Percutaneous Stellate Ganglion Block Suppressing VT in a Patient Refractory to VT Ablation

Ventricular tachycardia 4

KHRS 2019

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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

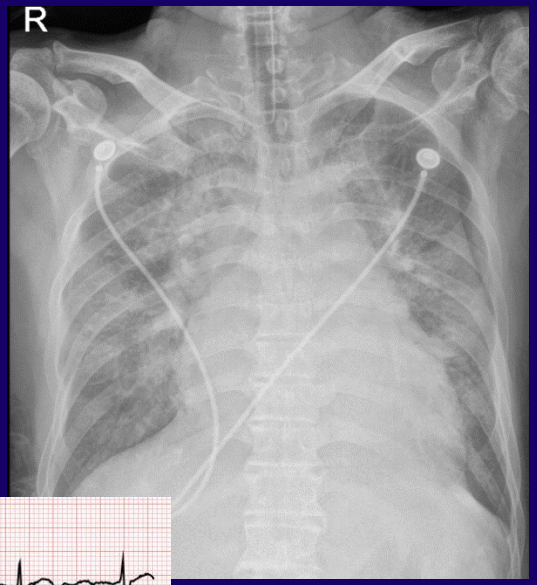
- **Surgical interruption of autonomic nervous system could decrease ES.**

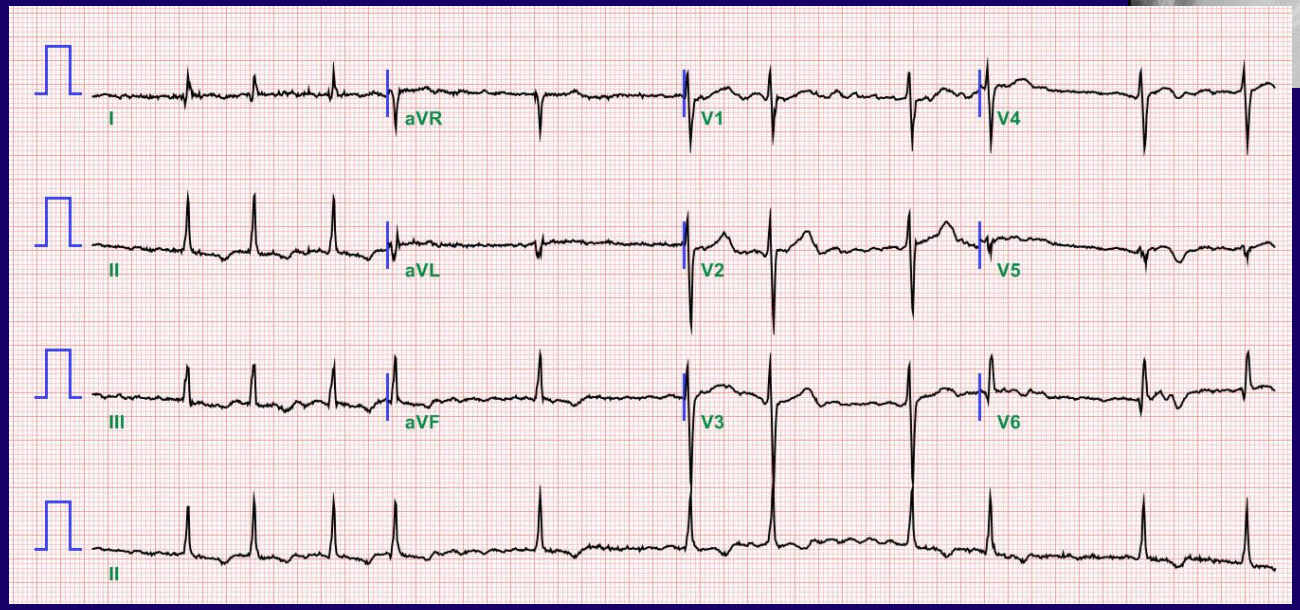
J Am Coll Cardiol. 2012; 59:91–92.

- **Percutaneous stellate ganglion blockade (SGB) as an effective therapy for drug refractory VT and VF (ES).**

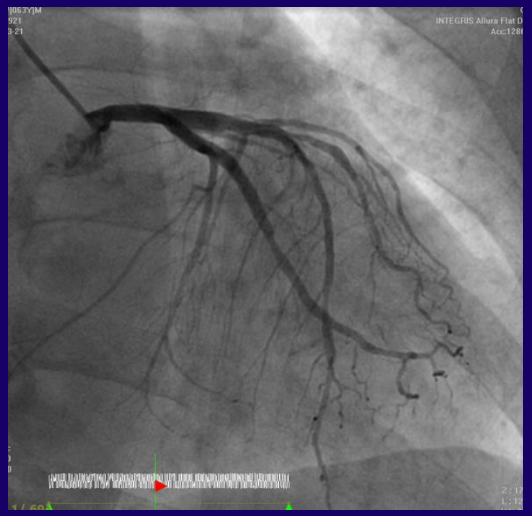
Brief History

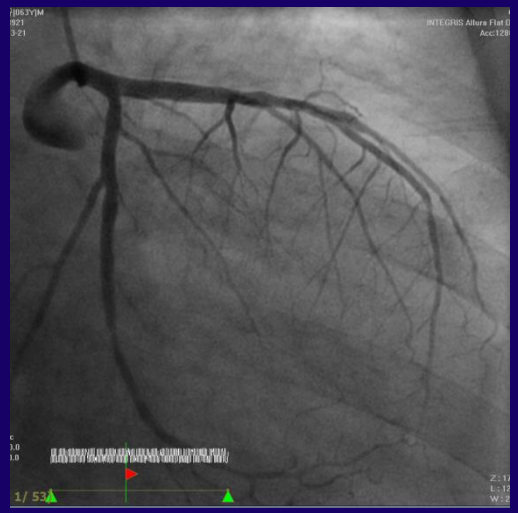
M/64 with right MCA infarction and AF presented with dyspnea at ER

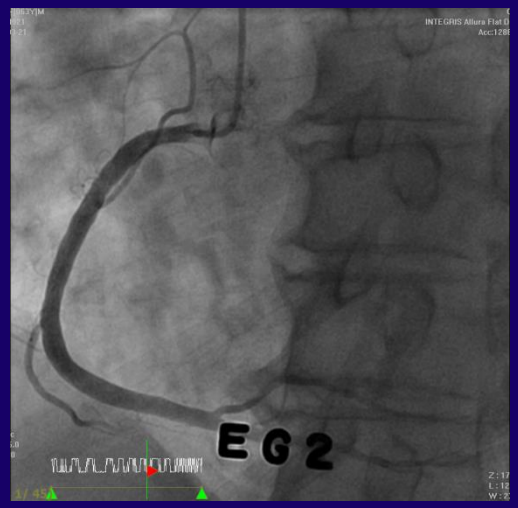




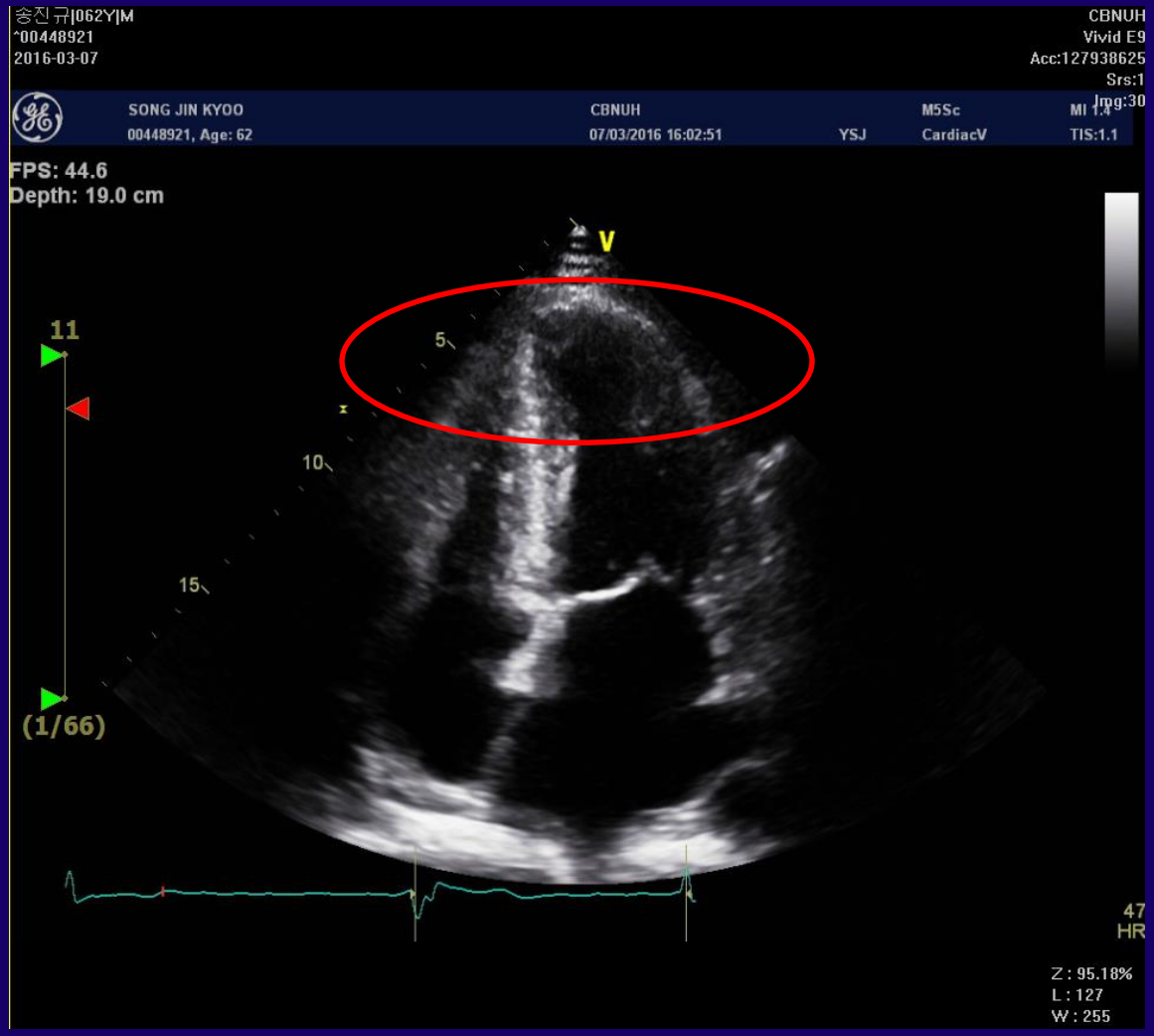
CAG (2017.11)





