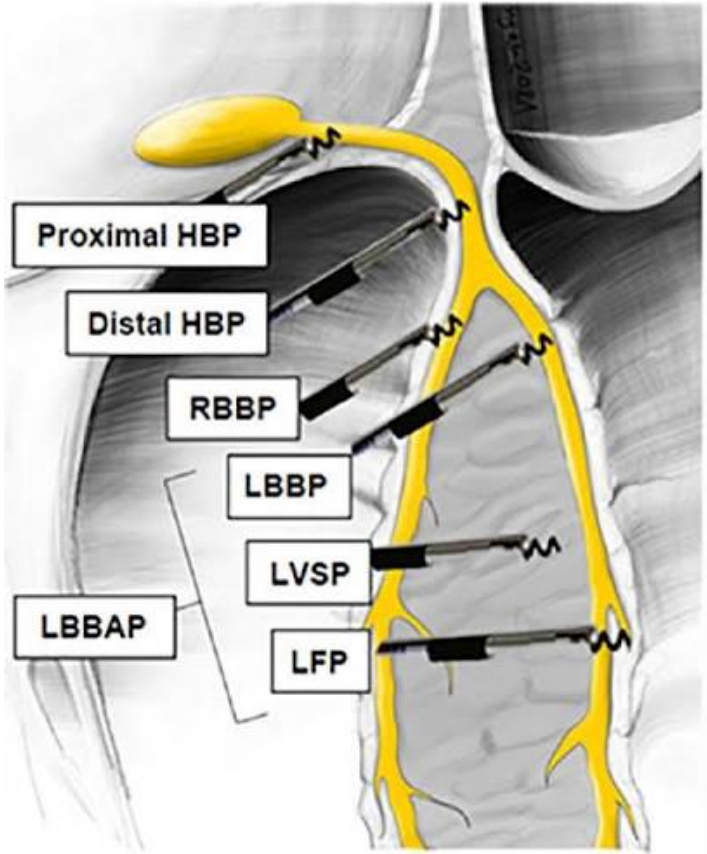
PLACE 2026
PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

