

Twenty Years of CFAE Ablation: What Have We Learned?

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Treatment of AF



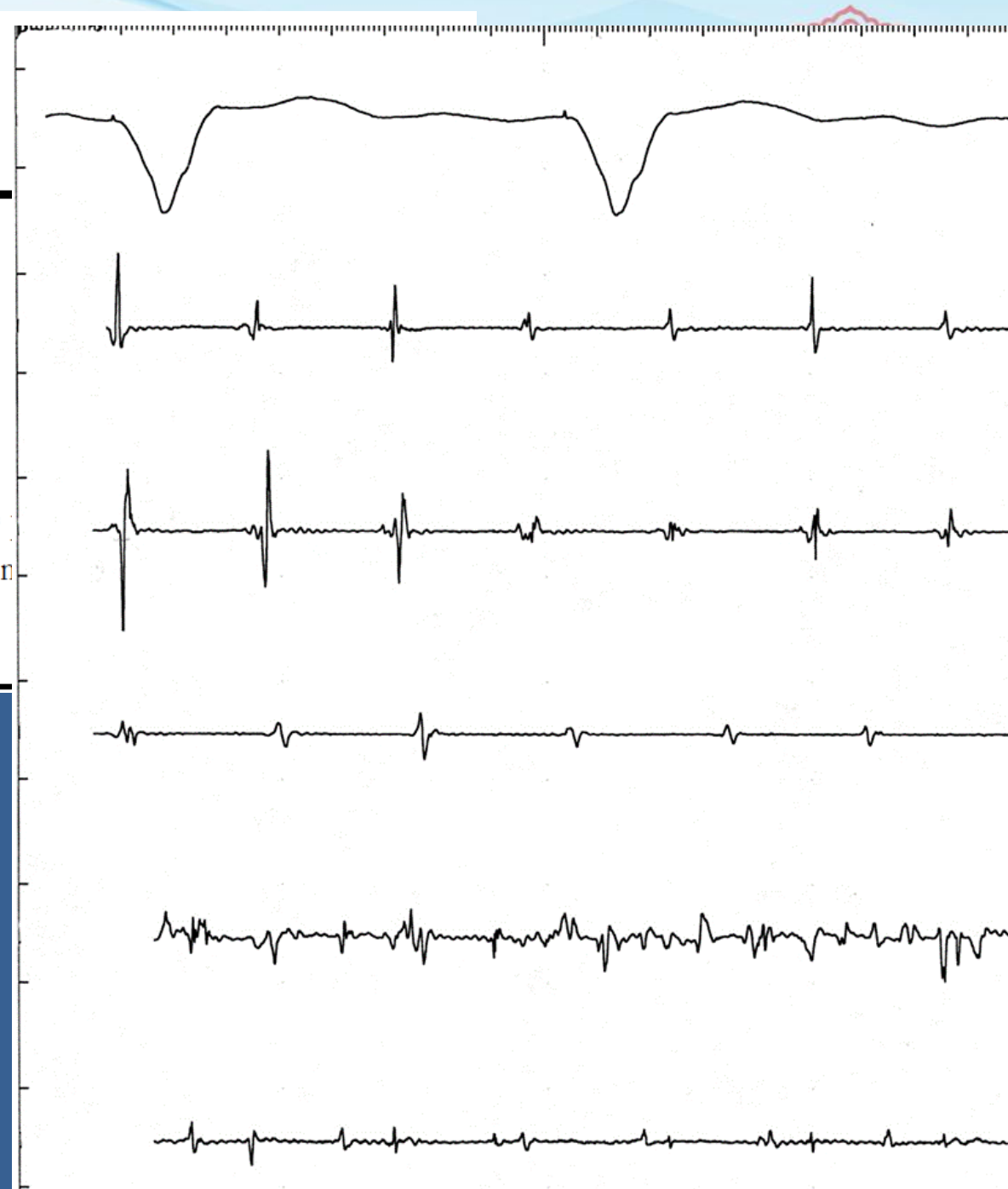
- To restore sinus rhythm
- To reduce risk of stroke.
- To improve survival rate.
- To reduce risk of CHF
- To eliminate AF symptoms

A New Approach for Catheter Ablation of Atrial Fibrillation: Mapping of the Electrophysiologic Substrate

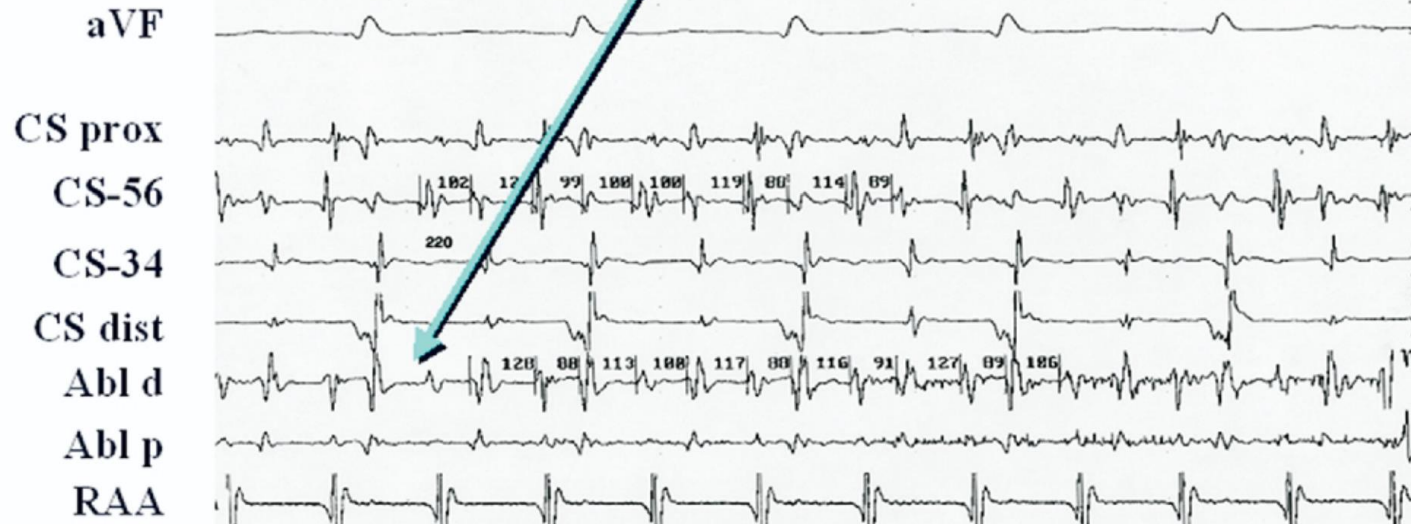
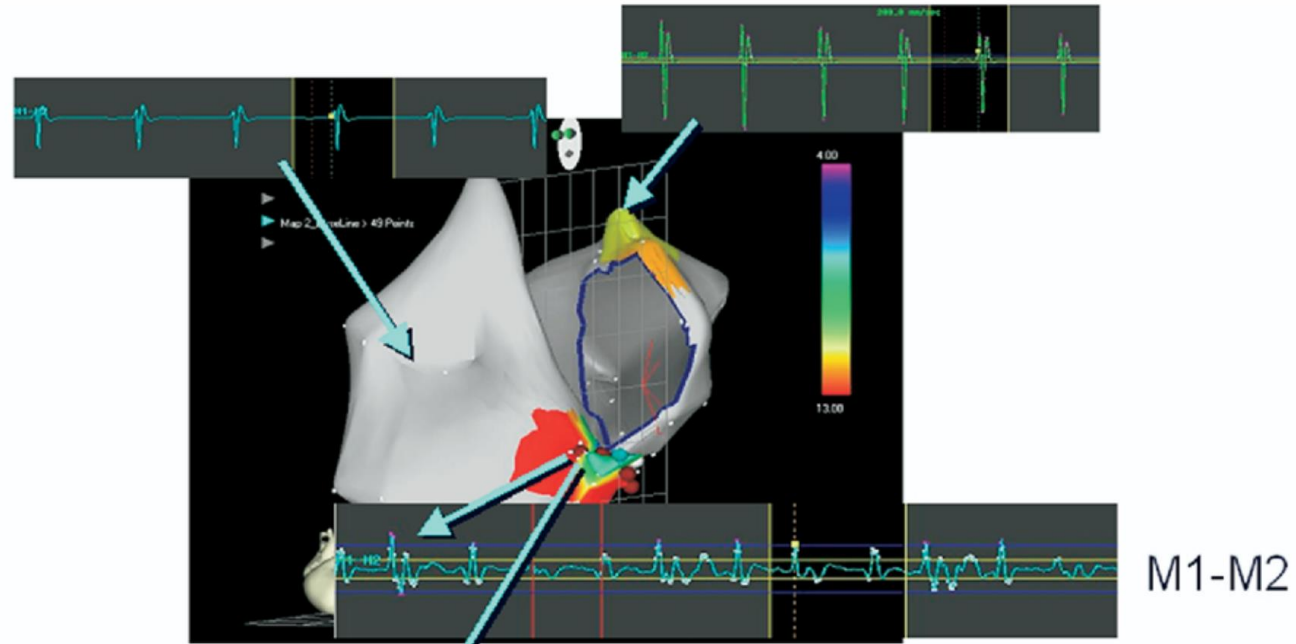
Koonlawee Nademanee, MD, FACC,* John McKenzie, MD,* Erol Kosar, MD,*
Buncha Sunsaneewitayakul, MD,† Thaveekiat Vasavakul, MD,* Chotikorn Khunni
Tachapong Ngarmukos, MD‡

