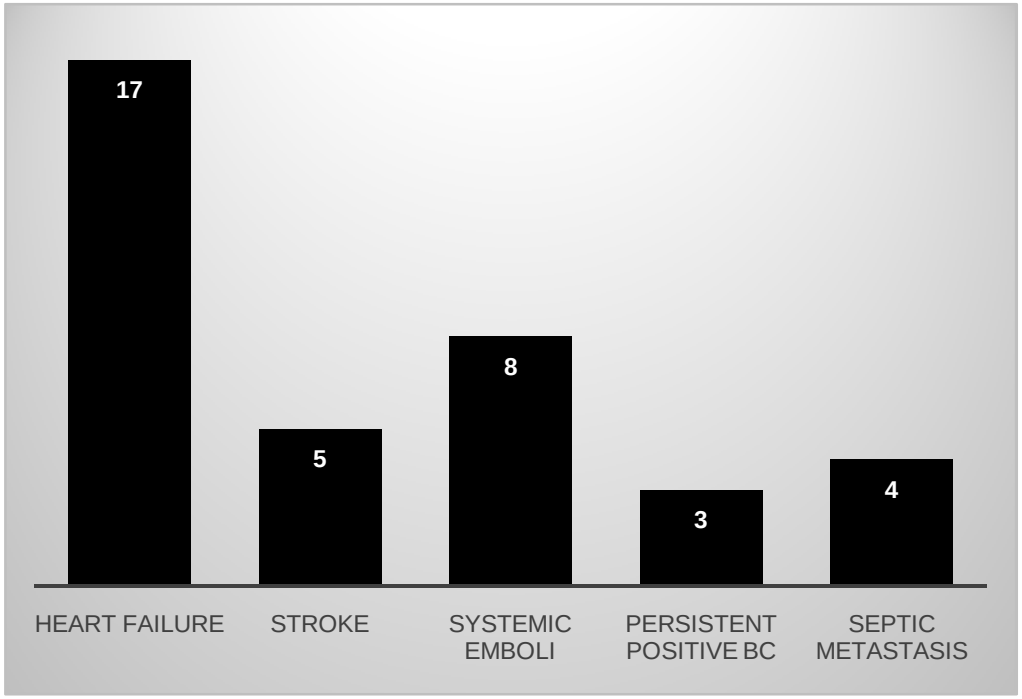


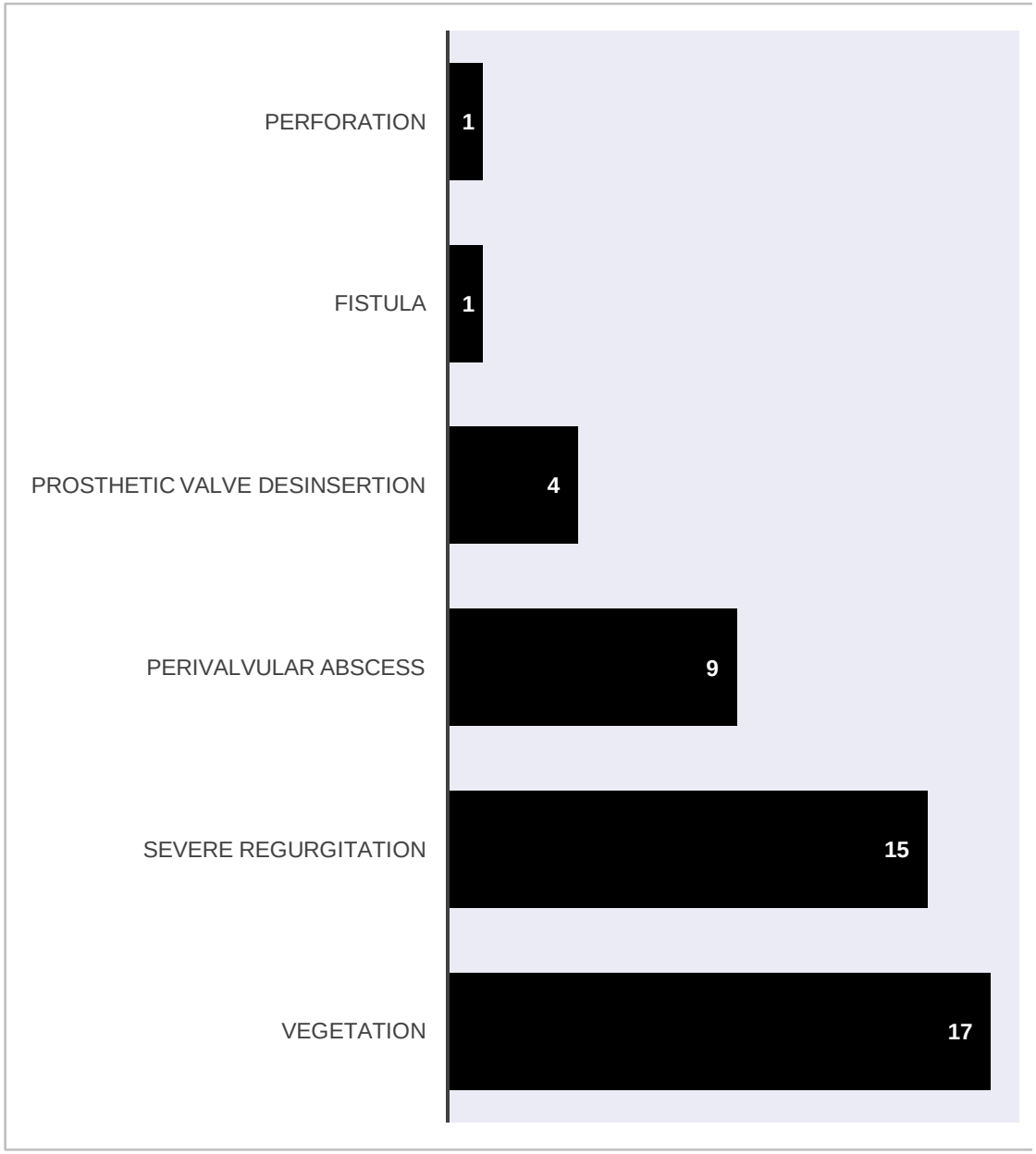
Microbiology

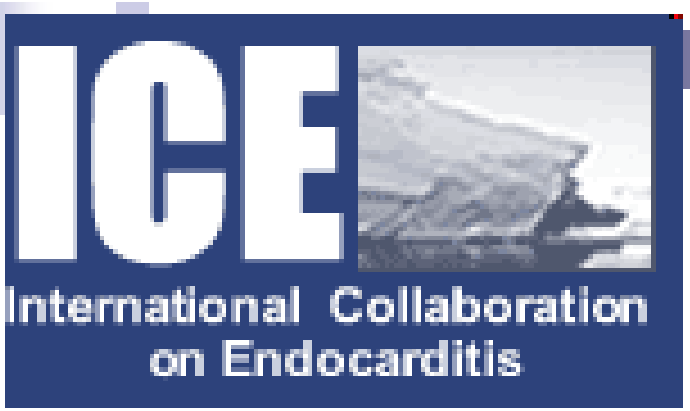
- *Streptococcus oralis*, n=4
- MSSA, n=3
- MRSA, n=2
- *Enterococcus faecalis*, n=2
- *S. viridans, S. constellatus, S. mutans, Mycoplasma hominis, Haemophilus para-influenzae, Candida albicans*

NB. Two cases remained undocumented

Complications





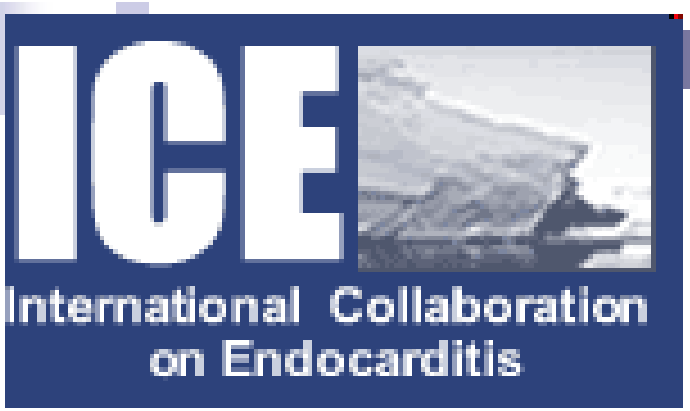


Cardiac surgery before HT

- **17 patients** (including 2 with 2 surgeries)
- Valvular replacement

- **Delay between admission and first surgery**
  - **Median 3 days (IQR 0-8)**
- **Indication(s) for HT**
  - **Heart failure, n=17 => 4 assistance (2 LVAD, 2 ECMO)**
  - **Life-threatening paravalvular lesions, n=9**

International Collaboration on Endocarditis



Heart transplant

- **Delay between 1st surgery and heart transplant**
  - **Median 28 days (IQR 18-71)**
- **Complications**
  - **Rejection (n=5), CMV infection (n=2),**
  - Other (n=1): **2nd HT**, CAD, kidney transplant, thrombotic microangiopathy
  - **Death, n=6** (**first month post HT, n=4;** 2 and 11 years post HT)
  - **13 patients survived (68%),** median F-U post HT 44 months (IQR 13-88)

Heart transplant as salvage treatment for IE: conclusions

- **HT not contra-indicated, but still rarely performed**
  - Rennes: IE = 3% of all indications for HT; HT = 5% of all cardiac surgery for IE
  - Barcelona: IE = 2% of HT (6/334), and HT = 1% of surgery for IE (6/478)
- **Selected patients**
  - Young (median, 52 years), limited comorbidities
- **Usual scenario**
  - Sepsis controlled
  - Life-threatening cardiac lesions, can't be fixed by cardiac surgeons anymore
- Outcome similar to other indications for HT (65% survival 5 years ?)

Gracias !

Heart transplant for IE Project investigators

Co-coordination: J. Miro, P. Munoz, A. Moreno, C. Mestres

- **Barcelona**

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