



# ELECTRA



5-6 DÉCEMBRE 2024

VILLA MASSALIA,  
MARSEILLE | FRANCE

18<sup>èmes</sup> journées françaises  
pratiques de rythmologie  
& de stimulation cardiaque

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# Resynchronisation et branche gauche : connectiques et configurations



Marchand Hugo

05/12/2024





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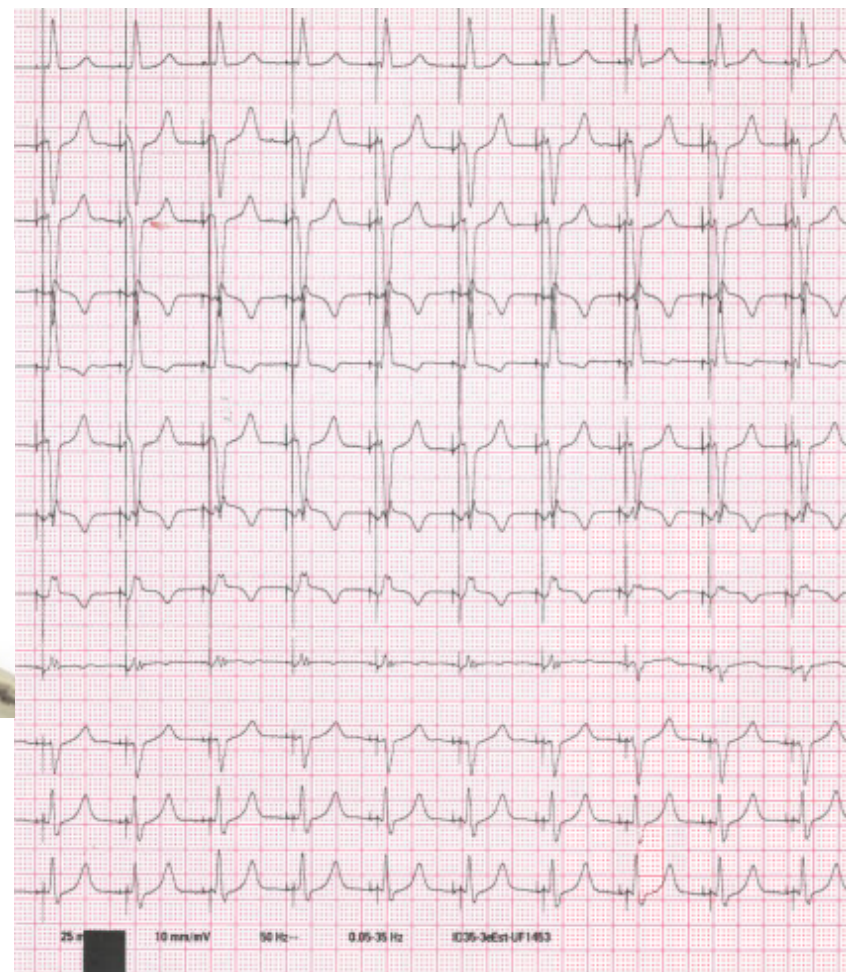
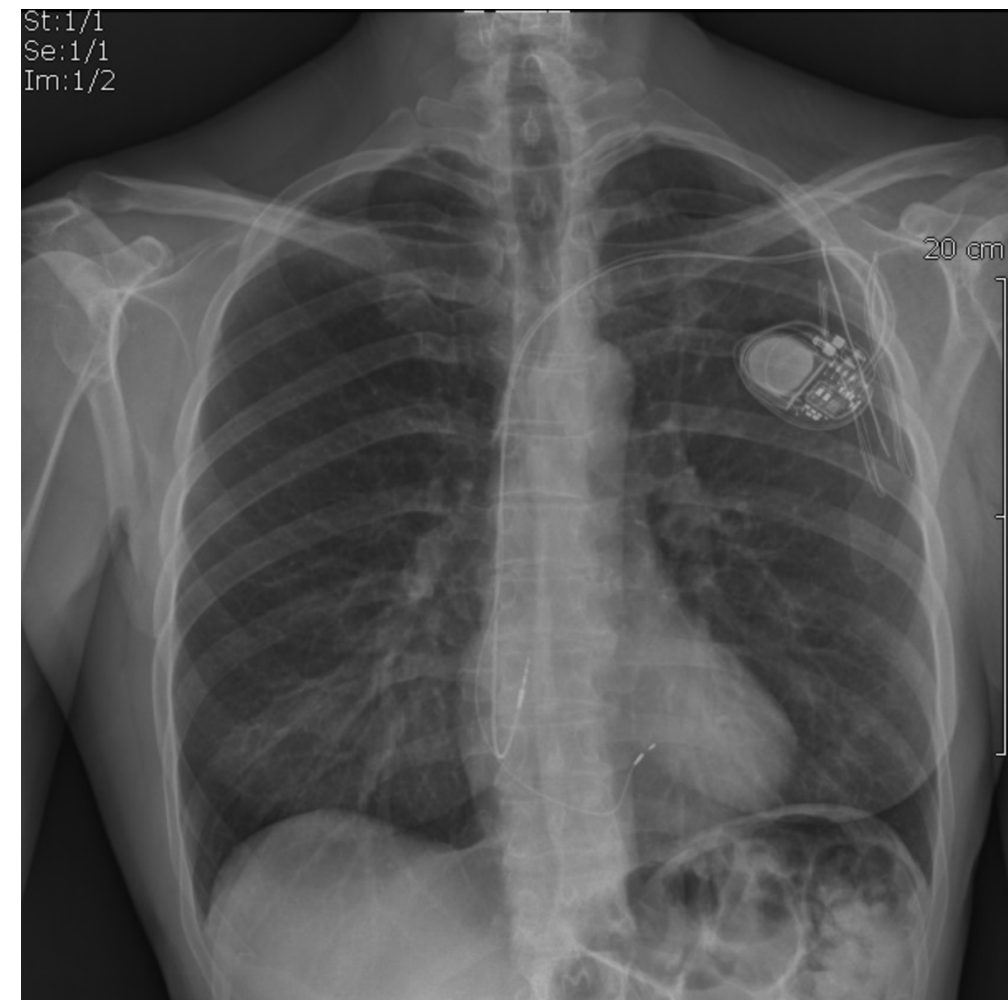
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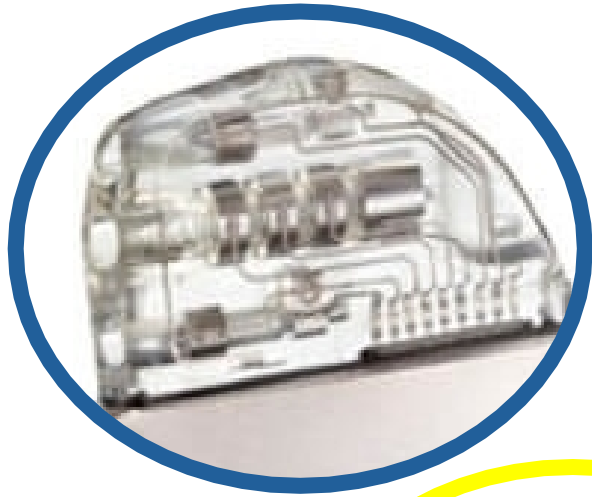
## Conflits d'intérêts

