31 GIORNATE CARDIOLOGICHE TORINESI

TURIN
October
24th-26th
2019

Lead positioning and stability for CRT

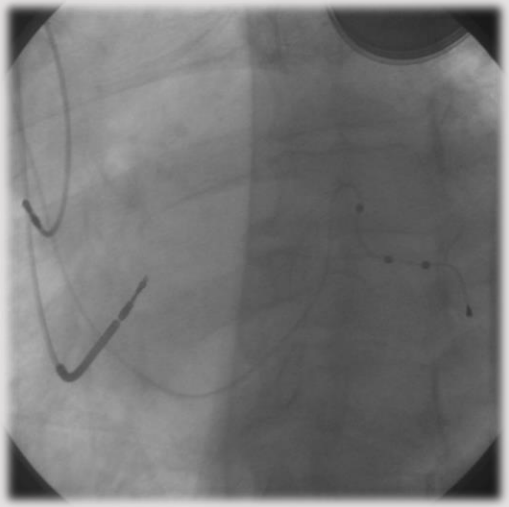
Gabriele Giannola

Fondazione Istituto G. Giglio - Cefalù

Turin 26th October 2019

CRT

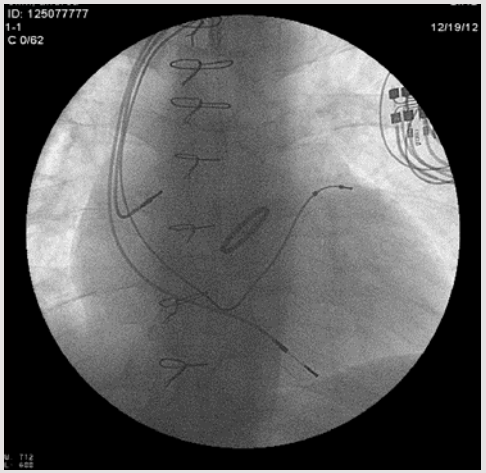
- Atrial lead
- RV lead
- LV lead



Success rate:

Implant 95-98%

Responder 50-90%

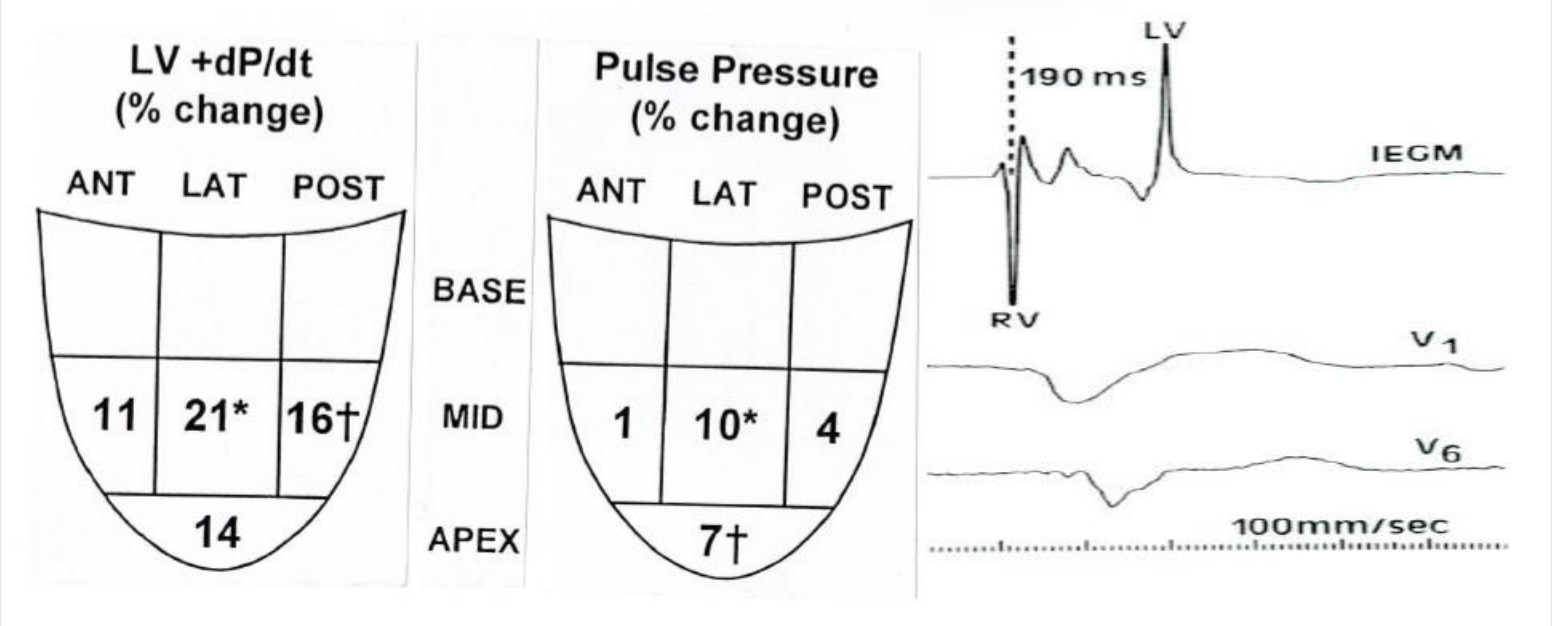


LV LEAD POSITIONING

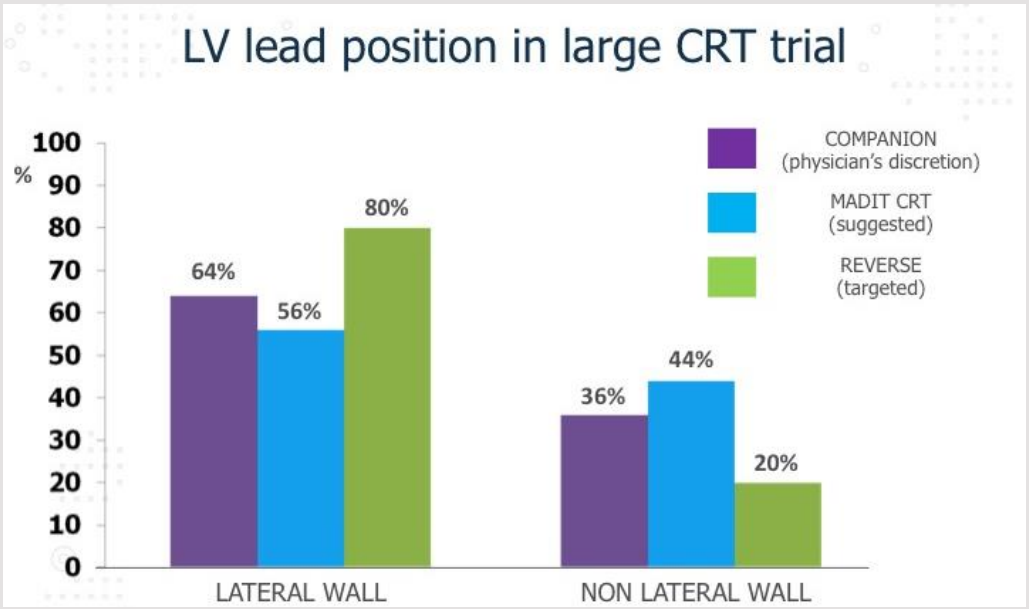
De novo LV lead positioning:

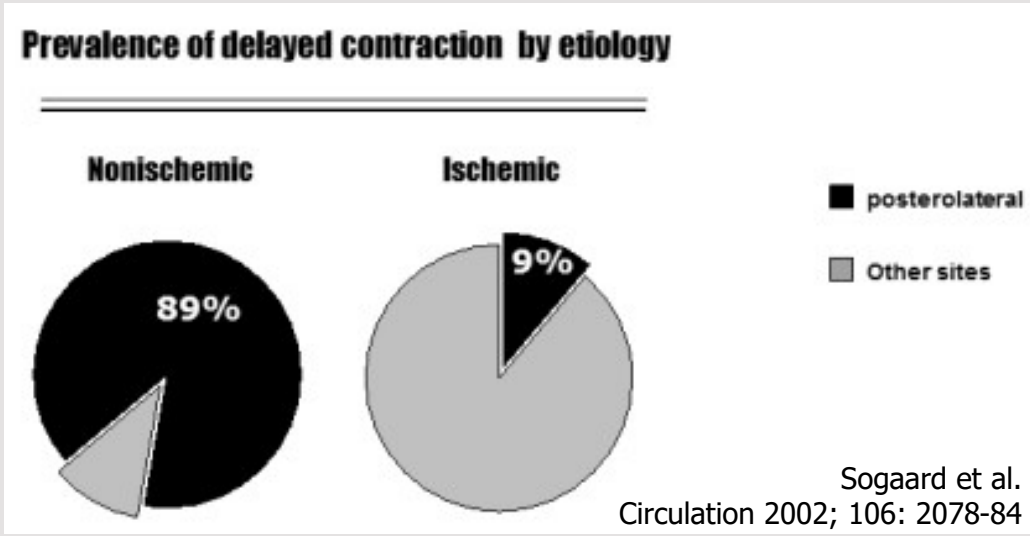
- How to choose the optimal position?

LV lead: lateral or postero-lateral in all cases?



