

Gestione clinica e ottimizzazione della CSP

CSP: come ridurre gli insuccessi procedurali utilizzando diverse sheaths

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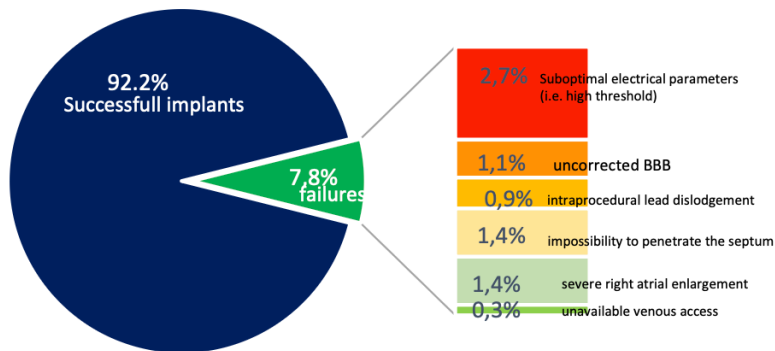


Conduction system pacing: procedural success and failures over the years

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Santa Maria della Misericordia Hospital, Rovigo, Italy

RESULTS

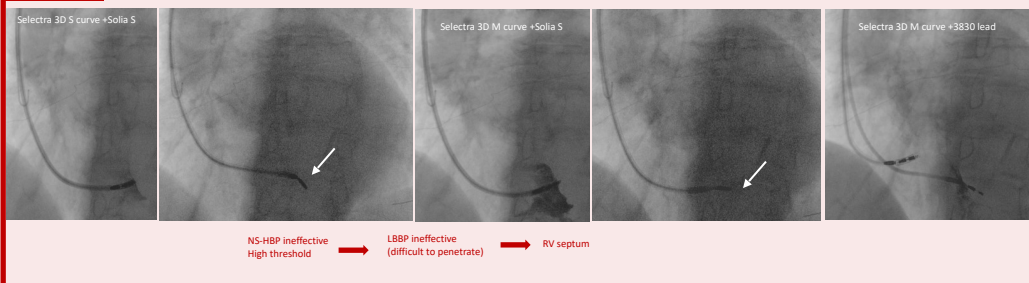
CSP was successfully achieved in 756 cases (92.2%) considering all indications.
In 64 (7.8%) cases lead implant failed (17 lumenless and 47 stylet-driven).



HF and EF<45% were found more frequently in the failed implant subgroup. Procedural failures were more frequently associated with more than 1 sheath and more than 1 lead utilization during the procedure. Interestingly, in 12.8 % of successful procedures the sheath was changed intraprocedurally; and in the 5.4% of successful procedures the lead was changed (from lumenless to stylet-driven or viceversa).

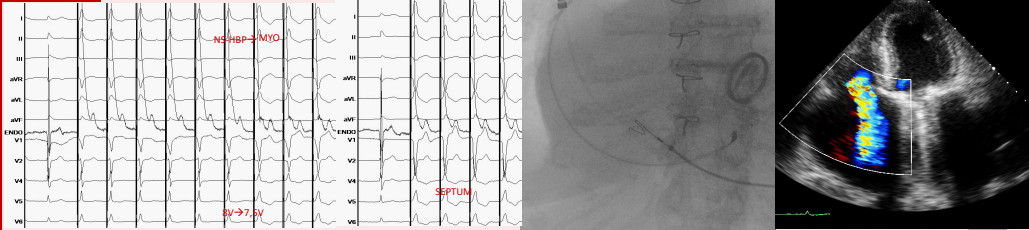
Case 1

V.G., female, 85 yo, ablate & pace. EF 59%.



Case 2

M.R. female, 78 yo. AF, slow ventricular rate, EF 43%



MELOS — MULTICENTER EUROPEAN LEFT BUNDLE BRANCH AREA PACING OUTCOMES STUDY



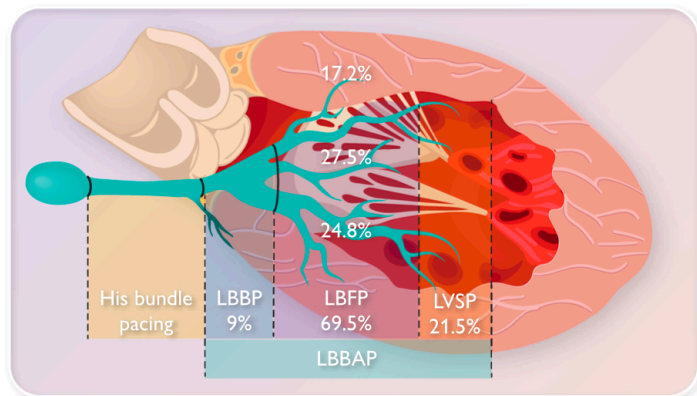
Prospective, multicenter,
registry-based observational study