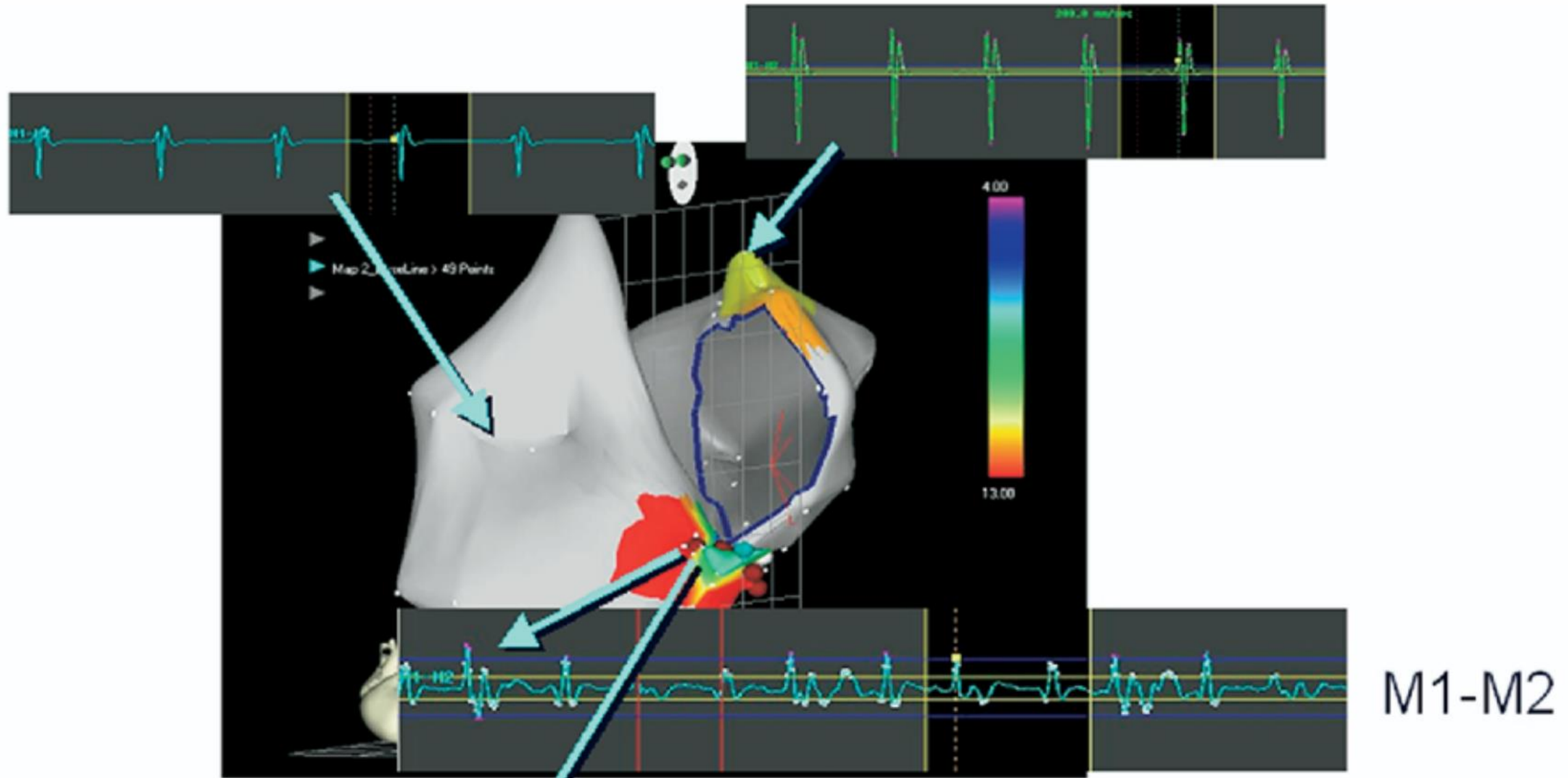
Inglewood, California; and Bangkok, Thailand

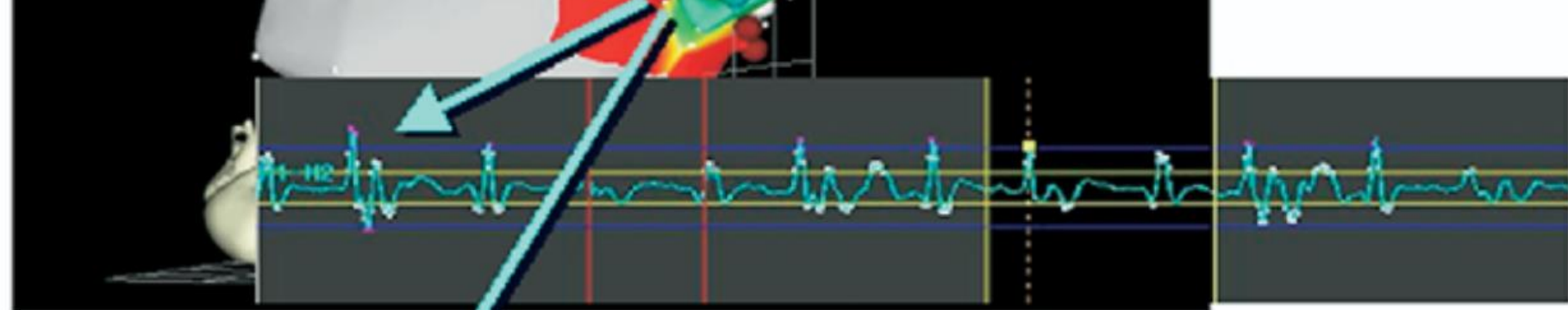
- Cited by 2600 publications since October 2004 (Google Citation)
- > 100 citations over the past year



A







M1-M2



Don't Ablate CFAE Sites

Passive and nonspecific for AF substrate.

One has to burn the whole LA.

PVs are not isolated?

Iatrogenic atrial flutter/tachycardia

Not reproducible results

Don't Ablate CFAE Sites

Passive and nonspecific for AF substrate.

One has to burn the whole LA.

PVs are not isolated?

Iatrogenic atrial flutter/tachycardia

Not reproducible results

EDITORIAL COMMENT

The Role of Complex Fractionated Atrial Electrograms in Atrial Fibrillation Ablation

Moving to the Beat of a Different Drum*

Koonlawee Nademanee, MD, FACC,
Naoya Oketani, MD

Inglewood, California

J Am Coll Cardiol 2009



Clinical Outcomes of High Risk Patients

Aims of the Study

- AF Burden
- Stroke and death rate

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FOCUS ISSUE: ATRIAL FIBRILLATION

Ablation Therapy of Atrial Fibrillation

Clinical Outcomes of Catheter Substrate Ablation for High-Risk Patients With Atrial Fibrillation

Koonlawee Nademanee, MD, FACC, Mark C. Schwab, MD, Erol M. Kosar, MD, FACC,
Margaret Karwecki, NP, Michael D. Moran, MD, FACC, Nithi Visessook, MD,
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Clinical Outcomes of High Risk Patients



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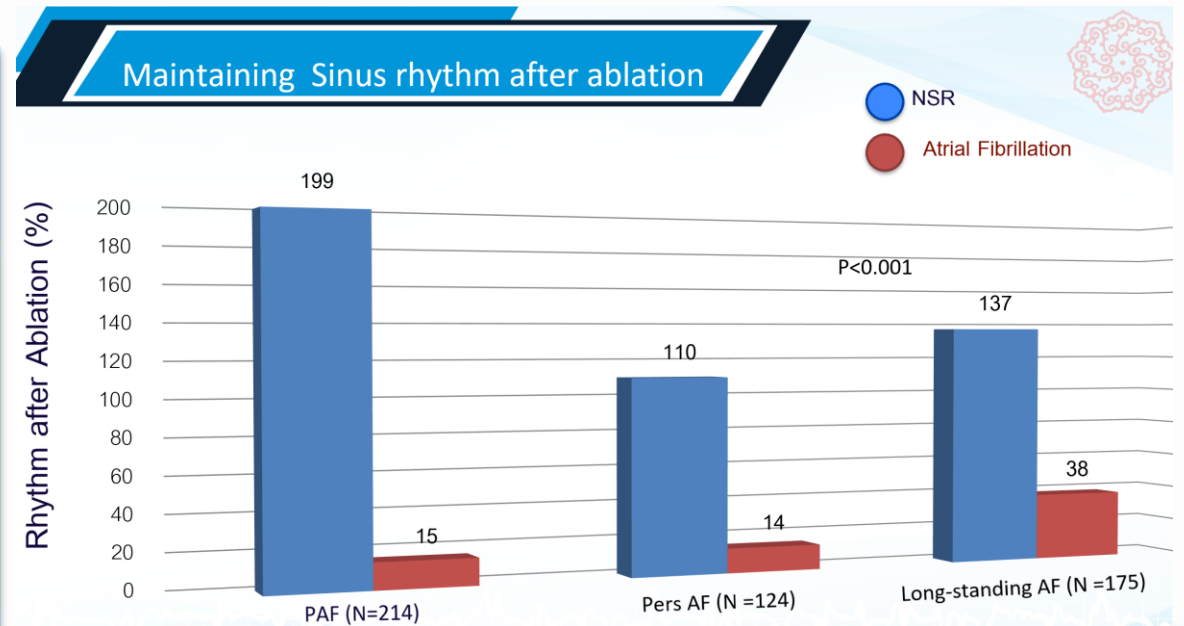
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Inglewood, California