Auricchio A. et al. Am J Cardiol 1999; 83:136D-42D

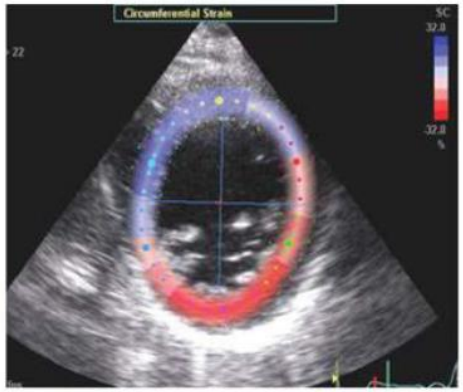


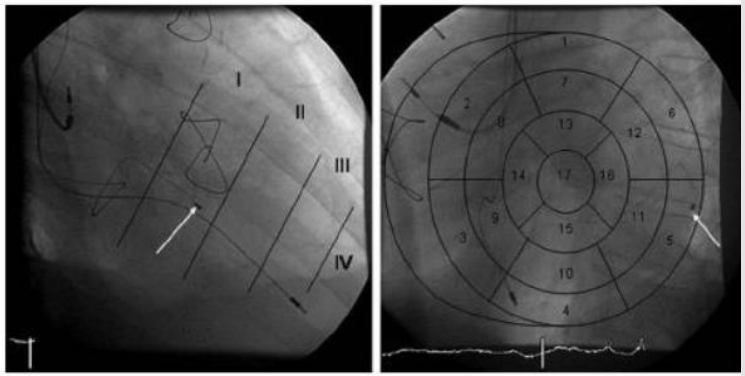


Sogaard et al.
Circulation 2002; 106: 2078-84

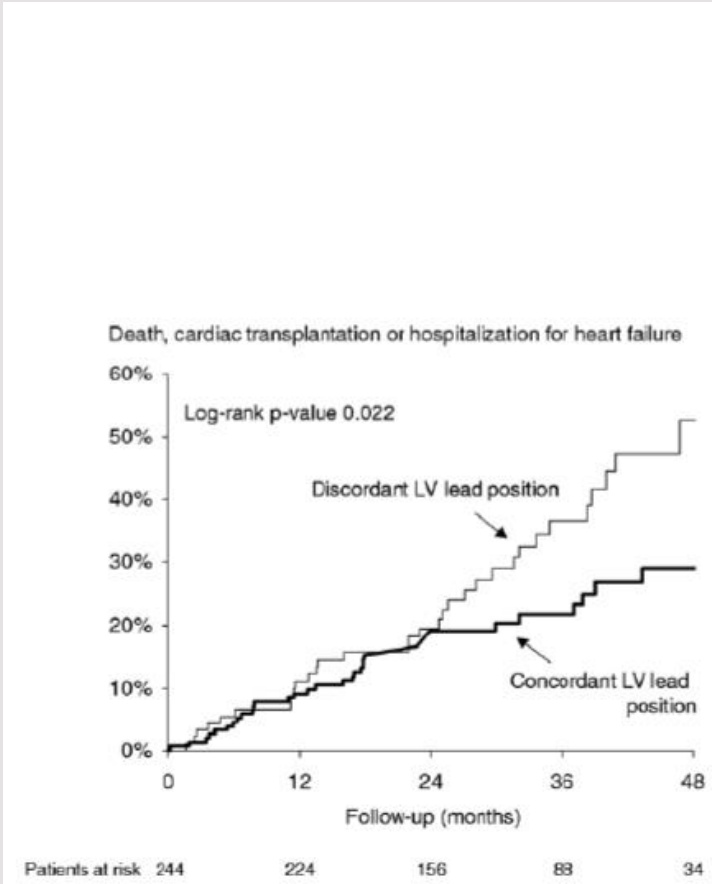
Impact of left ventricular lead position in cardiac resynchronization therapy on left ventricular remodelling. A circumferential strain analysis based on 2D echocardiography

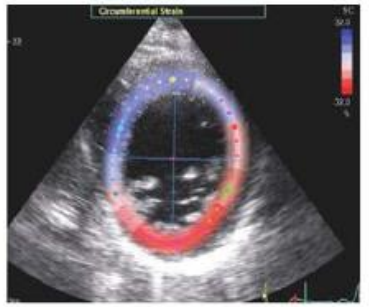
Michael Becker[1], Rafael Kramann[1], Andreas Franke[1], Ole-A. Breithardt[2], Nicole Heussen[3], Christian Knackstedt[1], Christoph Stellbrink[4], Patrick Schauerte[1], Malte Kelm[1], and Rainer Hoffmann[1]*

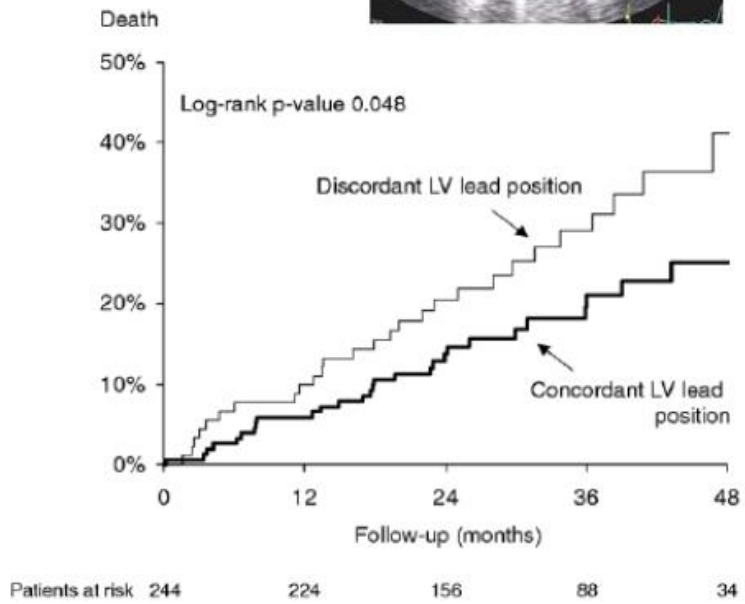




Site of latest activation:
Lateral 44%
Anterior 25%
Posterior 15%
Inferior 7%
Apical 9%


Death, cardiac transplantation or hospitalization for heart failure
60%
50%
40%
30%
20%
10%
0%
Log-rank p-value 0.022
Discordant LV lead position
Concordant LV lead position
0
12
24
36
48
Follow-up (months)
Patients at risk 244 224 156 88 34




Death
50%
40%
30%
20%
10%
0%
Log-rank p-value 0.048
Discordant LV lead position
Concordant LV lead position
0
12
24
36
48
Follow-up (months)
Patients at risk 244 224 156 88 34

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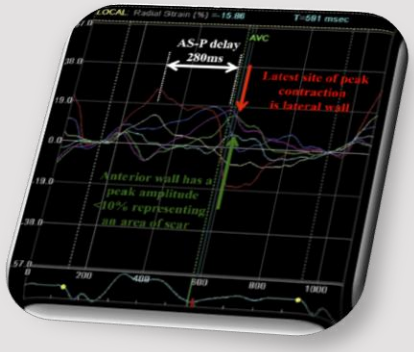
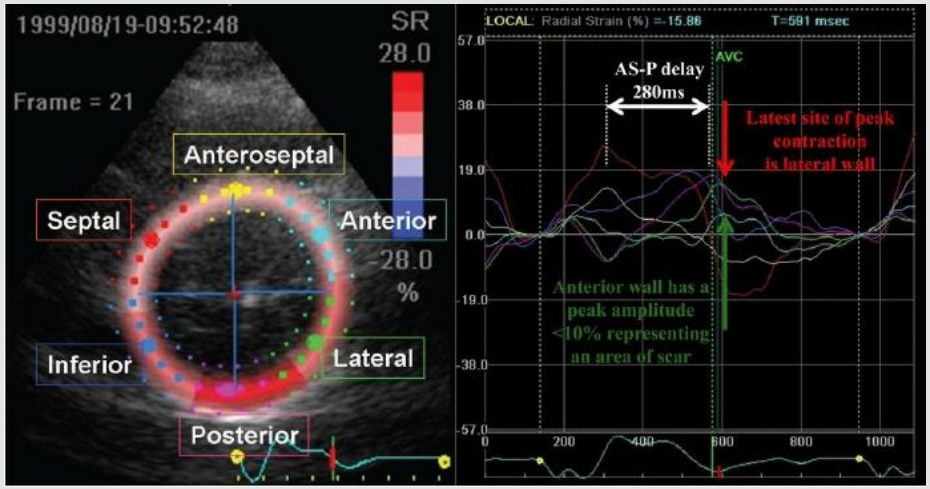
Targeted Left Ventricular Lead Placement to Guide Cardiac Resynchronization Therapy

The TARGET Study: A Randomized, Controlled Trial

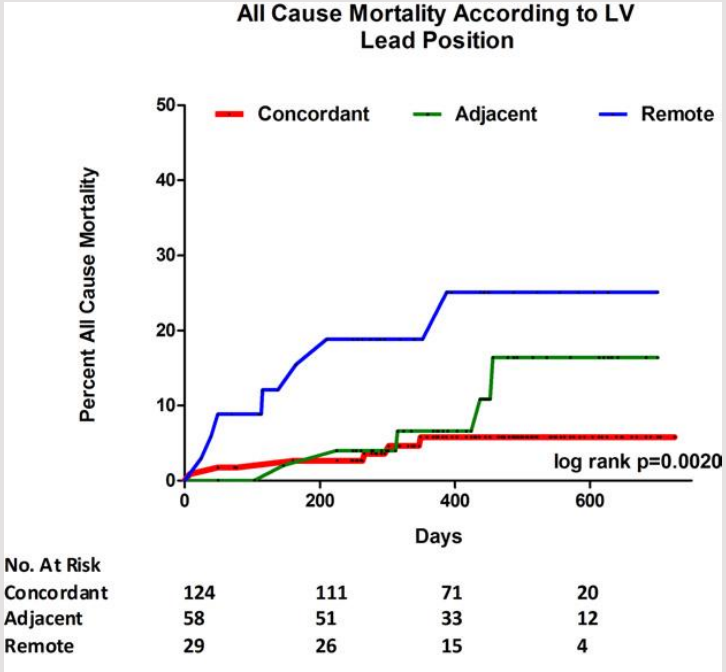
Fakhar Z. Khan, MA,* Mumohan S. Virdee, MD,* Christopher R. Palmer, PHD,† Peter J. Pugh, MD,‡ Denis O'Halloran, BCH,‡ Philip A. Read, MD,* David Begley, MD,* Simon P. Fynn, MD,* David P. Dutka, DM,‡