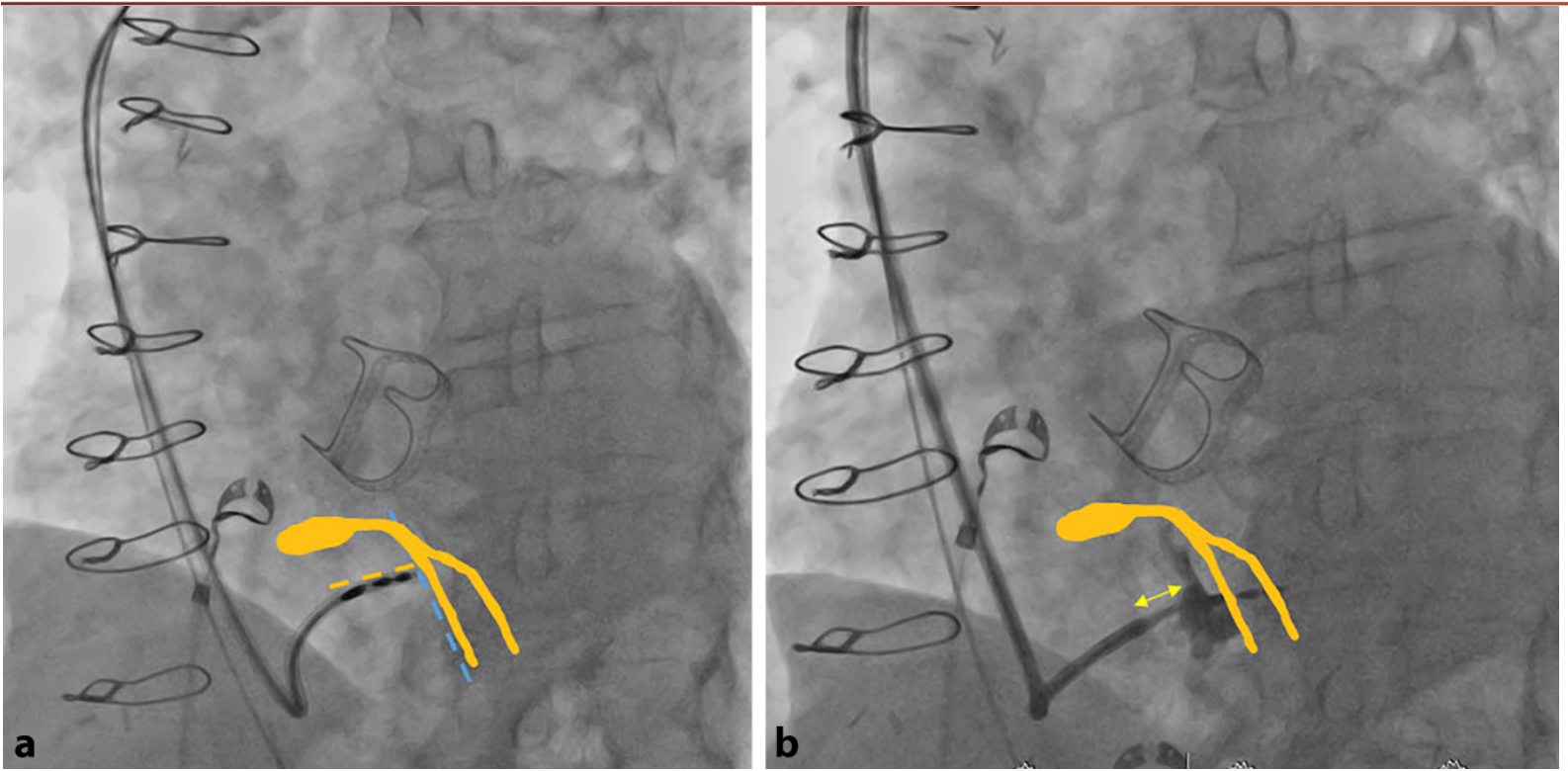
CONGRESSO
ROMA, 25 - 27 Giugno 2026

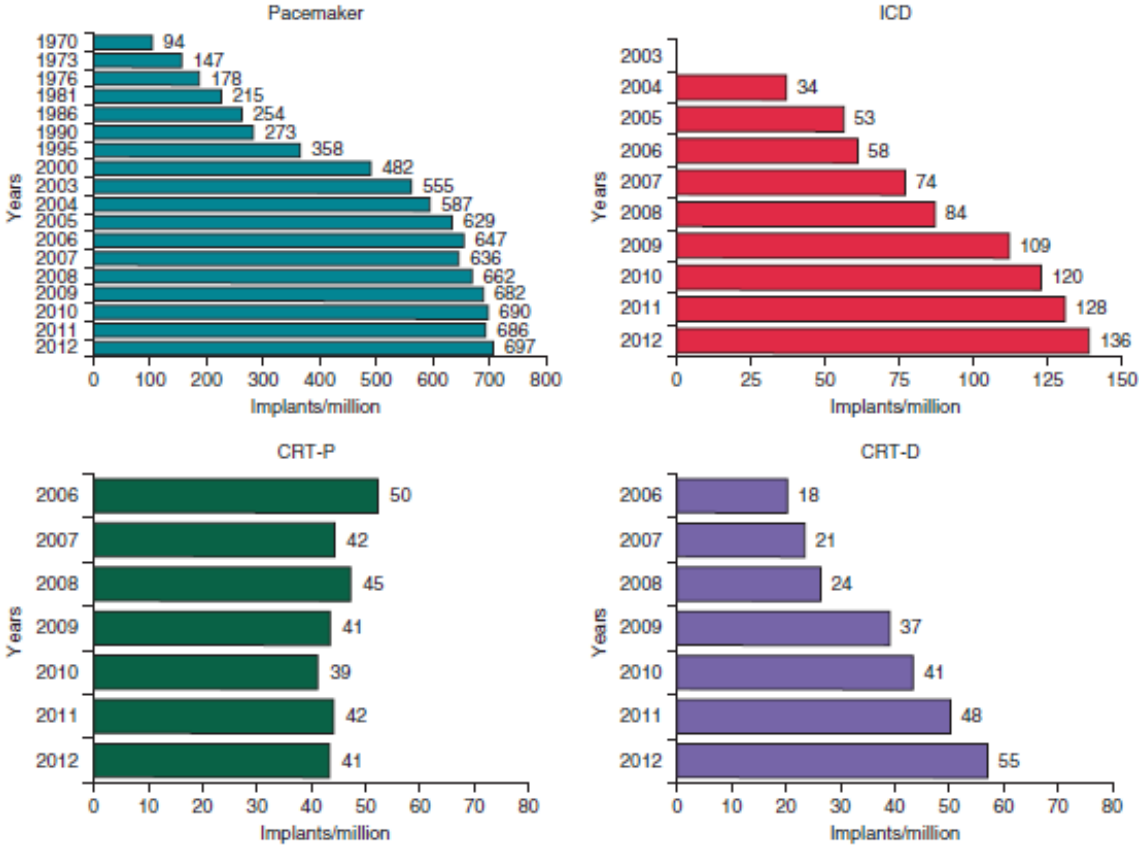