- Communications : Biotronik, Medtronic, Abbott

# PM simple/double : IS1



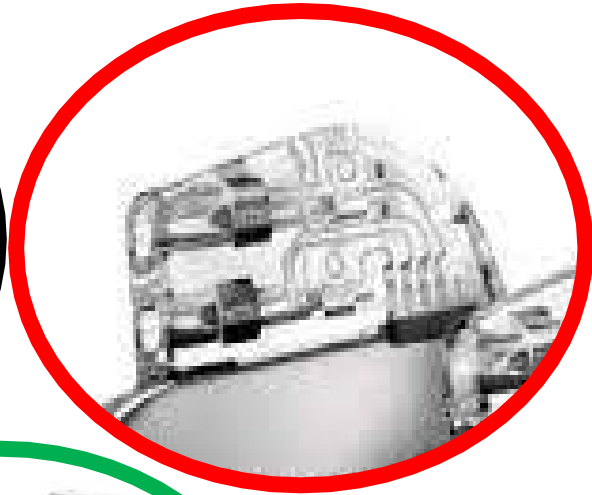
IS1(DF1)- IS4



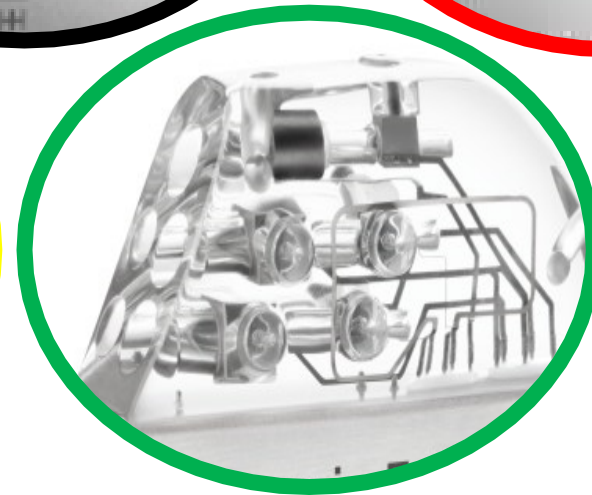
DF4



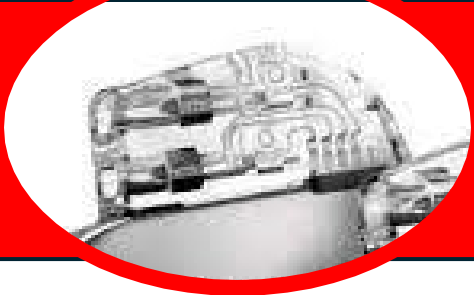
IS1



DF4 –  
IS1

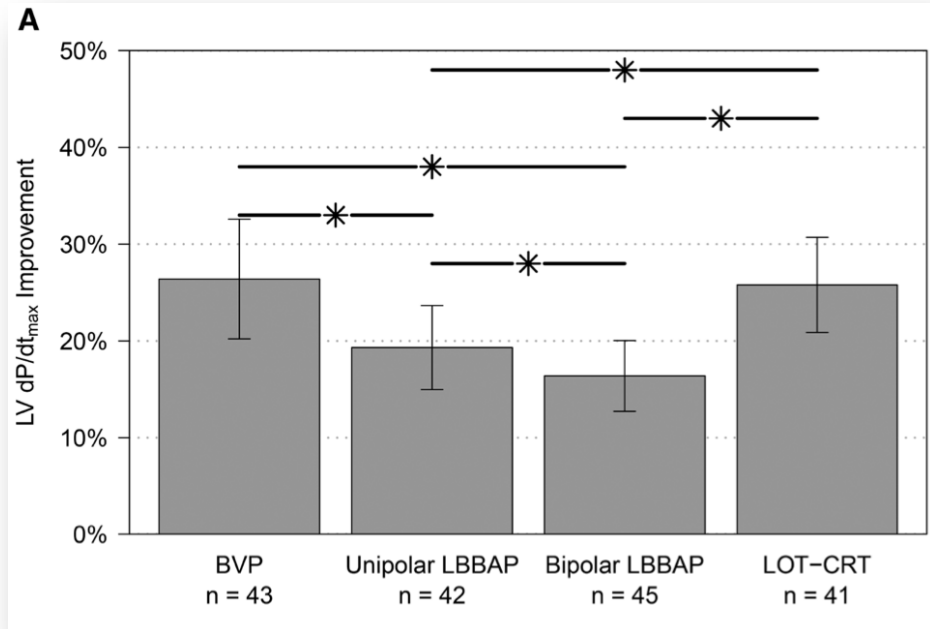


DF1-IS1

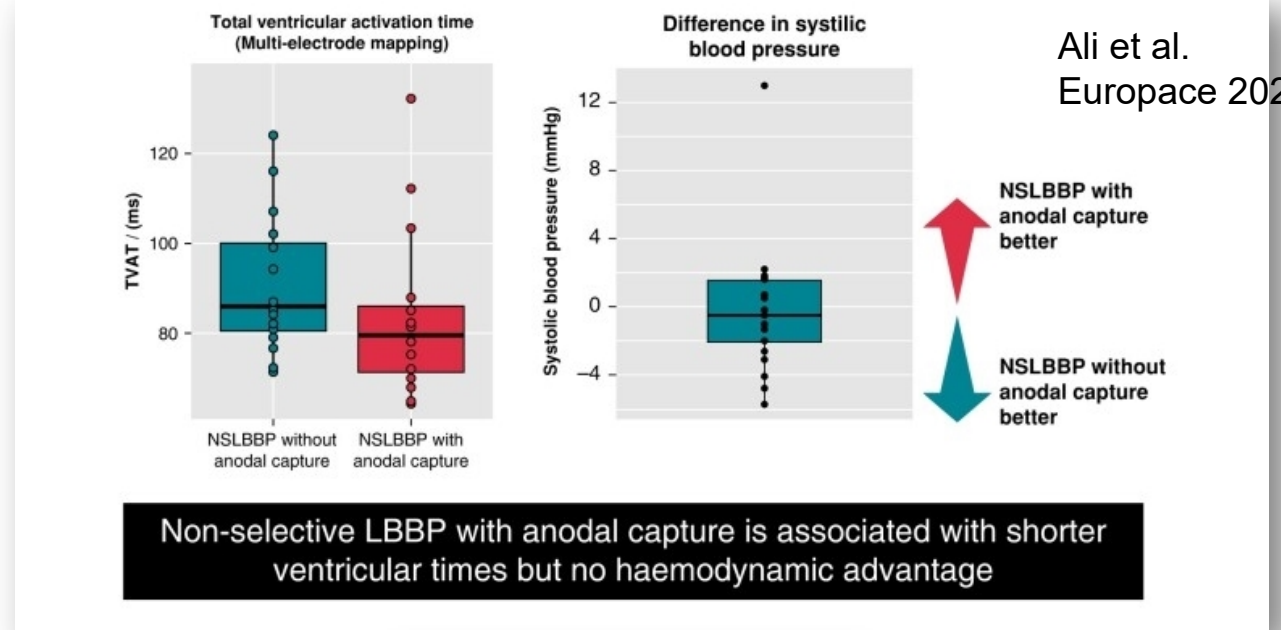


# PM simple/double IS1

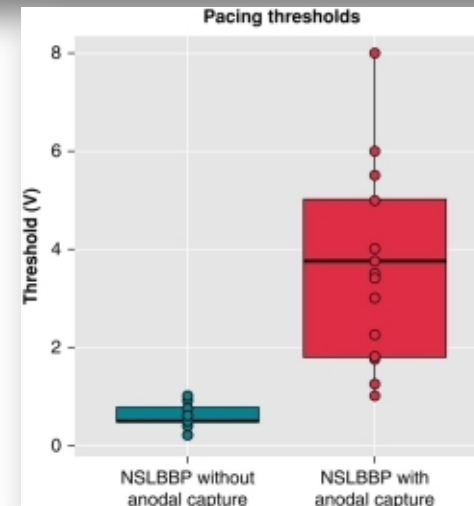
- Stimulation unipolaire

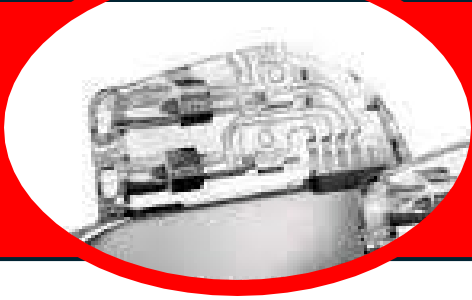


Jastrzębski et al.  
Circ EP 2024



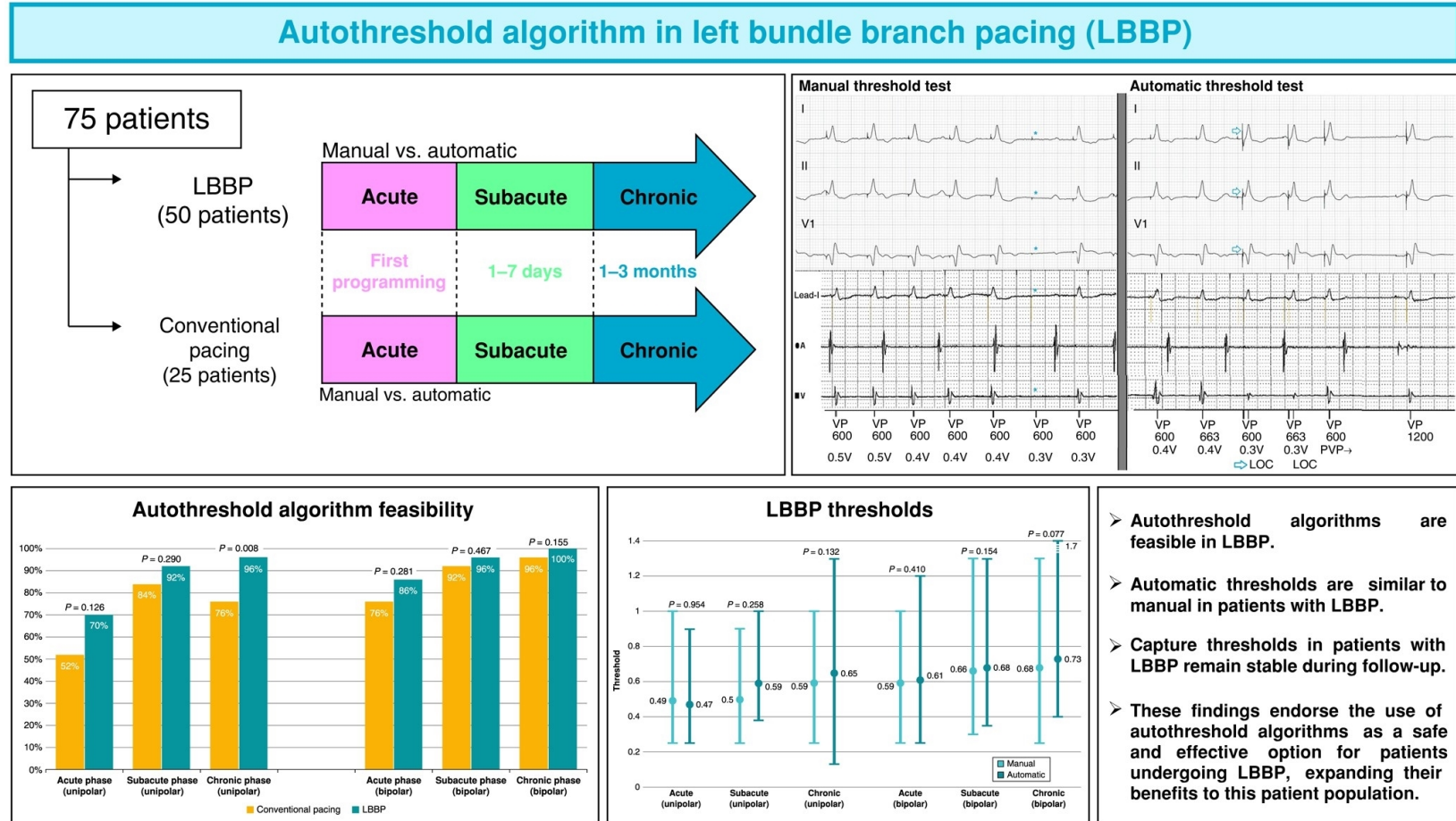
Ali et al.  
Europace 2023





# PM simple/double IS1

- Stimulation unipolaire
- Délai AV pour CRT
- Autocapture





- Stimulation unipolaire
- Délai AV pour CRT
- Autocapture
- Télécardiologie

## CENTRAL ILLUSTRATION: Lead Integrity and Failure Evaluation in Left Bundle Branch Area Pacing Study

### Study Design (LIFE-LBBAP)

Multicenter registry: 17 centers



8,255 patients with successful LBBAP

Median follow up: 16.4 [6.4:28.8] months

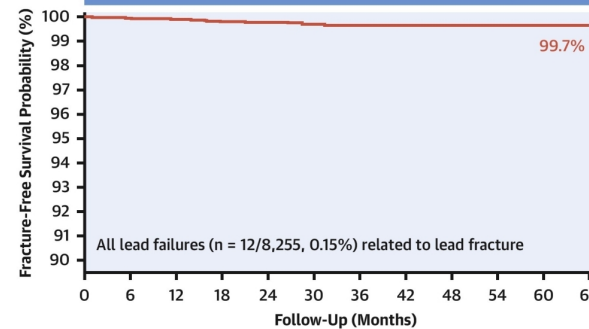
### Endpoint

LBBAP lead failure (lead fracture or insulation defects)