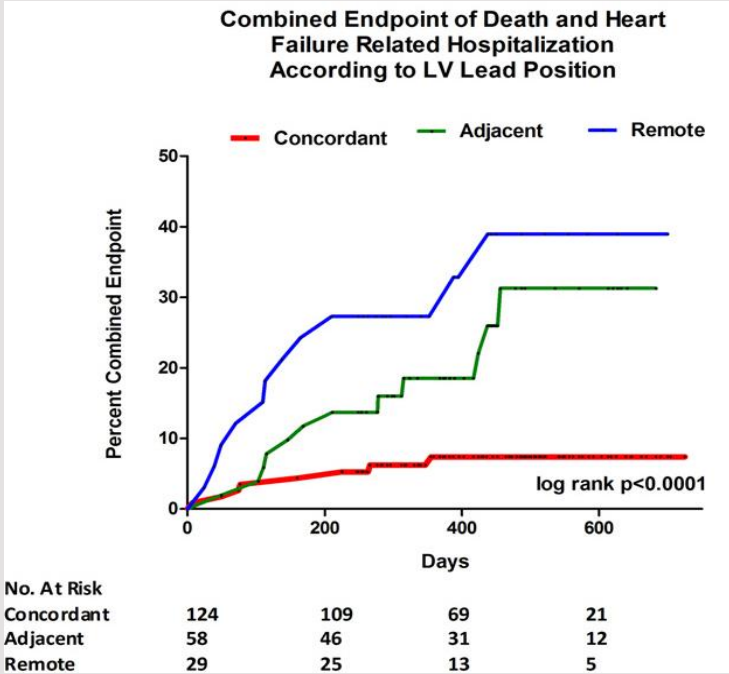
Cambridge, United Kingdom



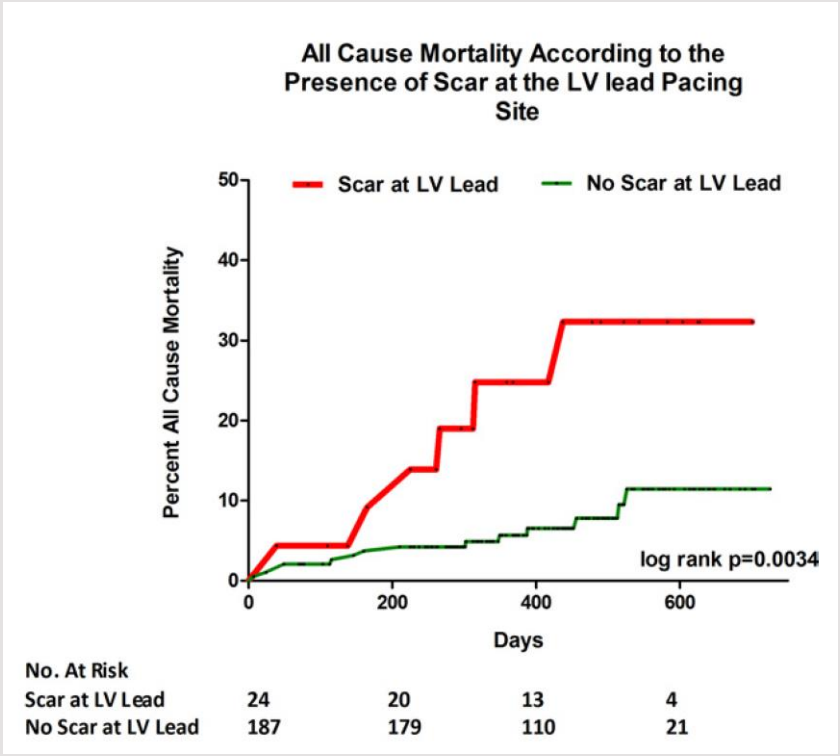


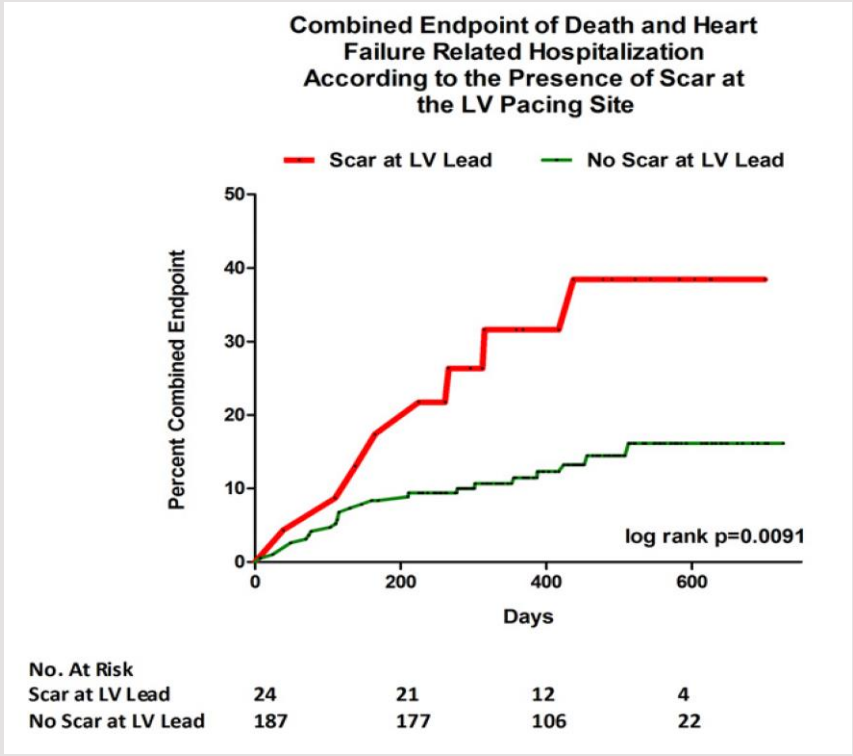
Targeted LV lead position improves outcomes

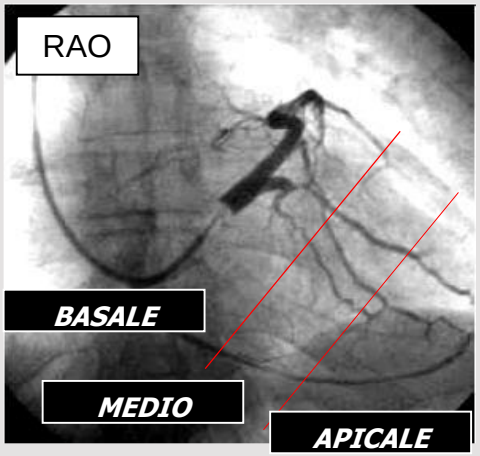




CRT RESPONSE: 70% IN ECHO GUIDED PTS vs 55% IN CONTROL PTS (P <0.05)


All Cause Mortality According to the Presence of Scar at the LV lead Pacing Site
Scar at LV Lead
No Scar at LV Lead
Percent All Cause Mortality
50
40
30
20
10
0
0
200
400
600
Days
log rank p=0.0034
No. At Risk
Scar at LV Lead 24 20 13 4
No Scar at LV Lead 187 179 110 21


Combined Endpoint of Death and Heart Failure Related Hospitalization According to the Presence of Scar at the LV Pacing Site
Scar at LV Lead
No Scar at LV Lead
Percent Combined Endpoint
50
40
30
20
10
0
0
200
400
600
Days
log rank p=0.0091
No. At Risk
Scar at LV Lead 24 21 12 4
No Scar at LV Lead 187 177 106 22

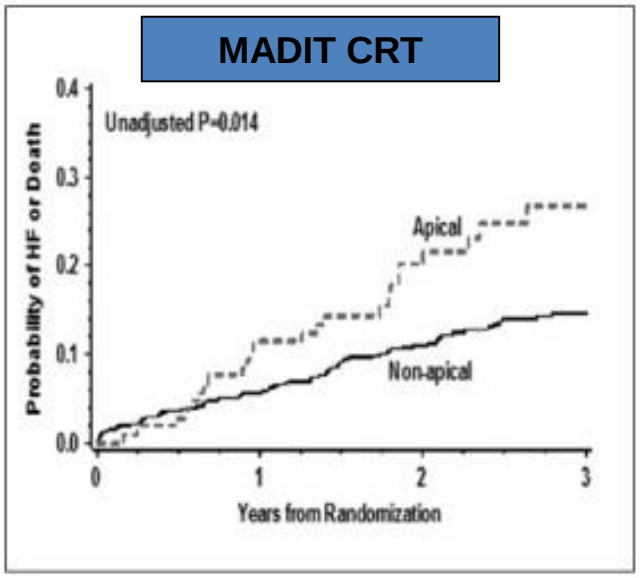


LV lead position: apical vs non apical

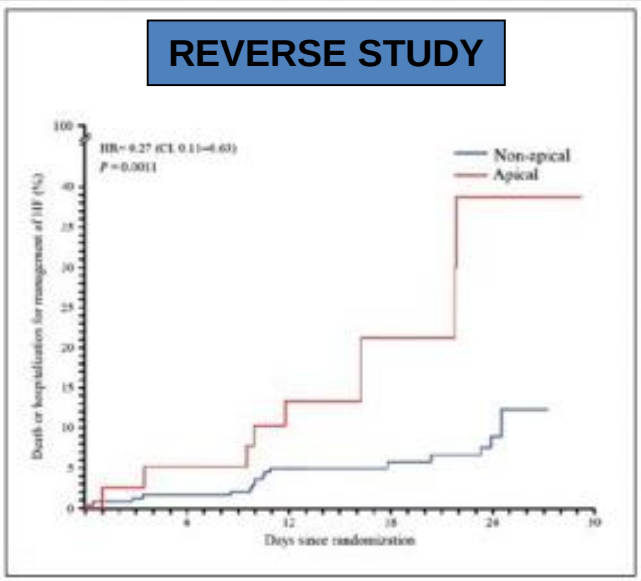
Thebault et al. Eur Heart J 2012; 33: 2662-71

