

Surgery for Infective Endocarditis Complicated by Cerebral Embolism - A Consecutive Series of 375 Patients -

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Disclosures

Speaker Honoraria: Sorin, St. Jude Medical, Medtronic

Background

- No changes of incidence of infective endocarditis (IE) during the past decades **Moreillon, Lancet 2004**
- 40 - 50% involve the aortic valve **Wallace, Heart 2002**
- 3 - 10 episodes / 100,000 person-years (NVE)
Habib, Eur Heart J 2009
- 0.2 to 1.4 episodes / 100 patients-years (PVE)
Mylonakis, NEJM 2001

Important Aspects

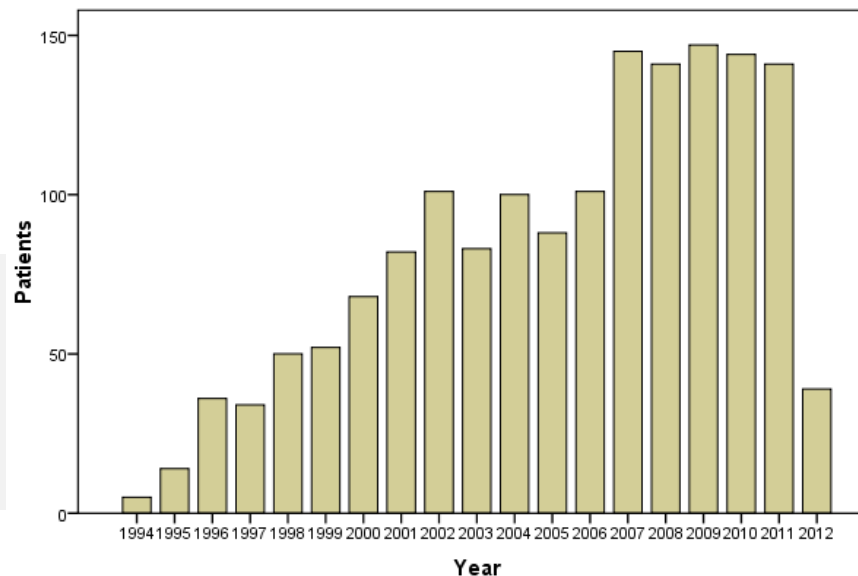
- Surgery on the basis of vegetations alone remains controversial **Chu, Circulation 2004; Deprele, Clin Microbiol Infect 2004**
- Potential risk of embolization may significantly increase with vegetations $\geq 10\text{mm}$ **Deprele, Clin Microbiol Infect 2004; Vilacosta, JACC 2002; Di Salvo, JACC 2001**
- Maybe higher risk for embolization in MV endocarditis compared to AV endocarditis **Cheiro, Arch Intern Med 2000**
- PVE and NVE with st. aureus >>> almost always surgery required **DiSalvo, JACC 2001; Jaffe, JACC 1990**

Neurological Complications

- Different clinical presentations (stroke, TIA, silent,...)
- Incidence of stroke up to 40% **Cooper, Circulation 2009**
- Silent / subclinical brain embolisation up to 48% **Cooper, Circulation 2009; Snygg-Martin, Clin Infect Dis 2008**
- Optimal timing for surgery (?) < 72h, > 4 weeks **Angstwurm, J Neurol 2004**
- Risk is increased before onset of antibiotic treatment
Thuny, Eur Heart J 2007; Heiro, Arch Intern Med 2000
- Cerebral hemorrhage (≈5%) has poorer outcome and requires different strategies **Derex, J Neurol 2010**
- Risk of complications during/after surgery may be lower than expected **Snygg-Martin, Clin Infect Dis 2008**

Patients and Methods

- 1571 consecutive patients with infective endocarditis between 05/1995-03/2012
- **375 patients** had confirmed cerebral embolism by preoperative routine CT scans (24%)
- Mean follow up: 3.1 ± 3.8 years (range: 0.1-16.9 years)