2533
Participants



14
European centres



LBBAP implantation success
Bradycardia indication success **92.4%**
Heart failure indication success **82.2%**

LBBAP lead complications **8.3%**

- Acute perforation to LV 3.7%
- Lead dislodgement 1.5%
- Acute chest pain 1.0%
- Capture threshold rise 0.7%
- Acute coronary syndrome 0.4%
- Trapped/damaged helix 0.4%
- Delayed perforation to LV 0.1%
- Other 0.7%

Independent predictors of LBBAP lead implantation failure

Heart failure indication **OR 1.49, 95% CI 1.01–2.21**
Baseline QRS duration, per 10 ms **OR 1.08, 95% CI 1.03–1.14**
LVEDD, per 10 mm increase **OR 1.53, 95% CI 1.26–1.86**

Left bundle branch area pacing outcomes: the multicentre European MELOS study

M. Jastrzębski, G. Kiełbasa, O. Cano, K. Curila, L. Heckman, J. De Pooter, M. Chovanec, L. Rademakers, W. Huybrechts, D. Grieco, Z. I. Whinnett, S. A.J. Timmer, A. Elvan, P. Stros, P. Moskal, H. Burri, F. Zanon, and K. Vernooij.

European Heart Journal (2022) 43, 4161–4173

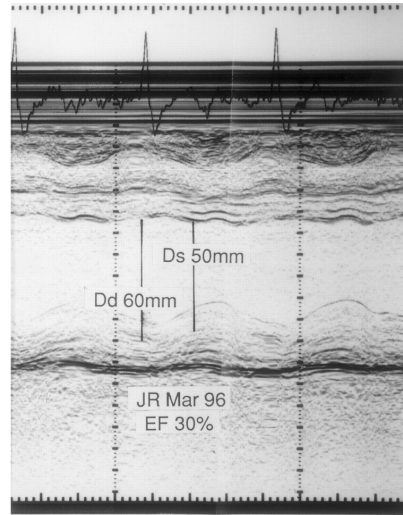
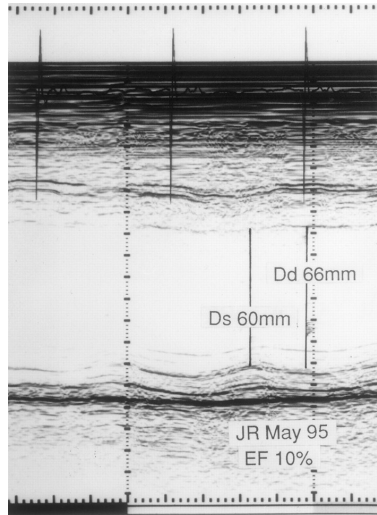


Permanent, Direct His-Bundle Pacing

A Novel Approach to Cardiac Pacing in Patients With Normal His-Purkinje Activation

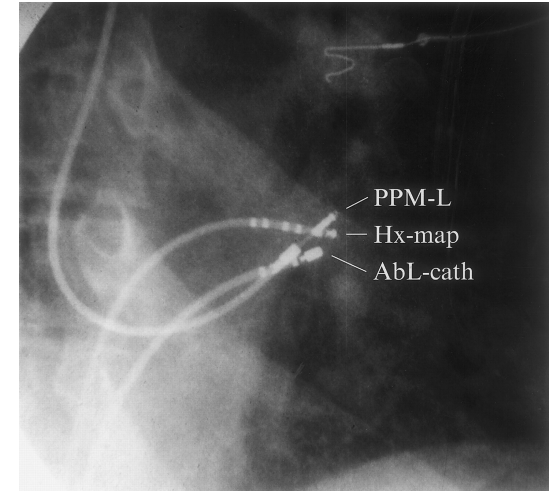
Pramod Deshmukh, MD; David A. Casavant, MS;
Mary Romanyshyn, CRNP; Kathleen Anderson, BSN

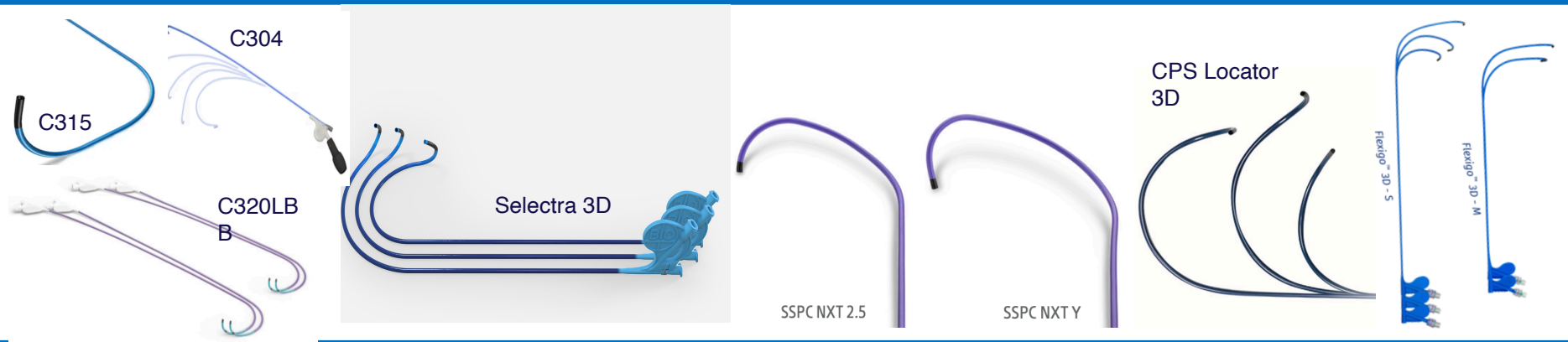
(Circulation. 2000;101:869-877.)