Maintaining Sinus rhythm after ablation



Clinical Outcomes of High Risk Patients



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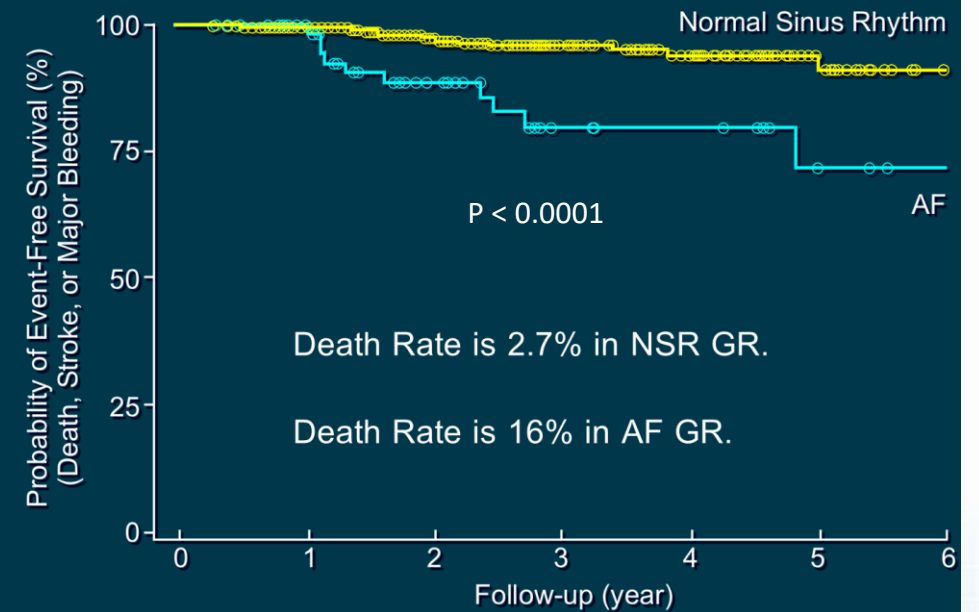
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Inglewood, California

Clinical Outcomes: AF vs. NSR



Clinical Outcomes of High Risk Patients



No Warfrin VS. Warfarin

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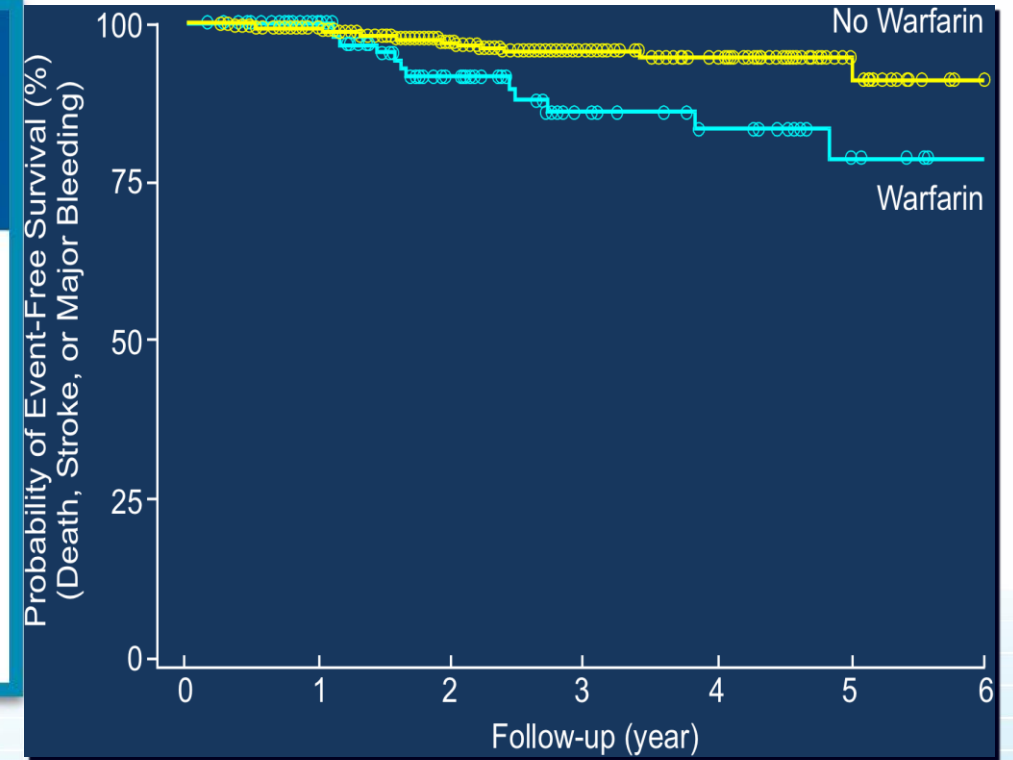
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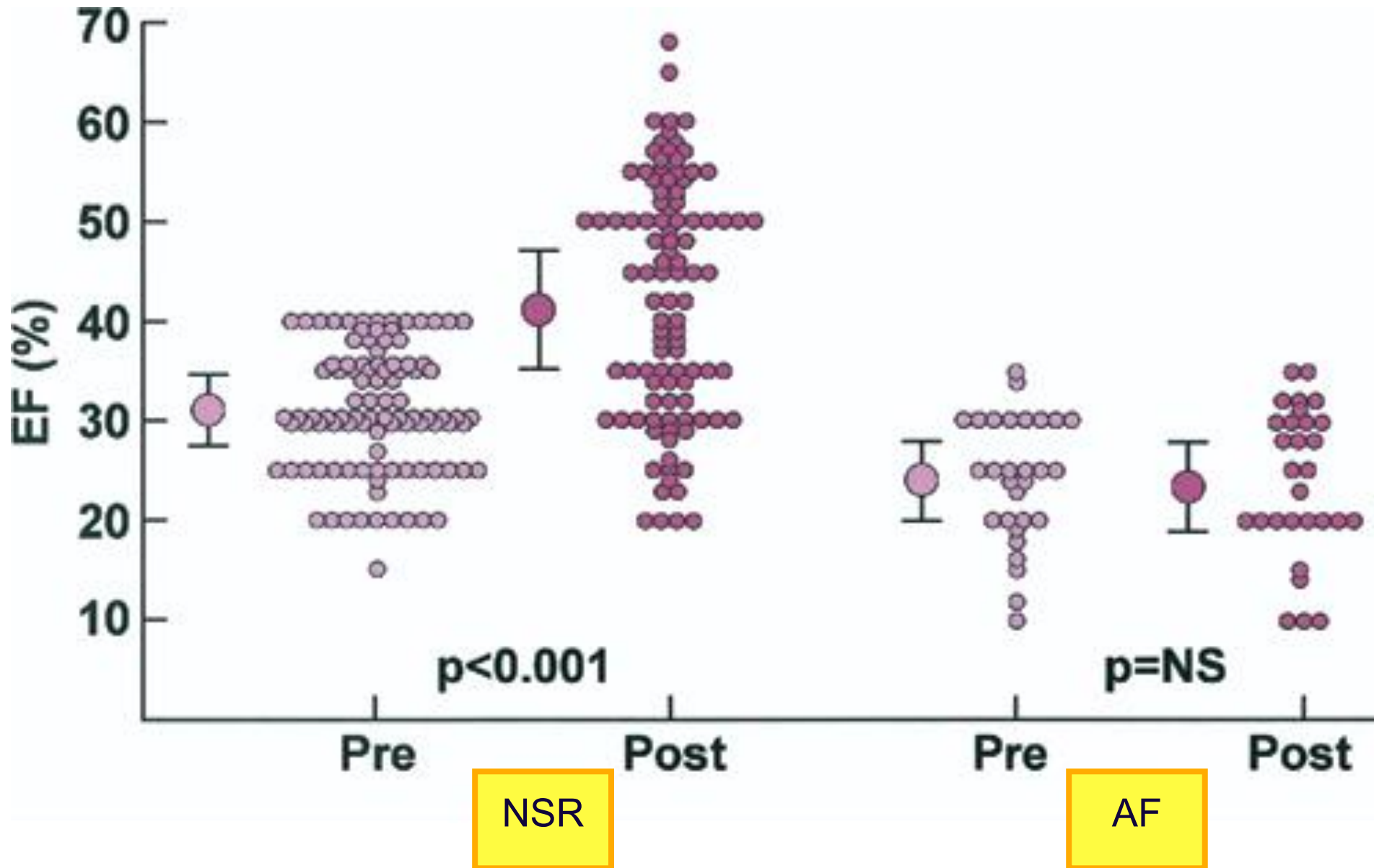
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Inglewood, California



