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18^{èmes} journées françaises
pratiques de rythmologie
& de stimulation cardiaque

5-6 DÉCEMBRE 2024

HOTEL VILLA MASSALIA,
MARSEILLE | FRANCE

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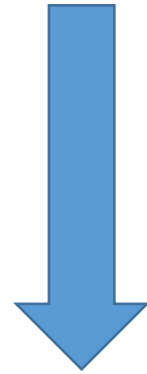
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IMPLANTE / IMPLANTE PAS

Endocardite Infectieuse et Explantation

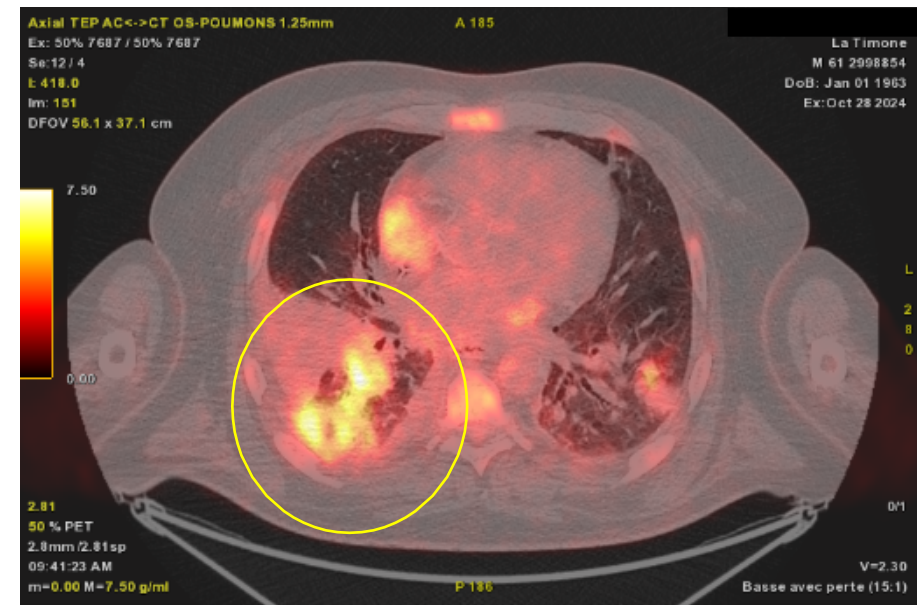
Dr J. Hourdain
CHU Timone Marseille

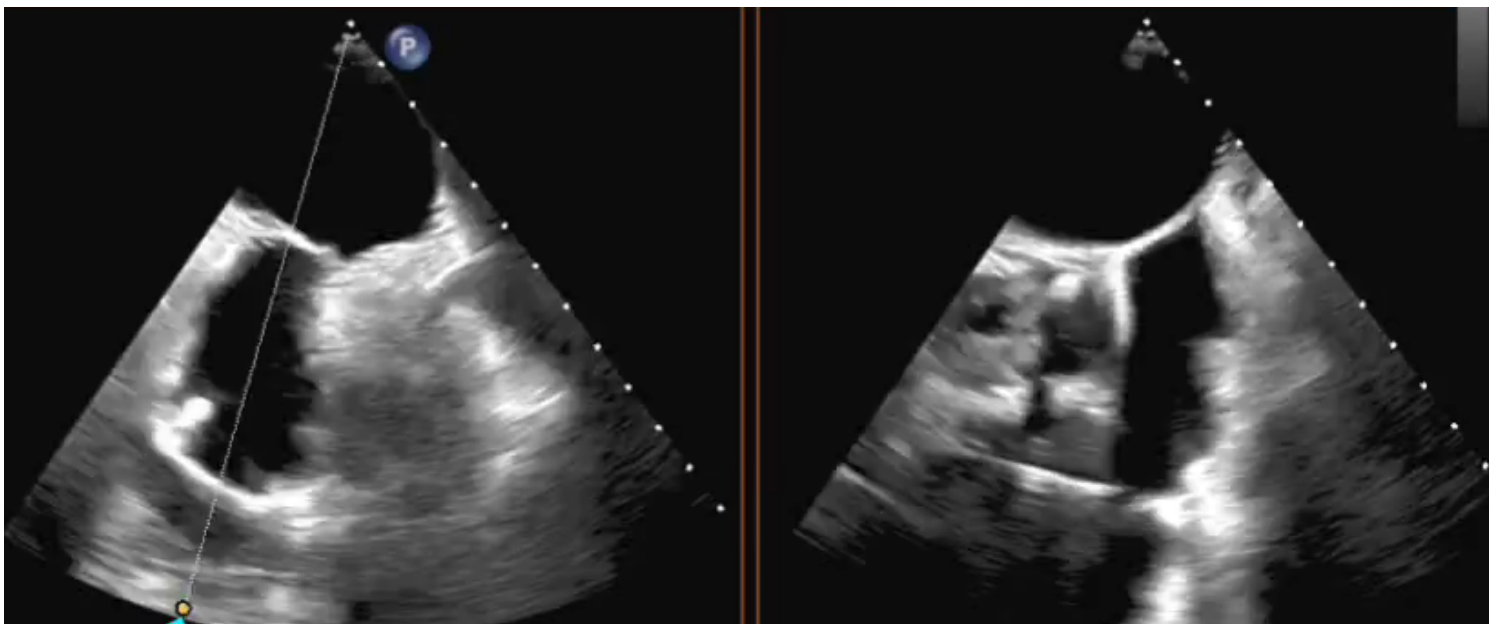
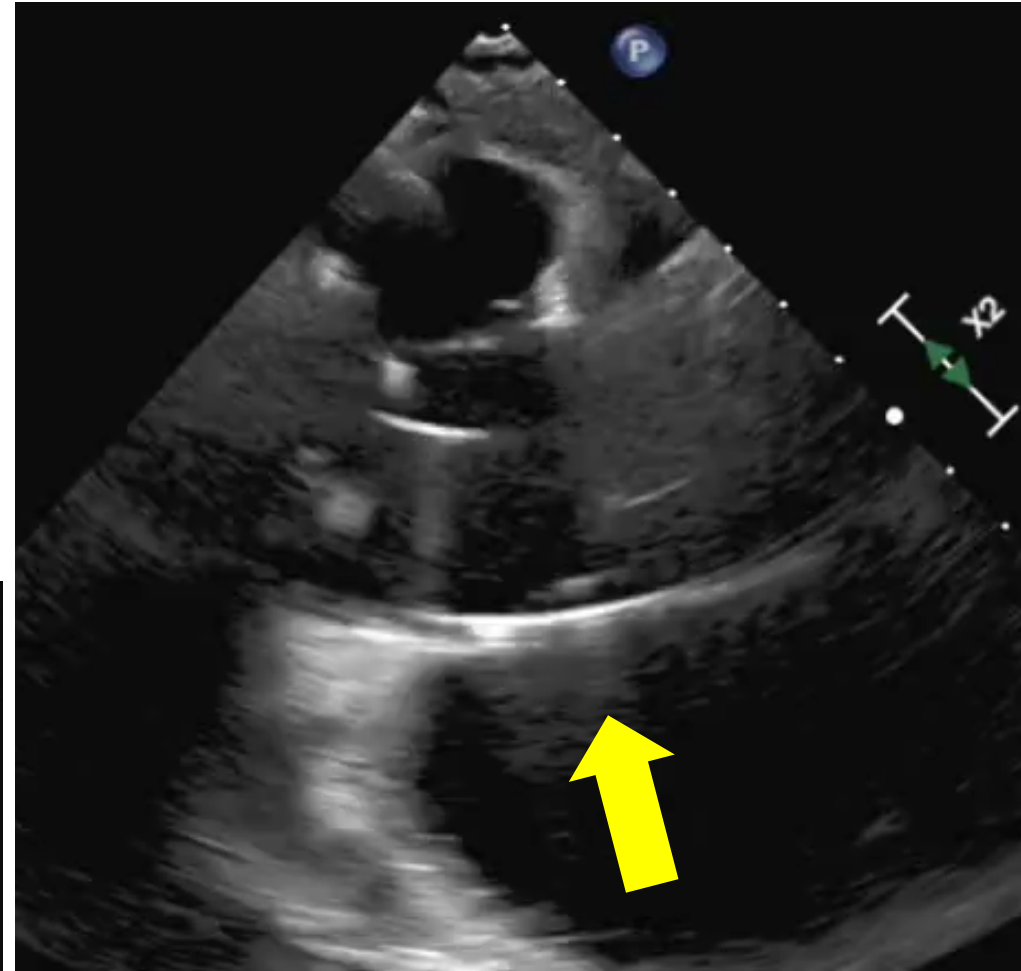
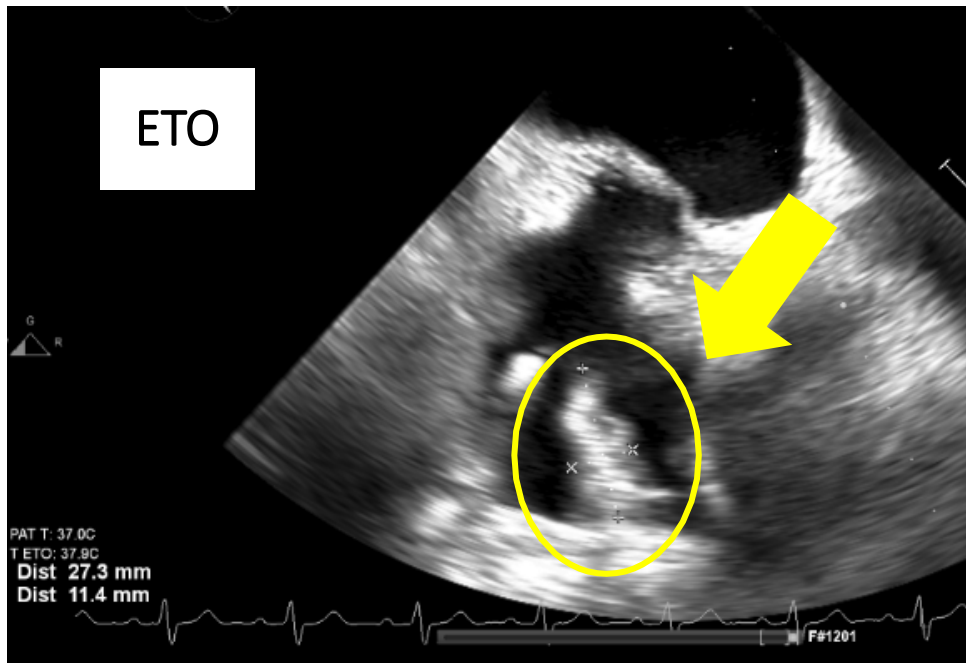
- 61 ans - Coronarien
- Primo implantation PM DC 2010: BAV complet paroxystique
- Upgrading CRT P 2023 pour dégradation FEVG devenu stimulo-dpdt



