

Multicenter hemodynamic assessment of the LOT-CRT strategy: When is one lead enough for resynchronization?



Primary results of the CSPOT-study

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Declaration of Interest

- I have nothing to declare

Left bundle branch–optimized cardiac resynchronization therapy (LOT-CRT): Results from an international LBBAP collaborative study group

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Background

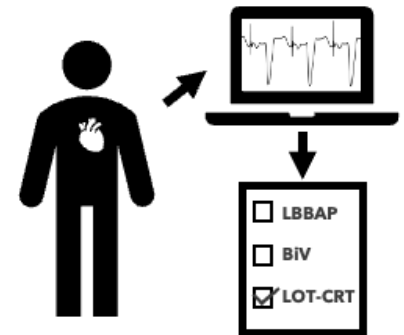
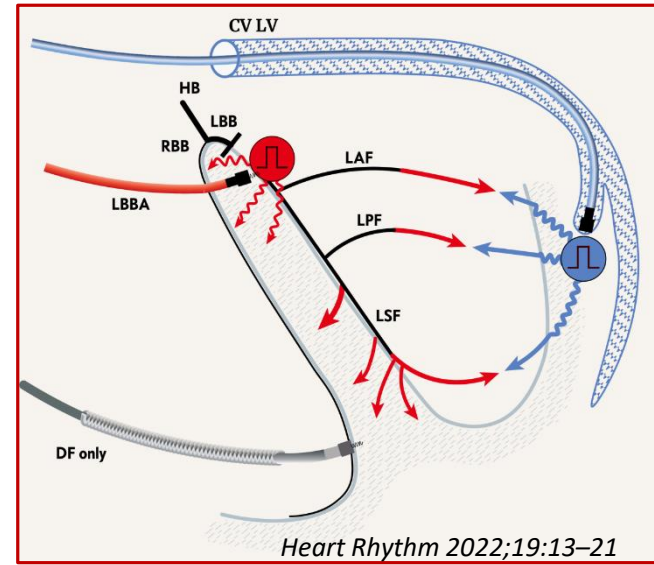
In patients undergoing cardiac resynchronization therapy using left bundle branch area pacing (LBBAP), the addition of a coronary venous lead (Left bundle branch optimized CRT [LOT-CRT]) might confer additional benefits.

Which patients benefit from the

LOT-CRT pacing strategy?

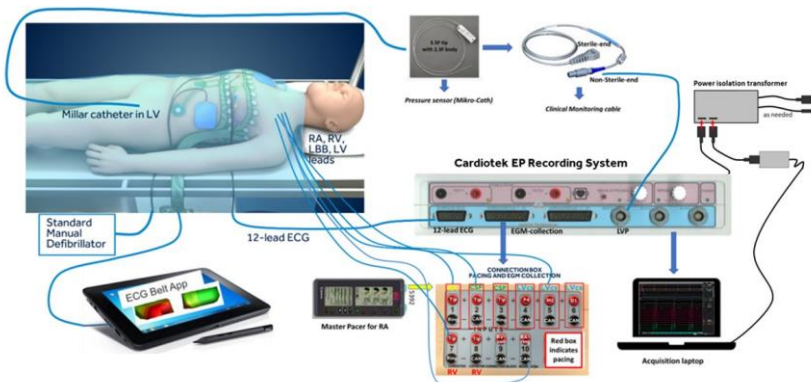
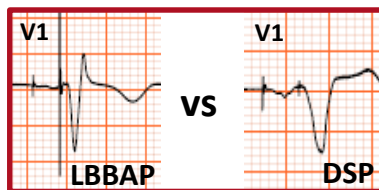
Objective

To compare the acute hemodynamic and electrocardiographic characteristics between conventional Biventricular Pacing (BVP), LBBAP and LOT-CRT



Study design and patient characteristics

The Conduction System Pacing Optimized Therapy (CSPOT) study, ClinicalTrials.gov NCT04905290, was a prospective, multi-center (5 EU and 7 US centres), study of LBBAP in CRT-indicated subjects.



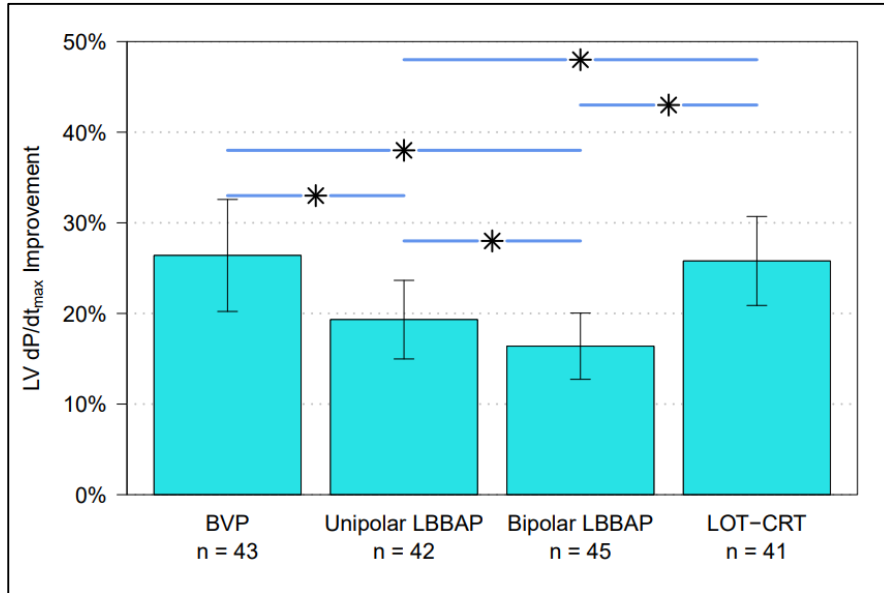
Acute experimental pacing and acquisition set-up.