Improved LVEF after NSR post ablation

Nademanee et al. JACC 2008

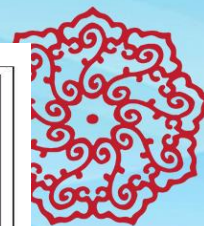


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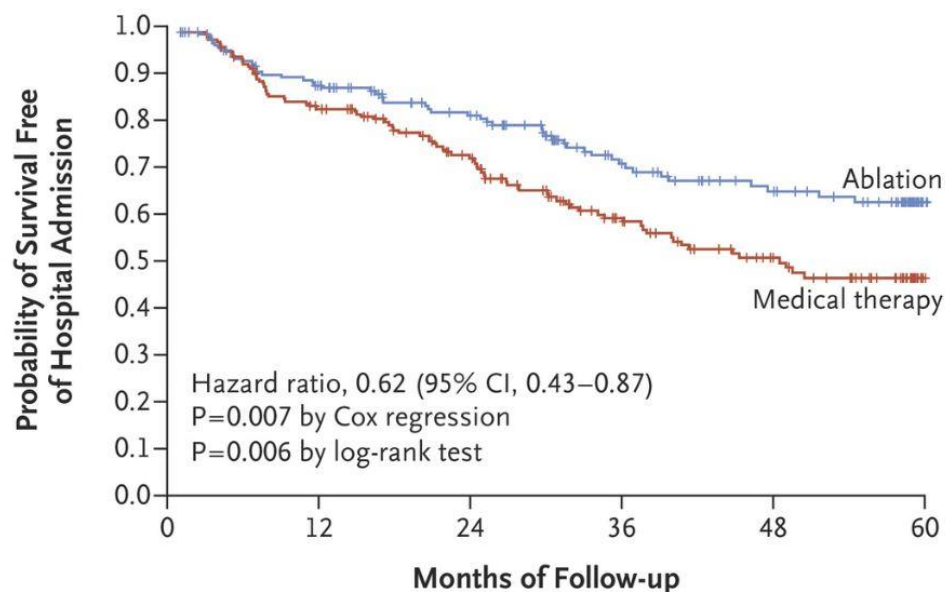
VOL. 378 NO. 5



Catheter Ablation for Atrial Fibrillation with Heart Failure

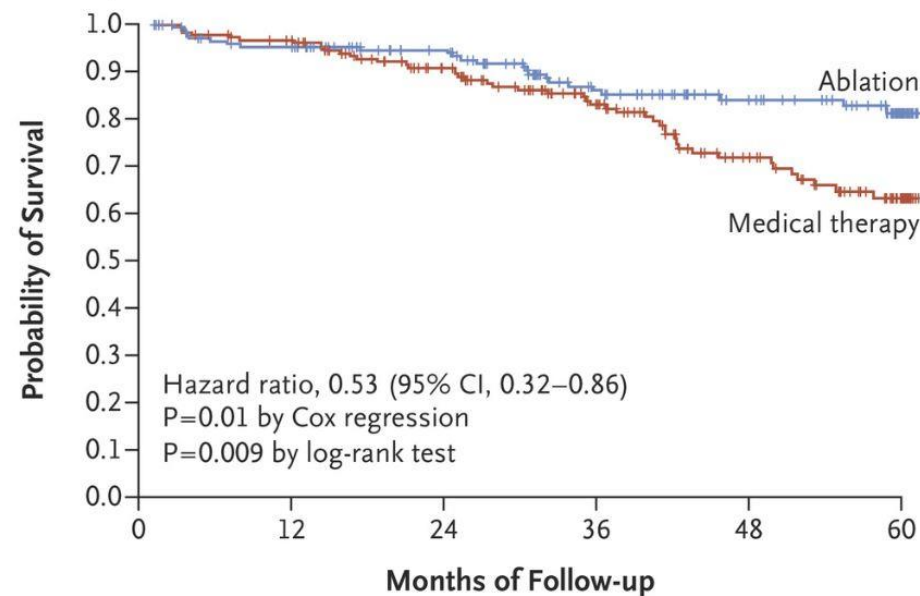
Nassir F. Marrouche, M.D., Johannes Brachmann, M.D., Dietrich Andresen, M.D., Jürgen Siebels, M.D., Lucas Boersma, M.D., Luc Jordaens, M.D., Béla Merkely, M.D., Evgeny Pokushalov, M.D., Prashanthan Sanders, M.D., Jochen Proff, B.S., Heribert Schunkert, M.D., Hildegard Christ, M.D., Jürgen Vogt, M.D., and Dietmar Bänsch, M.D., for the CASTLE-AF Investigators*

A Death or Hospitalization for Worsening Heart Failure



No. at Risk						
Ablation	179	141	114	76	58	22
Medical therapy	184	145	111	70	48	12

B Death from Any Cause



No. at Risk						
Ablation	179	154	130	94	71	27
Medical therapy	184	168	138	97	63	19

Benefits and risks of catheter ablation in elderly patients with atrial fibrillation



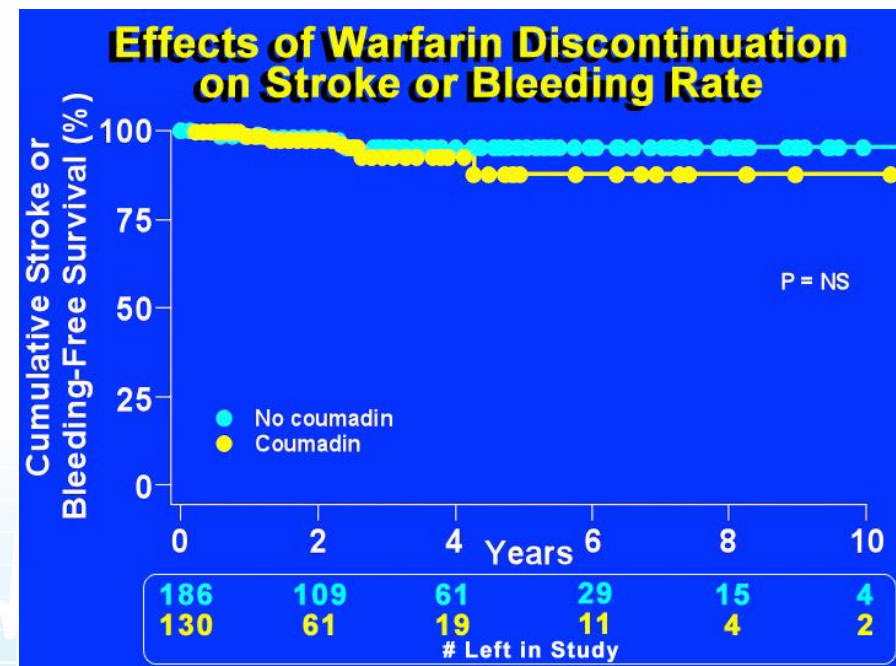
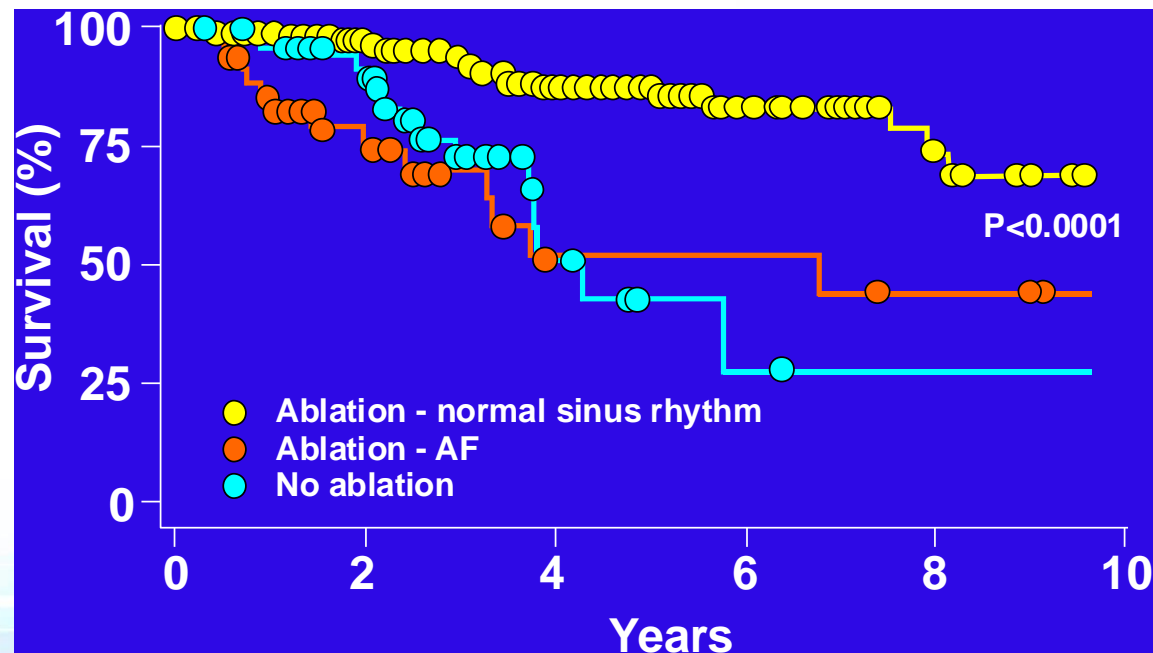
Heart Rhythm 2015;12:44–51)

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Benefits and risks of catheter ablation in elderly patients with atrial fibrillation ^e ^{CP} Heart Rhythm 2015;12:44–51)