Preoperative Patient Characteristics

Mean age	61.8 ± 13.6 years
Male	266 (70.9%)
Left-sided endocarditis	362/375 patients (96.5%)
Single aortic valve	N=165 (44%)
Single mitral valve	N=133 (35.5%)
Combined aortic and mitral	N=64 (17.1%)
Prosthetic valve endocarditis	N=90 (24%)
Prior cardiac surgery	N=102 (27.2%)
S. Aureus	N=143 (38.1%)
MRSA	N=11 (2.9%)
Logistic EUROScore	43.1 ± 25.4

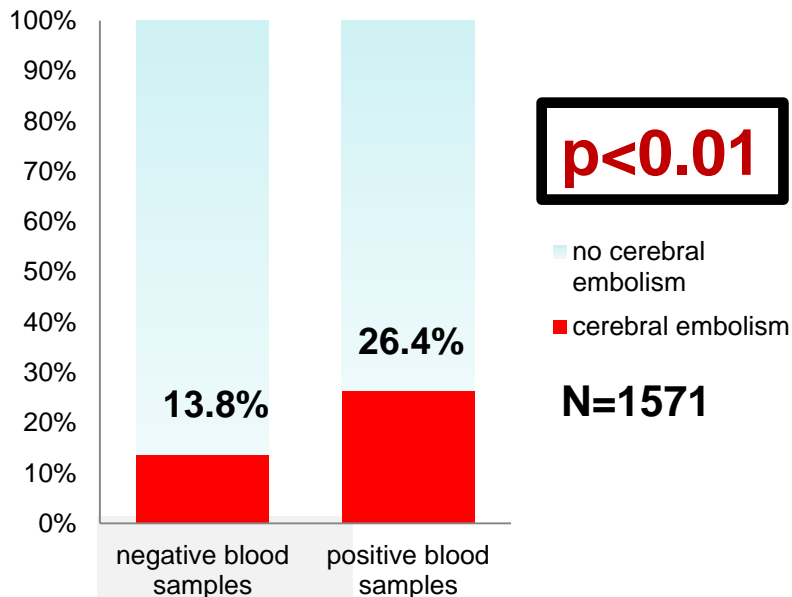
Results

- Cerebrovascular Manifestations -

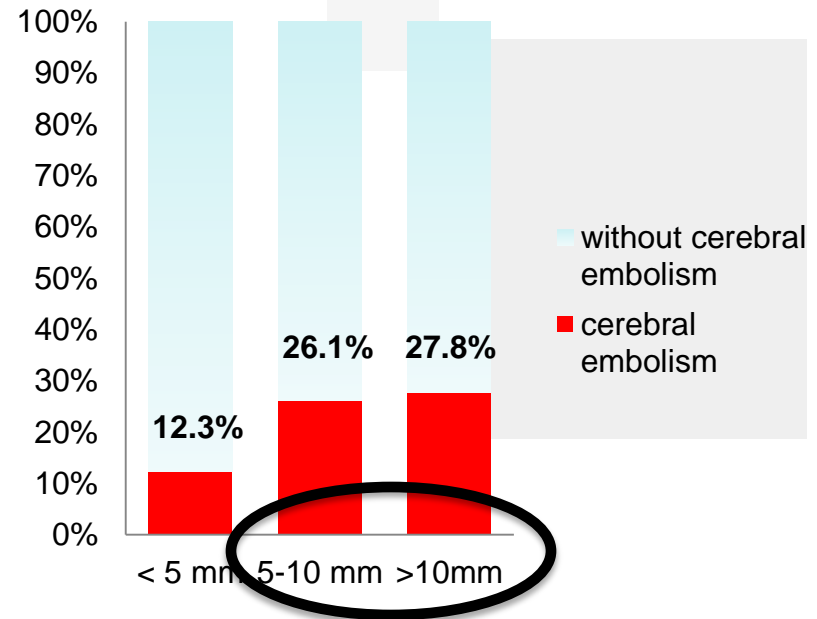
Silent embolism / TIA	N=135	(36%)
Symptomatic embolism	N=240	(64%)
Stroke	N=110	(29%)
PRIND	N=57	(15%)
TIA	N=22	(6%)
Meningitis/septic encephalitis	N=11	(3%)
<i>Seizures</i>	N=8	(2%)
<i>Altered level of consciousness</i>	N=60	(16%)
Intracerebral bleeding	N=5	(1%)