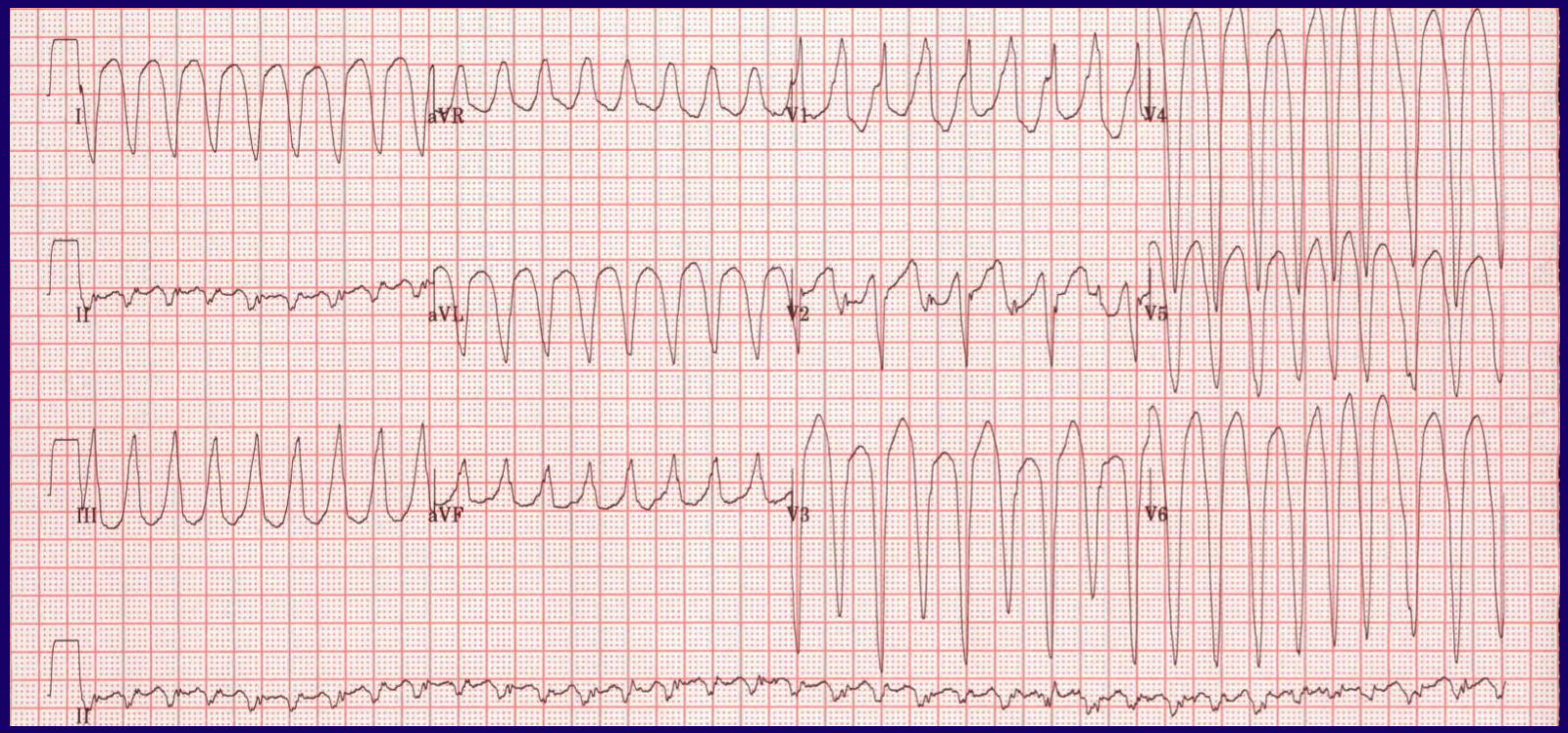


TTE (2017.11)



- Akinesia
- Aneurysmal change at LV apex
- LVEF up to 40%

Severe dyspnea and chest discomfort

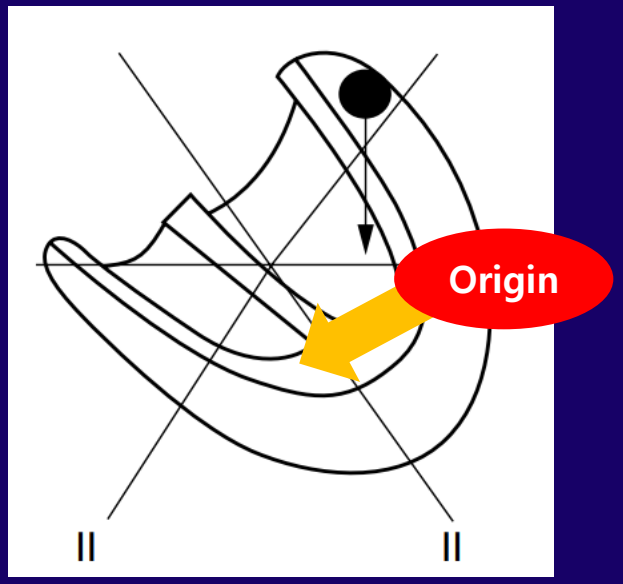


Wide QRS tachycardia (170 bpm)

- **QRS Morphology : RBBB**
- **QRS Axis: RAD**
- **Precordial transition: V2 (early RWP)**

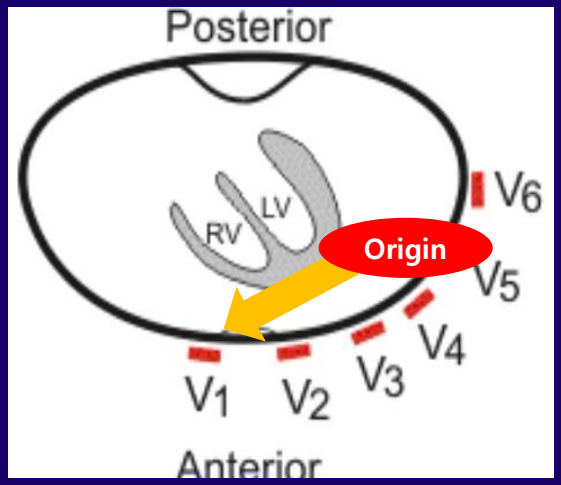
- **I and aVL: negative complex**
- **II: rS complex**
- **III and aVF: positive complex**