### Results

#### Lead Survival Probability

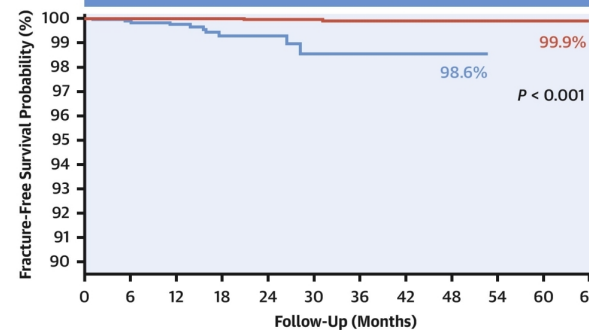
##### Overall Lead Survival Probability



No. at risk

8,255 6,278 5,151 3,786 2,746 1,928 1,152 672 362 155 40 1

##### Lead Survival Probability in SDL and LLL



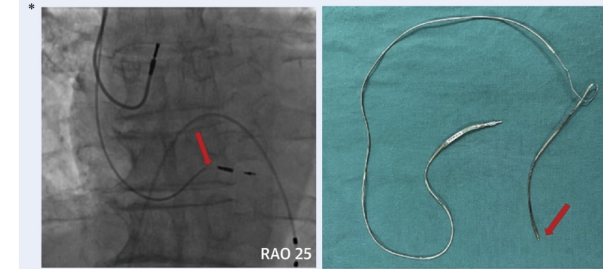
No. at risk

— 5,609 4,590 3,951 3,030 2,334 1,733 1,100 657 359 155 40 1  
— 2,646 1,687 1,199 755 411 194 51 14 2 / / /

— LLL — SDL

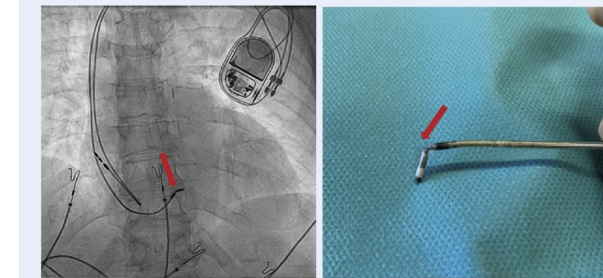
#### Lead Fracture Analysis

##### LBBAP LLL Fracture Location (n = 2/5,609, 0.04%):

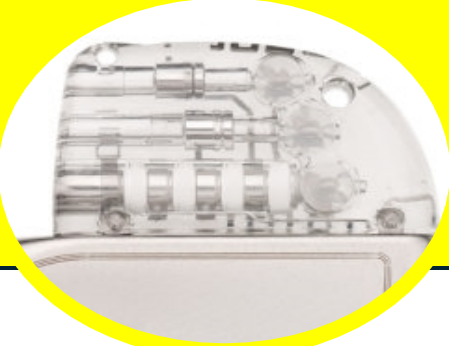


Fracture Occurs Proximal of Ring Electrode

##### LBBAP SDL Fracture Location (n = 10/2,646, 0.4%):



Fracture Occurs at Interelectrode Segment



DF4-IS1

## Sonde LBBAP canal VG

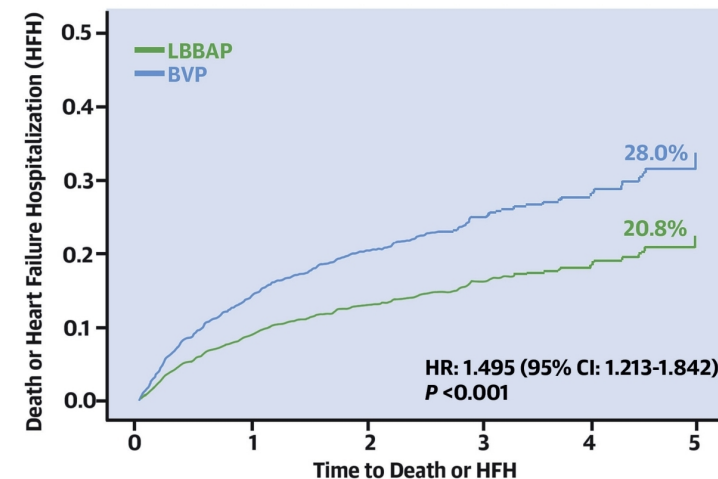
Echec de CRT via SC

Ou

1<sup>ère</sup> intention

### CENTRAL ILLUSTRATION: Death or Heart Failure Hospitalization

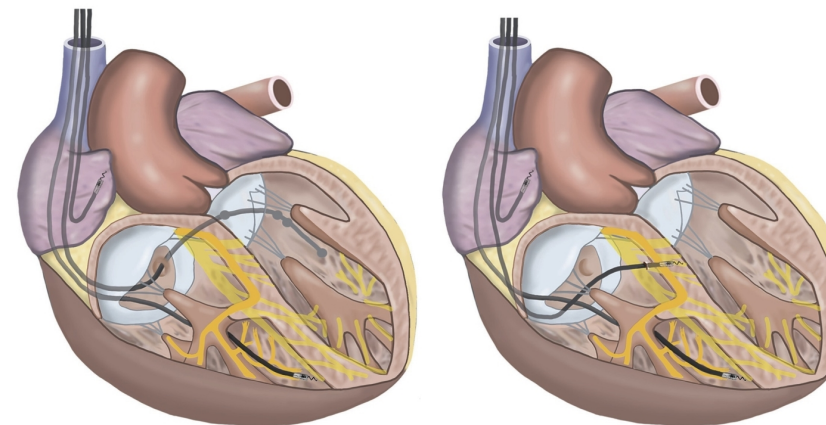
#### Time to Death or Heart Failure Hospitalization All Patients (n = 1,778)



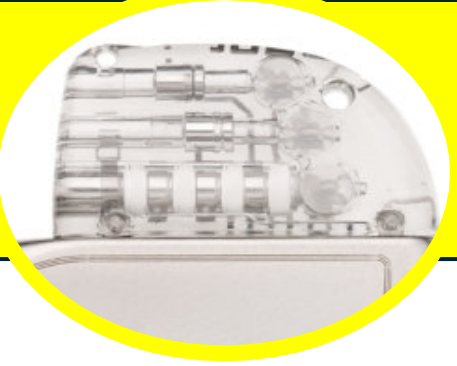
BVP	981	728	546	352	166	18
LBBAP	797	574	342	152	18	0

#### Biventricular Pacing (BVP)

#### Left Bundle Branch Area Pacing (LBBAP)



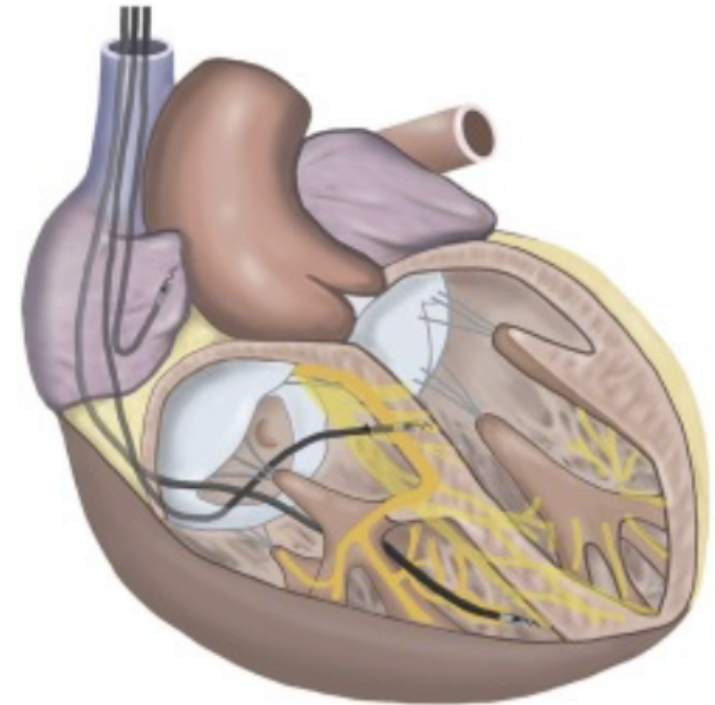


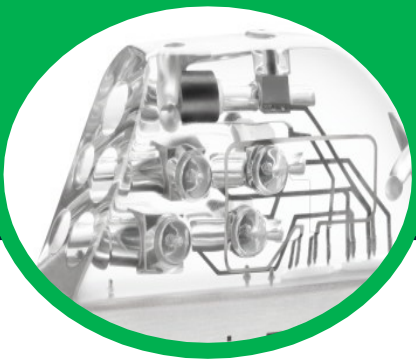


## Sonde LBBAP canal VG

- Polarité :
  - **Distal VG-boitier** (Biotronik, Boston )
  - **Distal VG- Coïl VD** (Medtronic, Abbott )
- **Précession VG ou Stim VG seule**
- **Algorithmes CRT Auto**

Left Bundle Branch Area Pacing (LBBAP)