Results

Cerebral embolism and +/- blood culture results



Rate of cerebral embolism and size of vegetations



➤ Rate of **silent cerebral embolism** in patients with prosthetic valve endocarditis: **37.8%**

Postoperative Neurological Outcome

	Silent embolism/TI A	Symptomatic embolism	total	p
Hemiparesis	12/135	18/240	32/375	0.69
Intracerebral hemorrhage	NO statistical difference in neurological outcome!			0.71
Seizures				0.73
Altered level of consciousness	7/135	17/240	24/375	0.52

Mortality

	Silent embolism/TIA	Symptomatic embolism	<i>p</i>
Hospital mortality	21.4 %	19.6 %	0.68
@ 1 year	56±5 %	59±3 %	0.77
@ 5 years	45±5 %	47±4 %	0.83
@ 10 years	40±6 %	32±5 %	0.86

Reasons for Hospital Death (N=81, 22%)

Septic shock with multi-organ failure

N=32 (40%)

Cardiac (LCO)

N=18 (22%)

Cerebral complications

N=12 (15%)

Gastrointestinal

N=7 (9%)

Haemorrhagic shock

N=4 (5%)

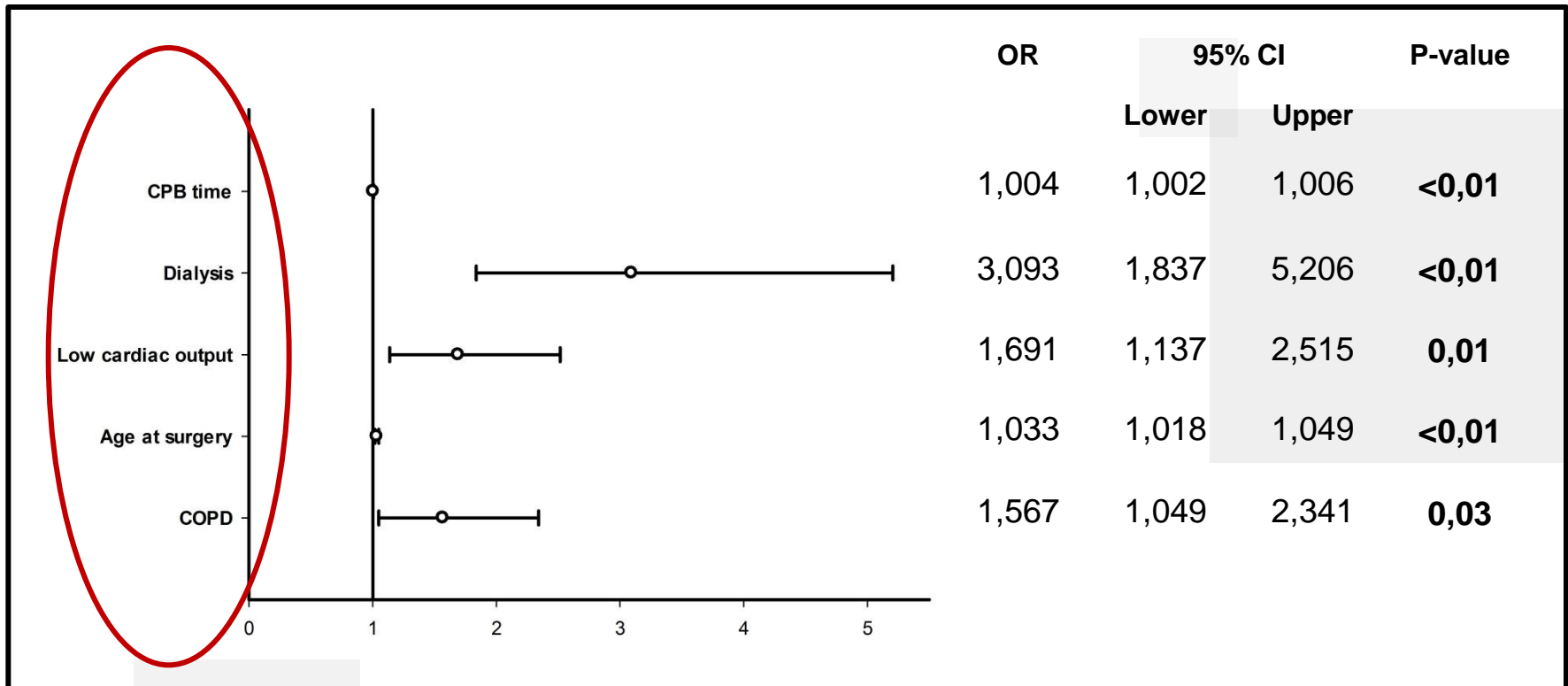
Pulmonary complications

N=2 (2%)

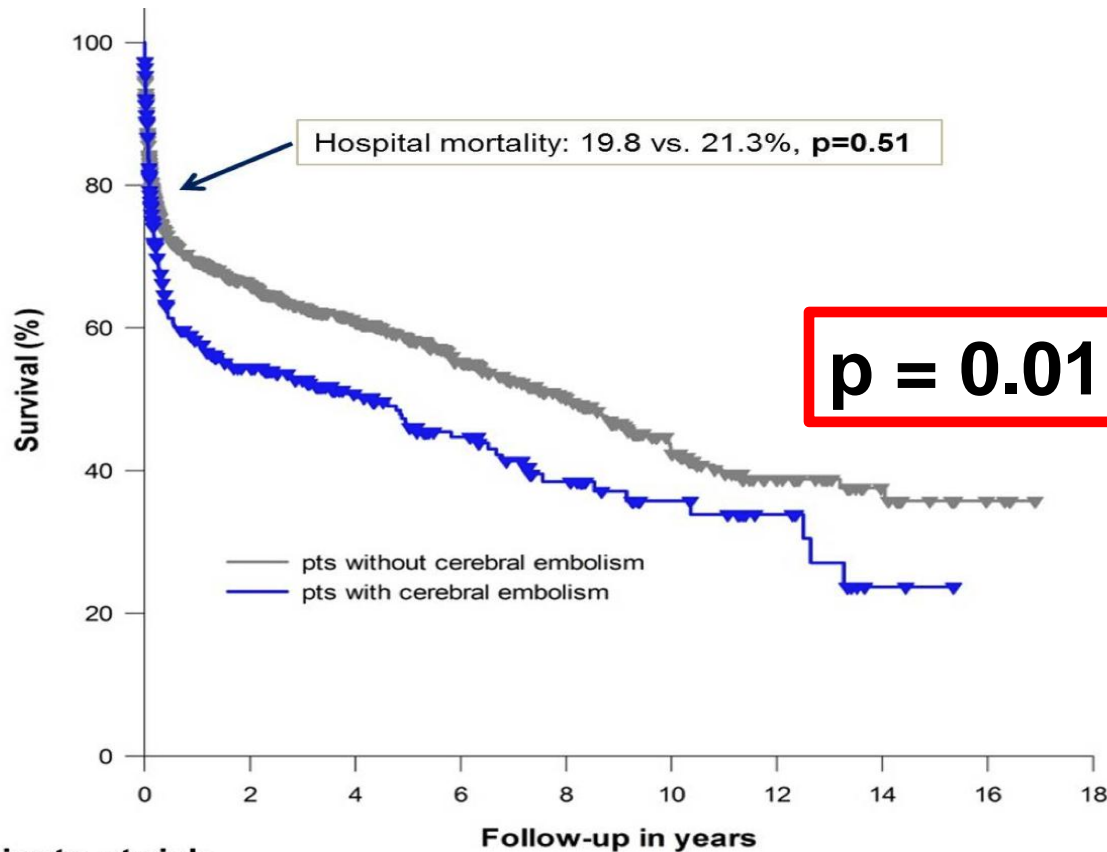
Other

N=6 (7%)