QRS Axis _ Inferior Axis



Frontal plane

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



Precordial leads

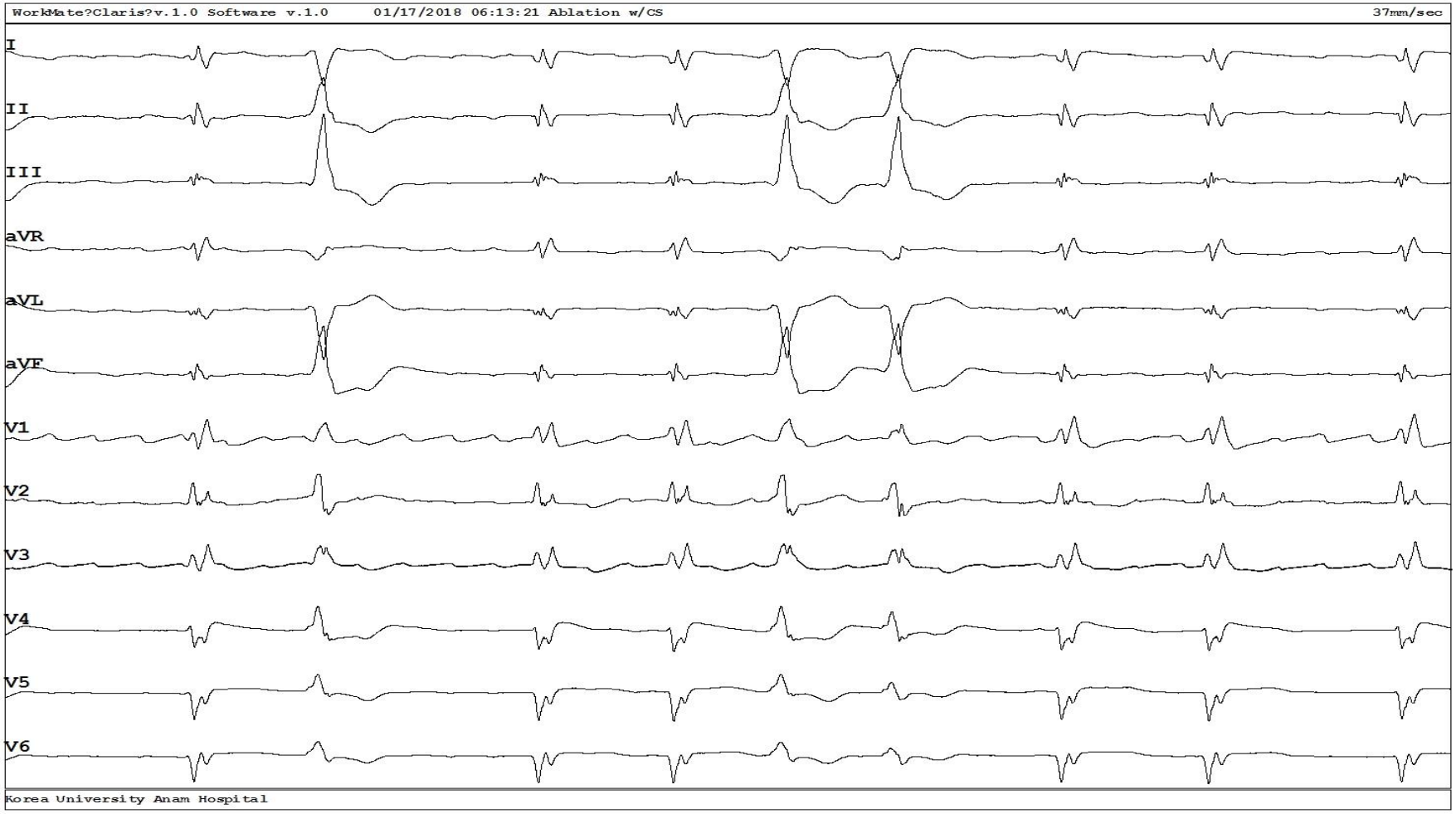
- Positive vector in V1-2
- Negative vector in V4-6

However

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

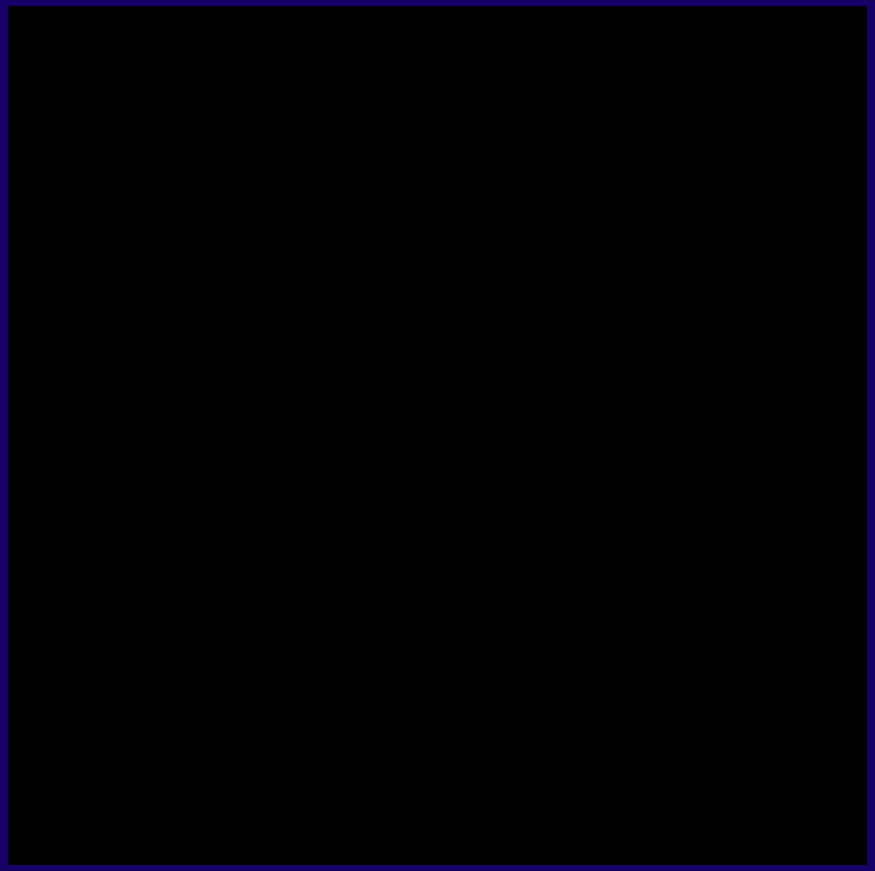
Patient was sedated.