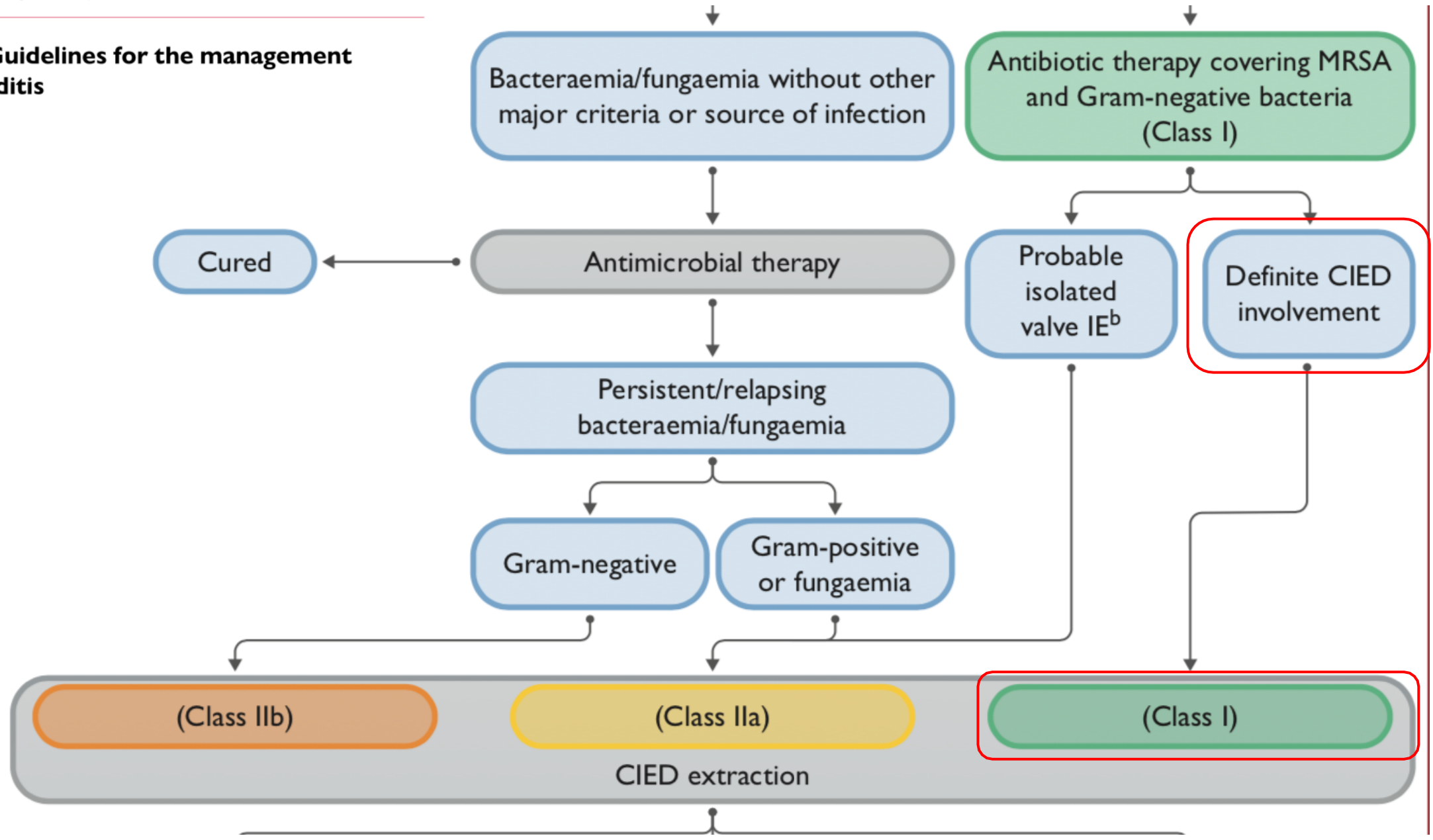
1 an – bon répondeur

- Pneumopathie résistante ATb
- Hémocs + à E faecalis





2023 ESC Guidelines for the management of endocarditis



Extraction certaine mais comment ?

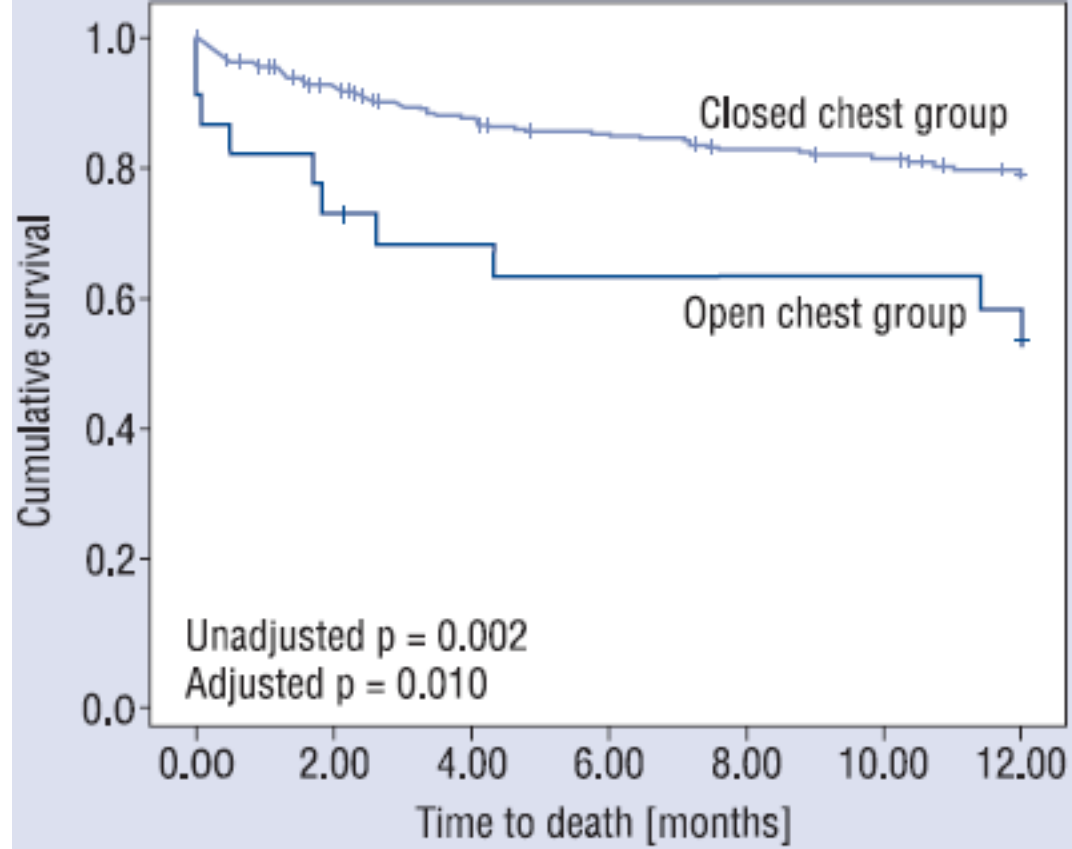


Endocavitaire



Chirurgicale

Large vegetations may be aspirated percutaneously before lead extraction to reduce risk associated with embolization.⁷⁰⁵ Surgical lead extraction should be considered in case of large vegetations (e.g. >20 mm)⁶⁷⁹ and if aspiration is not available or is unsuccessful. Surgical removal is also the preferred technique if valve surgery is indicated. Hardware retrieved from extraction, especially the lead tip, should be cultured.⁷⁰⁶ Sonication has been shown to increase diagnostic yield.^{707,708}



Variable	Open thoracotomy (n = 24)	Percutaneous techniques (n = 329)	P
Need for concomitant heart surgery:	67%	0%	< 0.001

Table 2. Mortality and non-lethal complication rates for the two study groups.

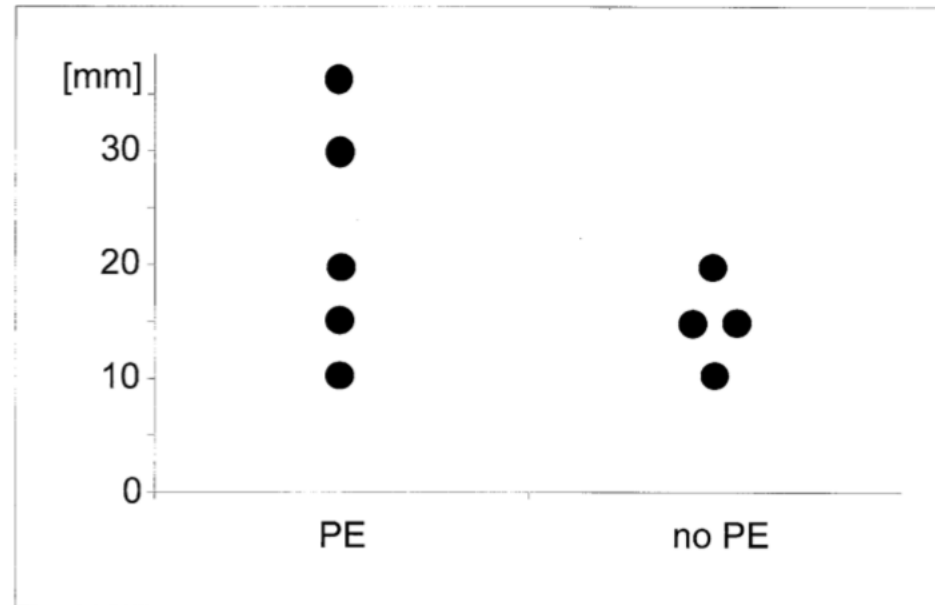
Adverse events	Open thoracotomy	Percutaneous techniques	P
Deaths after 30 days	4/24 (17%)	15/329 (5%)	0.036
Deaths after 6 months	8/24 (33%)	45/329 (14%)	0.020
Deaths after 1 year	10/24 (42%)	61/329 (19%)	0.012
Non-lethal complications during procedure	0/24 (0.0%)	6/329 (2.0%)	0.99
Non-lethal complications 30 days post procedure	2/24 (8%)	22/329 (7%)	0.31
Hospital length of stay [days]	23 ± 15	12 ± 9	< 0.001

Endocardial pacemaker or defibrillator leads with infected vegetations: A single-center experience and consequences of transvenous extraction

Hans K. Meier-Ewert, MD, Mary-Ellen Gray, PAC, and Roy M. John, MD, PhD *Burlington, Mass*

Am Heart J. 2003 Aug;146(2):339-44.

