Introduction

• Electrical storm (ES)
  – Occurrence of three or more episodes of VT during one day
  – Presence of incessant VT despite the optimization of antiarrhythmic drug therapy

• 20% of patients with ICD will evolve to ES

• Even though, catheter ablation stands as the initial treatment for VT refractory to antiarrhythmic drugs,

• Ablation can not be performed in patients with ES.
Introduction

- Surgical interruption of autonomic nervous system could decrease ES.


- Percutaneous stellate ganglion blockade (SGB) as an effective therapy for drug refractory VT and VF (ES).
M/64 with right MCA infarction and AF presented with dyspnea at ER
TTE (2017.11)

- Akinesia
- Aneurysmal change at LV apex
- LVEF up to 40%
Severe dyspnea and chest discomfort

Wide QRS tachycardia (170 bpm)

- QRS Morphology: RBBB
- QRS Axis: RAD
- Precordial transition: V2 (early RWP)
- I and aVL: negative complex
- II: rS complex
- III and aVF: positive complex
QRS Axis _ Inferior Axis

**Frontal plane**
- Positive vector in III and aVF
- Biphasic pattern in II
- Negative vector in I and aVL

**Precordial leads**
- Positive vector in V1-2
- Negative vector in V4-6
However

VT was refractory to cardioversion (10~20 times) and amiodarone infusion.

*Patient was sedated.*
Baseline AF at EP Room
LV Angiogram

LAO 35°

RAO 35°
VEST 350/230/220/210 – VT induction
Induced VT was same to Clinical VT
ABL site – EA 50 (endocardial), CBNUH
ABL Site (EPI): EA > 65ms, at KUMC
VT termination during ABL
ABL Site (EPI)
ABL Site (EPI)
ABL Site (EPI)
No induction of VT, PVC(+)
However, 1 month after ablation
Which is your option?

1) Repeat RFCA
2) Aneurysmectomy
3) Heart transplantation

He and his wife refused invasive procedure of surgery.
Mechanism of VT/VF Storm

Substrate
- LVEF 40%
- LV apex aneurysmal change
- Akinesia of apical inferolateral wall

Trigger
- Sympathetic hyperactivity
- HF decompensation
- Ischemia/infarction
- Electrolyte (K and Mg)
- Ectopy (PVC, NSVT)
- Etc.

VT/VF Storm
Stellate ganglion block

- Placed in a supine position.
- Local lidocaine was infused.
- 25-gauge spinal needle to the level of the proximal transverse process targeting left T1 stellate ganglion.
- 5cc of bupivacaine 0.5%
Stellate ganglion block

• Sympathetic **blockade** of the ipsilateral face and arm is induced by block.

• Therefore, a **successful block** produces an ipsilateral **Horner's syndrome** (ptosis, miosis, and anhydrosis), flushing of the face, and increased temperature of the arm.

• These effects are normal and last for the duration of the **blockade**.
Holter monitoring, 5 month later after blockade

Impressions and Findings:

- Basal ECG - Atrial fibrillation with wide QRS complex
- Avg.HR 62bpm min.HR 55bpm Max.HR 77bpm
- Multiform VPBs : 14.6% (13,101 times/24hrs)
  - V-couplets : 92 times/24hrs
  - V-triplets : 4 times/24hrs
- Max.R-R interval : 2.14sec
- further ST-T change : (-)

Report Number: 8F6607E20A2215
Report Date: 6/7/2016

CHUNGBUK CHEONG JU CITY
Patient: SONG, JIN KYU
## Experience of Severance Hospital

<table>
<thead>
<tr>
<th>Sex</th>
<th>Age</th>
<th>Heart disease</th>
<th>ICD</th>
<th>Electrical storm</th>
<th>Role of SGB</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>45</td>
<td>DCMP</td>
<td>0</td>
<td>0</td>
<td>Bridging to ablation</td>
</tr>
<tr>
<td>F</td>
<td>76</td>
<td>DCMP</td>
<td>0</td>
<td>0</td>
<td>Bridging to ablation</td>
</tr>
<tr>
<td>M</td>
<td>51</td>
<td>DCMP</td>
<td>X</td>
<td>0</td>
<td>Bridging to ablation</td>
</tr>
</tbody>
</table>
Summary

- Electrical storm is life threatening event.
- Catheter ablation cannot be performed in ES status.
- Autonomic modulation can effectively relieve the burden of VT episodes.
- Stellate ganglion blockade can act as bridging therapy to catheter ablation.
Thank you for your attention.