Baseline AF at EP Room



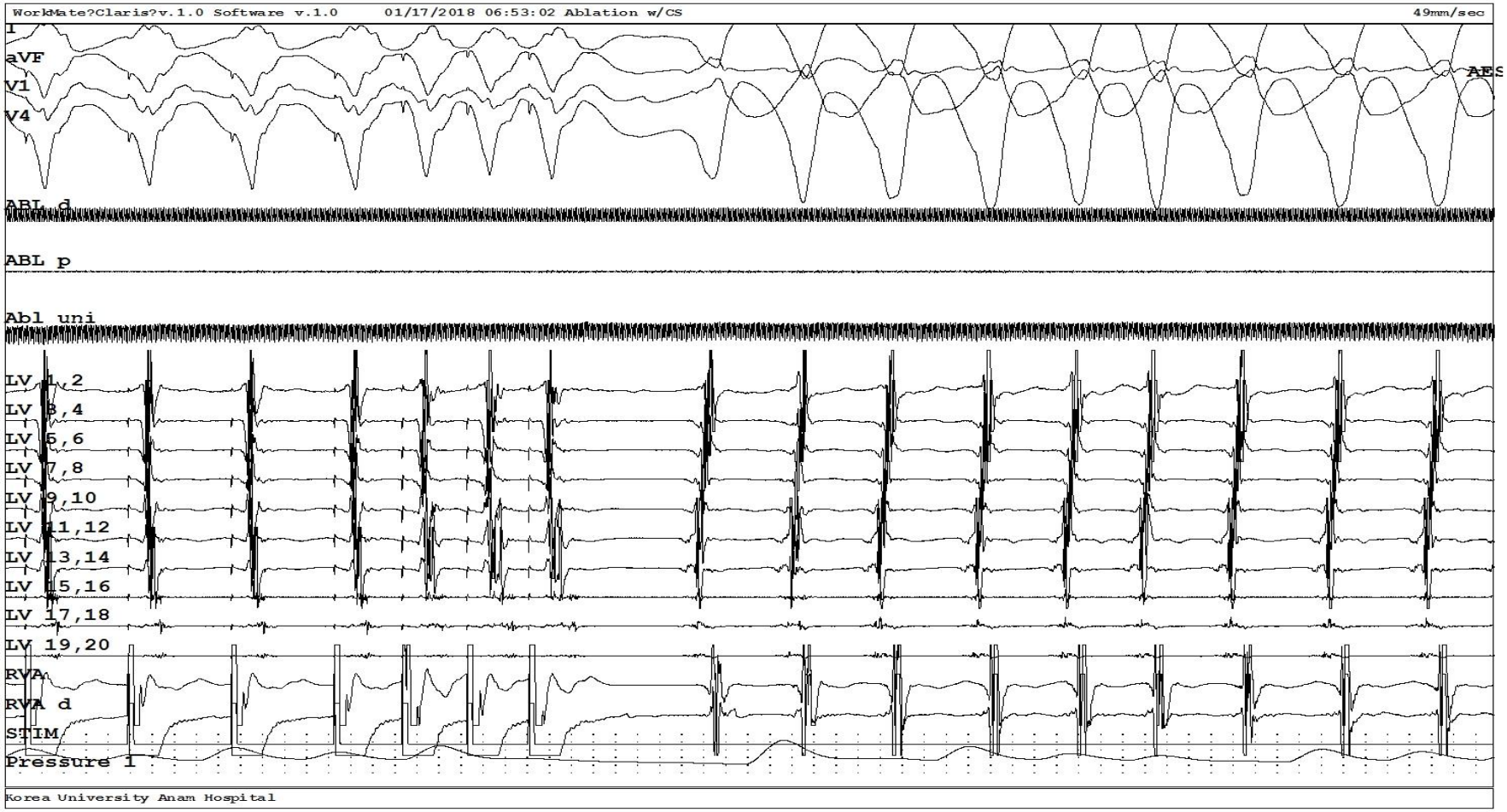
LV Angiogram

LAO 35°

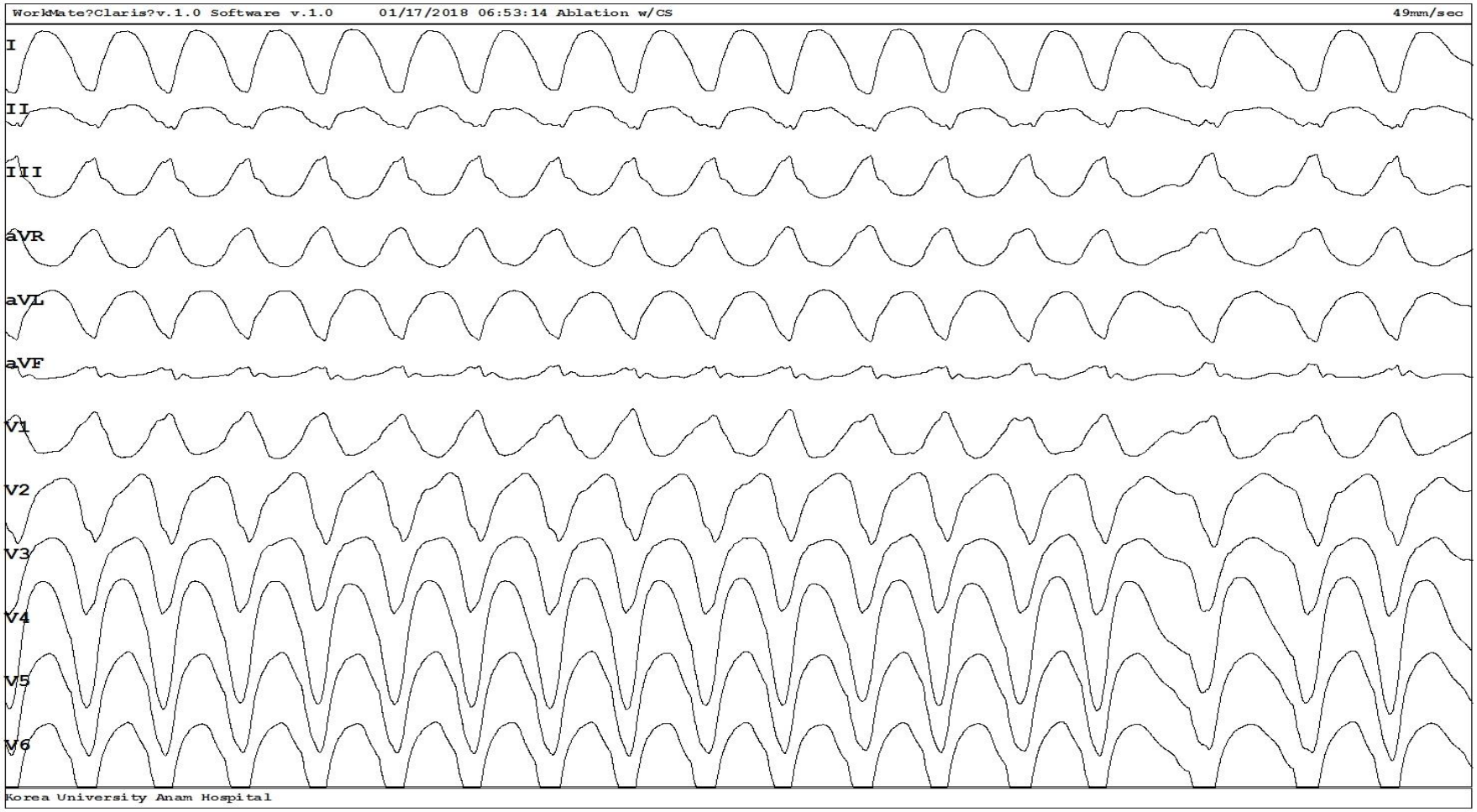


RAO 35°

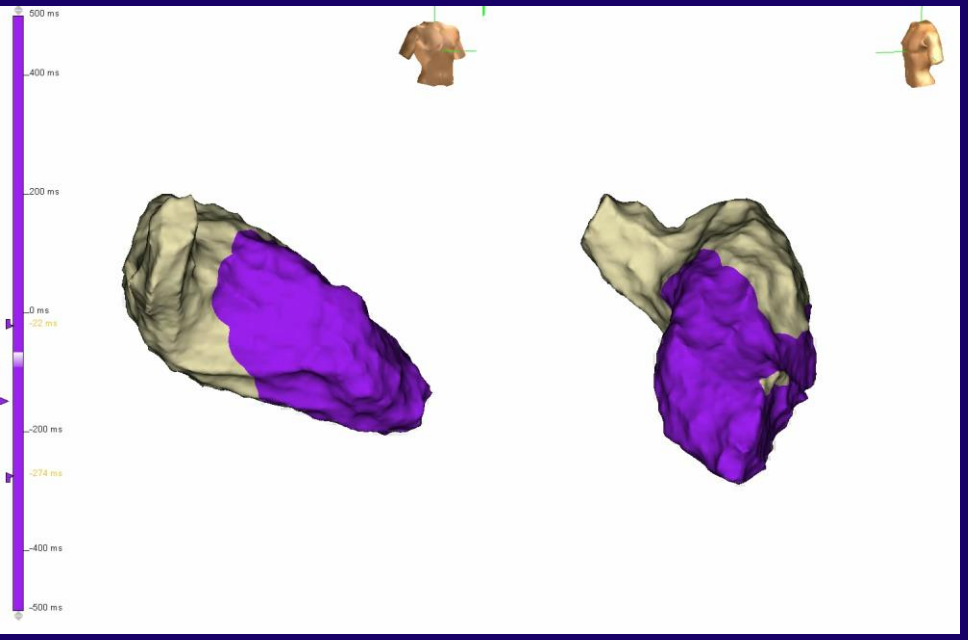
VEST 350/230/220/210 – VT induction

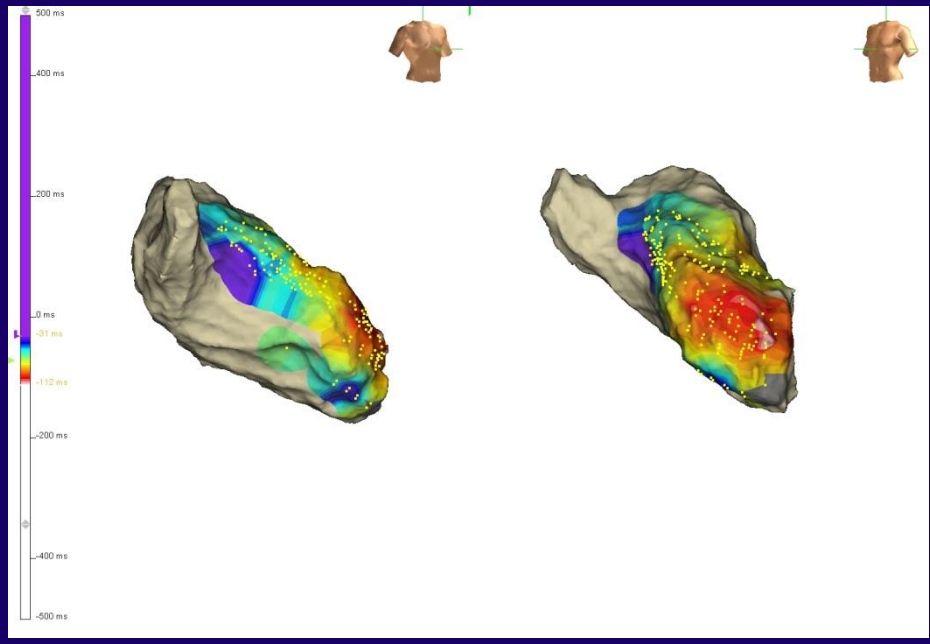