Conclusions Transvenous removal of infected pacemaker leads is an alternative to open-thoracotomy removal of infected leads. Fifty-five percent of patients with vegetations on endocardial leads in our series experienced pulmonary embolism, but neither survival nor length of hospital stay were affected by this complication. (Am Heart J 2003;146:339–44.)



Relation of vegetation size to occurrence of pulmonary emboli (PE).

Extraction Endocavitaire vs chirurgicale?

Endocavitaire

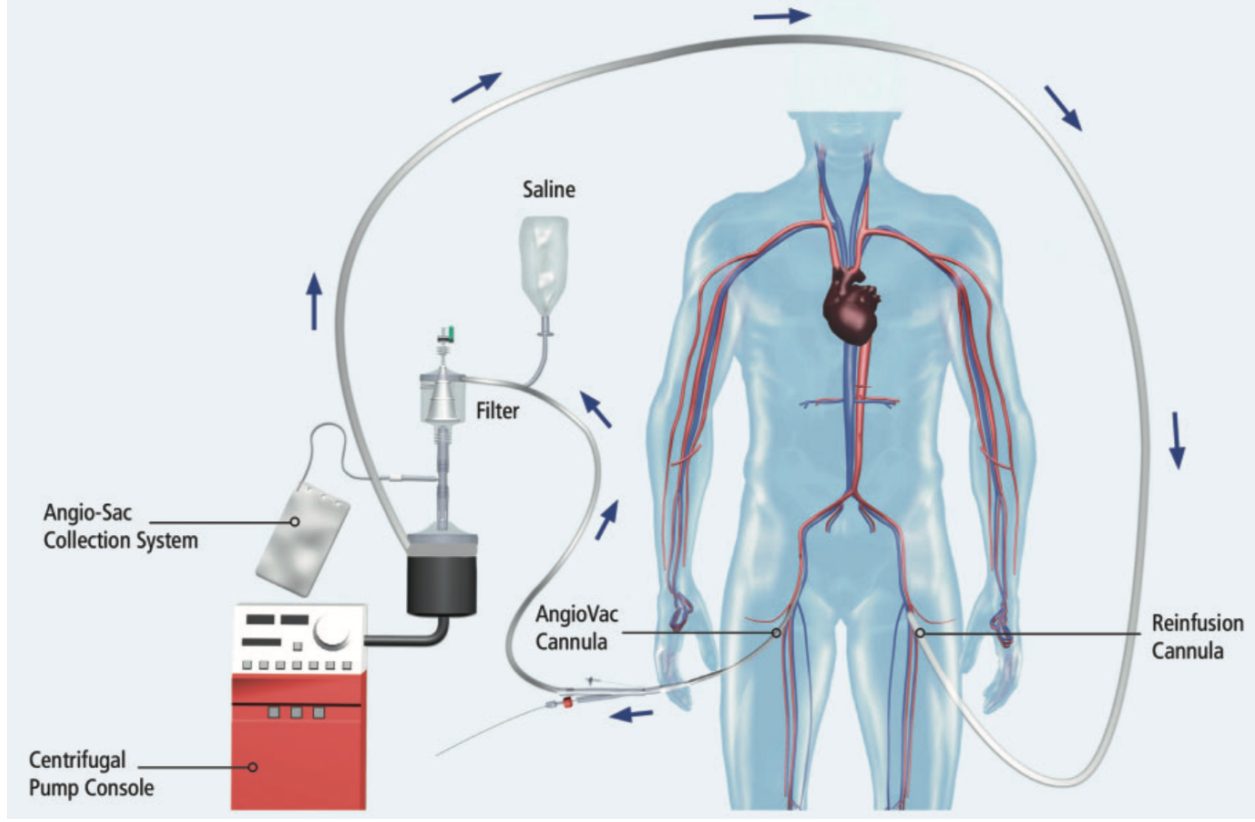
Abord percutané
Reimplantation Controlatérale
DAI

Embolisation et FOP
Lésions V Tricuspidé

Chirurgicale

Pas de Matériel endocavitaire
Reimplantation même tps
Réparation valvulaire associée

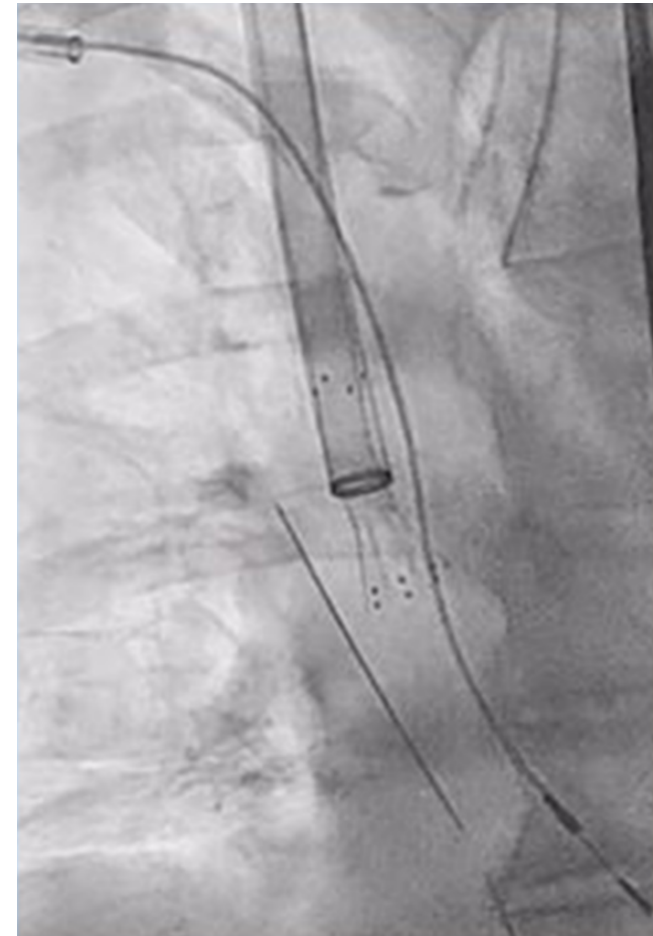
Sternotomie
Paramètres sondes
DAI et resynchronisation