Singh et al. Circulation 2011; 123: 1159-66

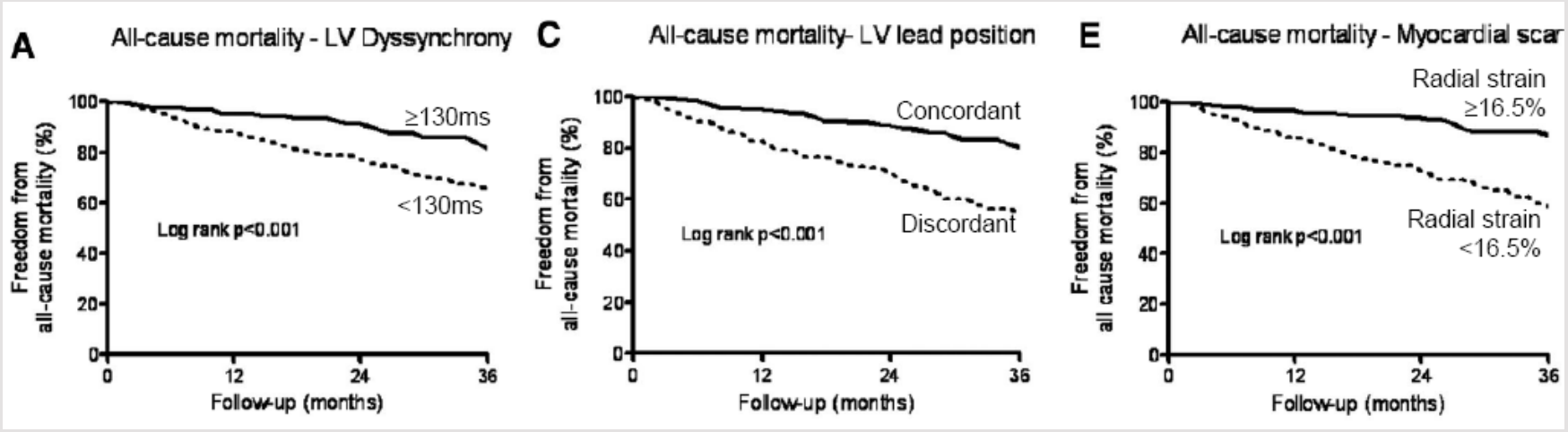
MADIT CRT

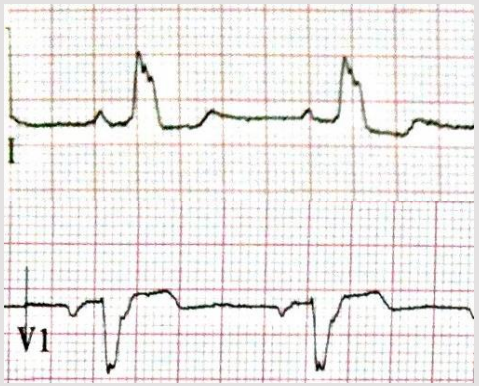


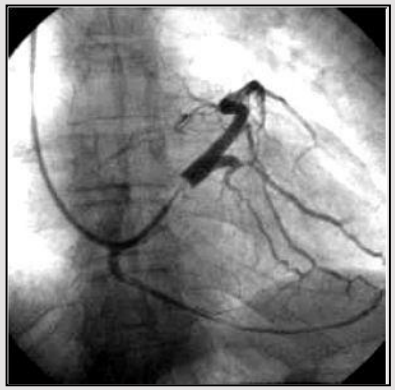
REVERSE STUDY



LV lead position







Delgado V et al. Circulation 2011; 123 (1): 70-8

LV LEAD POSITIONING

De novo LV lead positioning:

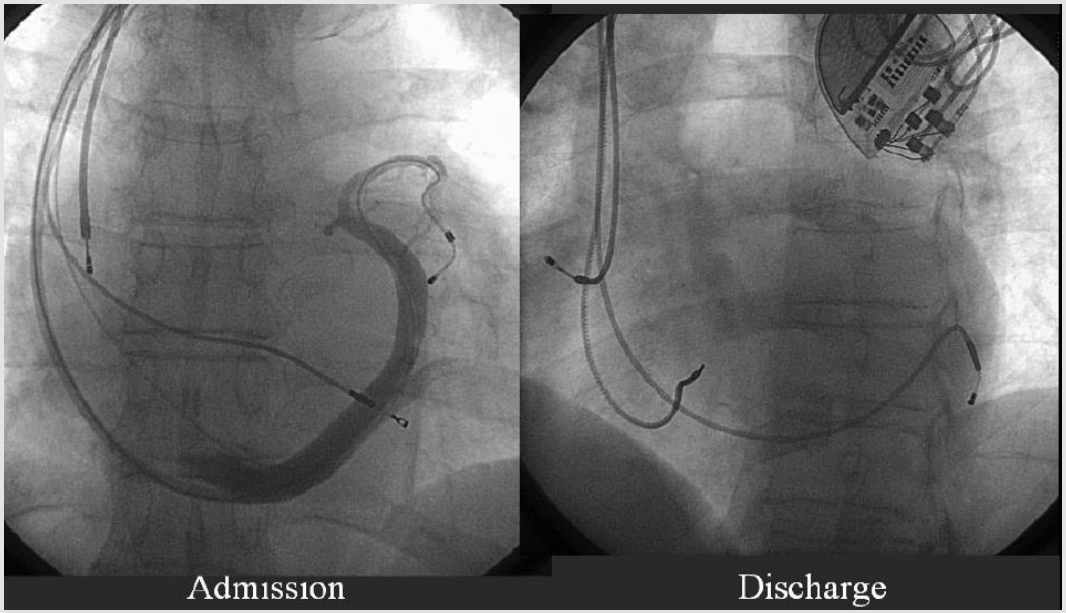
- How to choose the optimal position?

Patients already implanted with a LV lead:

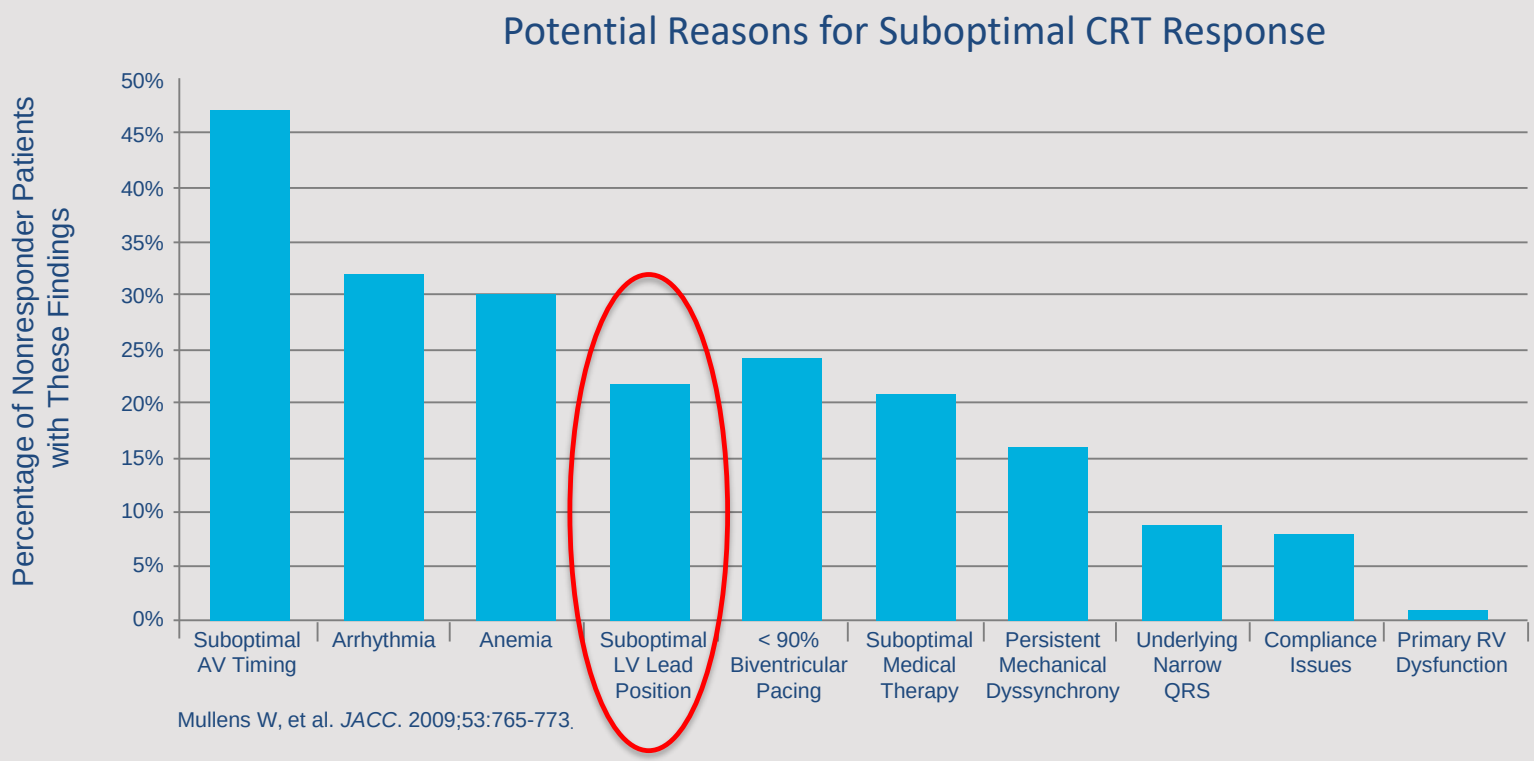
- How to imrove CRT?

Solutions

- Modification of the location of the LV lead
- Surgical approach
- LV dual site?
- LV endocardial

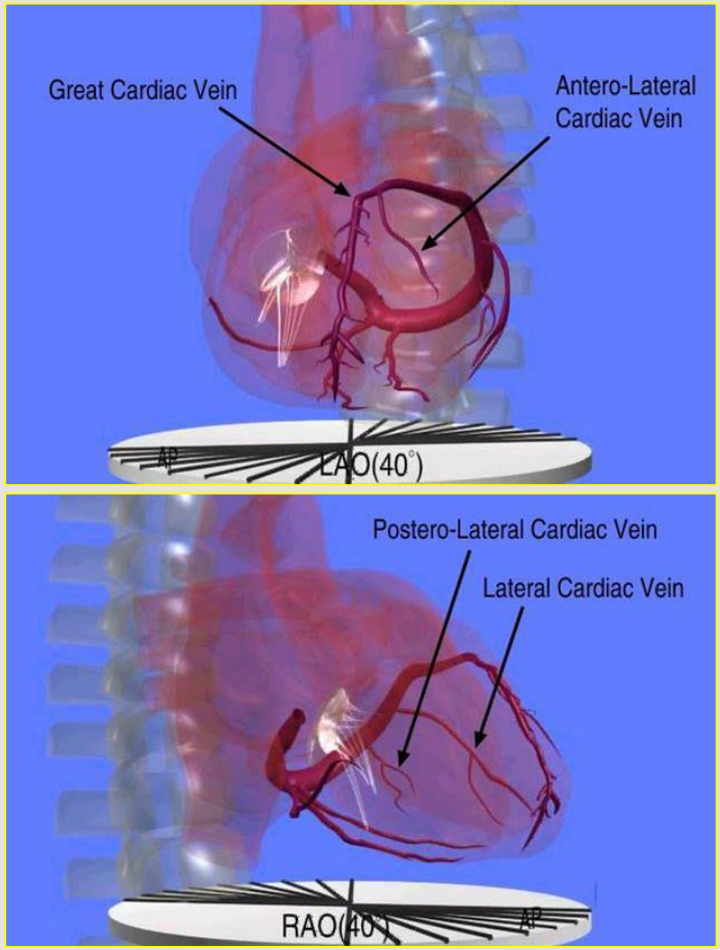


There Are Many Drivers for CRT NonResponse



Mullens W, et al. *JACC*. 2009;53:765-773.