Independent Risk Factors for Mortality



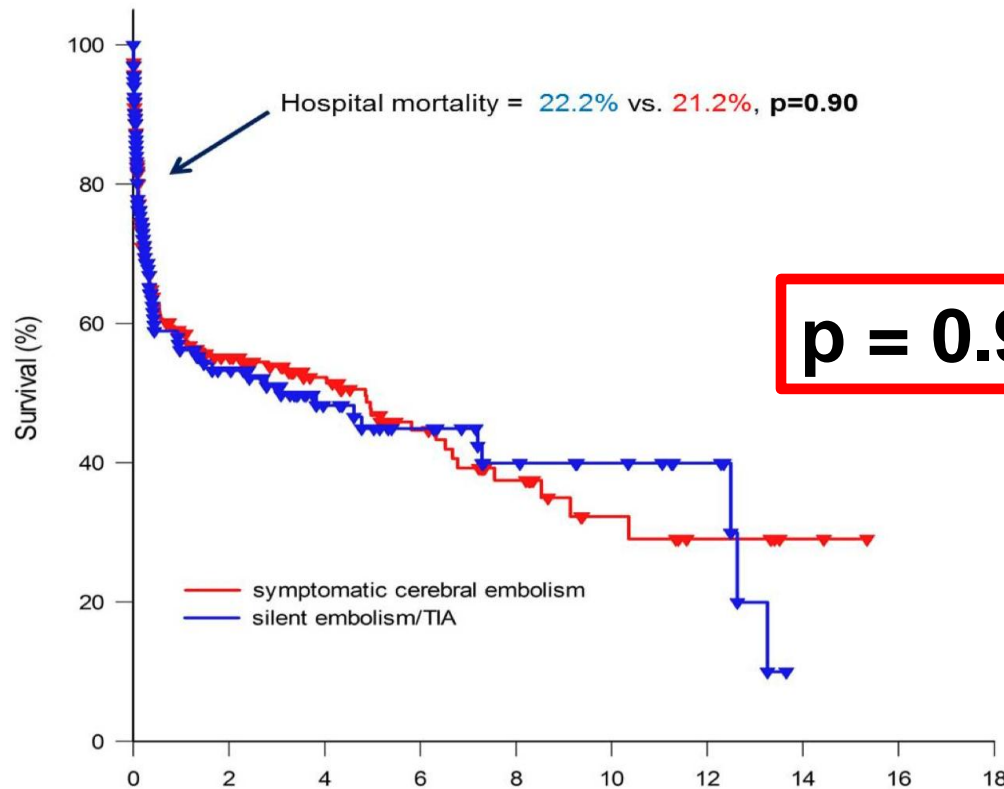
Long-term Survival: Cerebral Embolism Versus no Cerebral Embolism