LEAD EXTRACTION

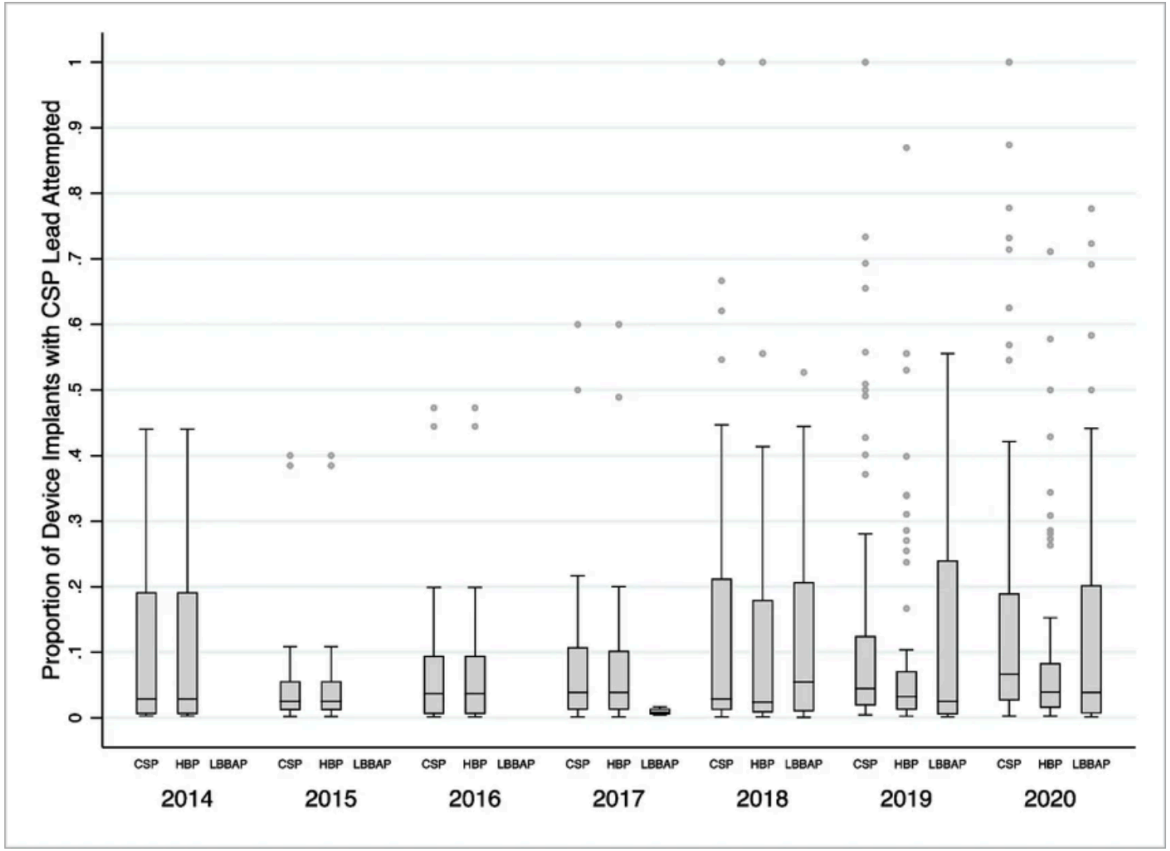
Estrazione di elettrocateteri in pazienti portatori di CSP