Anatomy


Great Cardiac Vein
Antero-Lateral Cardiac Vein
LAO(40°)
Postero-Lateral Cardiac Vein
Lateral Cardiac Vein
RAO(40°)

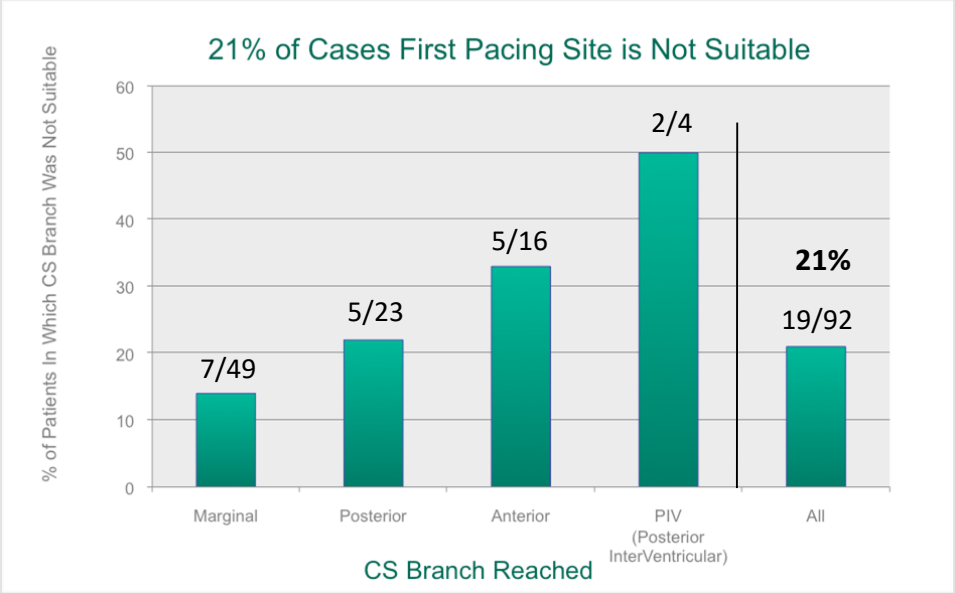

AIV
MCV

CRT pacing challenges: Lead stability

Coronary Sinus Side Branches for Cardiac Resynchronization Therapy: Prospective Evaluation of Availability, Implant Success, and Procedural Determinants

GABOR Z. DURAY, M.D., STEFAN H. HOHNLOSER, M.D., and CARSTEN W. ISRAEL, M.D.

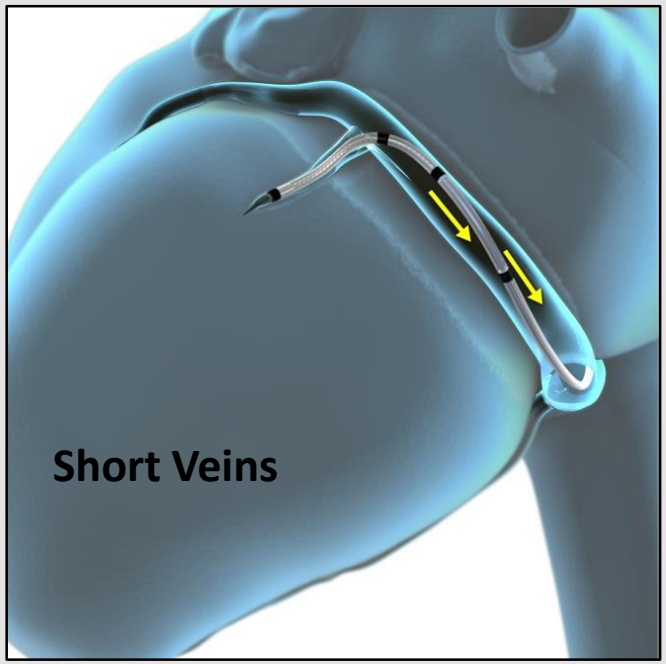
From the Department of Medicine, Division of Cardiology, Section Clinical Electrophysiology, J. W. Goethe University, Frankfurt, Germany

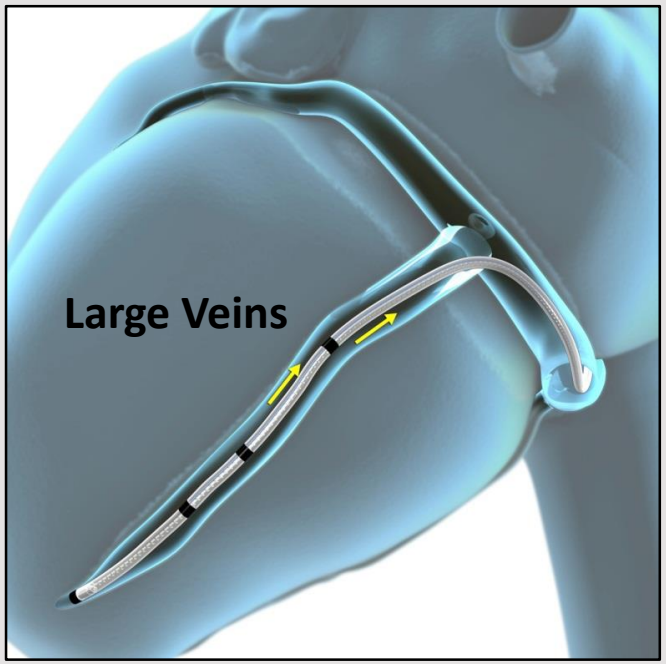


Duray et al. reported that in 21% (19/92) of cases with bipolar LV leads, the first pacing site chosen was not suitable due to lead instability and high pacing thresholds.

LV Lead Challenges

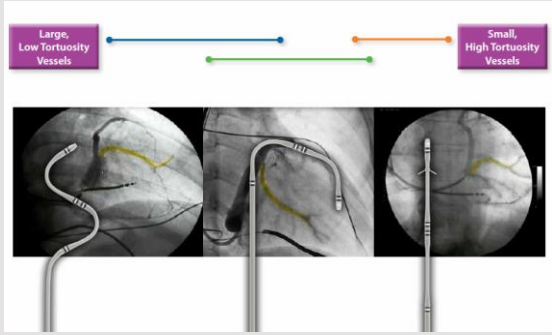
- Limited venous options
- Difficulties with precise placement
- Dislodgement and implant unpredictability

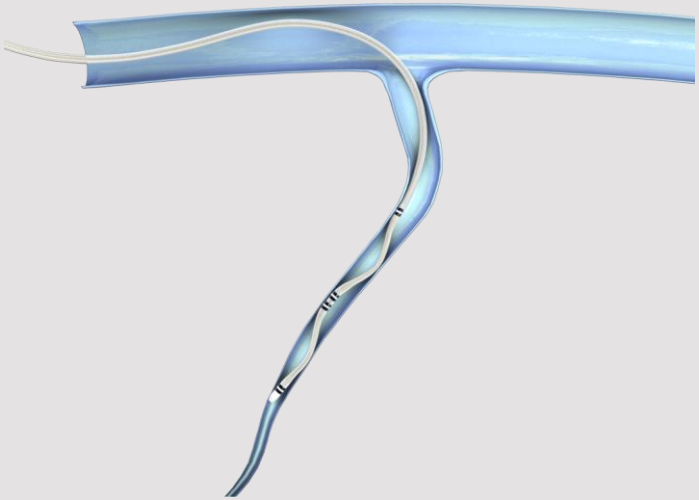


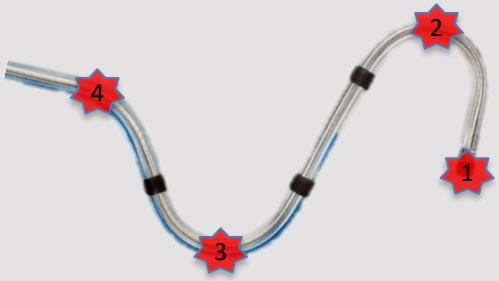


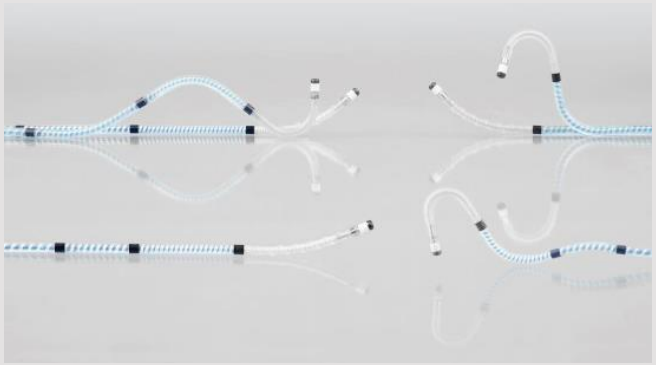
Requirements of a good catheter for left ventricular pacing:

1. It must arrive at the most appropriate point
2. It must be stable
3. Must have good thresholds
4. It should not cause extra cardiac stimulation