Patients at risk

1192	580	408	279	176	90	44	21
375	142	93	60	36	21	12	2

Long-term Survival: Silent Embolism Versus Symptomatic Embolism



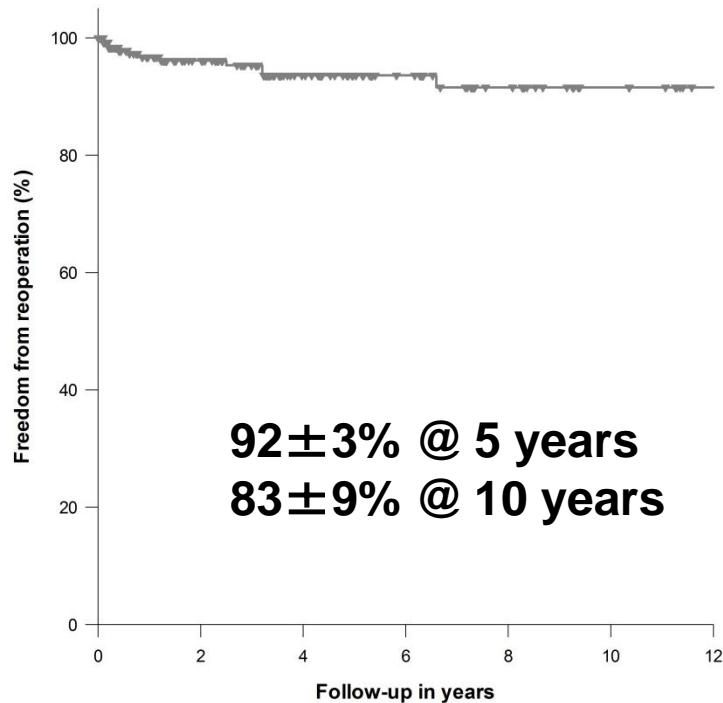
Patients at risk

0	2	4	6	8	10	12	14	16	18
240	78	54	32	17	9	4			
135	44	28	20	13	9	5			

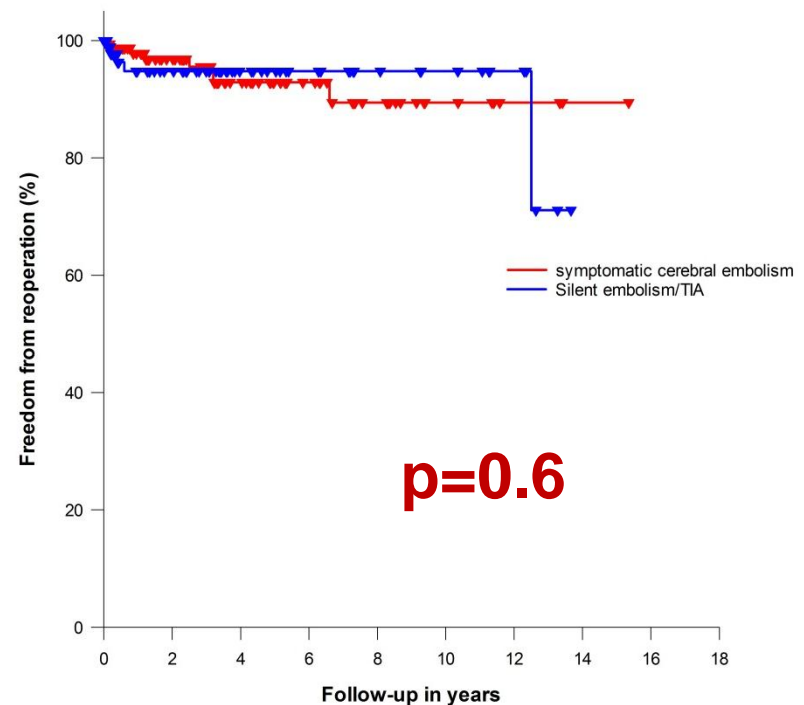
Follow up in years

Freedom from Reoperation

Patients with cerebral embolism



Symptomatic vs. silent embolism



➤ 13 patients (3.5%, **6 pts** vs. **7 pts**) needed re-op due to PVE
@ a mean of 2.08 ± 3.65 years (median: 5 months)

Conclusions

- Silent **cerebral embolism** is frequent in patients with infective endocarditis
- Cerebral embolism is a **predictor of an unfavourable short *and* long-term outcome**
- Long-term survival in patients with cerebral embolism is **independent of actual symptomatology**
- Embolism was **independent with regard to size of primary vegetation**
- Routine **preoperative CT scans** are necessary in order to detect silent embolism

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