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Epilogue

Ruth: 96 years old



Walt: 88 years old



Bob: 100 years old





Persistent AF

• Preprocedural CT with Cardioinsight vest

AF

NSR

ECGI & CARTO

Cardioversion to NSR

1) AF Triggers; 2) AF initiators 3) AF Perpetuators

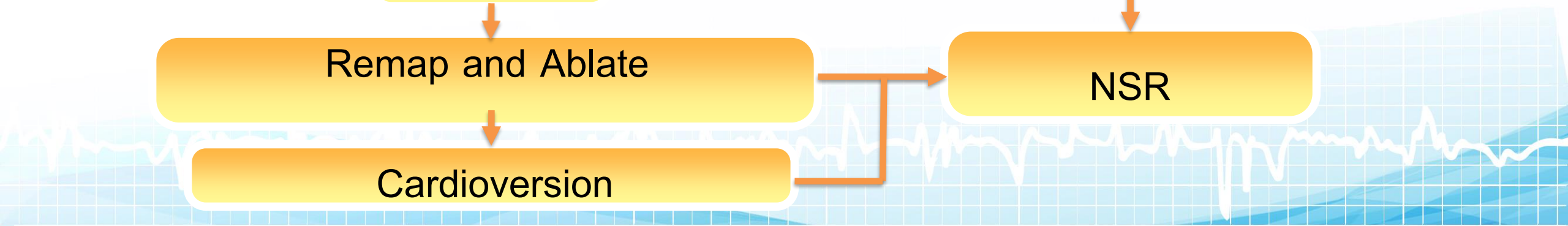
Repeat Mapping & Ablation

AT/AFL

Remap and Ablate

NSR

Cardioversion





Definitions

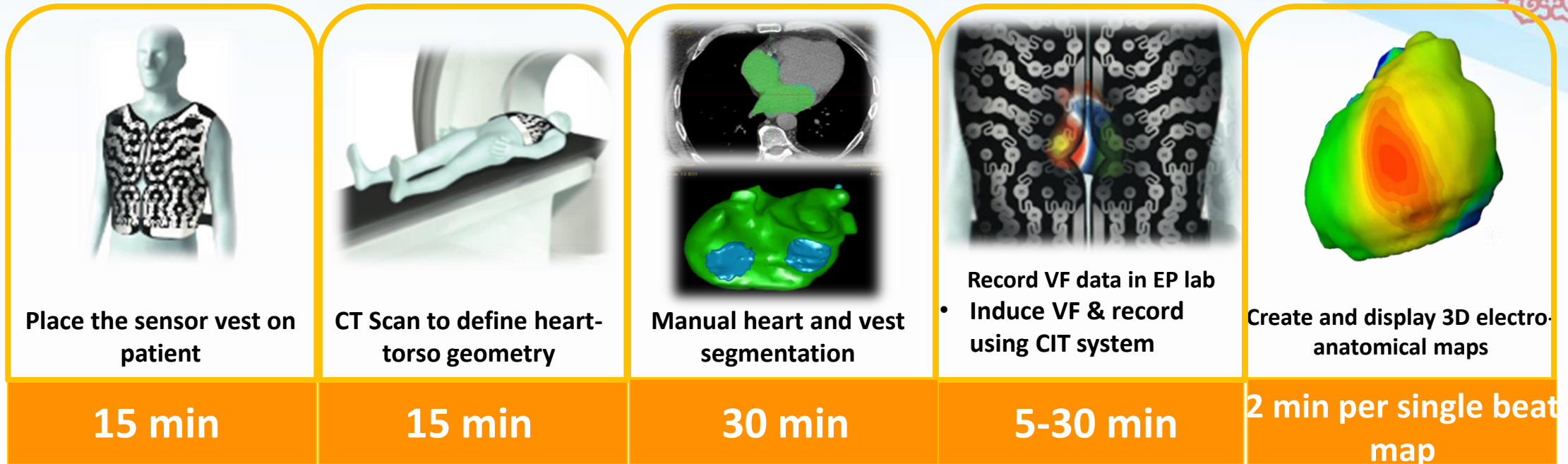
- ***AF trigger*** (atrial premature beat) that often produces atrial tachyarrhythmias
- ***AF initiator*** (atrial tachyarrhythmias, SVT or AT or atrial flutter) before degenerating into AF
- ***AF perpetuator*** - sites that have focal activity, repetitive rotors or reentrant circuits i.e. figure of eight or butterfly circuit that sustained AF.

AF Perpetuator = CFAE Sites?



CardioInsight Workflow

WORKFLOW STEPS AND PRACTICAL CONSIDERATIONS



- CIT personnel will place vest and operate system
- Entire workflow (including CT) must be done on same day
- CT scan (attached)
 - Field of view (FOV) includes the entire patient torso
 - Requires saving DICOM images to CD or USB stick
- Navigation patches underneath vest could decrease mapping resolution



Conclusions



- Low voltage, short-cycle length CFAE correlates very well with atrial dispersion during AF and AF drivers, rotors & Focal activity.
- Atrial activity with cycle length < 100 msec represent AF drivers and/or perpetuators that sustained AF.