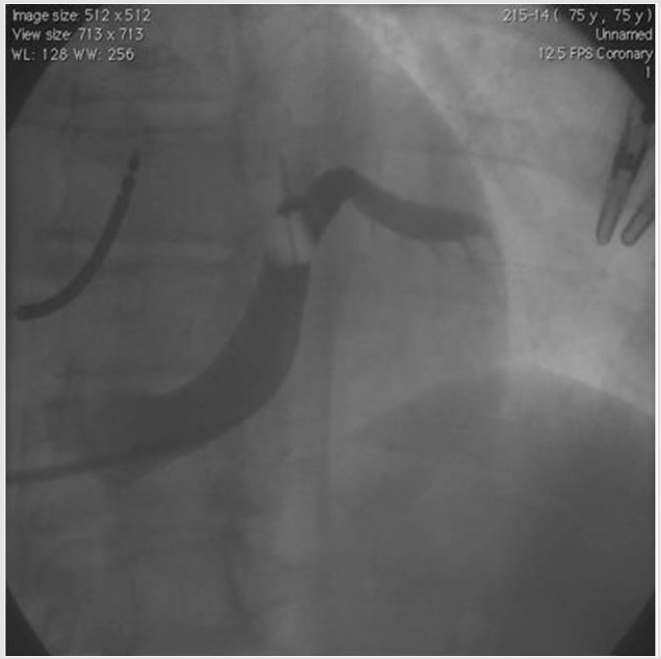


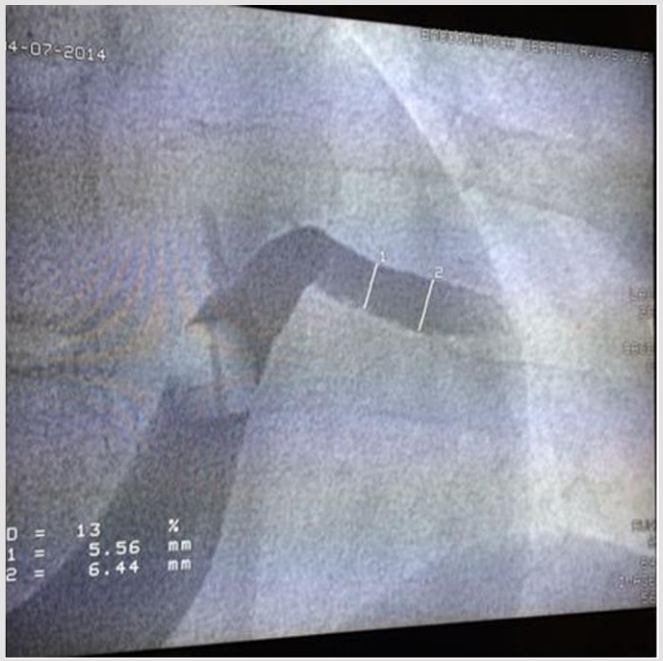


Overcoming an impossible anatomy with a novel left ventricular active fixation lead in the coronary sinus: A case report

Gabriele Giannola, MD, PhD,* Riccardo Torcivia, MD,* Riccardo Airò Farulla, MD,* Joeri Heynens, MSc†1

*From the *Cardiology Unit, Fondazione Istituto San Raffaele, G. Giglio–Cefalù (PA), Italy, and †Medtronic Bakken Research Center, Maastricht, The Netherlands.*





G. Giannola, Heart Rhythm CaseReports2015;1:130–132

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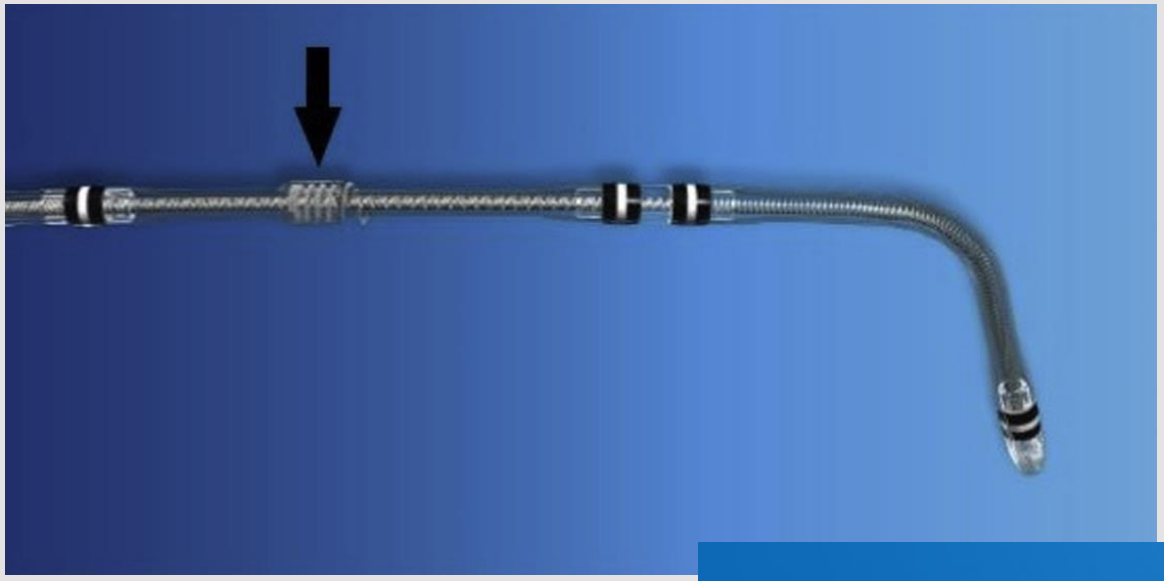