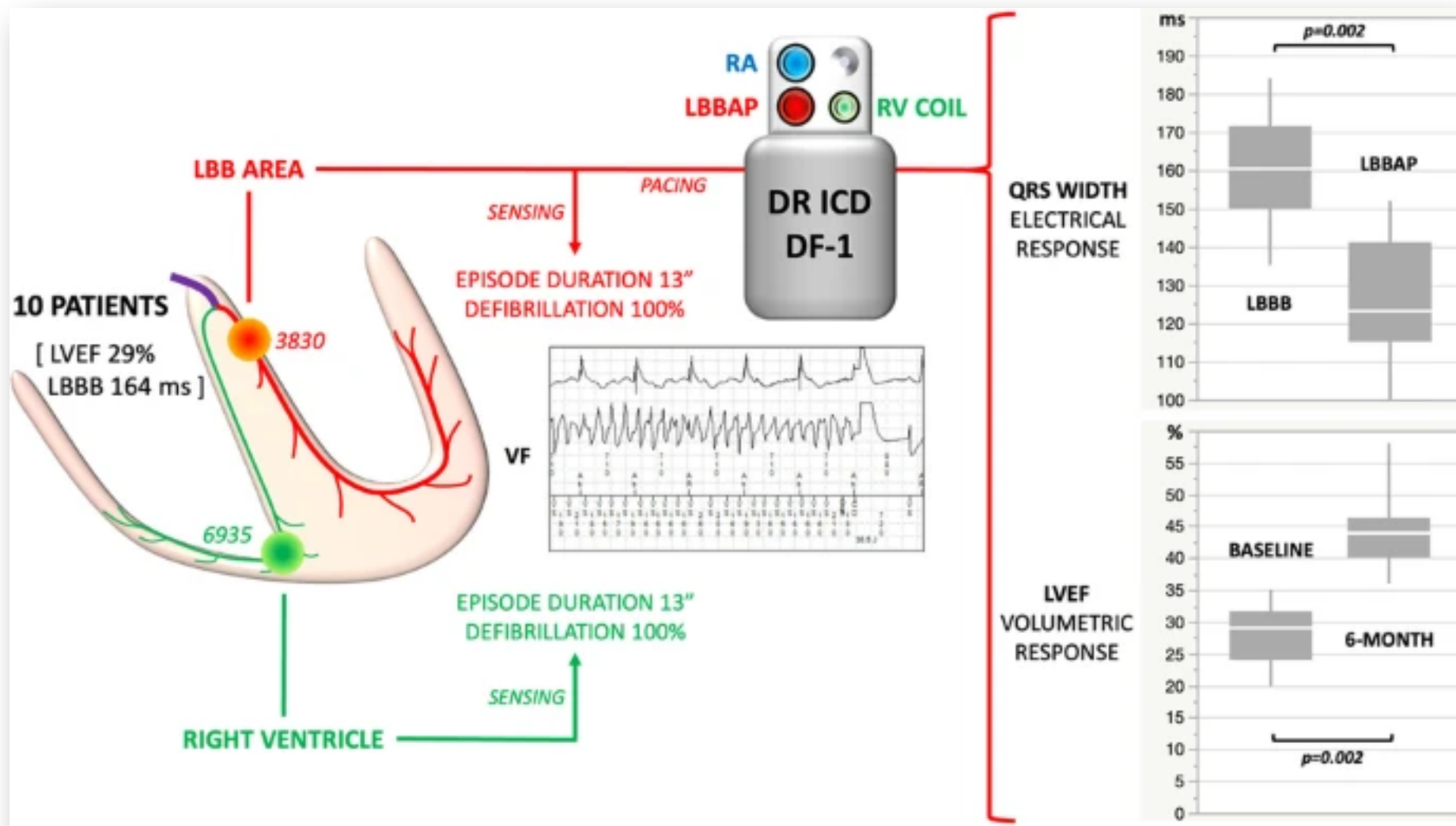




# LOT-ICD : DAI simple/double DF1-IS1

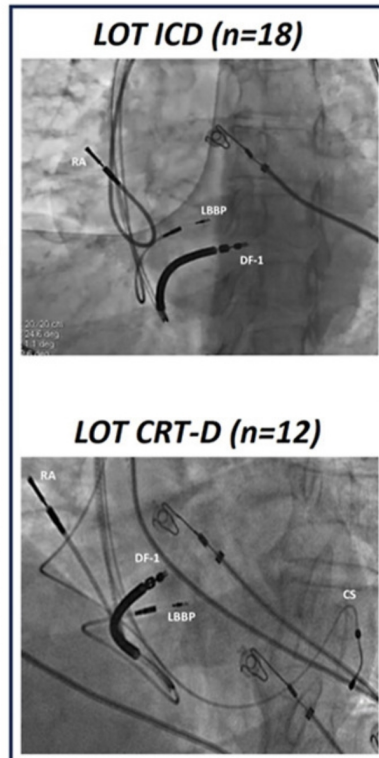
## Sonde LBBAP dans le canal IS1 VD

Brin IS1 de la sonde de DAI capuchonnée



# LOT-ICD : DAI simple/double DF1-IS1

## LBBP-ICD study

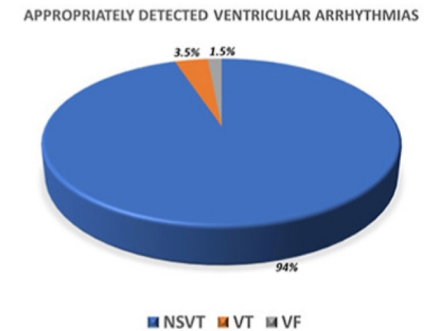
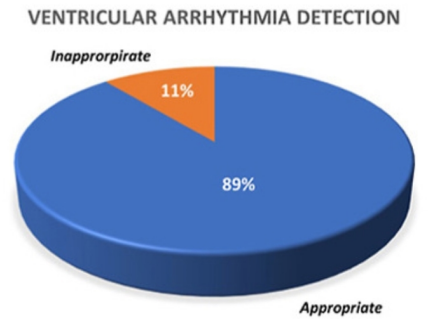


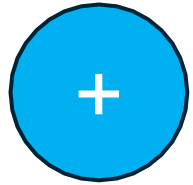
**22.9±12.5 months  
mean follow-up**

**R-wave amplitude  
11.2±5.2mV**

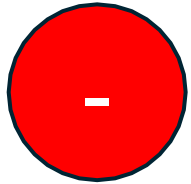
**254 Ventricular events  
detected**

**139 Supra-ventricular  
events detected**

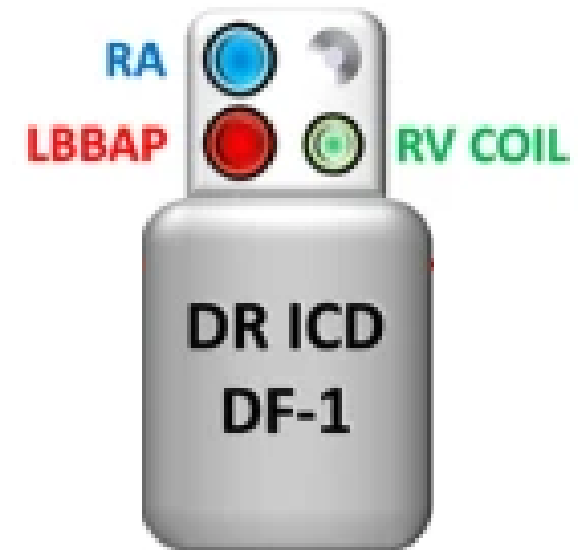




- Coût
- Volume du boîtier



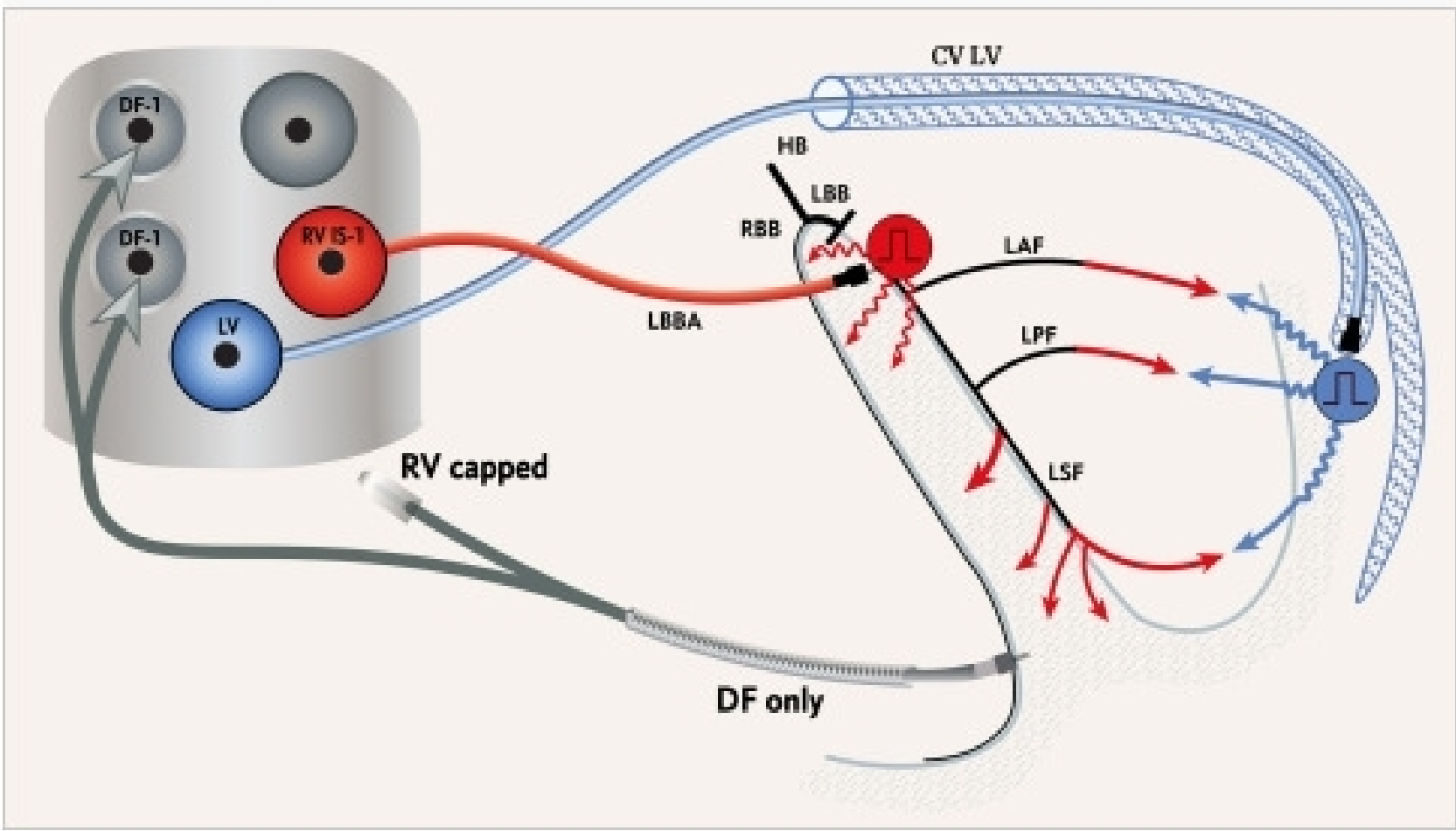
- Stimulation bipolaire
- Sonde capuchonnée (IRM ?)
- Volume du trident
- Validité algorithmes