- 18 pts with Narrow QRS (<120 ms)
- 12 successfully implanted with screw-lead
- AV nodal ablation, Implanted with VVI-R

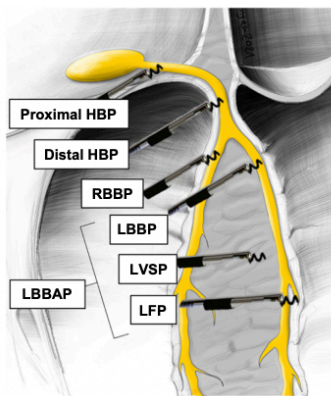
Mean EF improvement from $20 \pm 9\%$ to $31 \pm 11\%$





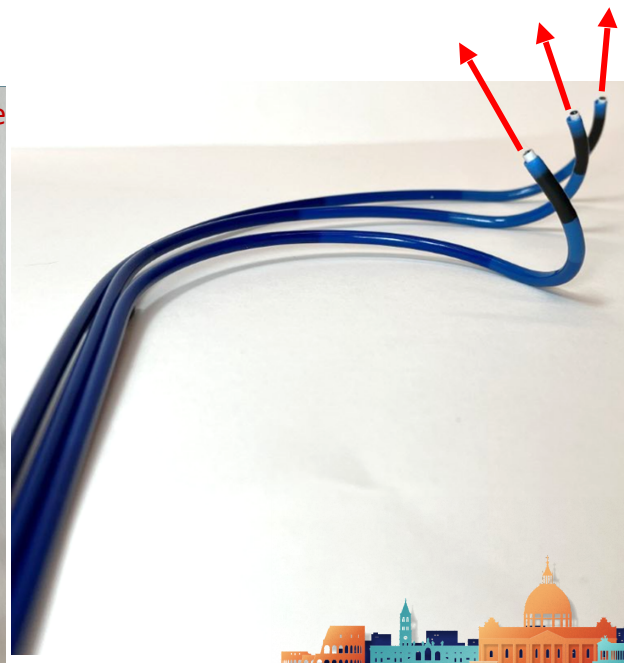
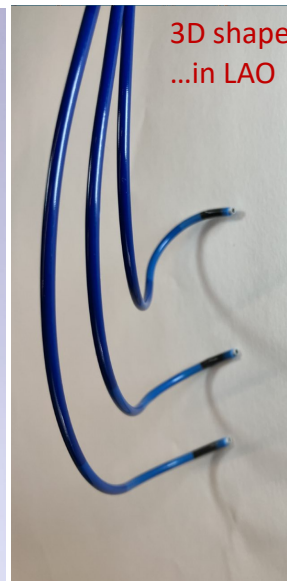
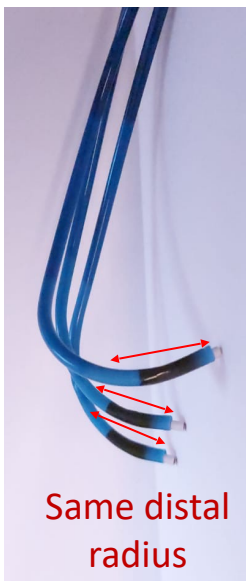
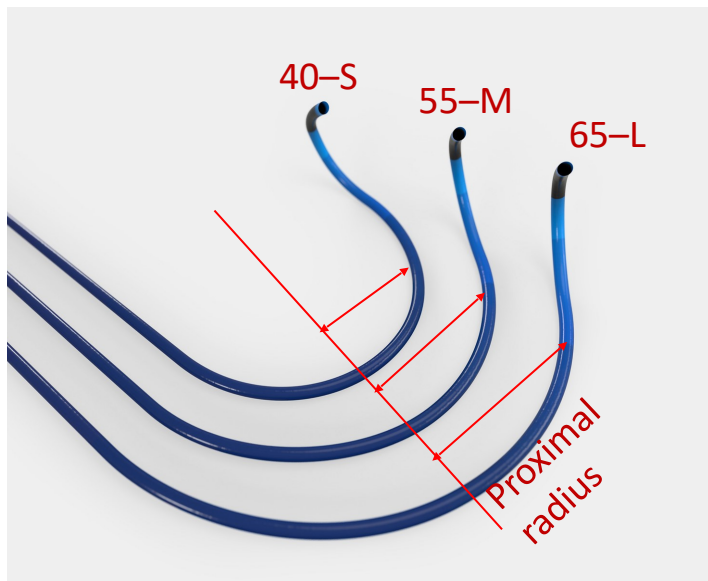
CSP: what do we want to achieve?