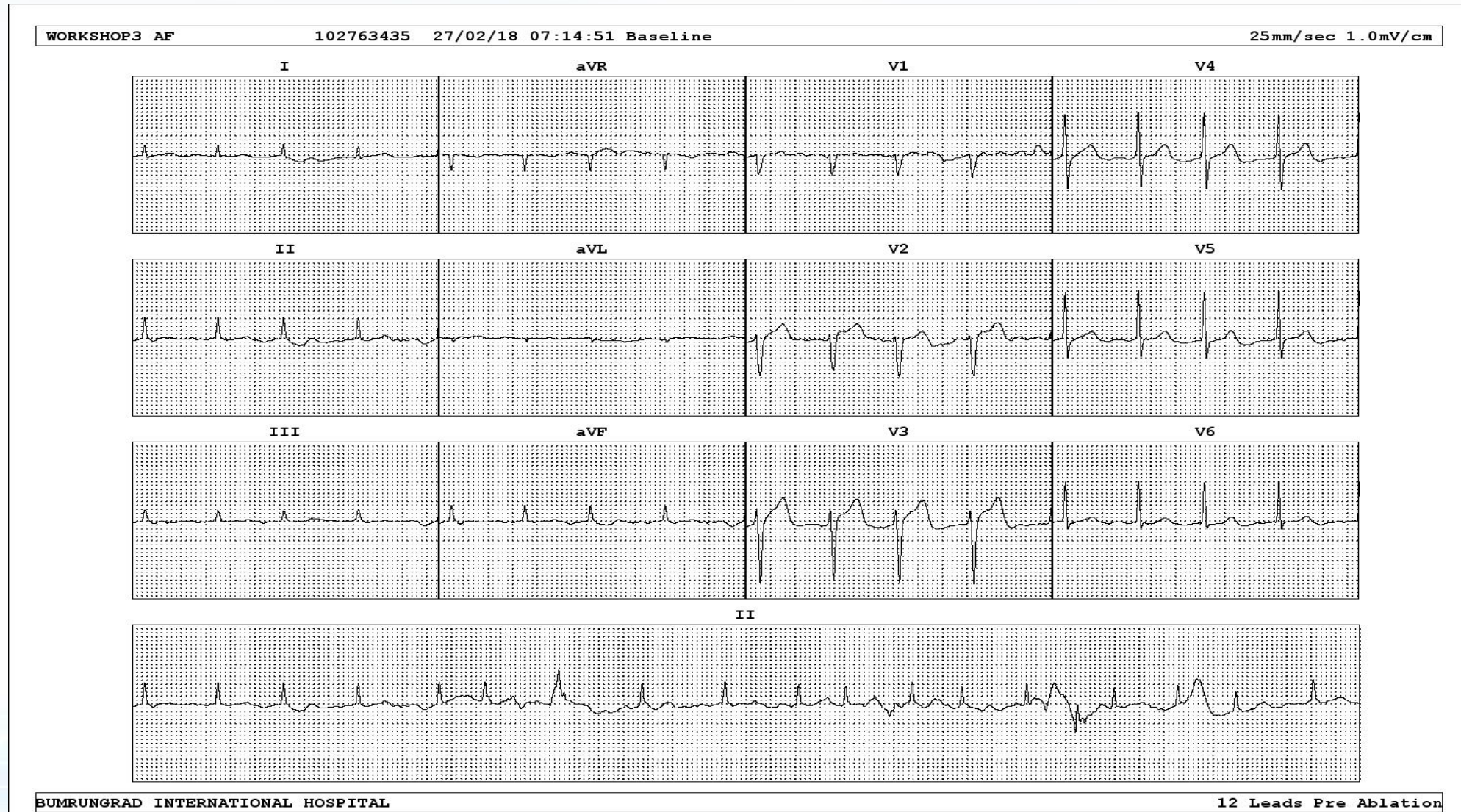
Conclusions



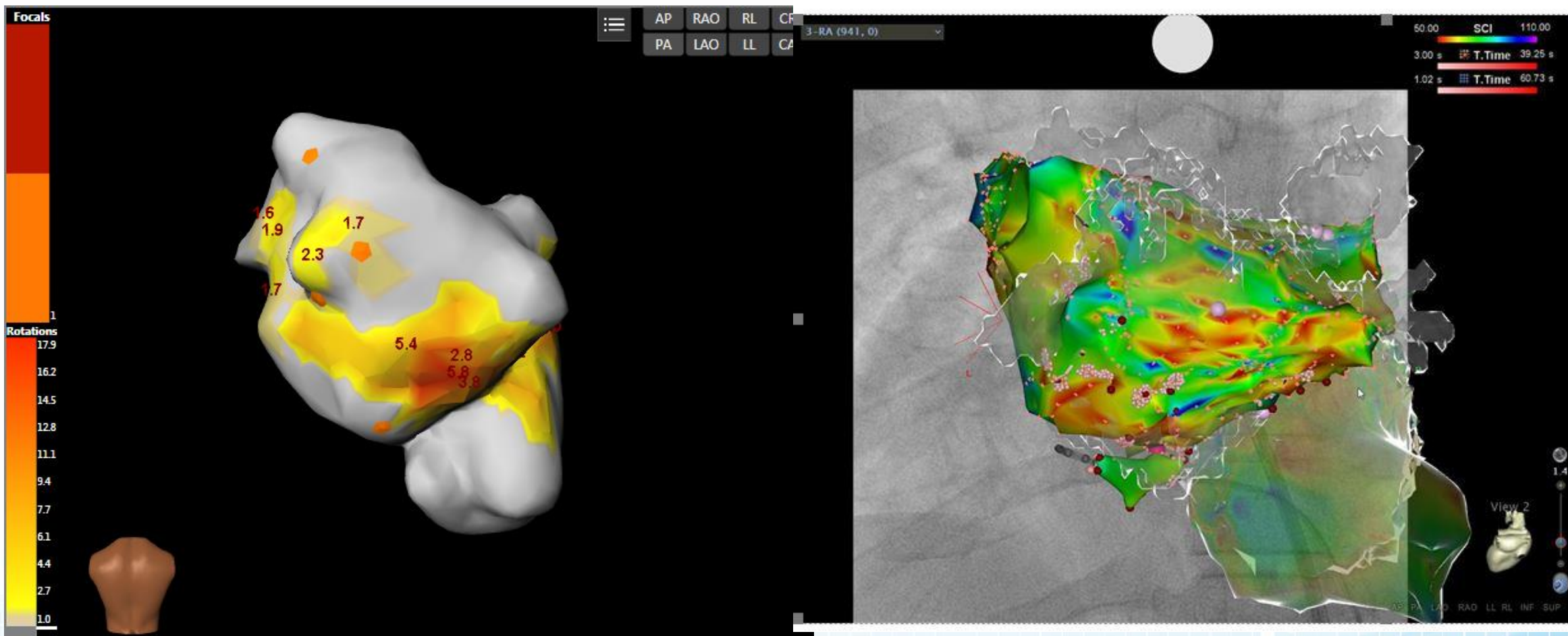
- Ablations at the primary CFAE sites remove AF substrate and terminate AF.
- Substrate ablation does not usually result in converting AF to sinus rhythm but often first change the rhythm into atrial flutter or atrial tachycardia that require further mapping and ablation before converting to sinus rhythm.
- Once sinus rhythm is achieved and AF is no longer inducible, Long-term outcome is excellent.



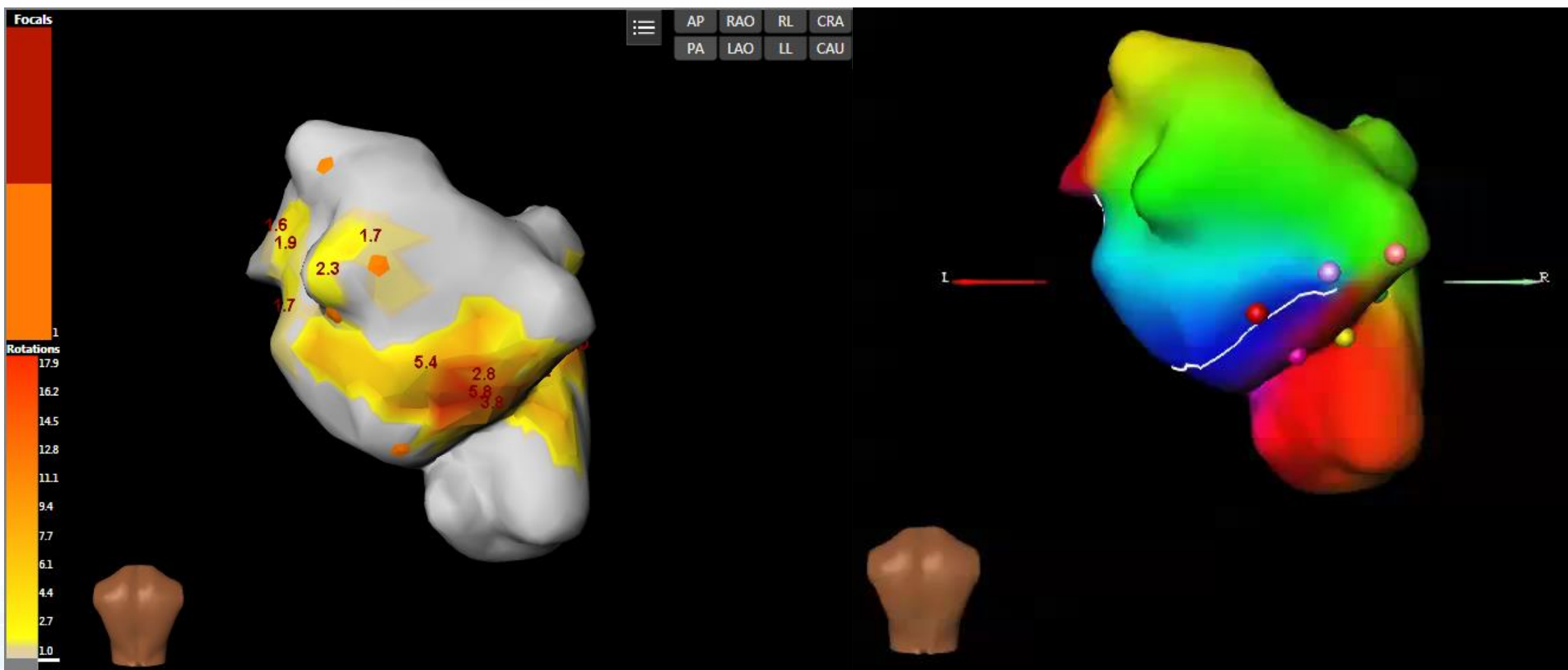
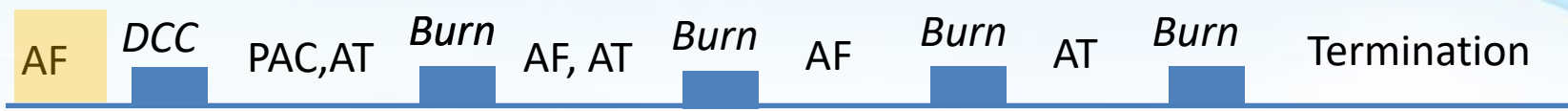
A 58 Yr old Burmese male with long-standing persistent AF

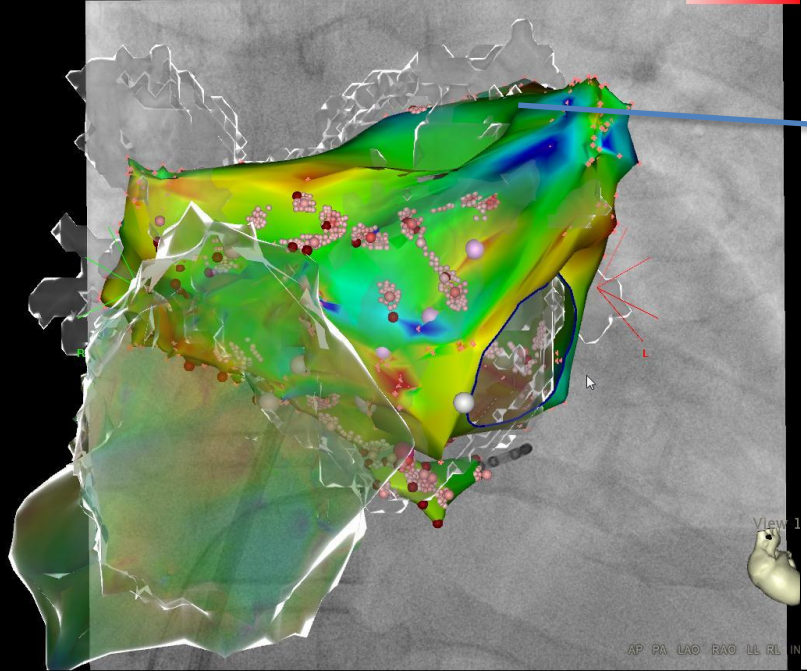
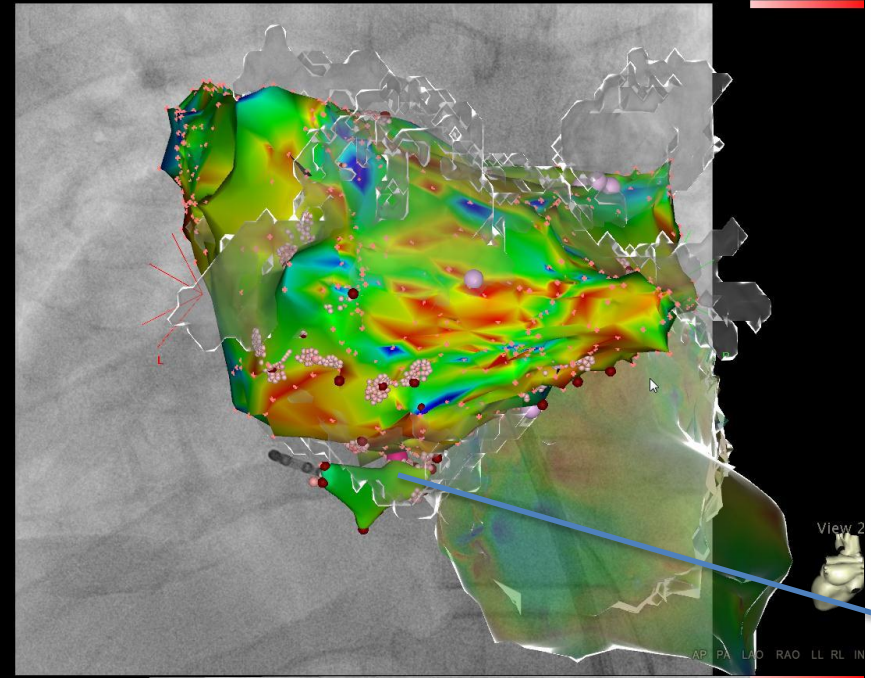