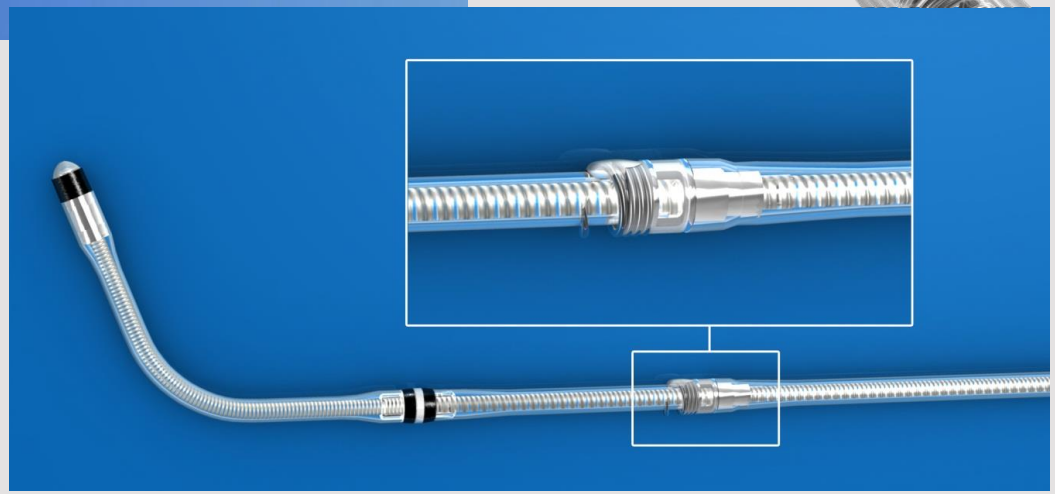

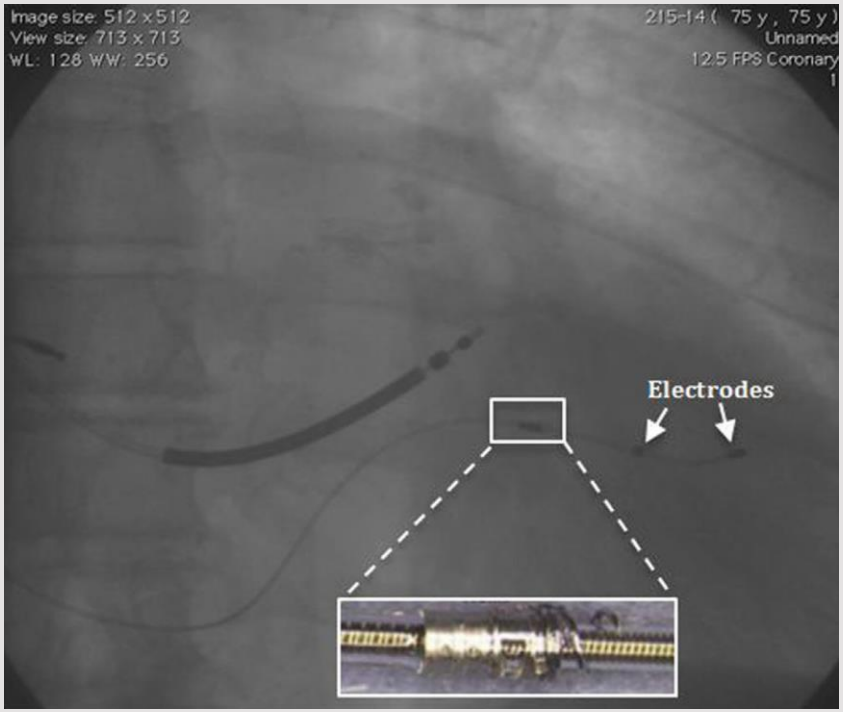
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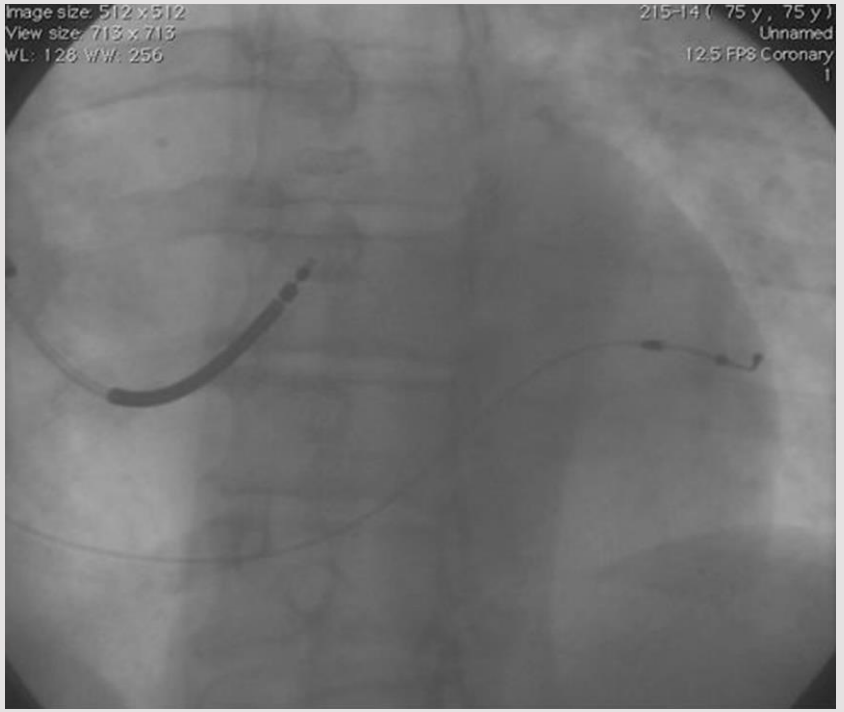
View size: 713 x 713
WL: 128 WW: 256
215-14 (75 y , 75 y)
Unnamed
12.5 FPS Coronary
1
Electrodes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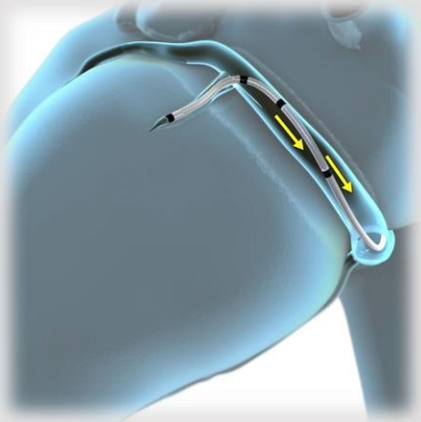
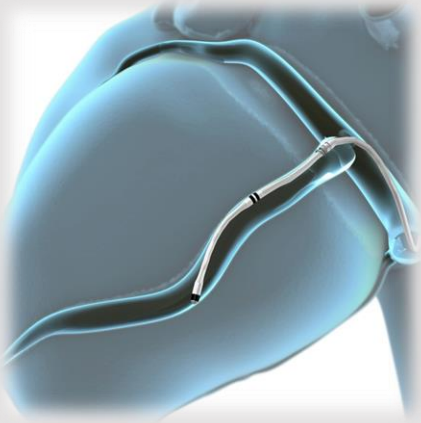
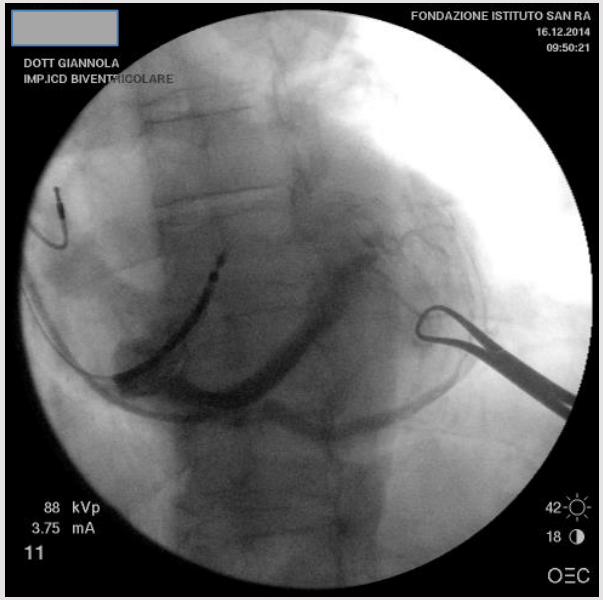
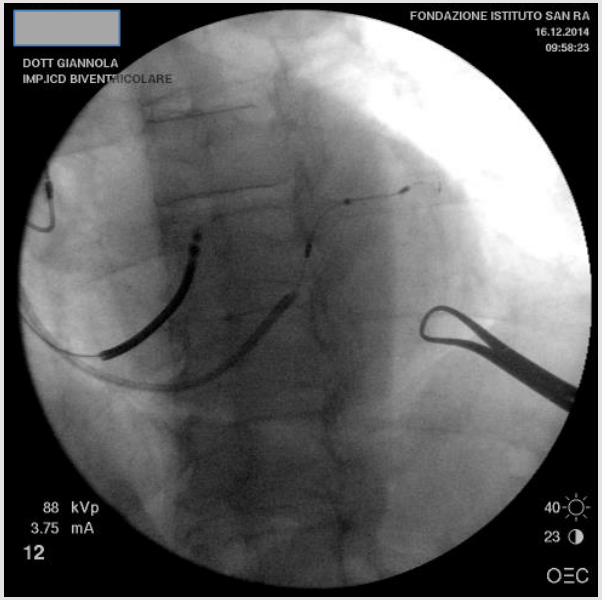
215-14 (75 y , 75 y)
Unnamed
12.5 FPS Coronary
1






FONDAZIONE ISTITUTO SAN RA
16.12.2014
09:50:21
DOTT GIANNOLA
88 kVp
3.75 mA
11
42
18
OEC


FONDAZIONE ISTITUTO SAN RA
16.12.2014
09:58:23
DOTT GIANNOLA
88 kVp
3.75 mA
12
40
23
OEC

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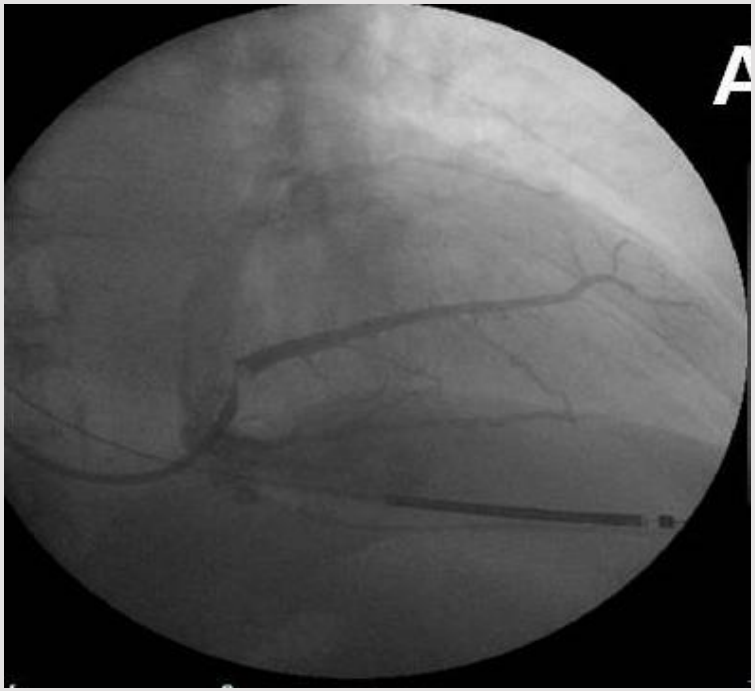
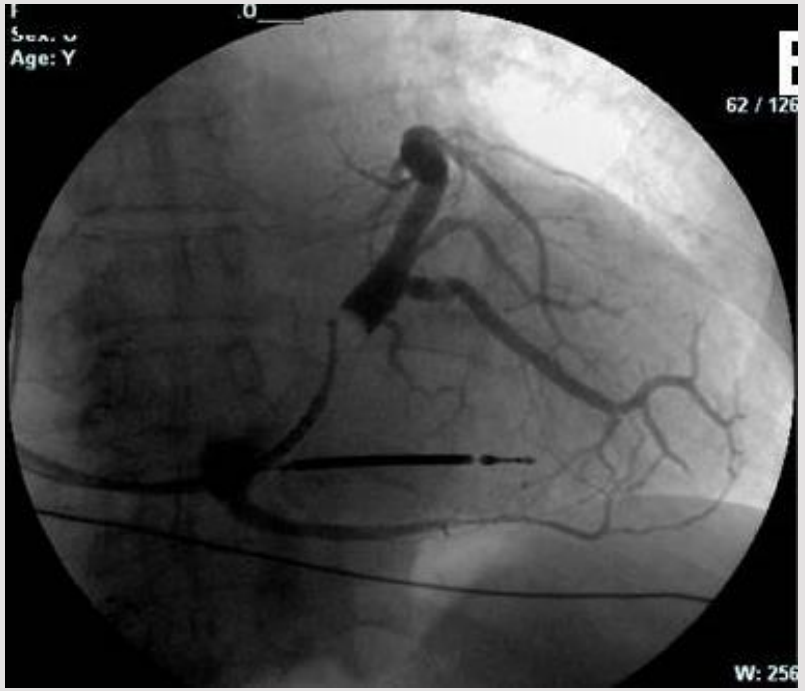
Left ventricular lead stabilization to retain cardiac resynchronization therapy at long term: when is it advisable?