Characteristic	Mean (95% CI) or Frequency (Percent)
Age	65.8 (62.6-68.9)
Male sex	32 (67%)
BMI	30.0 (28.6-31.3)
Ischemic cardiomyopathy	14 (29%)
ECG	
PR interval (ms)	202 (186, 217)
Blood pressure (mmHg)	
Systolic	120.7 (115.3-, 126.1)
Diastolic	70.2 (66.9-, 73.4)
NYHA classification	
I	3 (6%)
II	26 (54%)
III	16 (33%)
IV	1 (2%)
Conduction disease	
LBBB	19 (40%)
IVCD	27 (60%)
Echocardiography	
LVEF (%)	29.8 (25.9-33.7)
LVESV (ml)	143.4 (124.1-162.6)
LVEDV (ml)	201.5 (179.6-223.3)

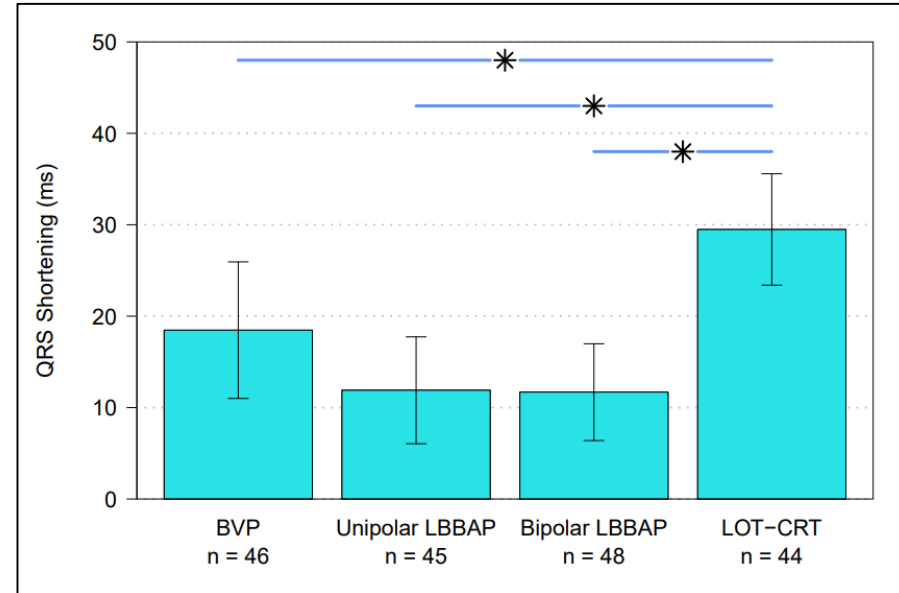
Procedural Characteristic	Mean (95% CI) or Frequency (Percent)
QRS duration (ms)	171 (165-177)
PR interval (atrial paced) (ms)	248 (229-267)
Q-LV interval (ms)	130 (120-140)
Q-LV/QRS duration (%)	75 (71-85)
Baseline (AAI) LV dP/dt_{max} (mmHg/sec)	846 (779-914)
Successful LBBAP	27 (56%)
DSP	21 (44%)
Anodal stimulation during LBBAP	25 (54%)