1. Be able to accommodate various anatomies and different lead locations
2. Reach the **His bundle** and be able to reach a **proximal/medial/distal** His to obtain the best paced QRS with optimal parameters
3. Reach different landing zones in the septum for LBBP
4. Shift from HBP to LBBP (and viceversa) if needed,
utilizing the same materials



**Different curves (3D) = possibility of reaching different zones of the septum
facilitating the perpendicularity**

Selectra 3D



Selectra 3D sheaths: 3 different landing zone

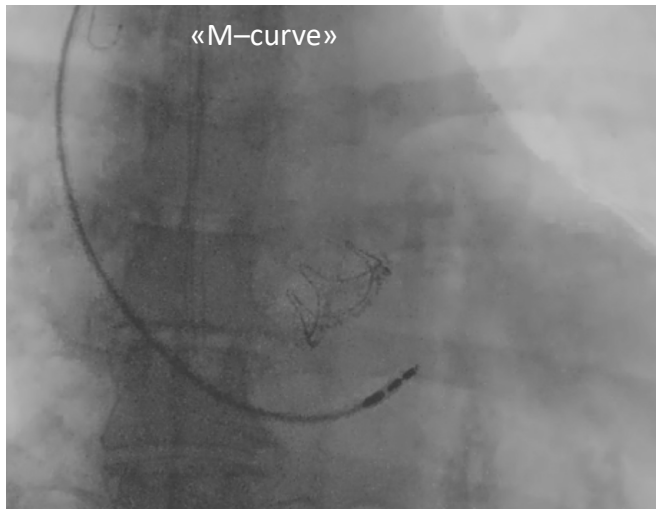
Selectra 3D 40-42

«S-curve»



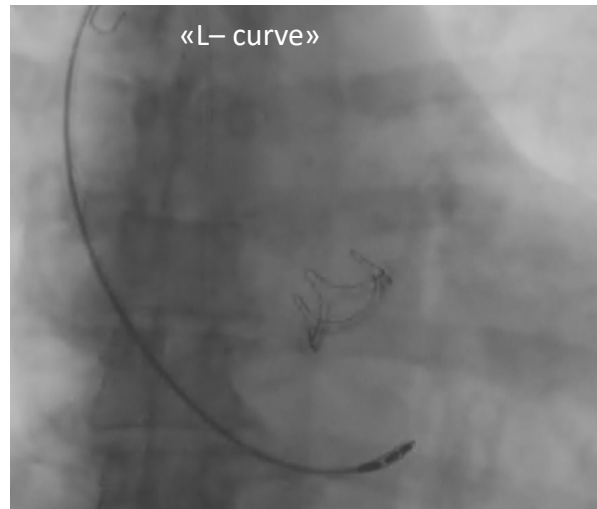
Selectra 3D 55-42

«M-curve»

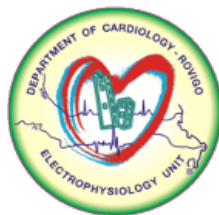


Selectra 3D 65-42

«L-curve»



M.B. Febr, 2023



Stylet-driven Leads or Lumenless Leads for Conduction System Pacing

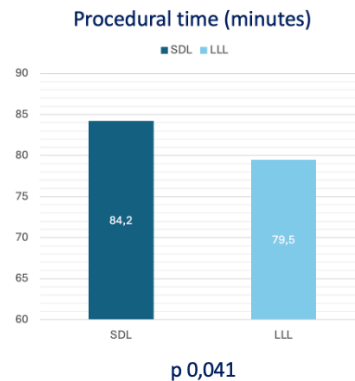
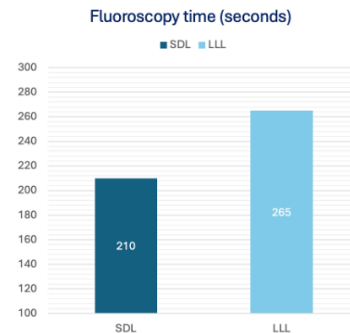
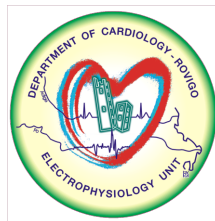
Óscar Cano ^{1,2}, Jan De Pooter ³ and Francesco Zanon ⁴