Induced VT was same to Clinical VT

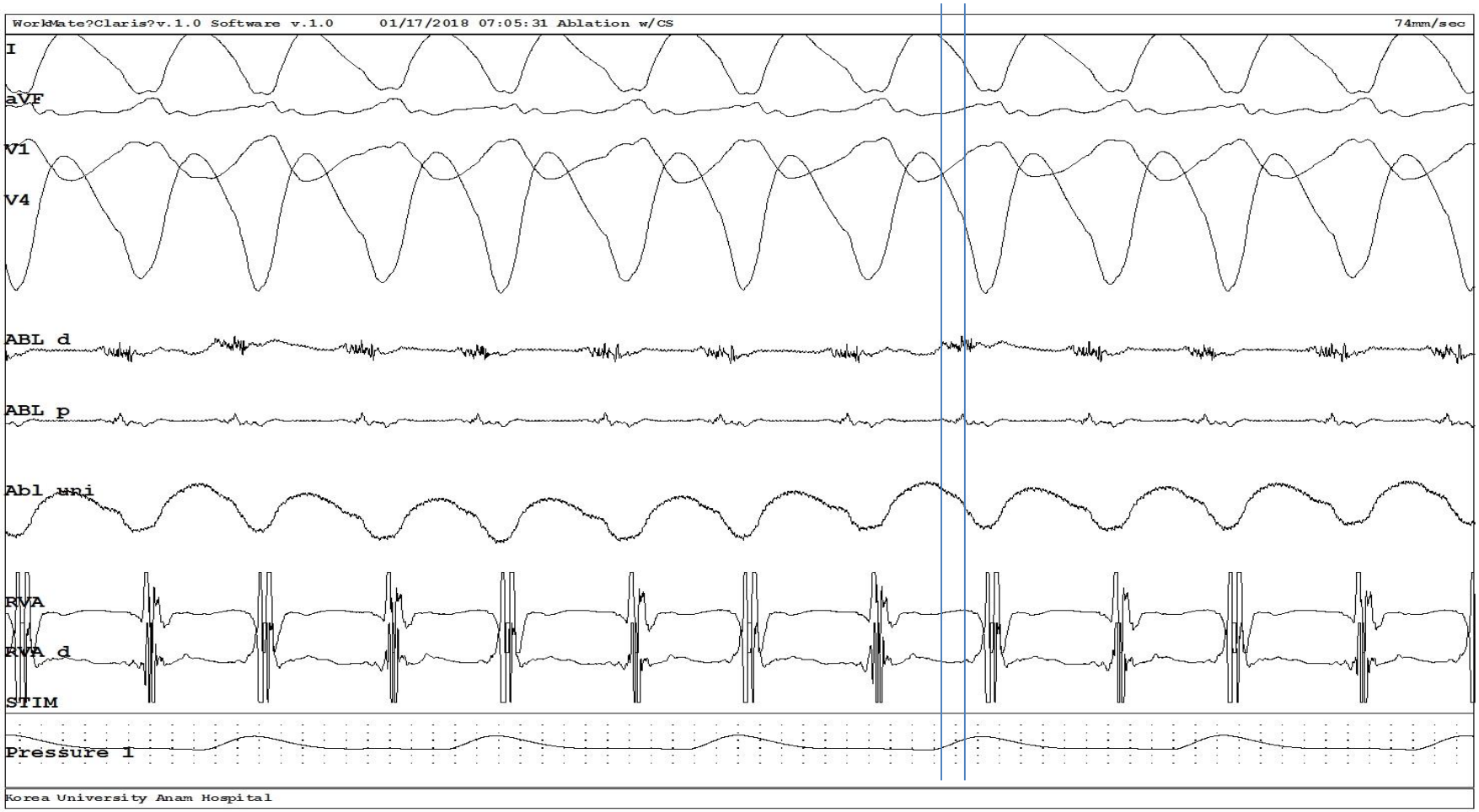


LAT MAP

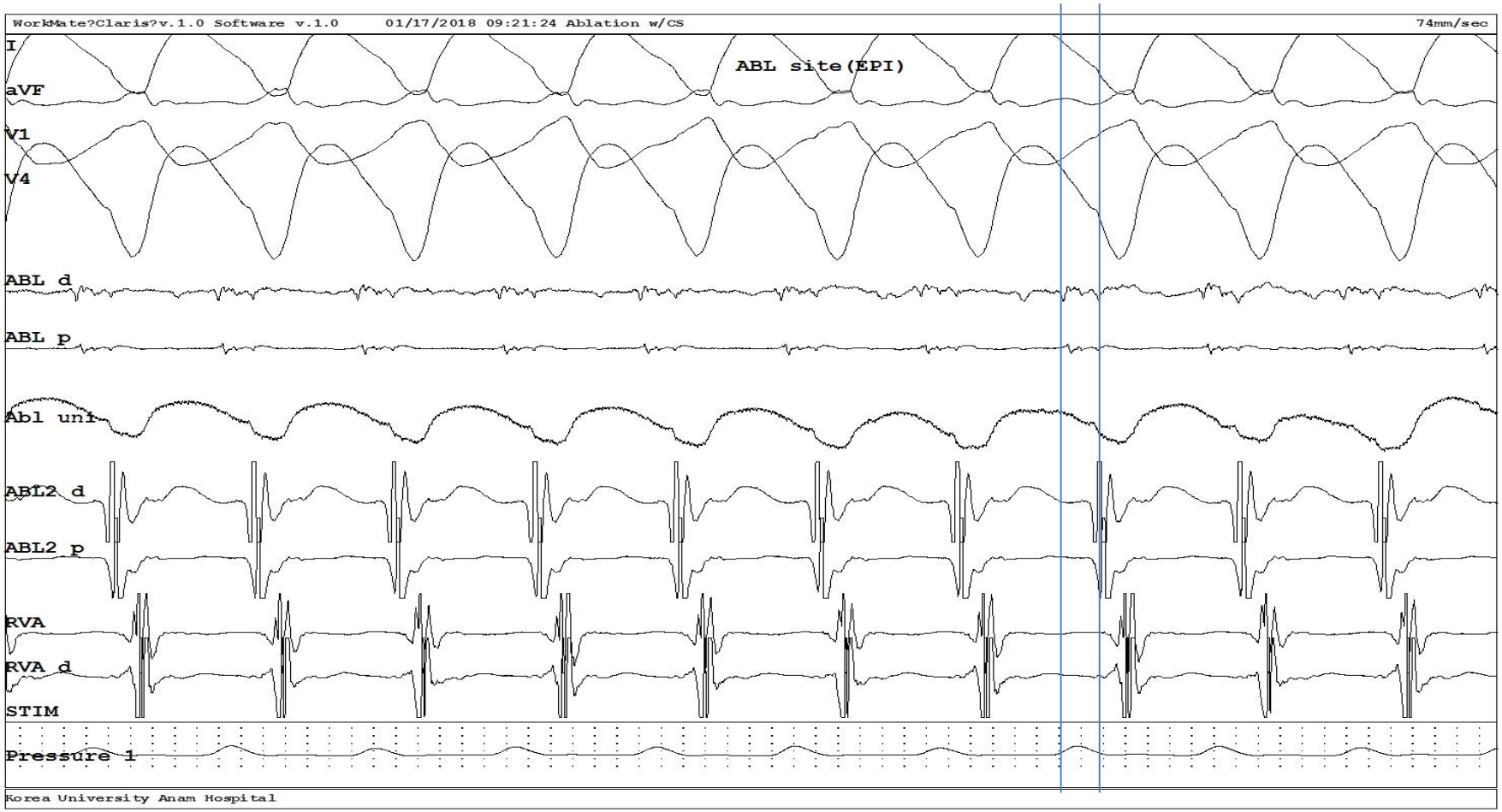

500 ms
400 ms
200 ms
0 ms
-22 ms
-200 ms
-274 ms
-400 ms
-500 ms


500 ms
400 ms
200 ms
0 ms
-31 ms
-112 ms
-200 ms
-400 ms
-500 ms