# IS1-IS4 / DF1-IS4 : LOT-CRT

## LOT-CRT

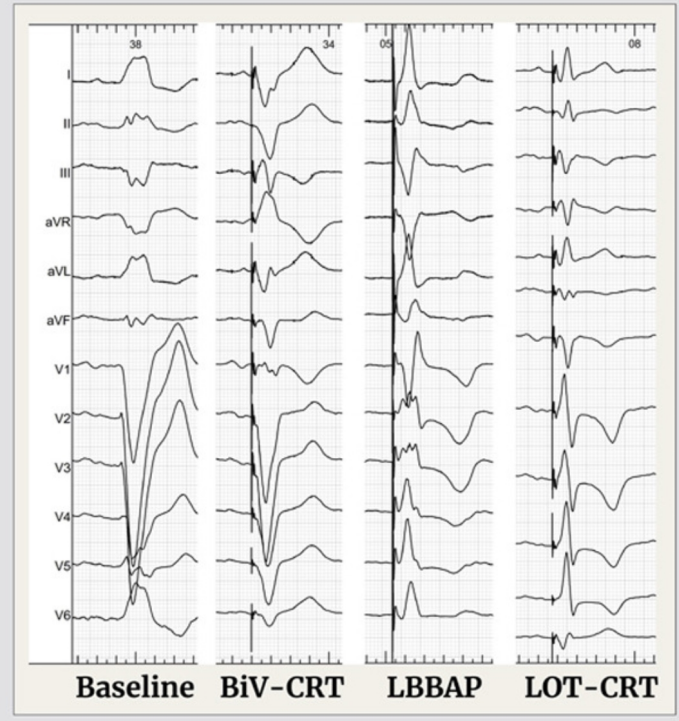
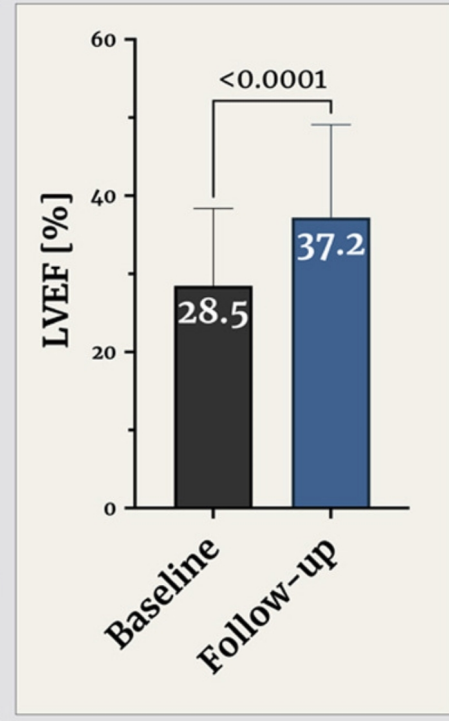
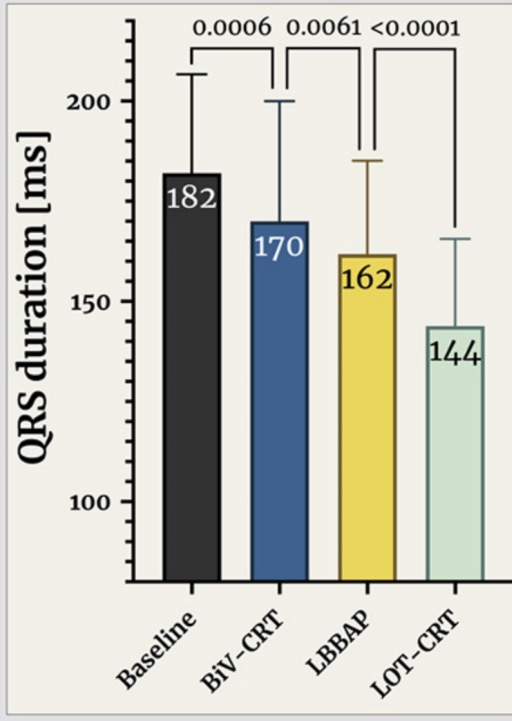
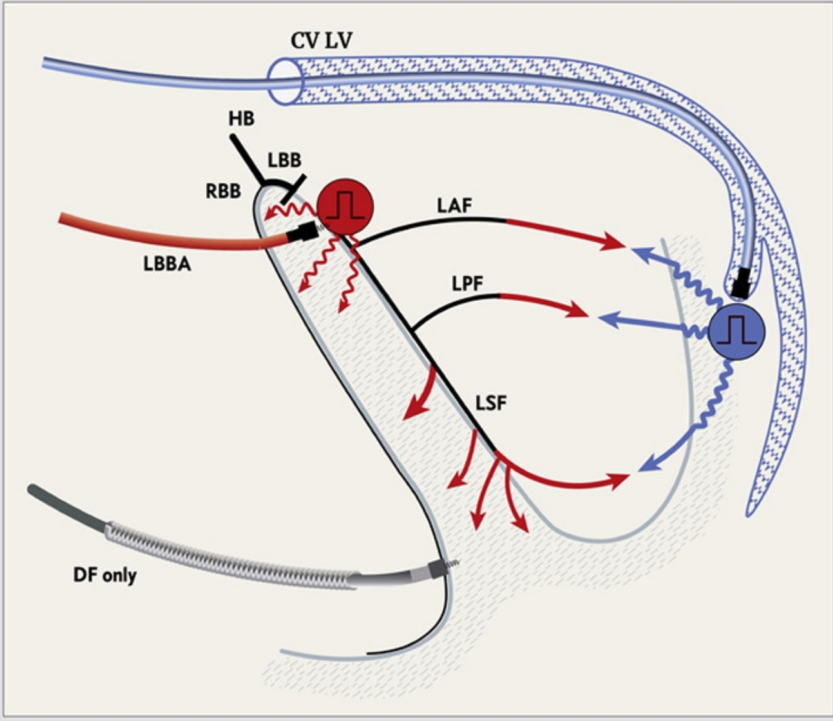




# IS1-IS4 / DF1-IS4 : LOT-CRT

## LOT-CRT

Left bundle branch area pacing (LBBAP) optimized CRT is feasible, safe and provides greater electrical resynchronization in comparison to BiV-CRT.



112 patients, 81% succès

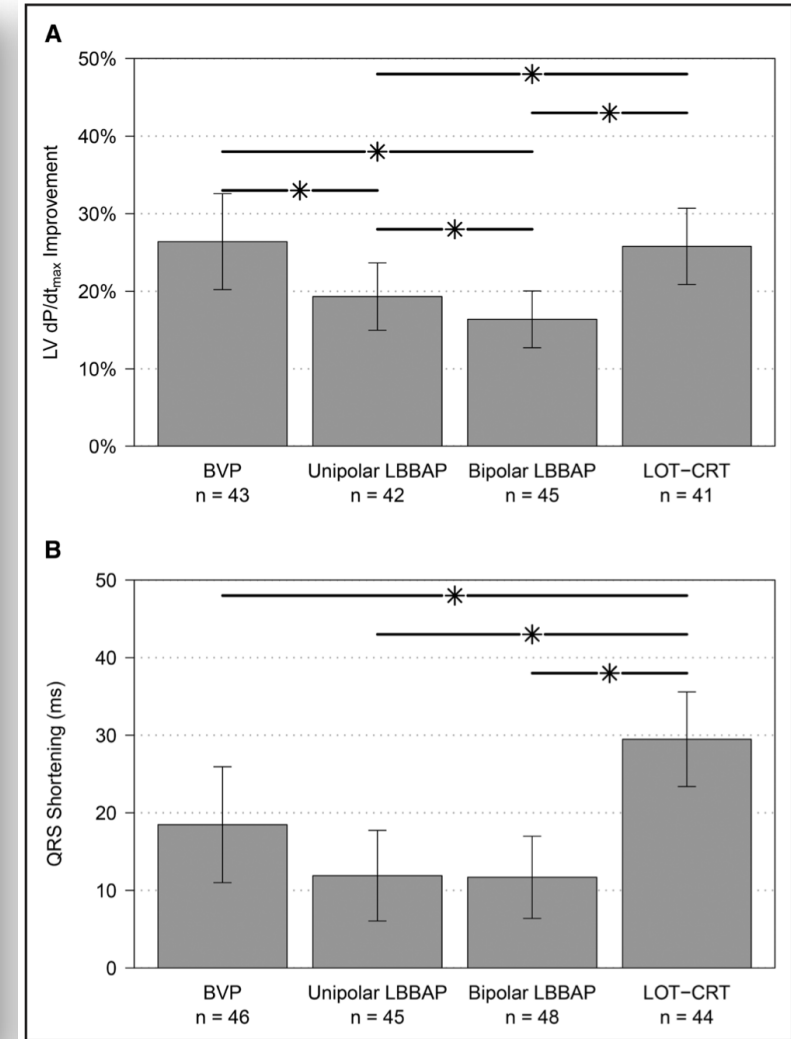
# LOT-CRT vs BVP vs LBBAP

48 patients  
Pose PM/DAI-CRT + sonde LBBAP

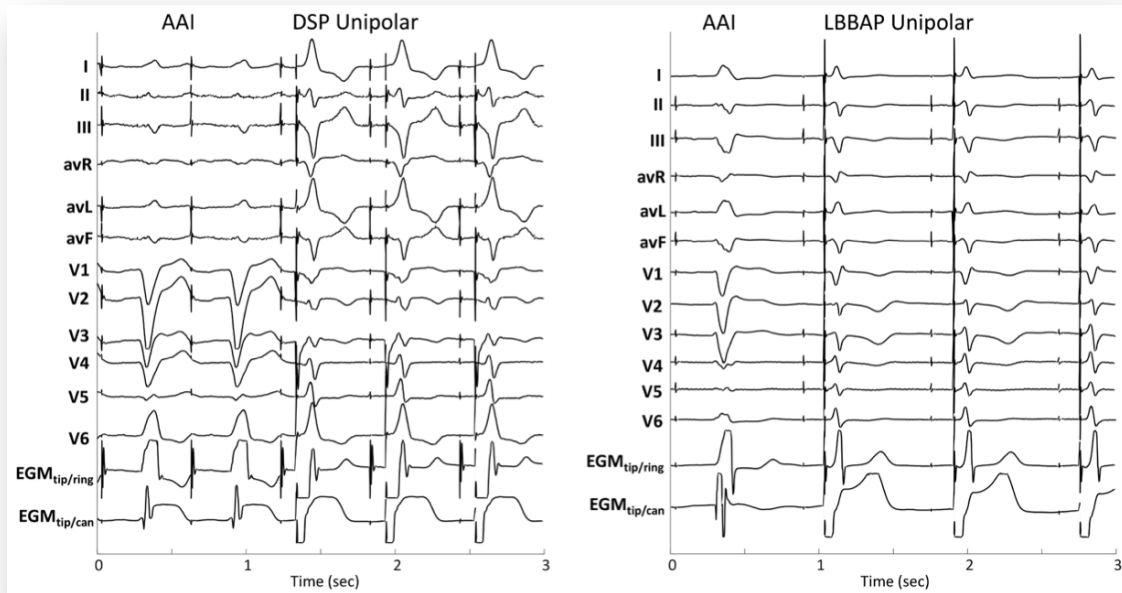
Comparaison des 3 modalités chez un même patient

Délai AV 70% du spontané  
Délai VV 0ms

Characteristic	Mean±SD or n (%)
Age, y	65.3±10.3
Male sex	32 (67)
BMI, kg/m <sup>2</sup>	30.1±4.8
Ischemic cardiomyopathy	14 (29)
ECG	
PR interval, ms	200±53
Blood pressure, mm Hg	
Systolic	120.6±18.7
Diastolic	70±11
NYHA classification	
I	3 (6)
II	26 (54)
III	17 (35)
IV	1 (2)
Conduction disease	
LBBB	19 (40)
IVCD	29 (60)
Echocardiography	
LVEF, %	31±11
LVESV, mL	144±62
LVEDV, mL	203±68