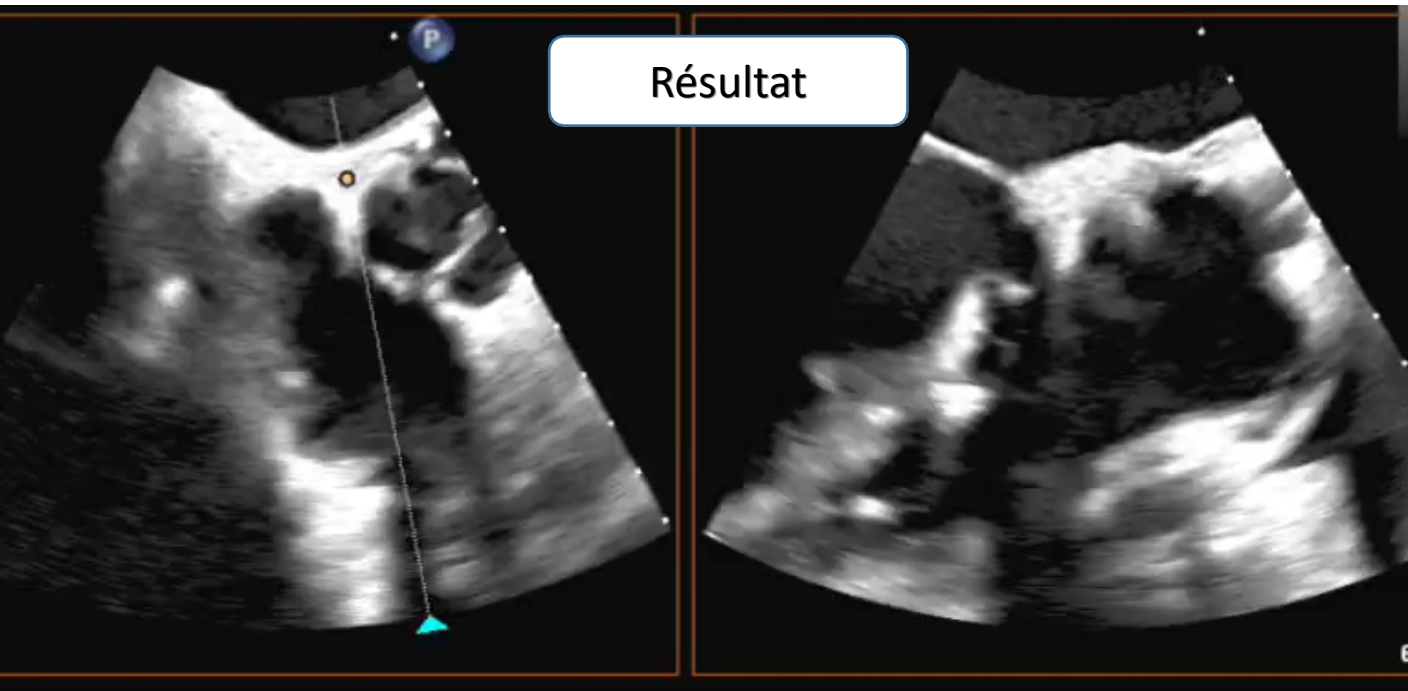
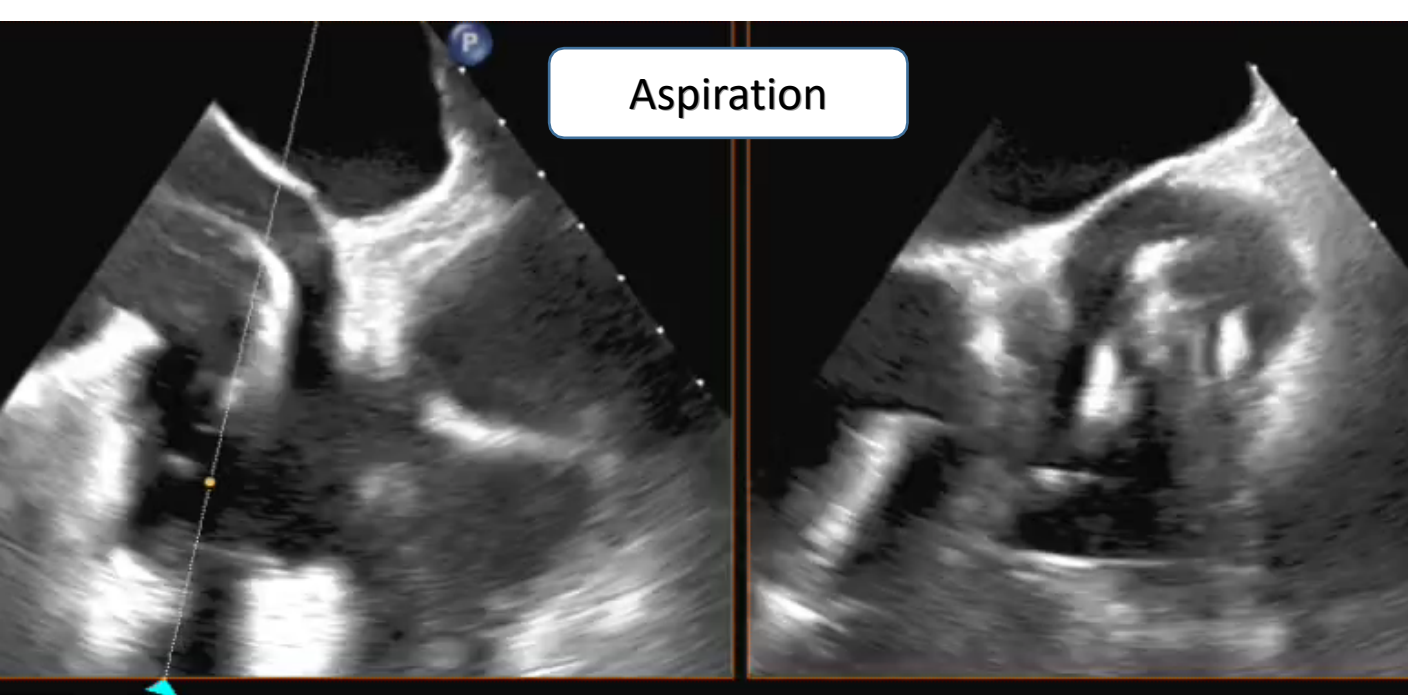
Mean lead vegetation size (mm) (preoperative TOE) 30.7 ± 13.5

Outcome percutaneous aspiration procedure

Complete procedural success	95 (94.0%)
Partial success	5 (5.0%)
Failure	1 (1.0%)
Major complications (device related)	3 (3.0%)



Starck CT, *et al.* Transcatheter aspiration of large pacemaker and implantable cardioverter-defibrillator lead vegetations facilitating safe transvenous lead extraction. *Europace* 2020;**22**: 133–138.