Improved LV dP/dt_{max} and QRS-duration shortening with LOT-CRT

LV dP/dt_{max}



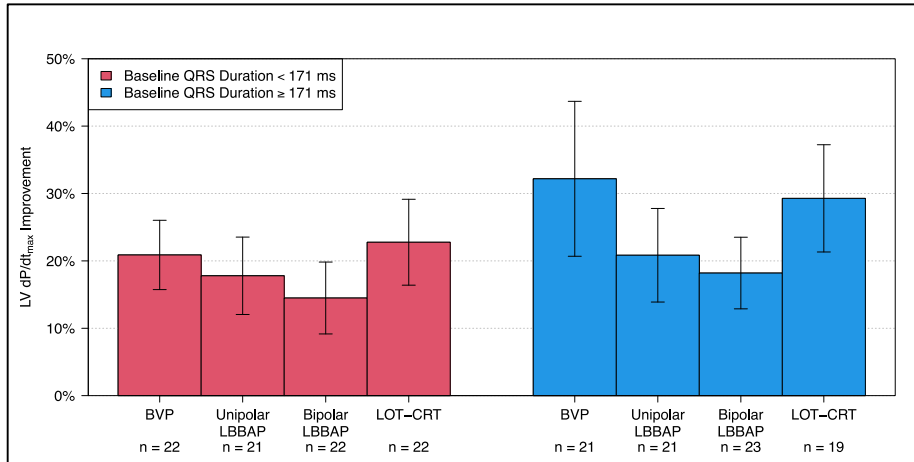
QRS-duration shortening



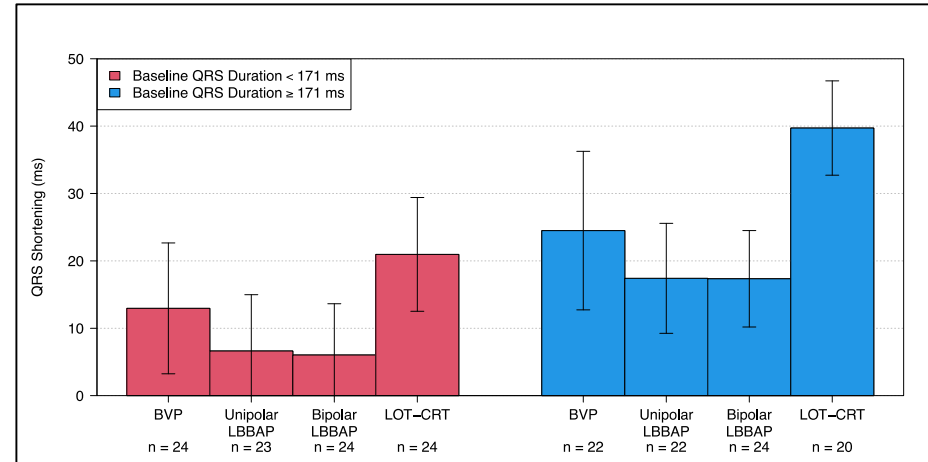
Displayed are means \pm 95% confidence intervals. * indicates $P \leq 0.005$.

Importance of Baseline QRS-duration in acute response

LV dP/dt_{max}

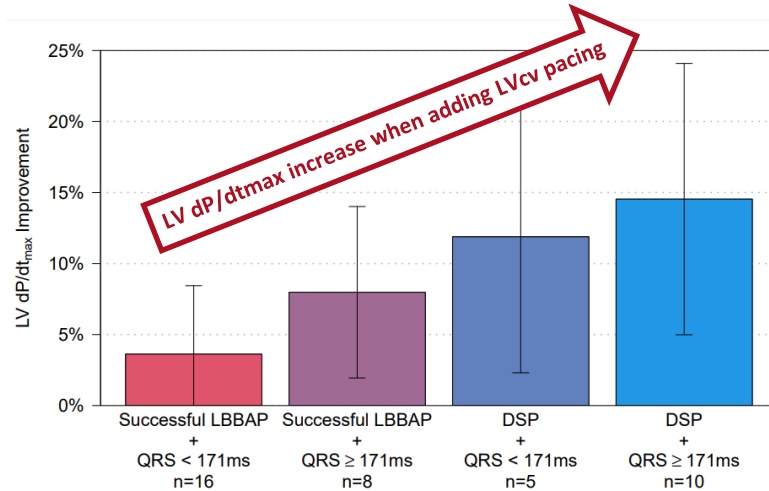


QRS-duration shortening

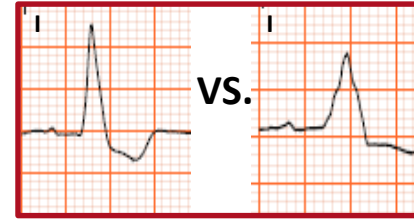
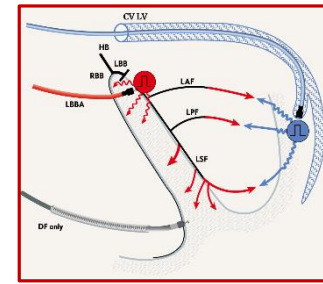


Conclusions

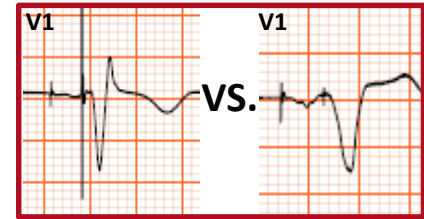
In a CRT cohort with advanced/difficult ventricular conduction system disease, LOT-CRT and BVP provided greater acute hemodynamic benefit than LBBAP alone.



Subjects with wider QRS or suboptimal outcome of LBBAP (i.e., DSP) are more likely to benefit from addition of a LVcv lead to implement LOT-CRT.



The SUBSTRATE



The CAPTURE type

Limitations

- No firm LBB capture confirmation
- Small study size
- Predominantly NIVCD patients
- Not representative of general CRT population
- Focus on acute responses