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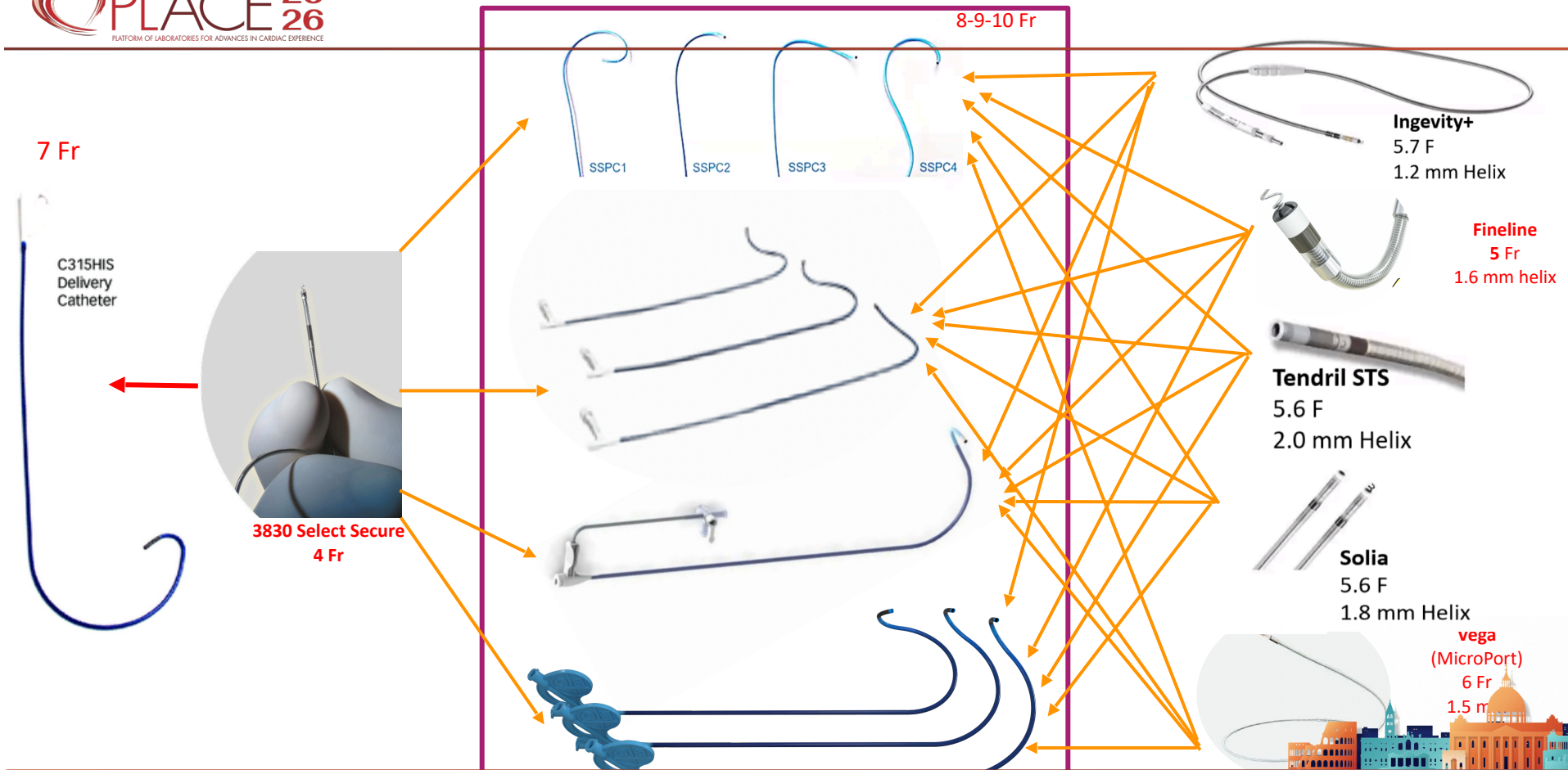
Received: 15 April 2024 Accepted: 30 May 2024 Citation: *Arrhythmia & Electrophysiology Review* 2024;13:e14. DOI: <https://doi.org/10.15420/aer.2024.18>

Clinical Perspective

- Lumenless leads (LLLs) have been extensively used for conduction system pacing (CSP) with stylet-driven leads (SDLs) being more recently introduced.
- Lead design and structural characteristics differ between LLLs and SDLs and may influence implant workflow and lead performance both acutely and in the long term.
- Direct comparisons in terms of lead performance and clinical outcomes are scarce and imbalanced considering the more recently available experience with SDLs.
- Electrical parameters and implant success rates appear comparable, but a higher rate of lead damage has been described with SDLs, which is probably related to the implant technique.
- With current data no specific recommendation of one lead type over the other can be made and the decision should be left to the implanter's preference and experience.