Gianluca Zingarini, Perugia


Proximal HBP
Distal HBP
RBBP
LBBP
LVSP
LBBAP
LFP


a
b


Pacemaker
Years
1970 94
1973 147
1976 178
1981 215
1986 254
1990 273
1995 358
2000 482
2003 555
2004 587
2005 629
2006 647
2007 636
2008 662
2009 682
2010 690
2011 686
2012 697
0 100 200 300 400 500 600 700 800
Implants/million
ICD
Years
2003
2004 34
2005 53
2006 58
2007 74
2008 84
2009 109
2010 120
2011 128
2012 136
0 25 50 75 100 125 150
Implants/million
CRT-P
Years
2006 50
2007 42
2008 45
2009 41
2010 39
2011 42
2012 41
0 10 20 30 40 50 60 70 80
Implants/million
CRT-D
Years
2006 18
2007 21
2008 24
2009 37
2010 41
2011 48
2012 55
0 10 20 30 40 50 60 70 80
Implants/million


Proportion of Device Implants with CSP Lead Attempted
0
.1
.2
.3
.4
.5
.6
.7
.8
.9
1
CSP HBP LBBAP
2014
2015
2016
2017
2018
2019
2020

INFECTIONS

REDUNDANT ABANDONED LEADS

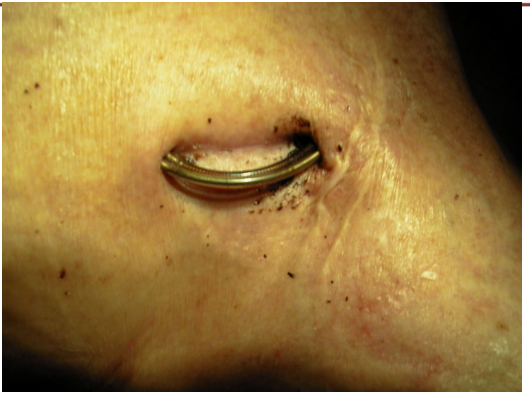
PSYCHOLOGICAL ISSUES

MALFUNCTION

THROMBOSIS

CHRONIC PAIN

MRI



INFECTIONS

REDUNDANT ABANDONED LEADS

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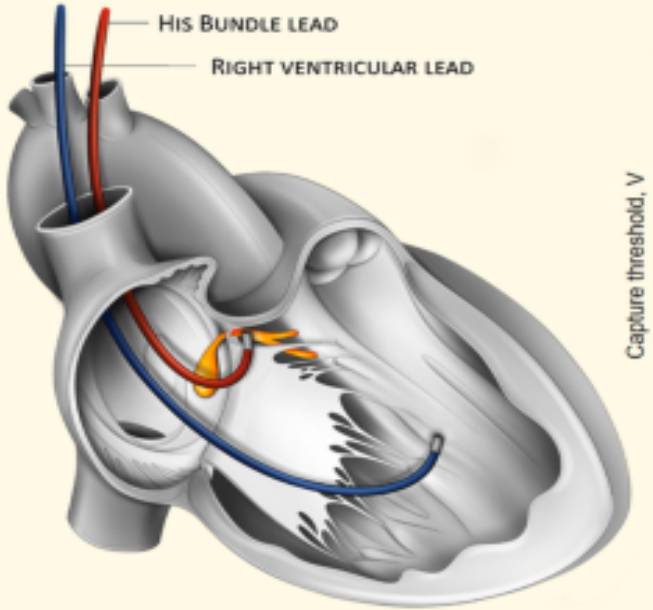
