Ventricular Premature Beat Catheter Ablation
Frédéric SEBAG
Institut Mutualiste Montsouris
Disclosure Statement of Financial Interest

I currently have, or have had over the last two years, an affiliation or financial interests or interests of any order with a company or I receive compensation or fees or research grants with a commercial company:

- Grant/Research Support: None
- Consulting Fees/Honoraria: None
- Major Stock Shareholder/Equity: None
- Royalty Income: None
- Ownership/Founder: None
- Intellectual Property Rights: None
- Other Financial Benefit: None
Target Focal activity

RVOT Ventricular Tachycardia

Right ventricular outflow tract

Area producing abnormal signals
2 mapping techniques

ACTIVATION

Earliest ventricular electrogram (EGM)

PACE-MAPPING

Similar QRS VPB morphology
X ray navigation

LAO

RAO

RVOT

His

RV

RA

RVOT

RF

RVA

RV
Activation mapping

Earliest local (EGM) activation

J Cardiovasc Electrophysiol. 16:1017-1022 2005
3D Electroanatomic Mapping

Heart Rhythm. 3:240-246 2006

Time from EGM to QRS (ms)
Unipolar Signal

J Cardiovasc Electrophysiol. 16:1017-1022 2005
Pace Mapping

J Cardiovasc Electrophysiol. 16:823-829 2005
3D Electroanatomic Mapping

Heart Rhythm. 3:240-246 2006
Activation & Pace Mapping

Time from EGM to QRS (ms)

VPB QRS Morphology correlation (%)
Anatomy

Anterior view

Sagittal view

RVOT

RV

Ao

PA

LV

Texas Heart Institute Journal Volume 39, Number 4, 2012
Caution: Coronary vessels
ECG Algorithm …

Step 1

- S-wave ≥ 0.1 mV in V6

- If N: go to Step 3
- If Y: go to Step 2

Step 2

- Precordial transition zone ≥ V4
- or I: No S-wave

- If N: go to Step 4
- If Y: LV end

Step 3

- R/S amplitude index < 0.3
- and R-duration index < 0.5

- If N: go to Step 6
- If Y: I = R or RR’

Step 4

- Q: aVL/aVR > 1.4
- or V1: S ≥ 1.2 mV

- If N: go to Step 7
- If Y: LSV

Step 5

- aVL = RSR’ or RR’

- If N: go to Step 6
- If Y: LV epi

Step 6

- RR’ in I and inferior leads
- and V2: S ≥ 3.0 mV

- If N: Near His
- If Y: RV septum

Step 7

- If N: RV free wall
- If Y: RV septum

J Cardiovasc Electrophysiol. 14:1280-1286 2003
My ECG algorithm: V1

So what do we do??

• **Ambulatory**
  – H° in case of arterial access

• **Local anesthesia+ Sedation**

• **Optional induction**
  – Isoprenaline, Adrenaline

• **Unique 8F introducer Right femoral vein**
  – Arterial access in case of LVOT VPB

• **3D mapping**
  – Contact catheter: RVOT → Cs → LVOT Map

• **Activation and pace-mapping**

• **Irrigated ablation 30W**
Mr B, 39 yo - ECG
Mr B, 39 yo – Activation RVOT

Pulm

Tric

-46ms

QS Uni
MrB, 39yo - RVOT Pace Mapping

90%
Mr H, 68 yo – RVOT Activation

Pulm

Tric

QS Uni

-30ms
Mr H, 68yo - RVOT PaceMapping

Pulm

Tric

67%...
Mr H, 68 yo – LVOT Activation
Mr H, 68yo LVOT Pace Mapping

LVOT

Ao

86%
Mr H, 68 yo - LV/RVOT Activation

Diagram labels:
- Pulm
- Ao
- LVOT
- Tric
Mrs A, 38 yo - ECG
Mrs A, 38 yo - RVOT Activation

Pulm

-11 ms

QS Uni
Mrs A, 38 yo – Cs Activation

-23 ms

GCV

QS Uni...
Mrs A, 38yo- Cs/RV Activation
Mrs A, 38 yo - Cs Pace Mapping

GCV

97%
## Safety/Efficacy

<table>
<thead>
<tr>
<th>Recommendations</th>
<th>Class&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Level&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Ref.&lt;sup&gt;c&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Catheter ablation of RVOT VT/PVC is recommended in symptomatic patients</td>
<td>I</td>
<td>B</td>
<td>525–528</td>
</tr>
<tr>
<td>and/or in patients with a failure of anti-arrhythmic drug therapy (e.g. beta-blocker) or in patients with a decline in LV function due to RVOT-PVC burden.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment with sodium channel blockers (class IC agents) is recommended in LVOT/aortic cusp/epicardial VT/PVC symptomatic patients.</td>
<td>I</td>
<td>C</td>
<td>529–531</td>
</tr>
<tr>
<td>Catheter ablation of LVOT/aortic cusp/epicardial VT/PVC by experienced operators after failure of one or more sodium channel blockers (class IC agents) or in patients not wanting long-term anti-arrhythmic drug therapy should be considered in symptomatic patients.</td>
<td>IIa</td>
<td>B</td>
<td>195,531–533</td>
</tr>
</tbody>
</table>

VPB Ablation

Take Home Message

• Straightforward mapping techniques
• 3D Electroanotomic mapping
  – Zero fluoroscopy
• Ambulatory patient, unique 8F intro
• 90% success / Rare adverse events
• ESC guidelines
  – Class IB (RVOT) / ClassIIaB (LVOT)