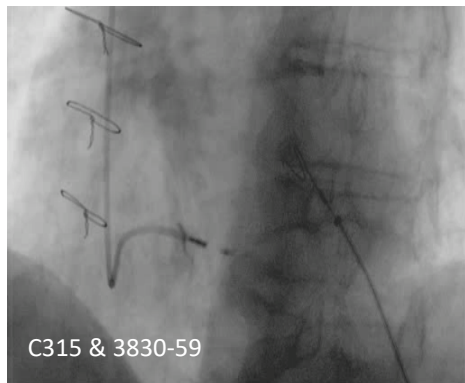
Customize the implant



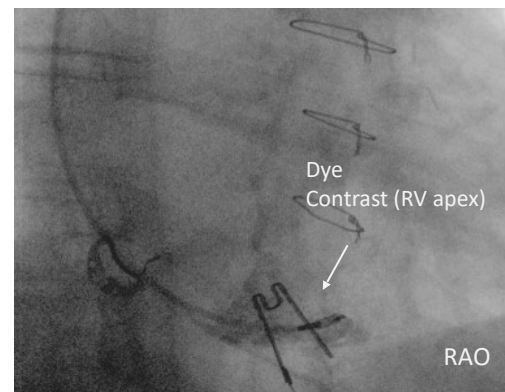
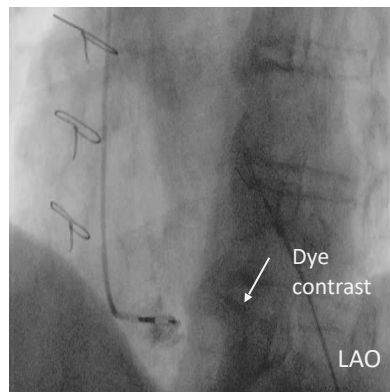
Case 1

B.R. male, 86 yo, atrial flutter → SR PM Oct 2021

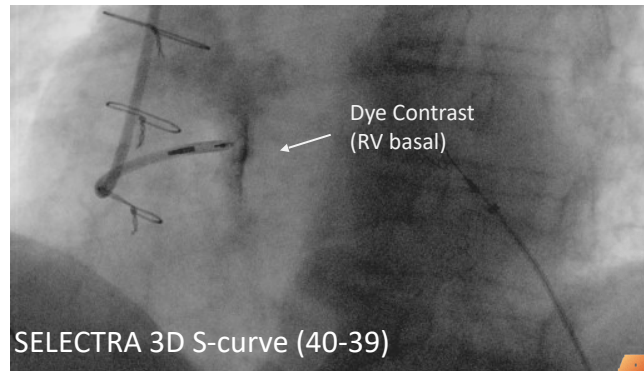
1° position:
not accepted



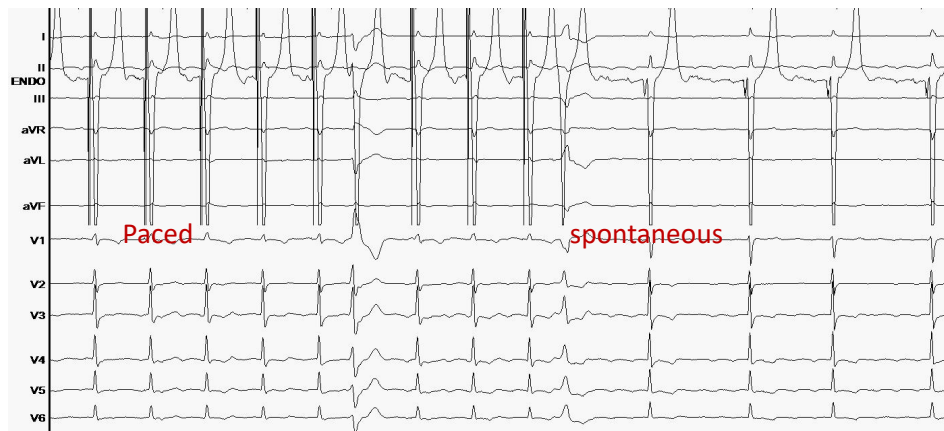
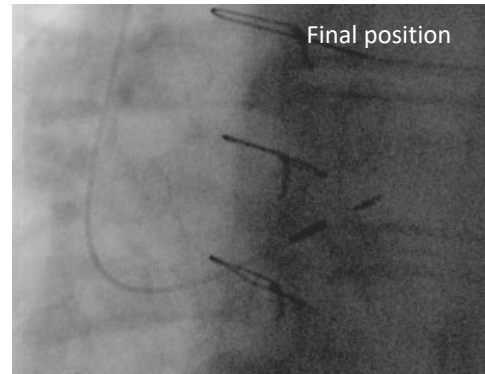
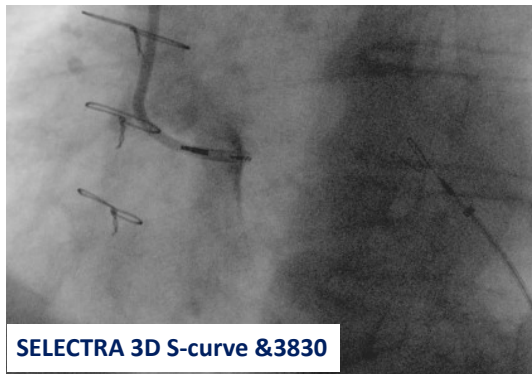
2° position:
not accepted