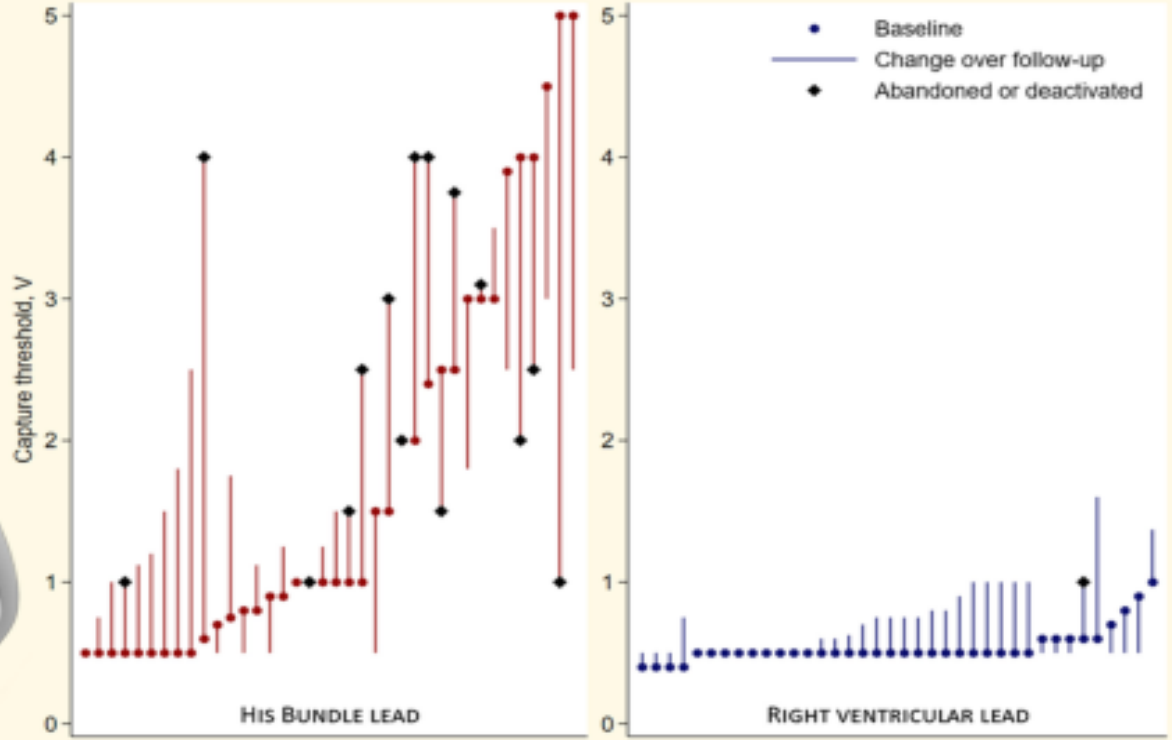




Capture thresholds at baseline and last follow-up with an active lead

Lead Technology for Left Bundle Branch Area Pacing (LBBAP)
Lumenless vs. Stylet-Driven Leads

Lumenless Lead (LLL)

Thin profile
Fixed helix
No lumen
High torque control
Lower shaft support

What does the evidence show?

LLL ⟷ SDL

Data are relying on small RCTs and observational studies

- High implant success with both
- Comparable pacing and sensing

✓

- Higher early complications with SDL (learning curve)

✓

- Large RCTs
- Lead fracture and durability (Need for robust long-term data)
- Lead extraction (safety, succsess rates?)
- Optimise CSP lead design (Innovative helix, materials?)

?

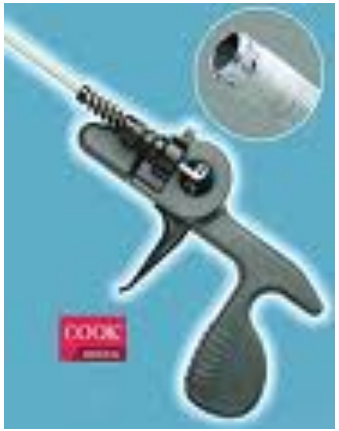
Stylet-driven Lead (SDL)

Thicker profile
Extendable helix
Stylet inside
Stylet guidance
Higher shaft support

Both lumenless (LLL) and stylet-driven leads (SDL) enable effective LBBAP
Choice should be individualised based on anatomy, operator experience and device-specific performance