ESC

European Society
of Cardiology

Europace (2020) **22**, 515–516

doi:10.1093/europace/euz246

EHRA CONSENSUS PAPER

The recommended technique for device system removal is percutaneous, transvenous extraction technique. Epicardial leads require surgical removal



105

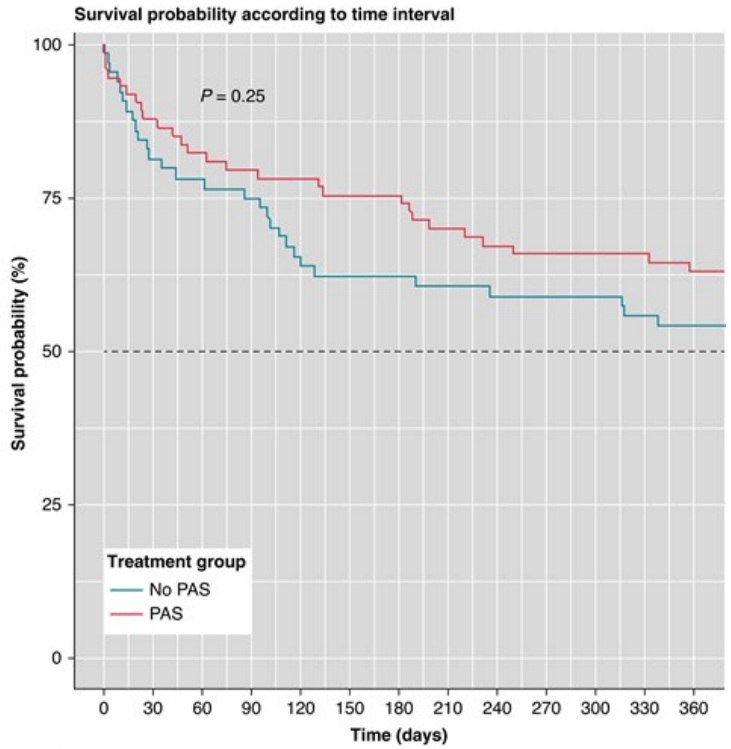
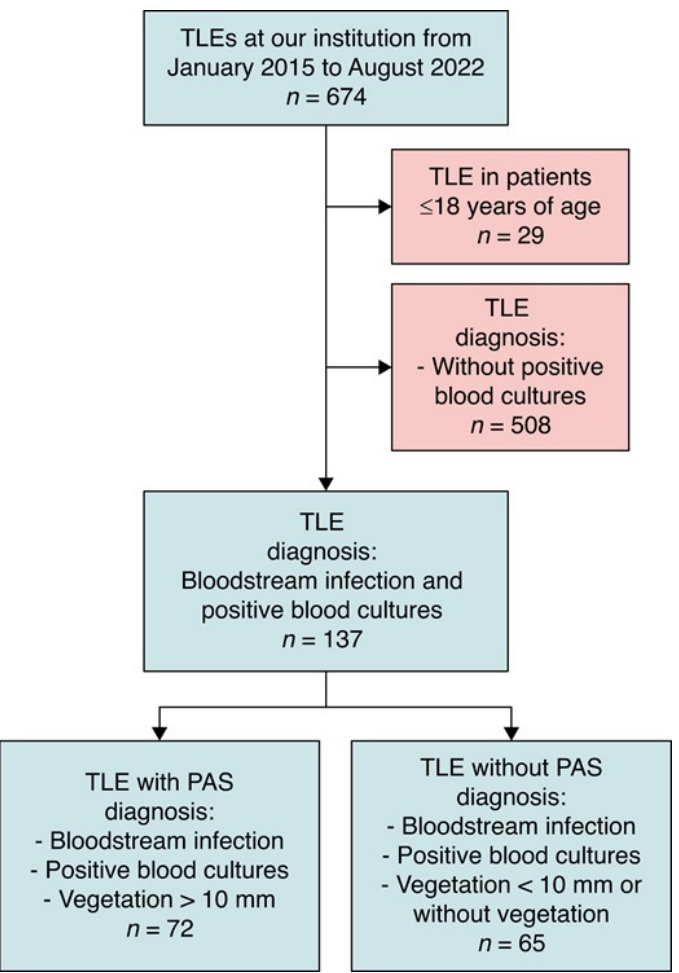
In patients with systemic infection and lead vegetations of approximately >20 mm, percutaneous aspiration of vegetations prior to and during transvenous lead extraction or alternatively surgical extraction may be considered



105–107

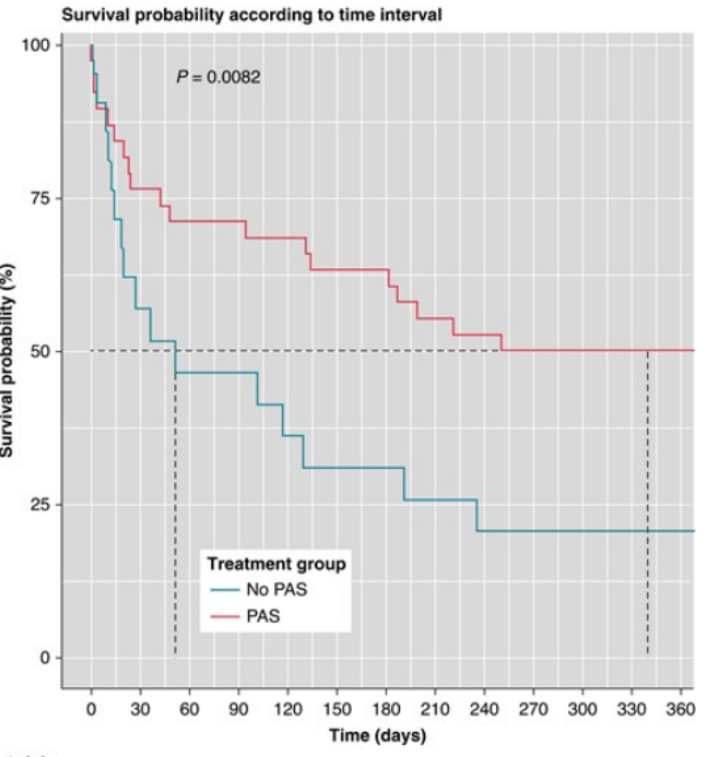
Infectious mass debulking in lead-associated endocarditis with a percutaneous aspiration system

Roland Heck ^{1,2}, Leonard Pitts ^{1,2}, Julius Kaemmel ^{1,2}, Leonhard Wert ^{1,2}, Volkmar Falk ^{1,2,3}, Gerhard Hindricks ^{2,4}, and Christoph Starck ^{1,2,5*}



Number at risk		0	30	60	90	120	150	180	210	240	270	300	330	360
No PAS	No PAS	64	51	49	47	41	39	39	38	37	37	37	35	34
PAS	AngioVac	73	64	60	58	57	55	55	51	49	46	46	46	43

Aspiration précoce









Number at risk		0	30	60	90	120	150	180	210	240	270	300	330	360
No PAS	No PAS	21	11	9	9	7	6	6	5	4	4	4	4	4
PAS	AngioVac	38	29	27	27	26	24	24	21	20	19	19	19	19

After diagnosis of CIED infection, the device removal procedure should be performed without unnecessary delay (ideally within 3 days)



Réimplantation : comment ?