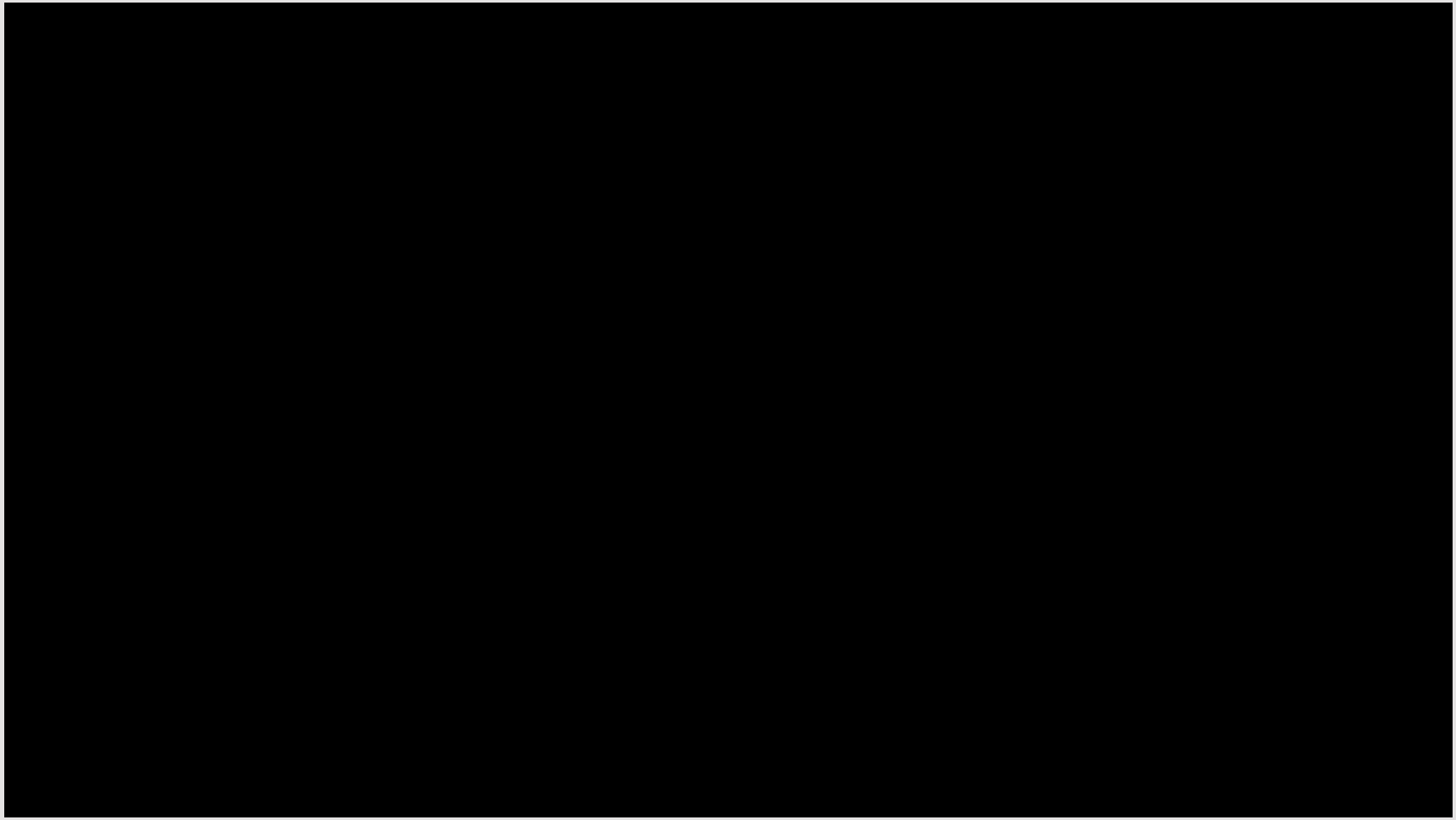
Mauro Biffi[1]*, Matteo Bertini[2], Matteo Ziacchi[1], Igor Diemberger[1], Cristian Martignani[1], and Giuseppe Boriani[1]

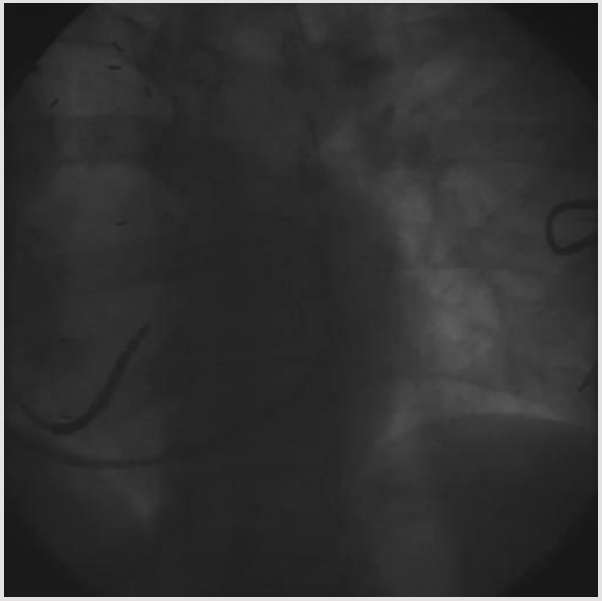


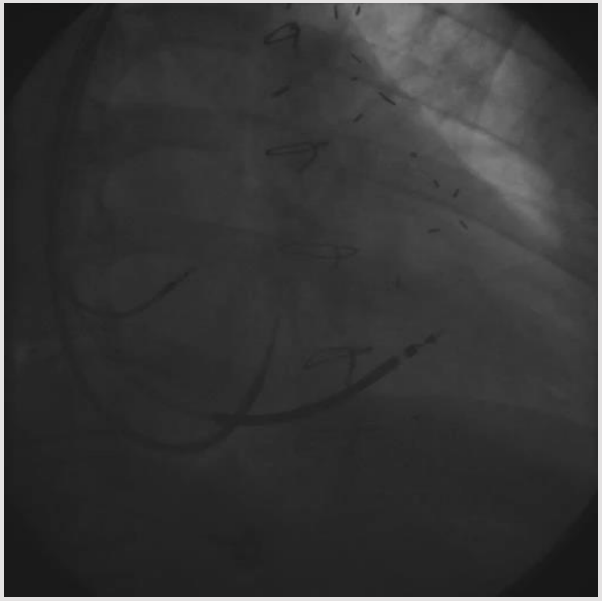


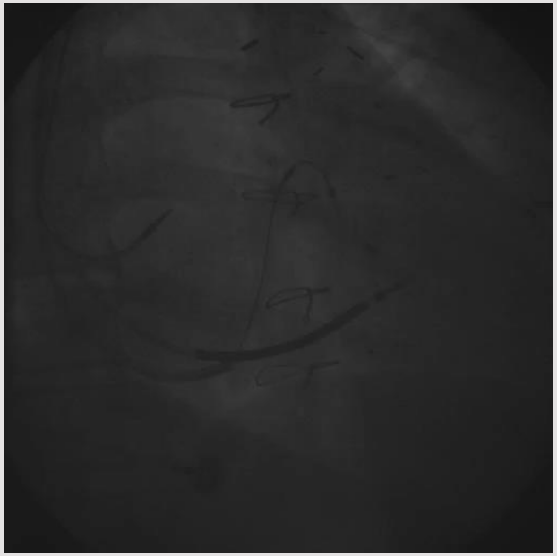
Attain Stability® 20066

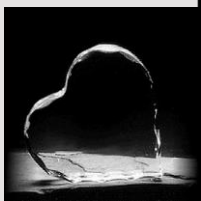
Active Fixation Lead

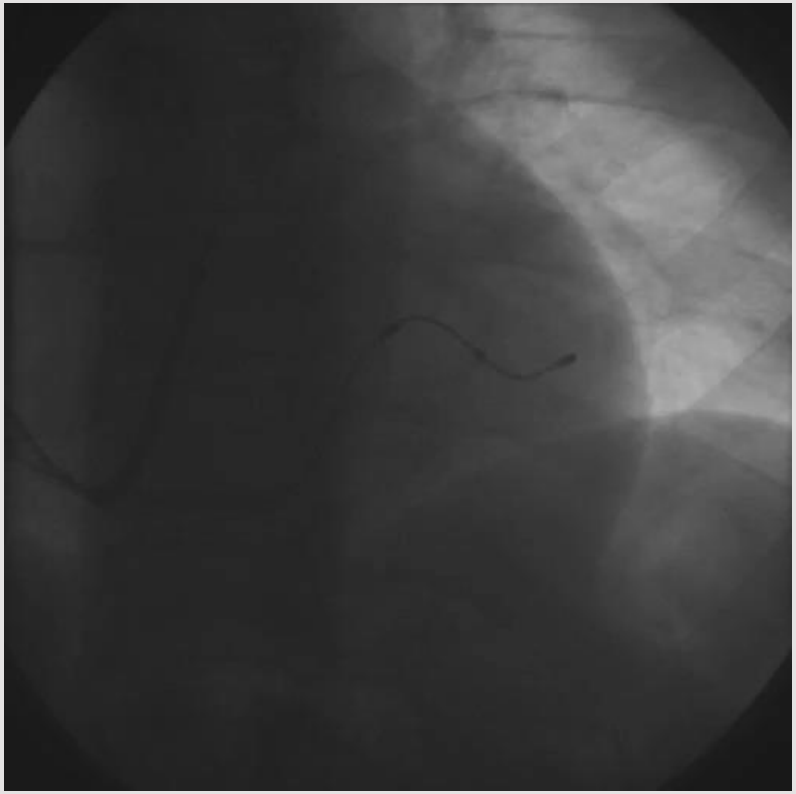










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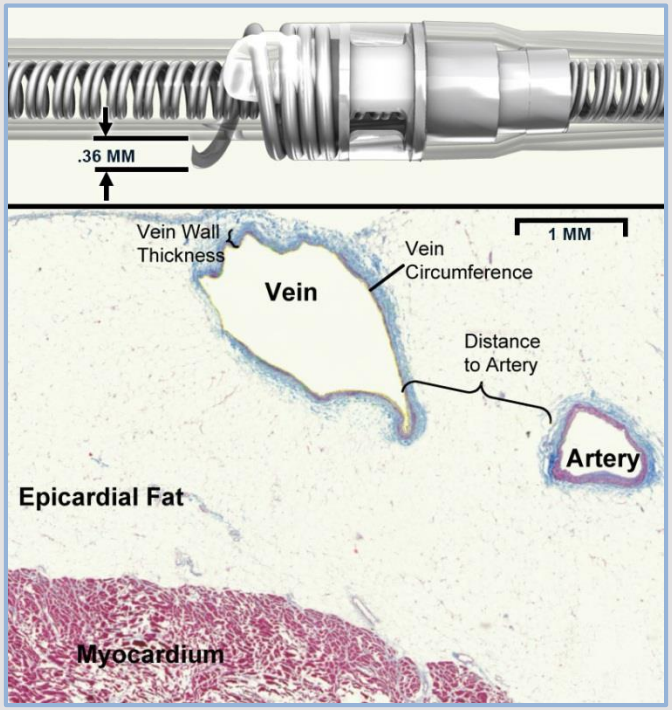
Stability and safety

Large safety margin

Distance between helix tip to lead body prevents disturbance of neighboring arteries

Reposition with confidence

Helix diameter of .2 mm has shown negligible vein disturbance



Prevent over-rotation

Mechanical stop will prevent helix from over-rotating, protecting vein tissue

Stability and safety

Implant a lead in CS is different to improve heart failure and survival reaching the best CRT.

The best results in CRT need:

- the appropriate patient
- the appropriate timing
- the appropriate LV placing
- the appropriate technology
- the appropriate programming
- the appropriate pharmacological Tx

Thank you for the attention