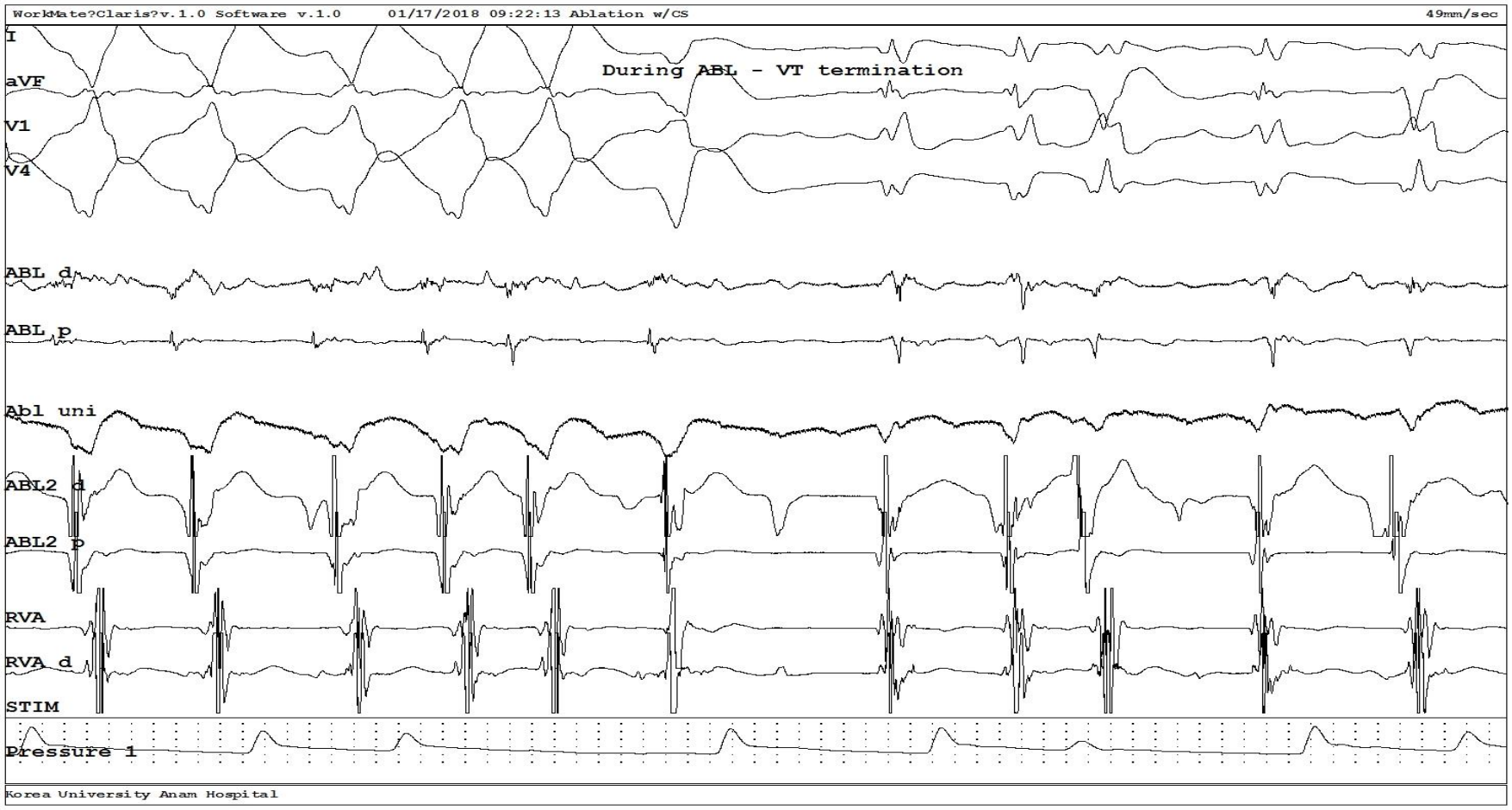
ABL site – EA 50 (endocardial), CBNUH



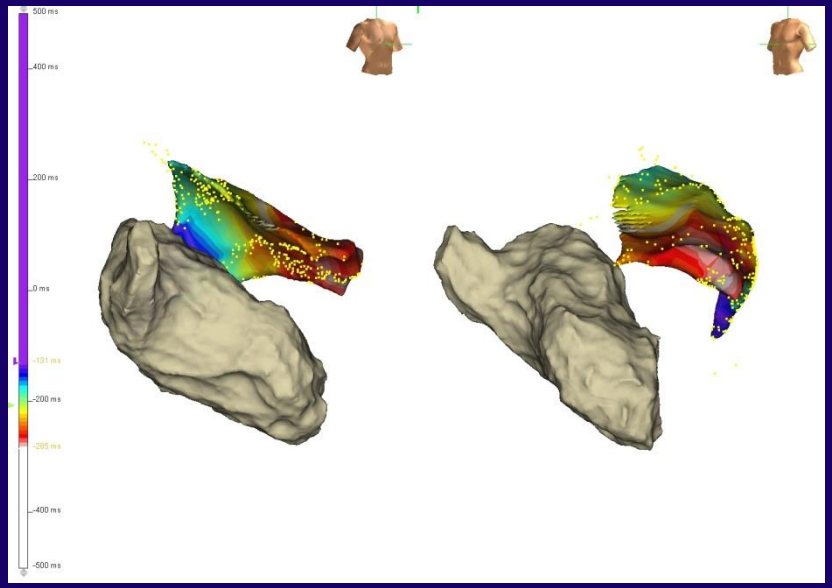
ABL Site(EPI): EA > 65ms, at KUMC

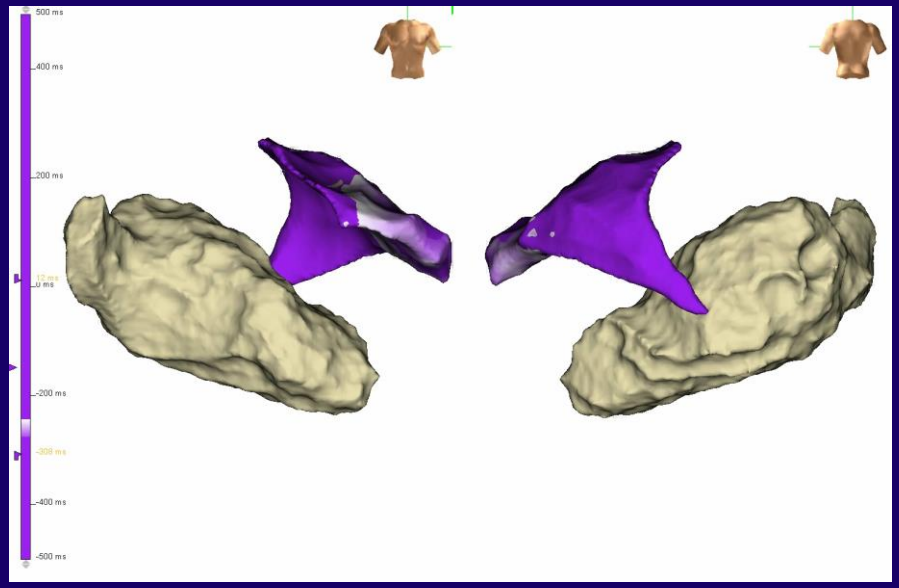


VT termination during ABL

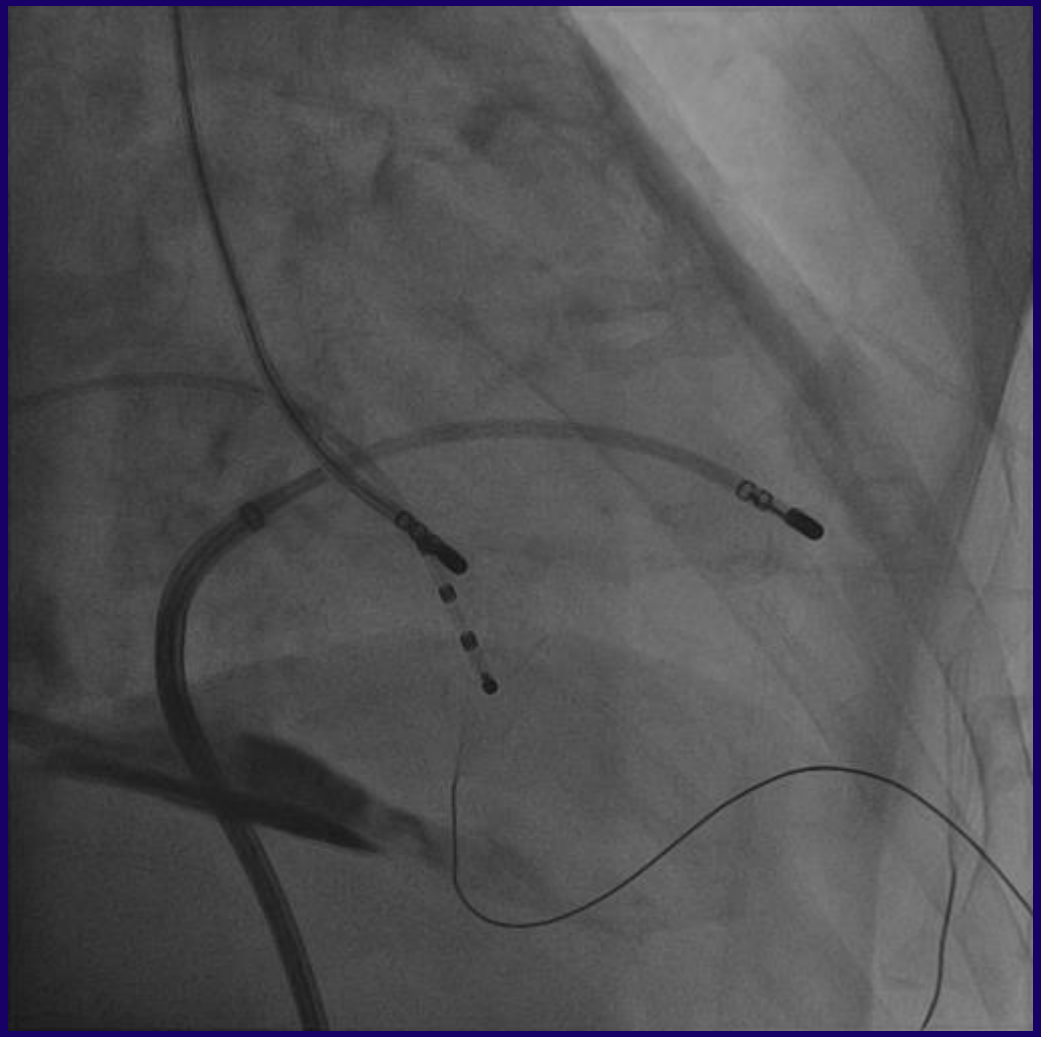


ABL Site(EPI)

