Characteristics of malignant premature extrasystoles originating from right ventricular outflow tract

Atsunobu Kasai, Shigetoshi Sakabe, Kazuki Mori, Kei Miyagawa, Akihiro Takasaki, Keishi Moriwaki, Tadafumi Sugimoto, Takeshi Takamura, Masahide Horiguchi, Akihiro Kawamura, Tetsuya Seko

Department of Cardiology, Ise Red Cross Hospital, Ise, Japan
Premature extrasystoles (PES) originating from right ventricular outflow tract (RVOT) are often observed in patients without structural heart diseases and are generally considered as benign ventricular arrhythmias.

However, ventricular fibrillation (VF) and/or polymorphic ventricular tachycardia (PVT) are occasionally initiated by the PES originating from RVOT.
Aim

To clarify how to differentiate malignant (M) PES from benign (B) PES originating from RVOT
Methods 1

Consecutive 30 patients
in whom radiofrequency catheter ablation was conducted for PES originating from RVOT

Age 49 ± 16 y/o, Gender (F/M) 20/10, Underlying heart disease (+) 0 pts., Syncope (+) 9 pts.

M-group (n=9)
Spontaneous VF and/or PVT was initiated by the PES.

B-group (n=21)
Monomorphic VT or nothing was initiated by the PES

CM5
NASA
(Case 3)

(Case 10)
Methods 2

① Coupling interval (msec)
② QRS duration (msec)
③ QRS morphology
  A. Broad R wave (>120msec) in I-lead
  B. Notch on QRS wave in II-, III- and aVF-lead
  C. aVR- to aVL-lead QS wave amplitude

(Case3)

400msec
Methods 3

④ Optimal ablation site for premature extrasystole arising from RVOT

Target PES | Pacing
---|---

PES -40msec

free wall, posterior side, distal from PA ring

Lots of ventricular responses during RF delivery

(Case8)
**Results 1**

**Patients characteristics**

<table>
<thead>
<tr>
<th></th>
<th>M-group (n=9)</th>
<th>B-group (n=21)</th>
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</thead>
<tbody>
<tr>
<td>Age (y/o)</td>
<td>44 ± 11</td>
<td>51 ± 14</td>
<td>ns</td>
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<tr>
<td>Gender (F/M)</td>
<td>6/3</td>
<td>14/7</td>
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<tr>
<td>UHD(+)</td>
<td>0</td>
<td>0</td>
<td>ns</td>
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<tr>
<td>Syncope(+) (%)</td>
<td>7 (78)</td>
<td>2 (10)</td>
<td>P&lt;0.01</td>
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</tbody>
</table>
Comparison of coupling interval and QRS duration of premature extrasystoles arising from RVOT between M- and B-gr
Results 3

Comparison of QRS morphology of premature extrasystoles arising from RVOT between M- and B-group

Notch on QRS in inferior leads

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<tr>
<td>p</td>
<td>&lt;0.01</td>
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<td>9/9</td>
<td>3/21</td>
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Broad R wave in I

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<td>7/9</td>
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Ratio of aVR- and aVL-lead QS wave amplitude (aVR/aVL) >1

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Results 4

Optimal ablation site for premature extrasystoles arising from RVOT

N=30
- M-group
- B-group

Premature extrasystoles arising from posterior, free wall

p<0.01

7/9
1/21
Summary of Results

PES arising from posterior side of free wall in RVOT, with notch in inferior leads and/or broad R wave in I-lead, frequently initiate VF and/or PVT.
Conclusions

Malignant form of premature extrasystoles in RVOT could partially depend on the localization of its origin.