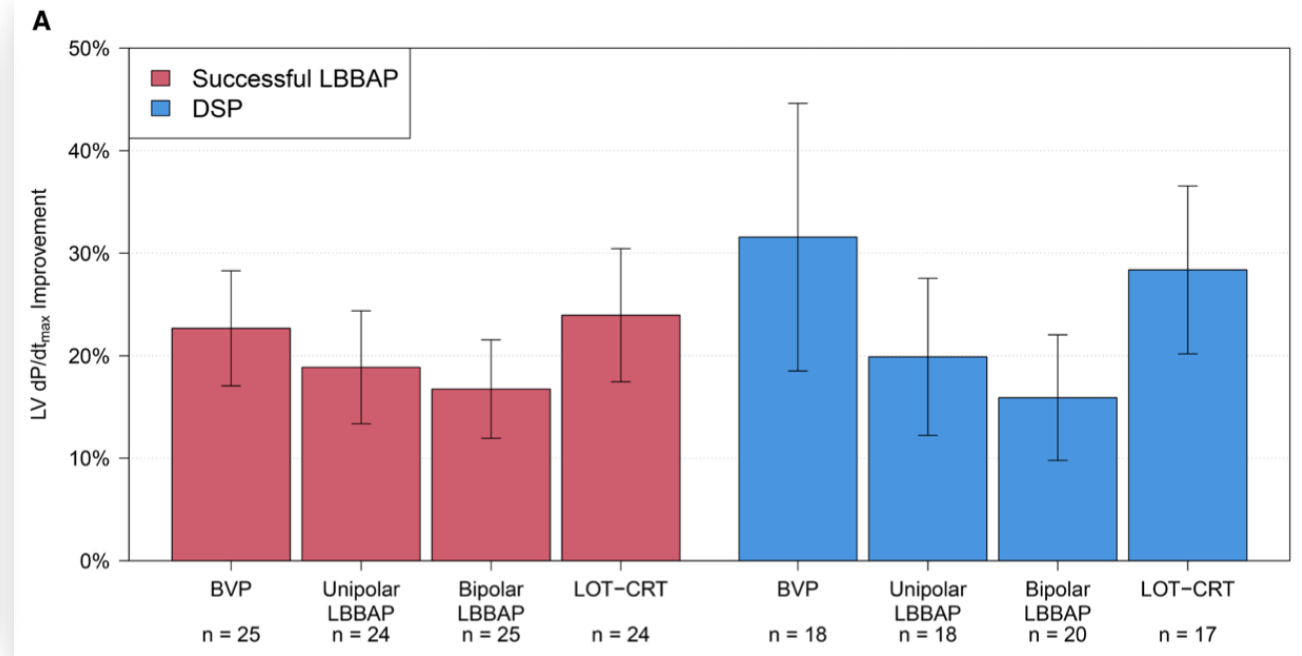


# LOT-CRT vs BVP vs LBBAP



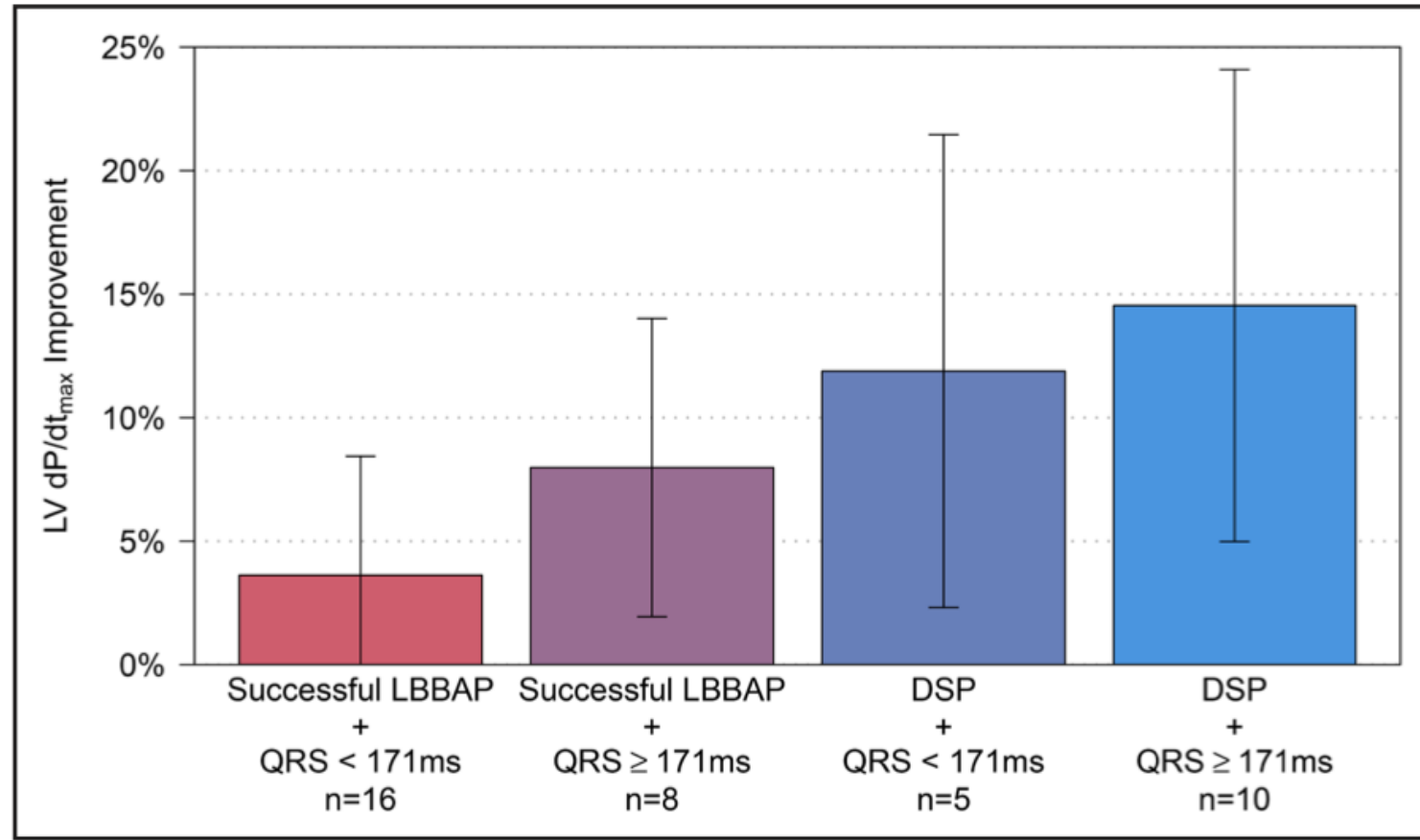
44% DSP

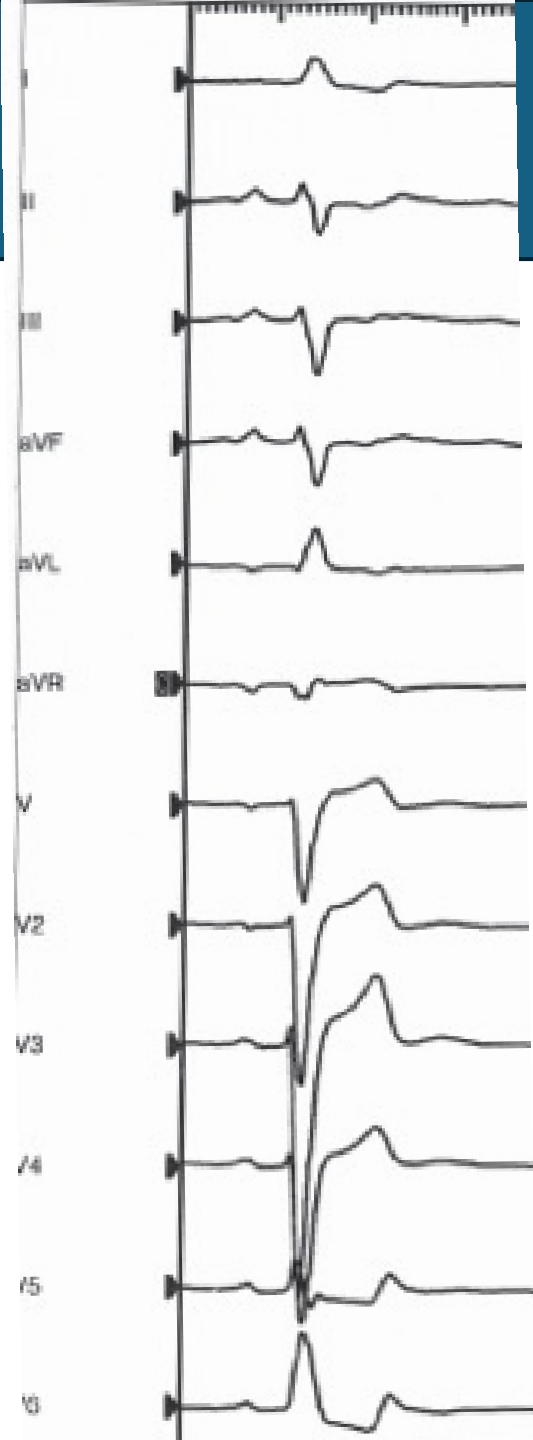
56% LBBAP