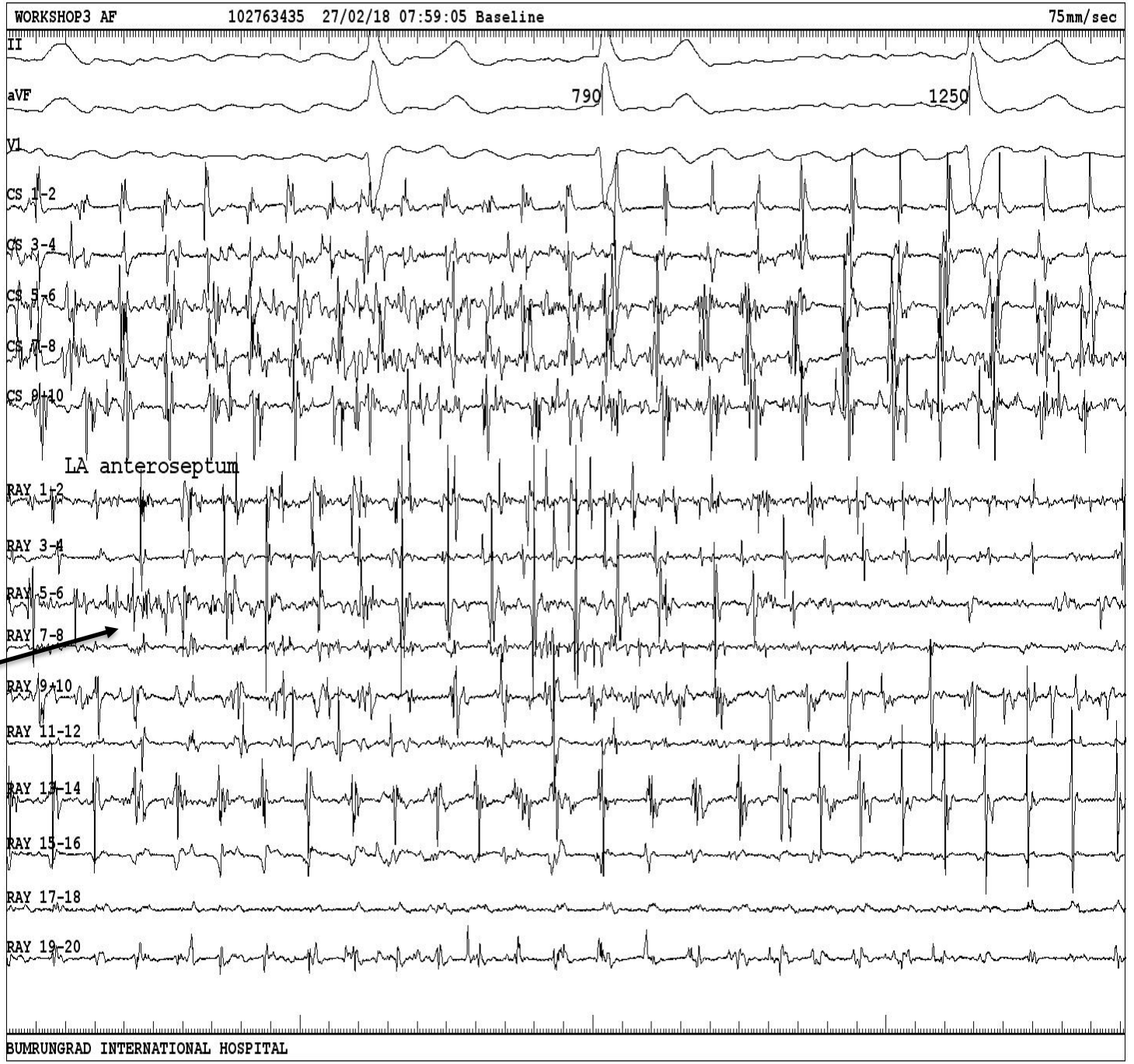
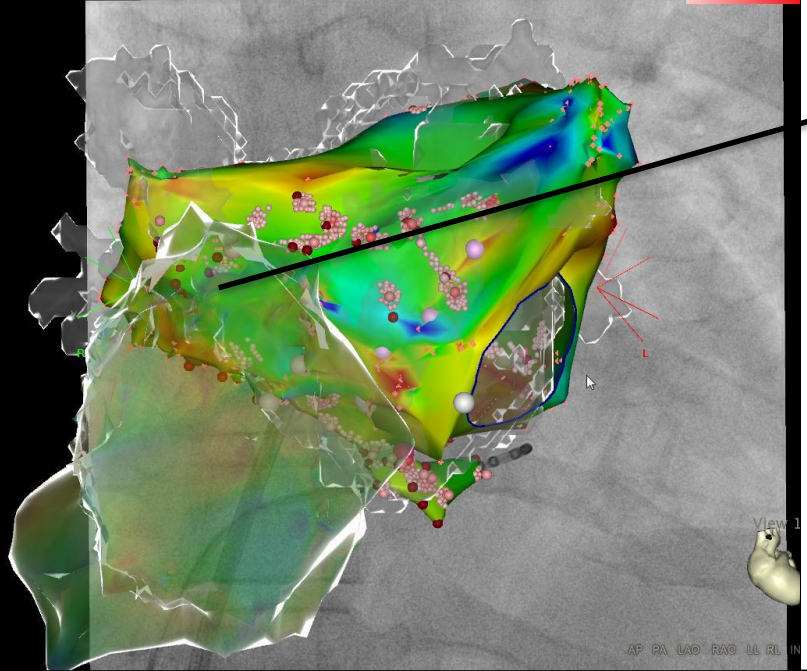
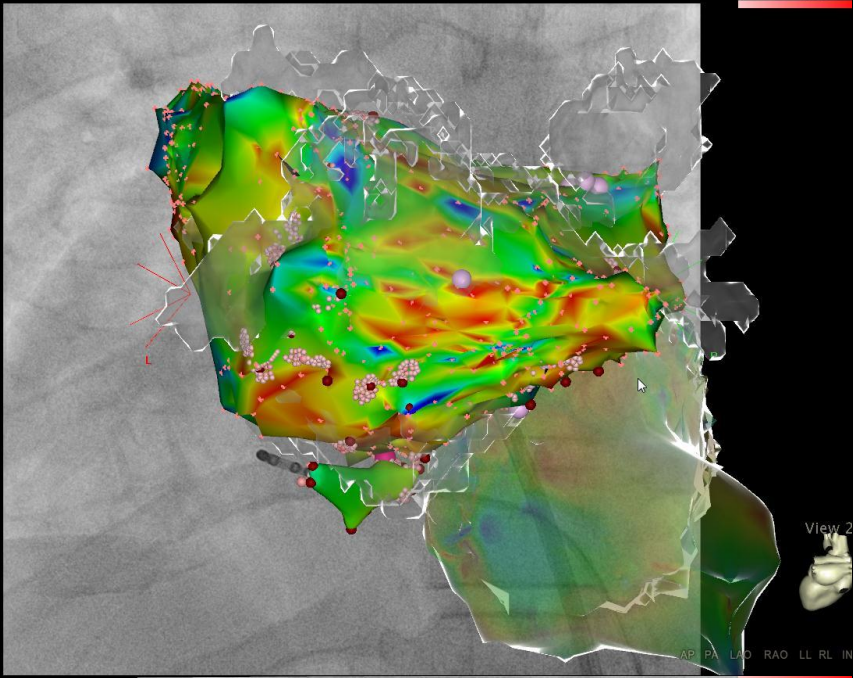
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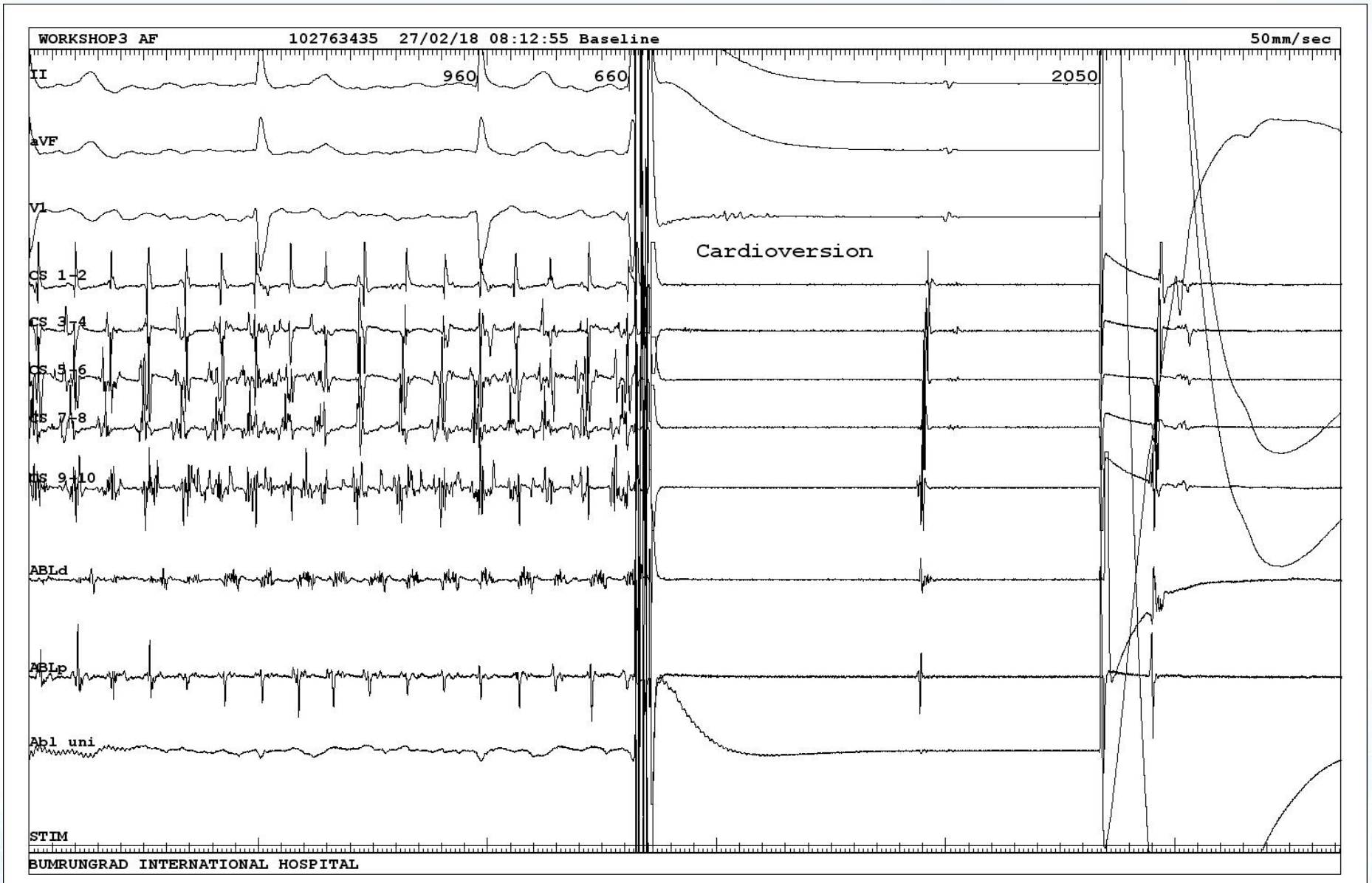