3° position:

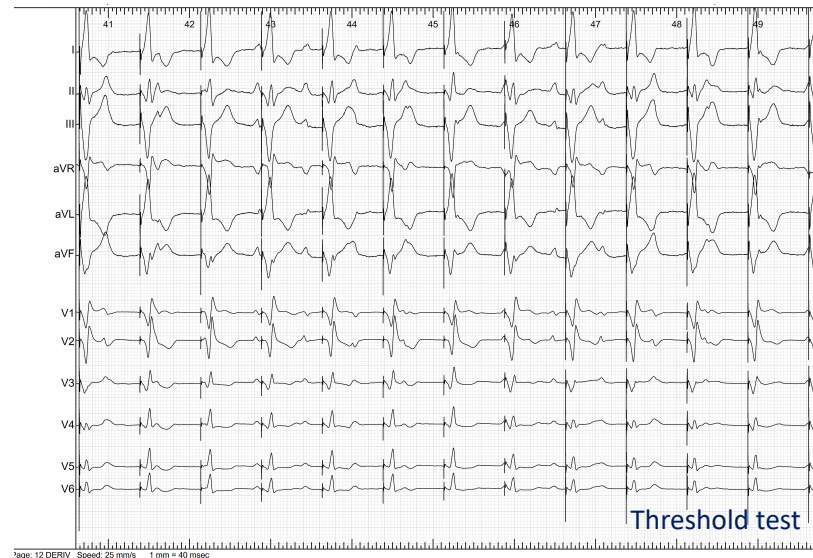
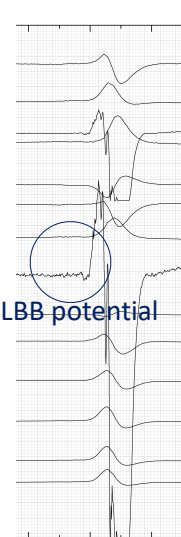
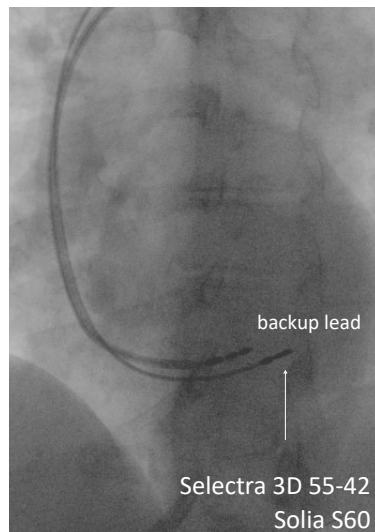
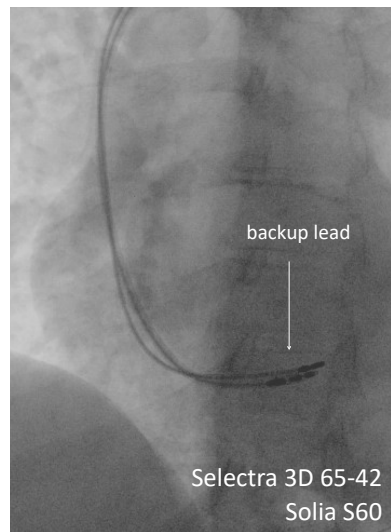


whether/how to change sheath



Case 2

A.P. female, 60 yo, uncorrected interatrial defect OS, complete AV block

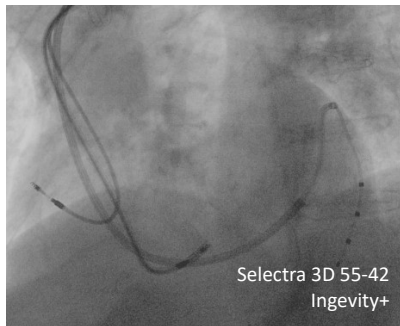


Smaller delivery leads to reach successfull site even in enlarged right chambers.
Backup lead was utilized, then placed in RA appendage