Table 10 Recommendations for preventive strategies after device implantation and for new re-implantations including alternative novel devices

Consensus statement	Statement class	Scientific evidence coding	References
After device extraction, re-assessment of the indication for re-implantation is recommended		O	38,122
Whenever possible, re-implantation may be avoided or delayed until symptoms and signs of systemic and local infection have resolved		O	38,123
A temporary pacemaker with ipsilateral active fixation strategy may be considered in pacemaker-dependent patients requiring appropriate antibiotic treatment before re-implantation		O	124–127
Preferred access sites for replacement device are the contralateral side, the femoral vein, or epicardially		E, O	38,128,129
Temporary pacing in patients who are not pacemaker dependent		O	28
Replacement device implantation ipsilateral to the extraction site		E	38

If CIED reimplantation is indicated after extraction for CIED-related IE, it is recommended to be performed at a site distant from the previous generator, as late as possible, once signs and symptoms of infection have abated and until blood cultures are negative for at least 72 h in the absence of vegetations, and negative for at least 2 weeks if vegetations were visualized.^{701,711}

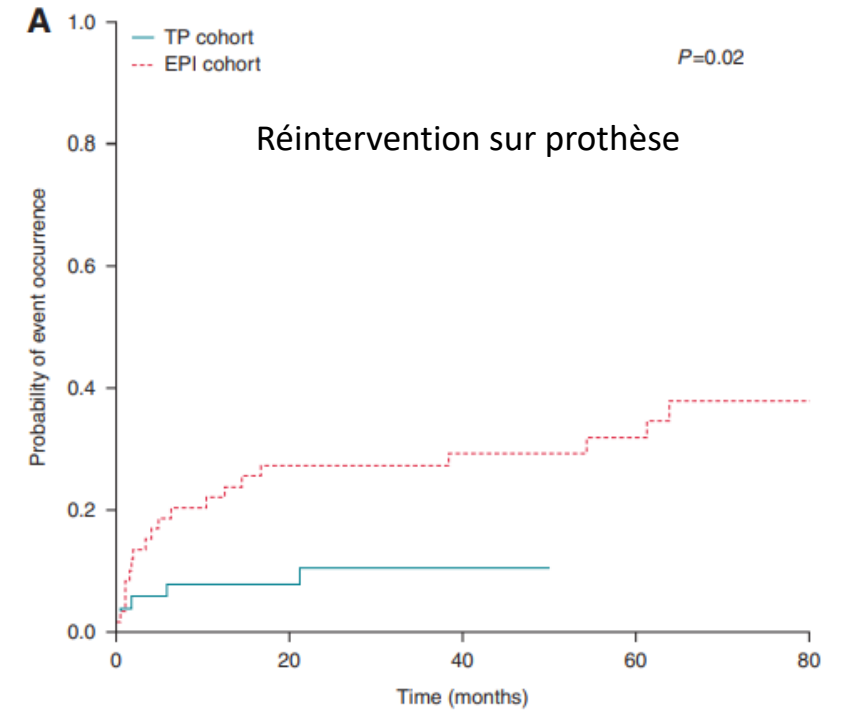
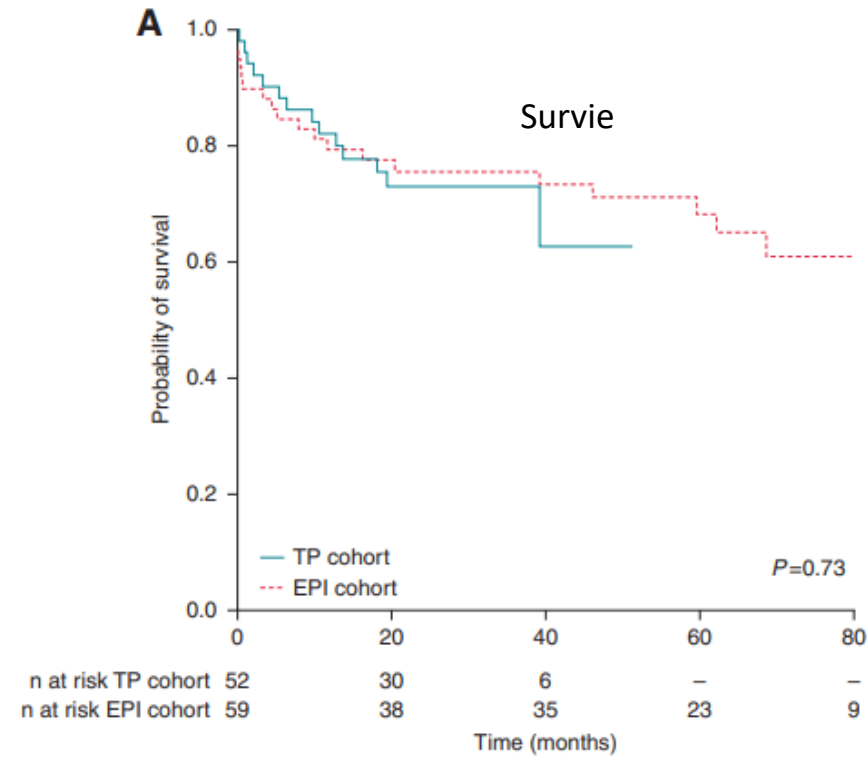
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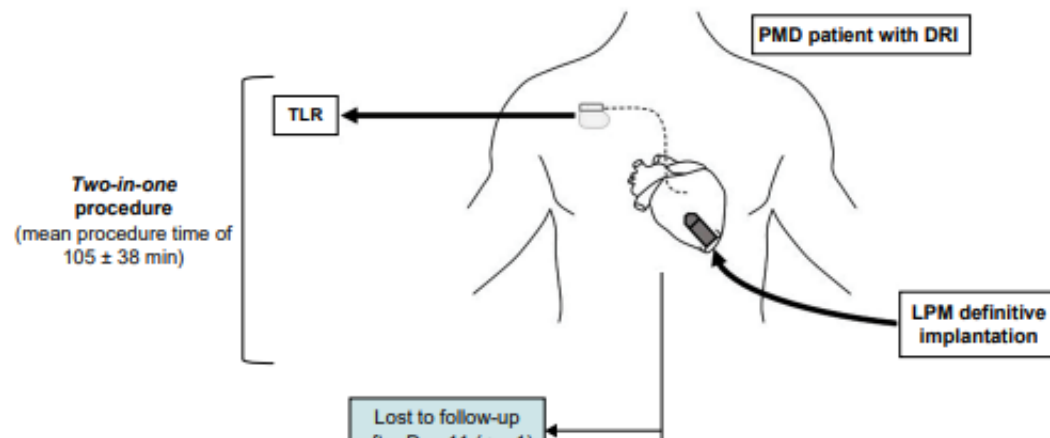
Blomström-Lundqvist, Carina, et al. (EHRA) International Consensus Document on How to Prevent, Diagnose, and Treat Cardiac Implantable Electronic Device Infections—Endorsed by the Heart Rhythm Society (HRS), the Asia Pacific Heart Rhythm Society (APHRS), the Latin American Heart Rhythm Society (LAHRS), International Society for Cardiovascular Infectious Diseases (ISCVID) and the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) in Collaboration with the European Association for Cardio-Thoracic Surgery (EACTS). *EP Europace* 22, no. 4 (1 April 2020): 515–49.