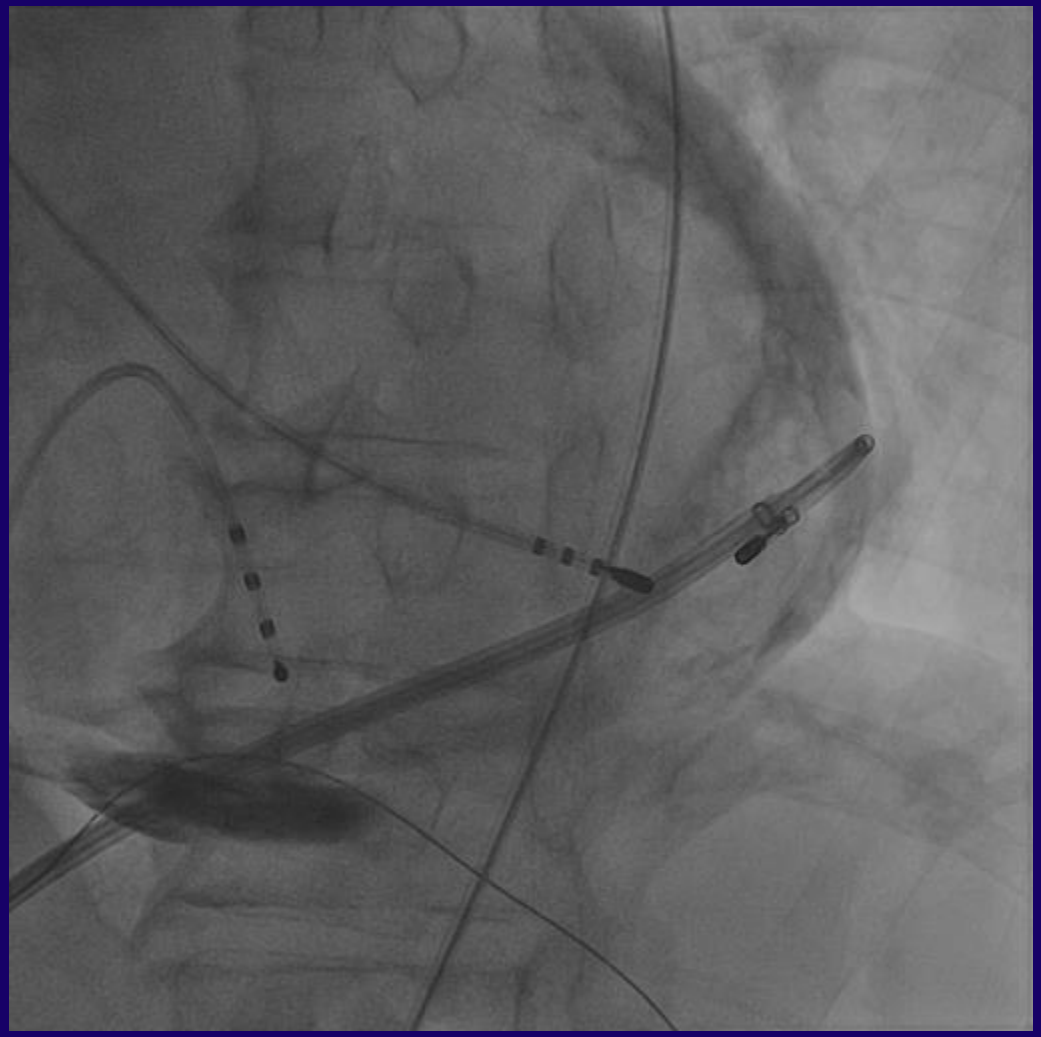

500 ms
400 ms
200 ms
0 ms
-200 ms
-400 ms
-500 ms


500 ms
400 ms
200 ms
0 ms
-200 ms
-400 ms
-500 ms

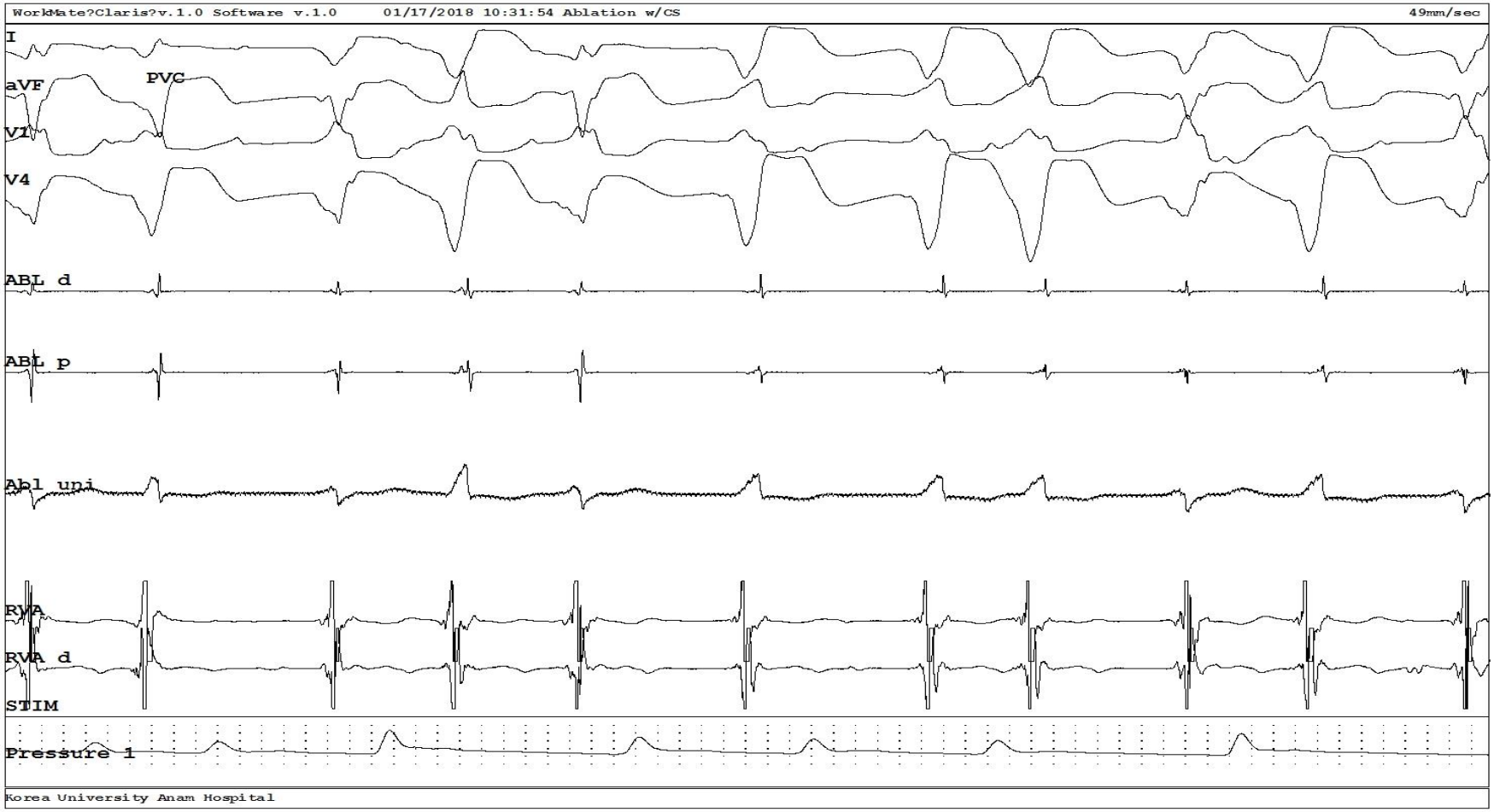
ABL Site(EPI)