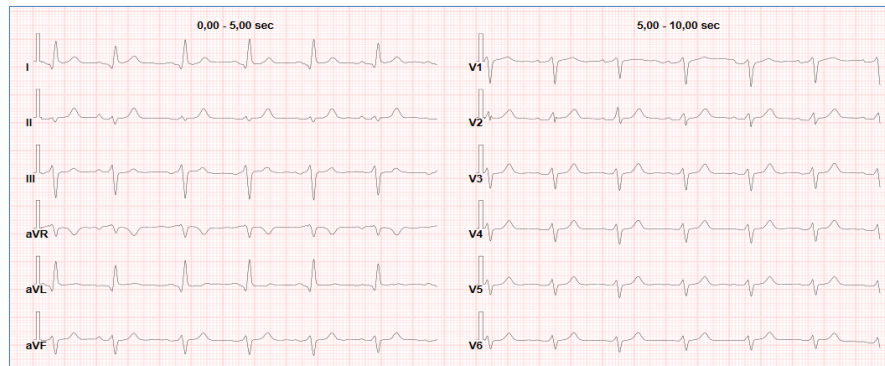
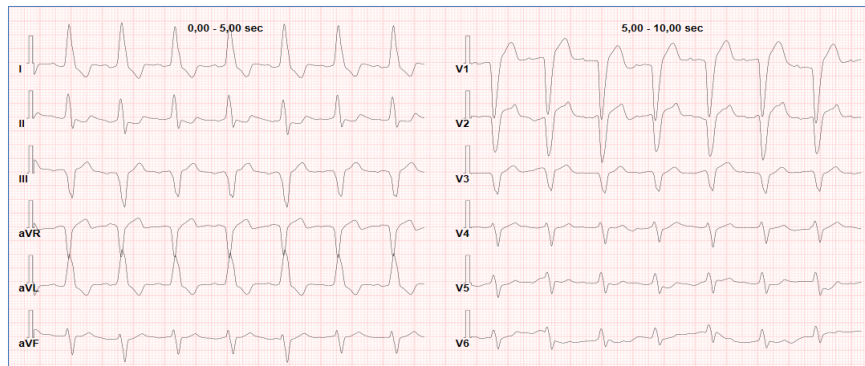
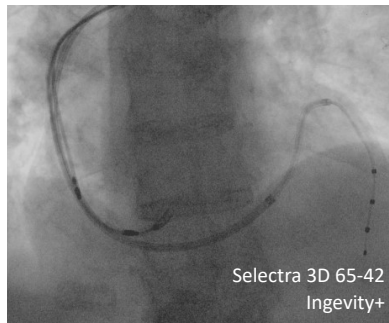


Case 3

S.A. female, 74 yo, HFrEF - DCM, failure HOT-CRT bailout LOT-CRT



His Bundle area
difficult to reach
← both delivery →
curve

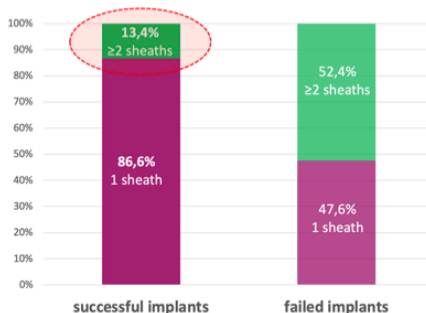
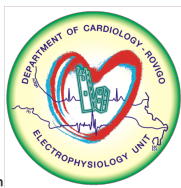
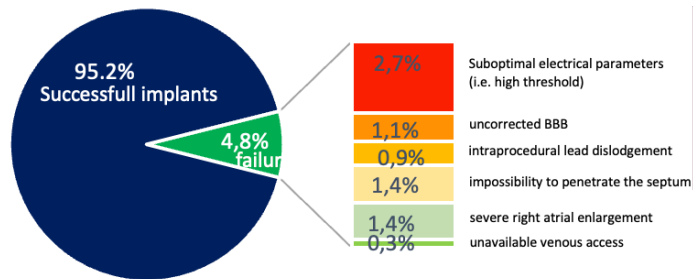


2019-2025

- 1312 CSP implant were performed (64 % of the overall implants).
- 39% were styled-driven leads while 61% were lumenless.
- In 317 patients His bundle pacing (24%) was performed while 995 patients received left bundle branch area pacing (76%)

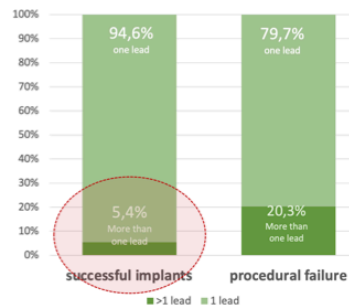
RESULTS

CSP was successfully achieved in **95.2%** of cases considering all indications. In 4.8% of cases lead implant failed



Sheath changes

≥ 2 Sheaths	n.153
Selectra 3D→ Selectra 3D different curve	47
C315 His MDT →C315 His MDT	43
C315→ Selectra 3D	30
Selectra 3D→ C315	13
SSPC→SSPC different curve	5
C304 His → C315 His	5
AgilisHisPRO→Selectra 3D	4
SSPC→ C315	2
CPS Abbott→ C315	2
C315 His→ C304 His	1
AgilisHisPRO→C315	1



lead changes	n.55
SDL→ LLL	21
LLL→SDL	18
SDL→ different SDL	9
LLL→LLL	7



Conclusion

- There are currently no strong evidences on how to correlate a curve based on heart measurements.
- New delivery catheters available extend the possibility of procedural success.
- The portfolio of available introducers supports effectively and safely the lead implant on conduction system (**HBP and LBBP**), allowing the implant of both **lumenless and stylet-driven leads**, leading to procedural success of 92-95%.
- The **first sheath** utilized allows to reach the target in the majority of cases. Based on the obstacles encountered with the first curve, we consider whether/how to **change sheath**.



Thank you for your attention