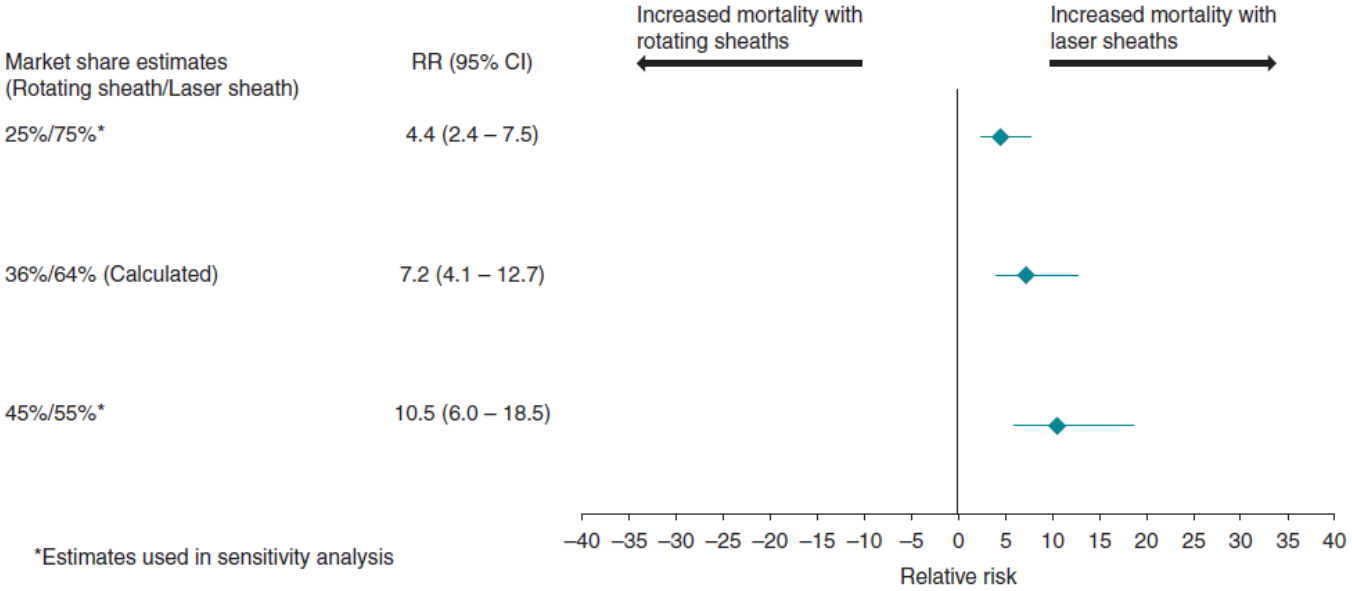
	Lumenless Leads	Stylet-driven Leads	Evidence Summary
Implant success	High	High	No consistent difference
Capture thresholds	Low/stable	Low/stable	Comparable
Sensing amplitudes	Adequate	Adequate	Comparable
Lead dislodgement	Low	Low to moderate	Operator dependent
Septal perforation	Rare	Rare	Technique related
Lead fracture	Rare, unknown long-term	Low, unknown long-term	Data lacking
Extractability	Feasible (limited data)	Feasible (limited data)	Major knowledge gap