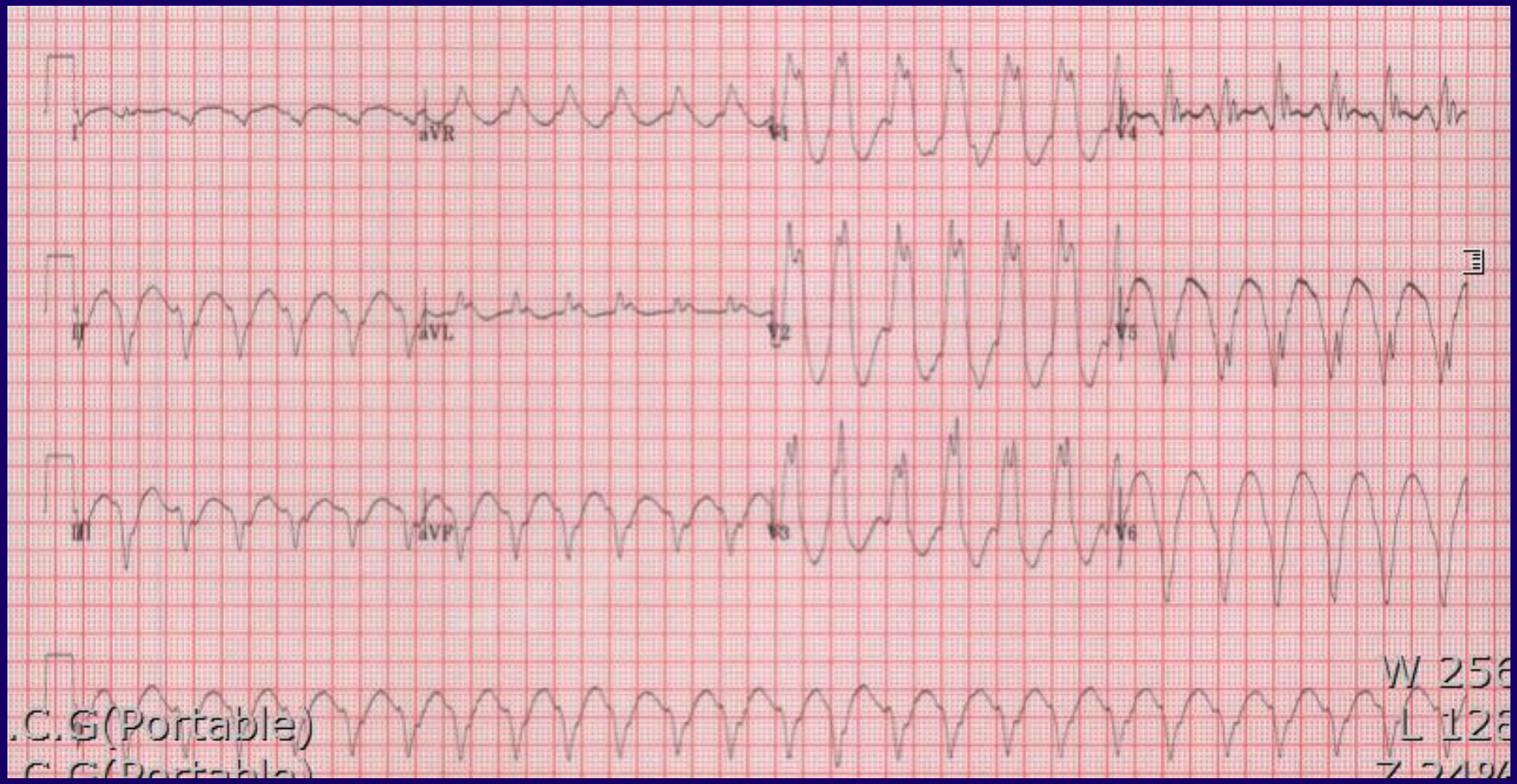
ABL Site(EPI)



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

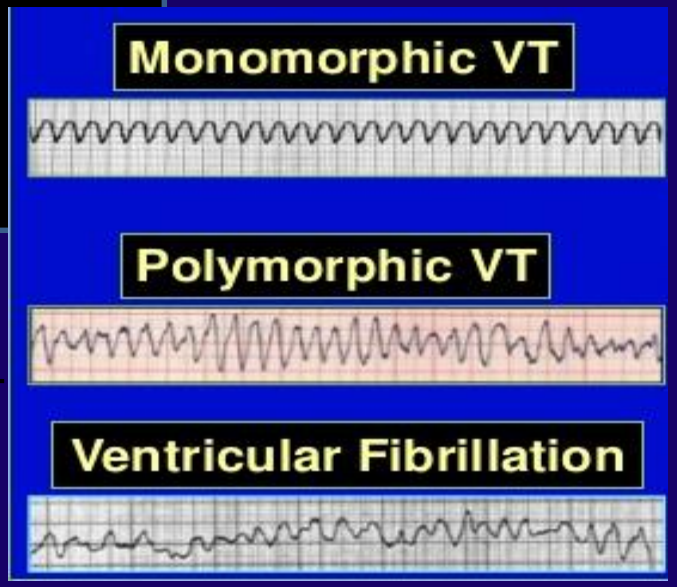
Substrate

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

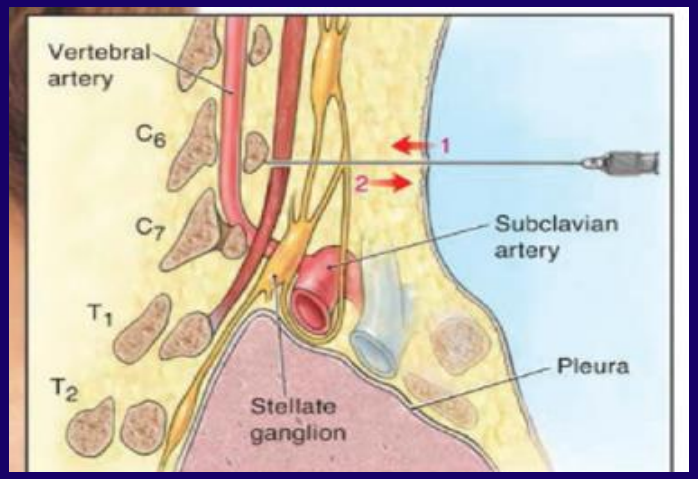
Trigger

- 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 transvere 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

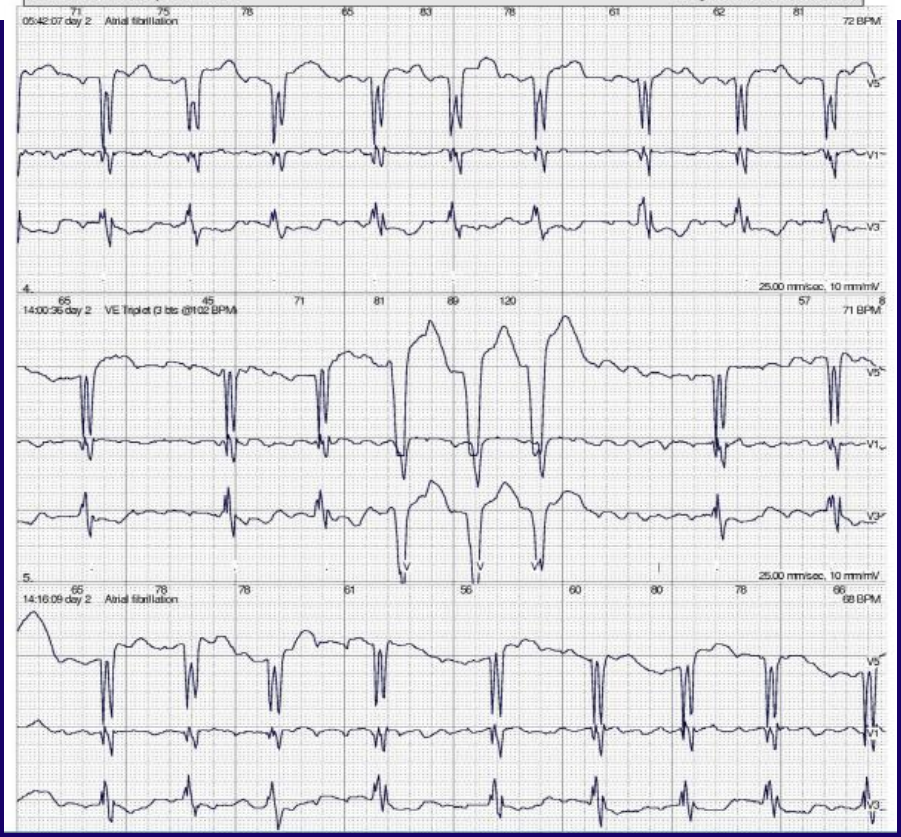
Impressions and Findings

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 : (-)

CHUNGBUK CHEONG JU CITY *Report Number: 8F66077E20A2215*
Patient: SONG, JIN KYU *Report Date:6/7/2018*



Experience of Severance Hospital

Sex	Age	Heart disease	ICD	Electrical storm	Role of SGB
M	45	DCMP	0	0	Bridging to ablation
F	76	DCMP	0	0	Bridging to ablation
M	51	DCMP	X	0	Bridging to ablation

Summary

- Electrical storm is life threating event.
- Catheter ablation can not 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.