## LOT-CRT : quel patient ?





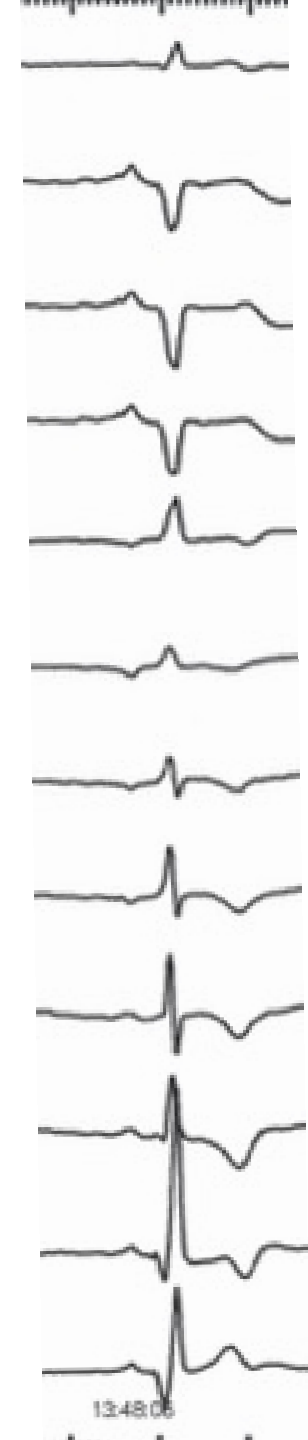
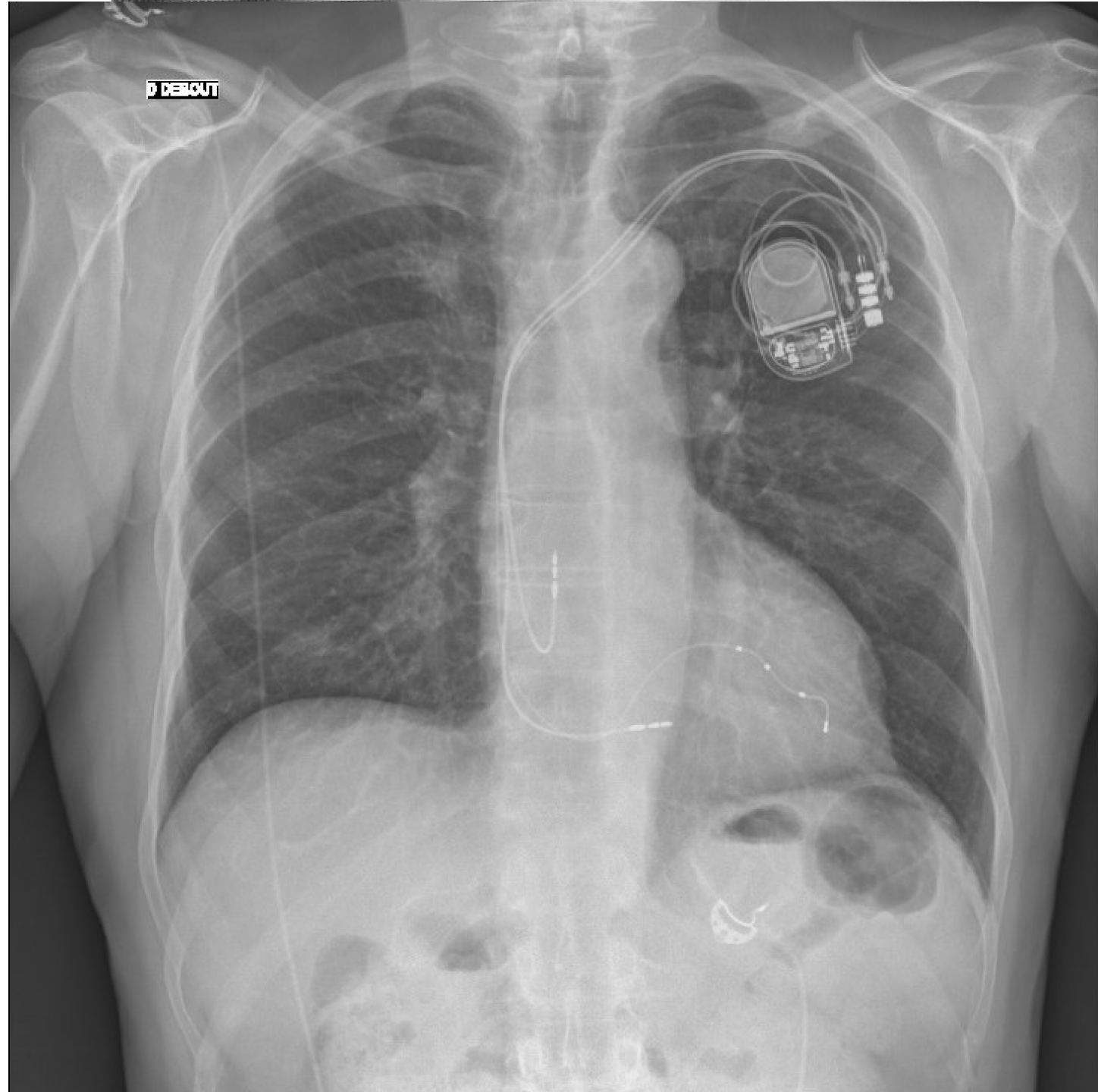
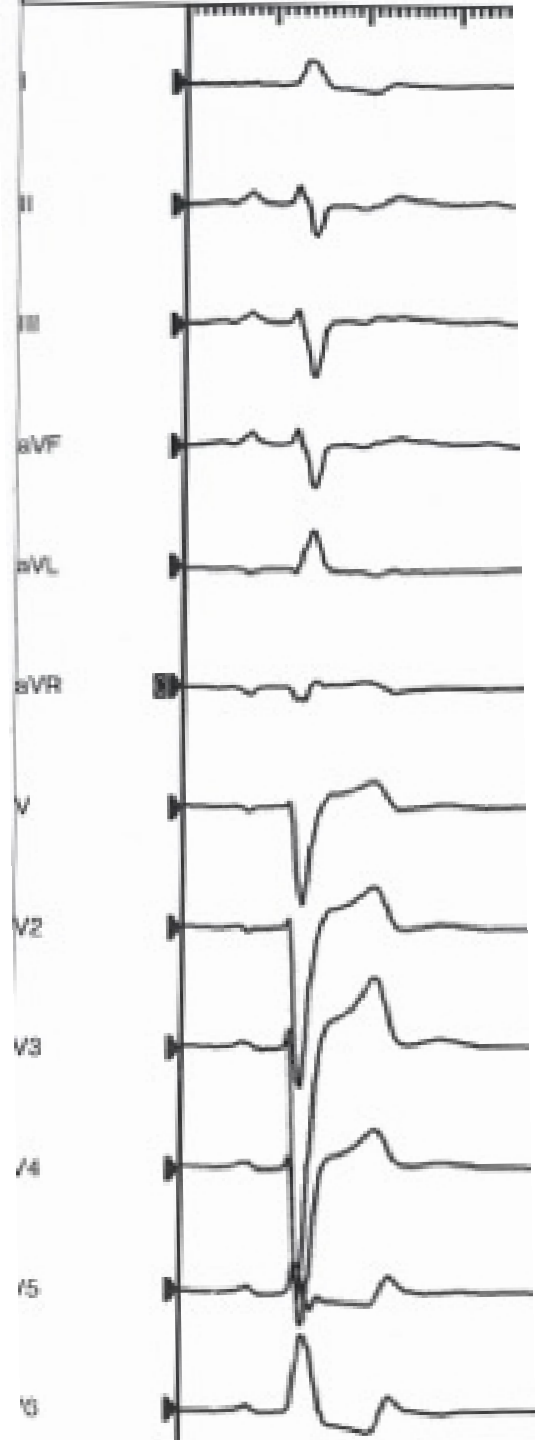
82 ans