Tip

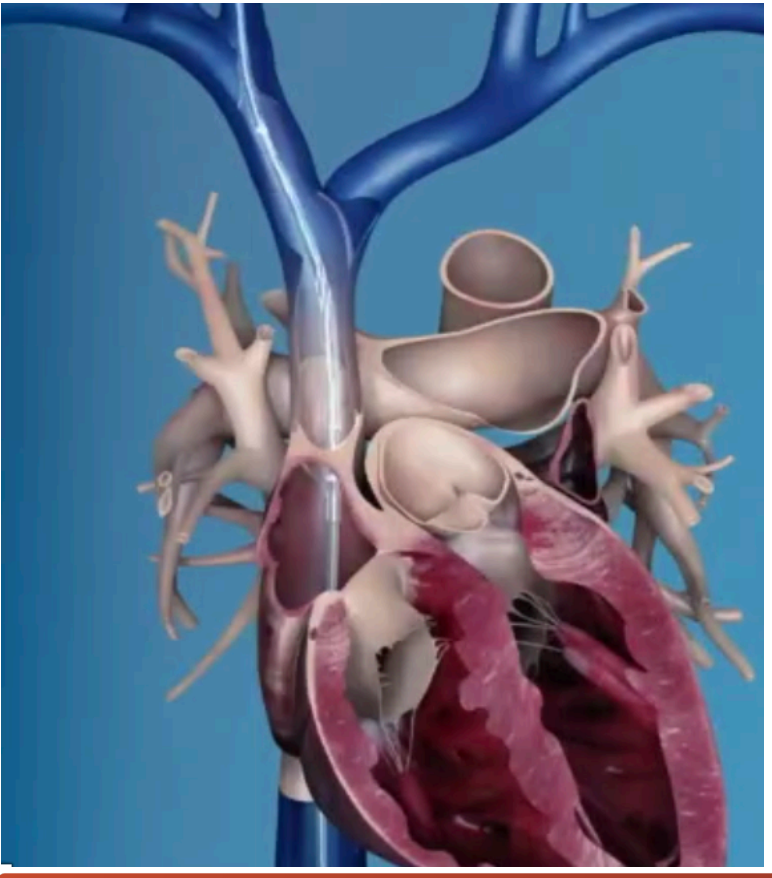



Rotating Dilator Sheath
Spectranetics
13F

Tools and techniques

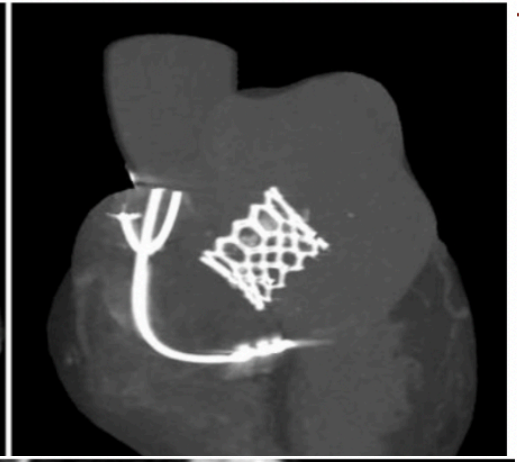


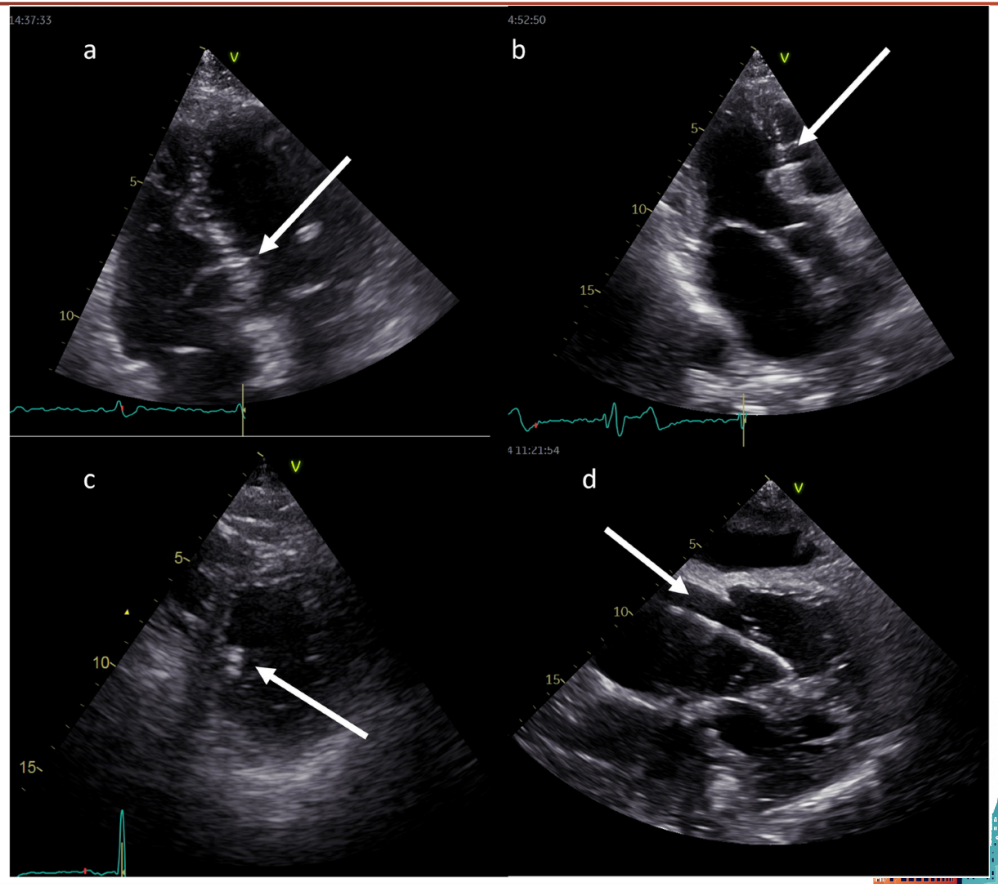
Laser sheaths seem associated with higher mortality compared to mechanical rotating sheaths




Bridge
Occlusion balloon
Bridge to surgery
Introducing the Philips Bridge
occlusion balloon for lead extraction.