Epi vs endocardial reimplantation in pacing dependant patient?

Epicardial reimplantation before TVE
Vs
Temporary pacing after TVE in view
of delayed reimplantation



A Two-in-one procedure (n = 45) successful TLR and simultaneous LPM definitive implantation

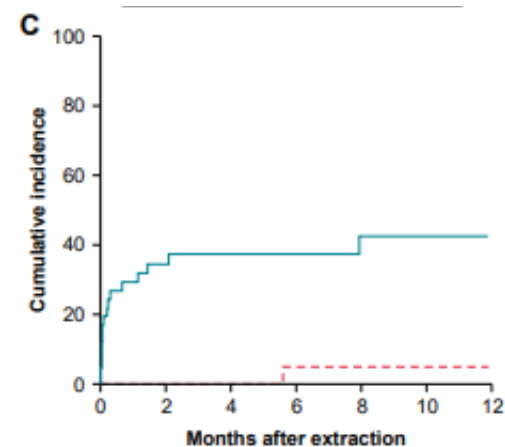
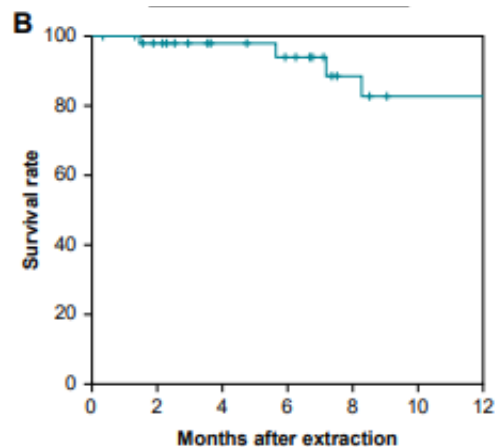


Alternative novel devices as LPM and S-ICD may be considered in selected patients with high infective risk or in patients in whom these devices are considered better options after an CIED infection



Patients r
 • Two died du
 • One died c

	Two-in-one procedure cohort	Historical cohort	P
Number of days alive and out of hospital during the 30 days after the TLR, days	22.2 (8.6)	17.6 (7.3)	0.02
Duration of stay before TLR, days	8.0 (10.6)	4.9 (3.0)	0.13
ICU duration stay, days	1.2 (2.7)	7.0 (4.9)	<0.001
Patients alive at 1 month after TLR with a cured DRI	41 (93.2%)	26(86.7%)	0.35
Complication-free survival rate of patients with a cured DRI at 1 month	27(61.4%)	18 (60.0%)	0.91





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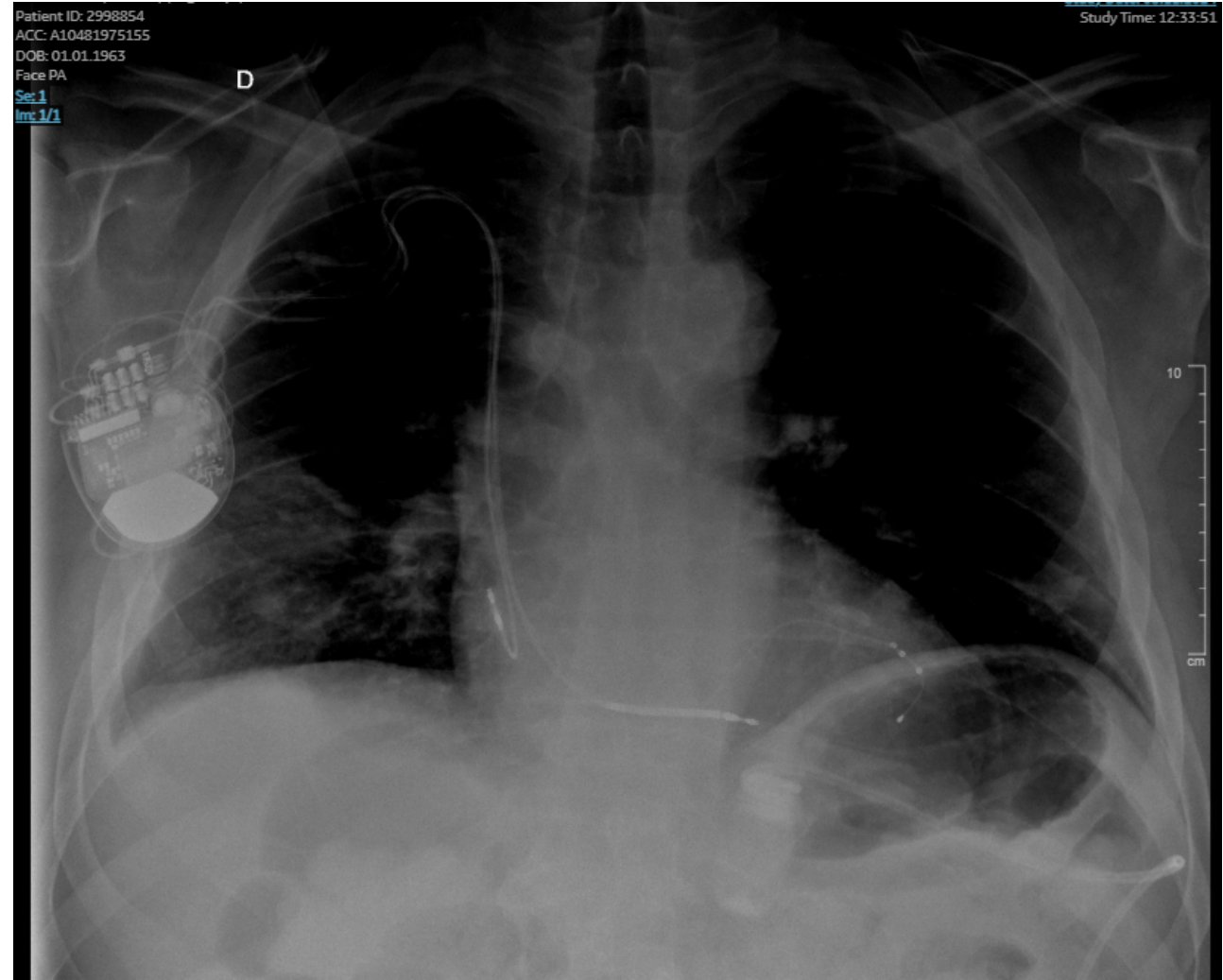
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CRT-D controlatéral
J14 post Extraction





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Conclusion

- EI = Extraction complète
- Extraction = percutanée
- Aspiration végétations
- Réimplantation :
 - Approche multidisciplinaire
 - A distance spatiale et temporelle (séquence rapide possible)