CMD FE 25%

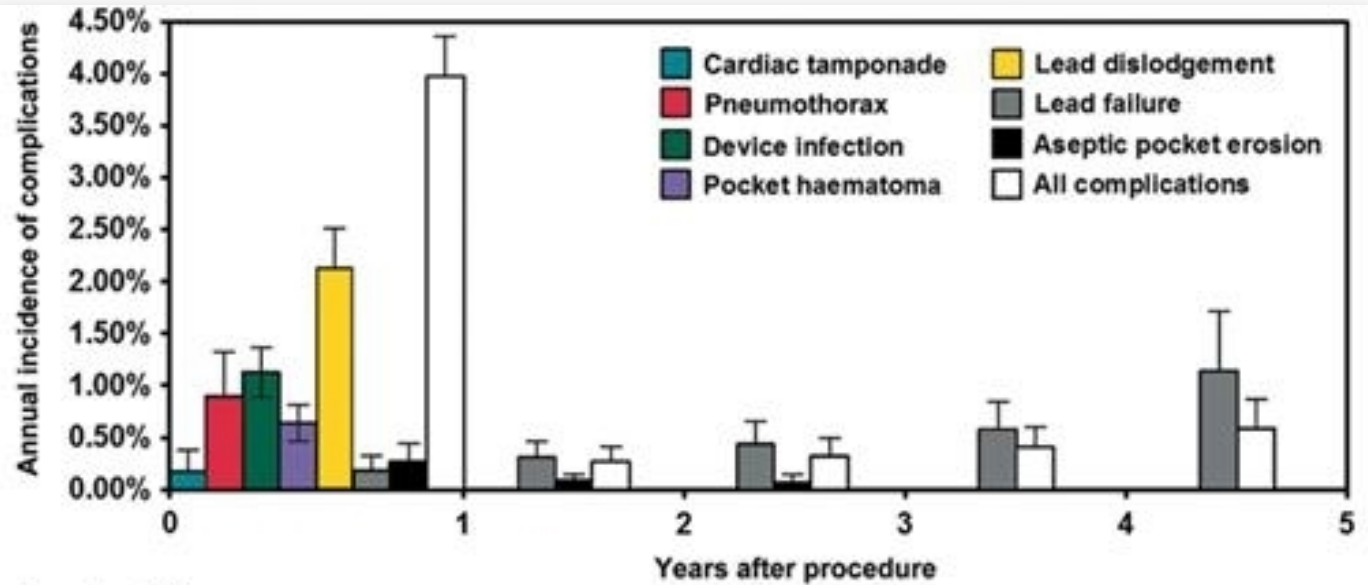
Coronaires saines

IRM sans réhaussement

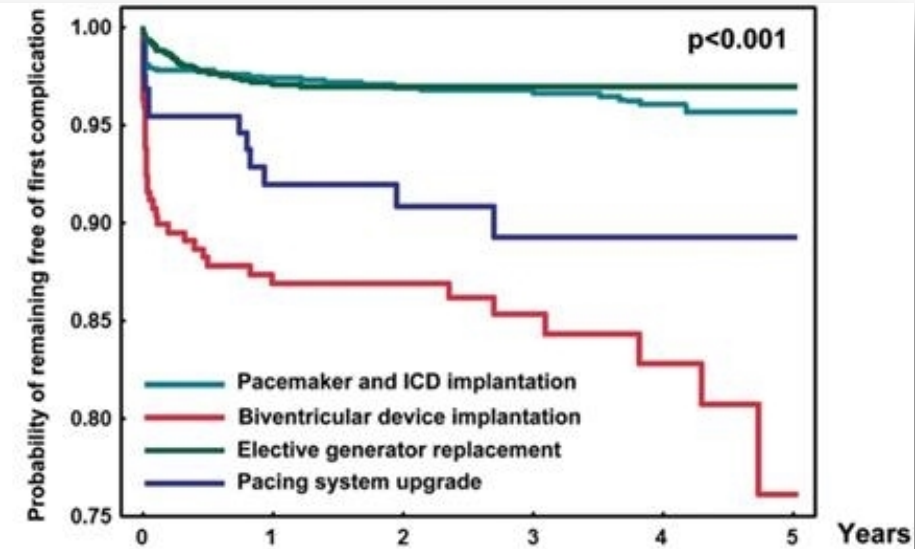
NYHA 3



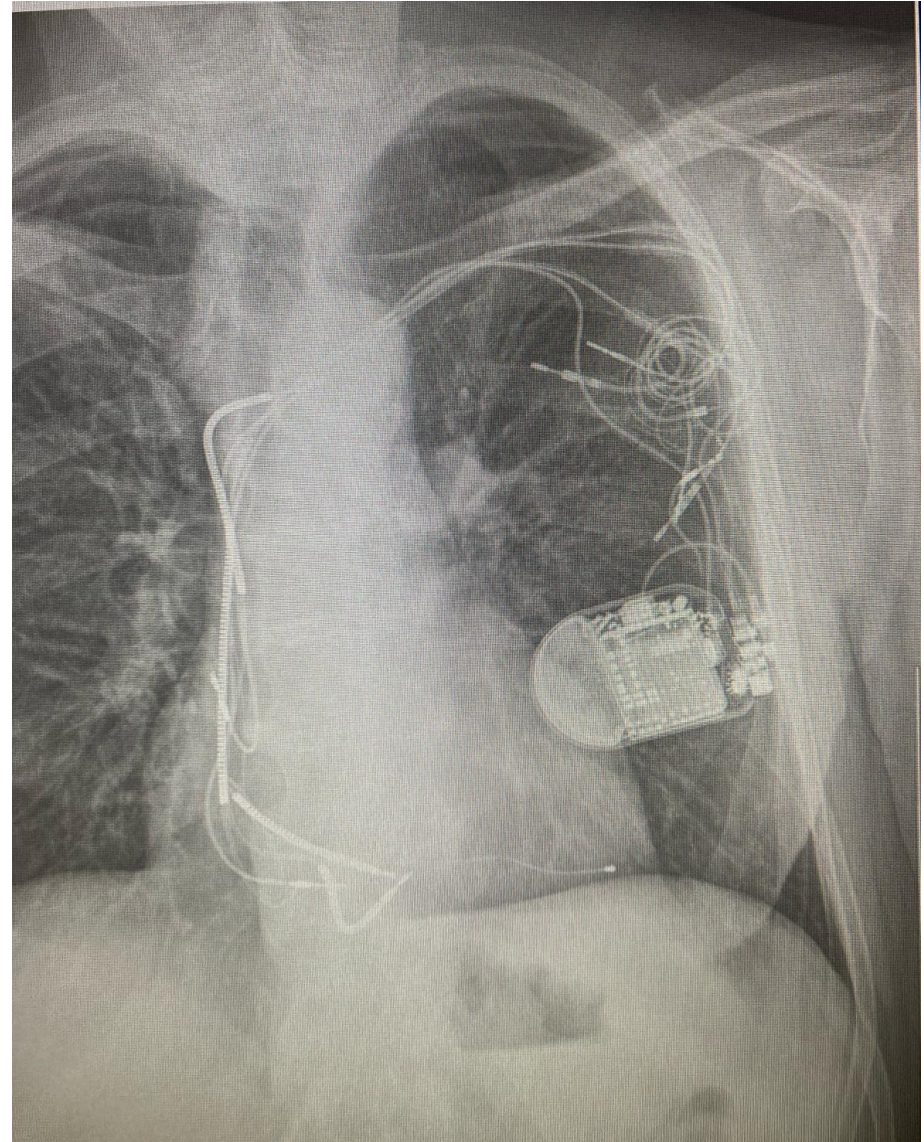
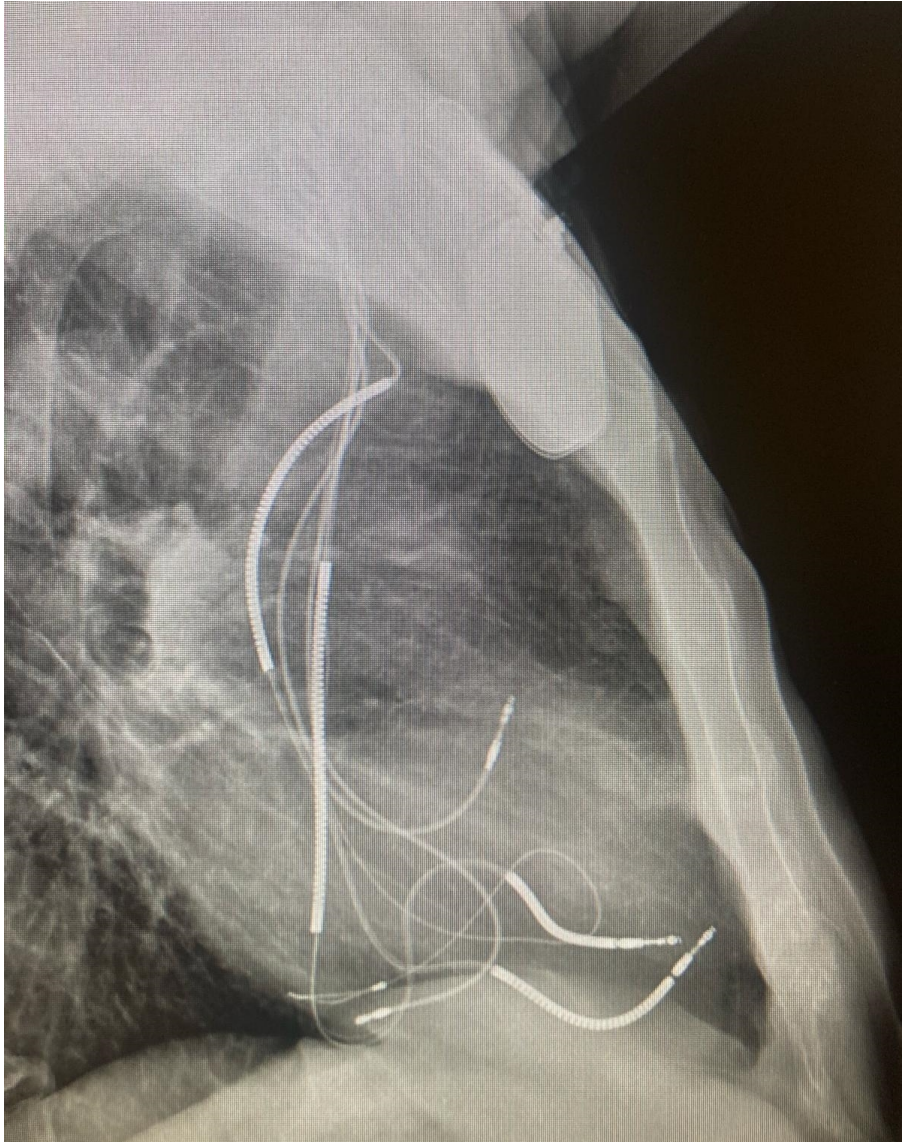
# Primo-implantation à 4 sondes



N. of procedures at risk of all complications	0	1	2	3	4	5
	2671	2237	1634	1102	611	173
N. of procedures at risk of cardiac tamponade, pneumothorax and lead-related complications	1637	1295	931	705	354	125



Procedures at risk	0	1	2	3	4	5
Pacemaker and ICD implantation	1269	1039	756	521	281	78
Biventricular device implantation	242	194	136	91	49	10
Elective generator replacement	1034	825	611	403	234	82
Pacing system upgrade	126	102	82	51	30	9



IIa

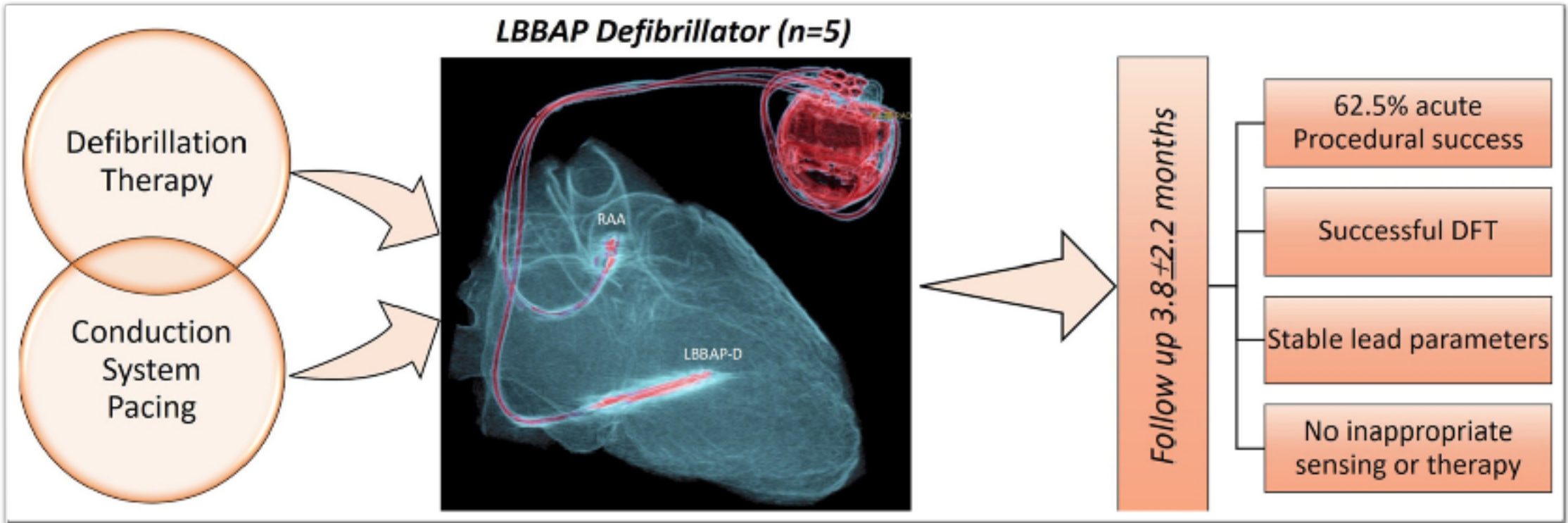
C-LD

**Lead removal can be useful for patients if a CIED implantation would require more than four leads on one side or more than five leads through the SVC.**

110,193,  
200



DF4



Procédure time  $115.6 \pm 38.1$ , Fluoro  $10.6 \pm 3.5$  minutes.

Threshold  $0.58 \pm 0.23V/0.4$  ms, R-wave  $9.6 \pm 2.2$  mV,

Pacing impedance  $560 \pm 145 \Omega$ , and shock impedance  $65.4 \pm 5.5 \Omega$ .



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## Conclusion

- Choix de connectiques multiples
- LOT-ICD : Peser avantages / inconvénients
- LOT-CRT prometteuse
  - Patients sélectionnés.
  - Début de la « maladie » avec 4 sondes
- Futur : DF4-LBBAP

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## COMITÉ D'ORGANISATION

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