Imaging Pre-Procedurale

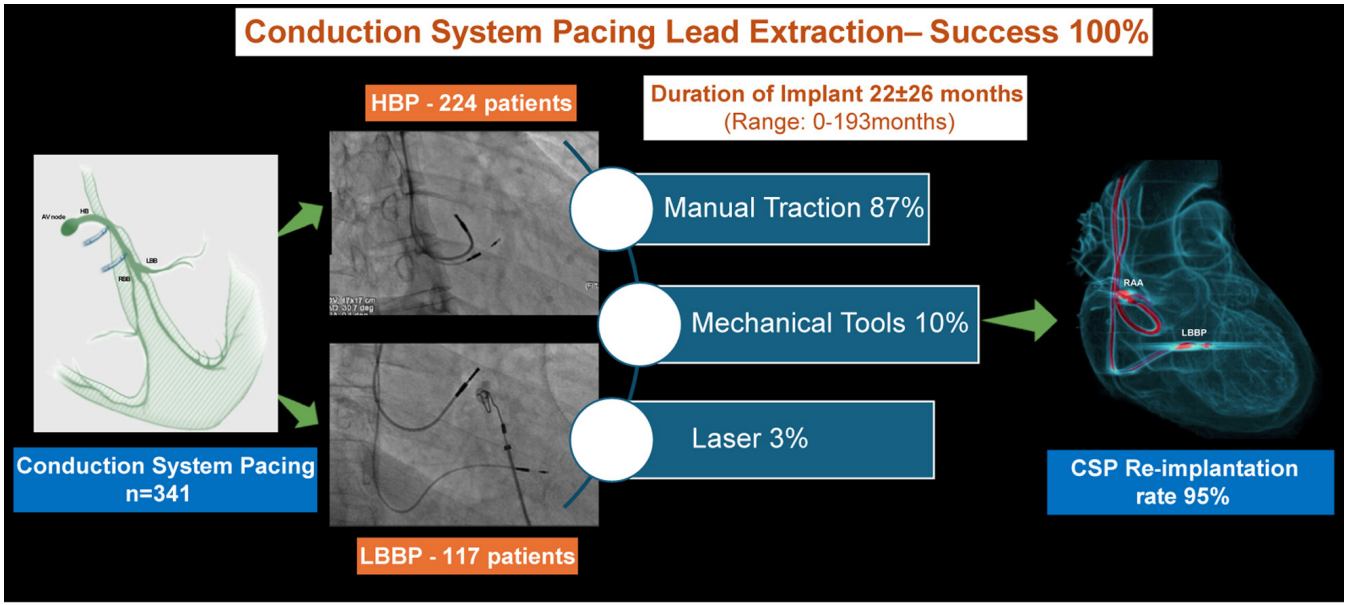




HeartRhythm
Heart Rhythm Society SM

Transvenous extraction of conduction system pacing leads: An international multicenter (TECSPAM) study

Pugazhendhi Vijayaraman, MD [1] · Rohan S. Trivedi, MD [1] · Jayanthi N. Koneru, MD [2] · ... · Mishal Mumtaz, MD [11] · Kenneth A. Ellenbogen, MD [2] · Bengt Herweg, MD [11] ... Show more



38 pts

Conclusioni

- L’estrazione di elettrocateteri CSP è una procedura fattibile e senza particolari complicanze aggiuntive rispetto a una estrazione di elettrodi non CSP
- Le tecniche non differiscono da estrazioni standard
- Scarsi dati in letteratura
- Ricordarsi quando si mette un catetere alla possibilità che questo potrà essere estratto in futuro

GRAZIE