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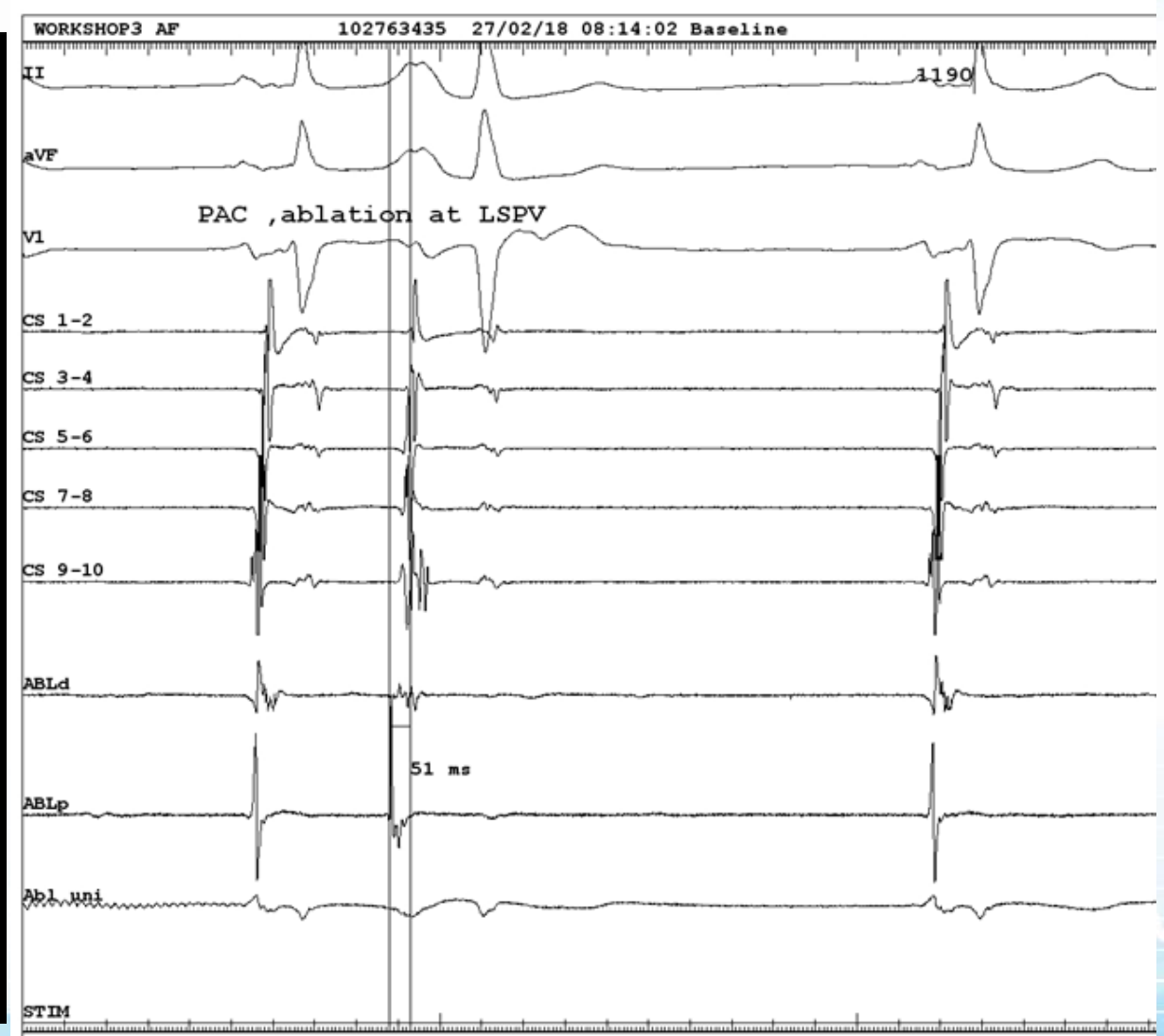
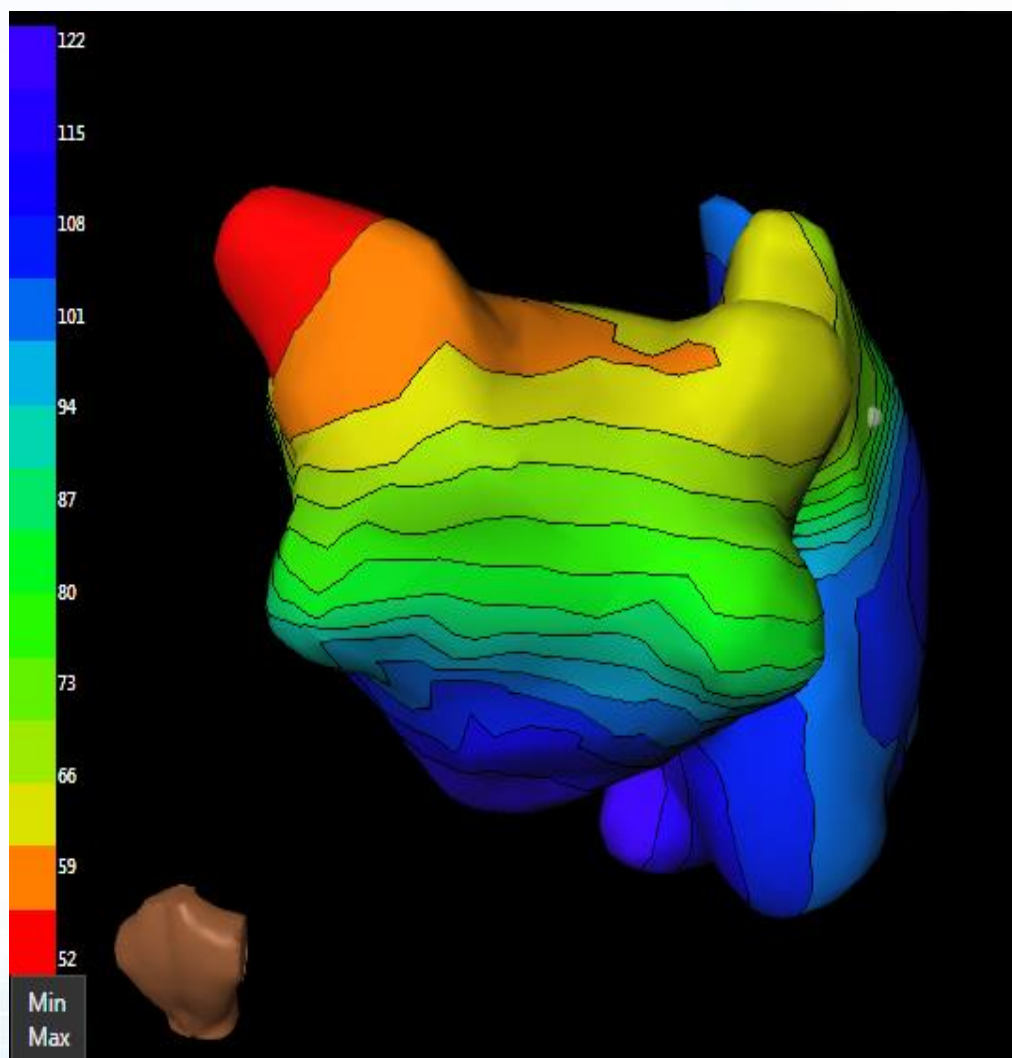


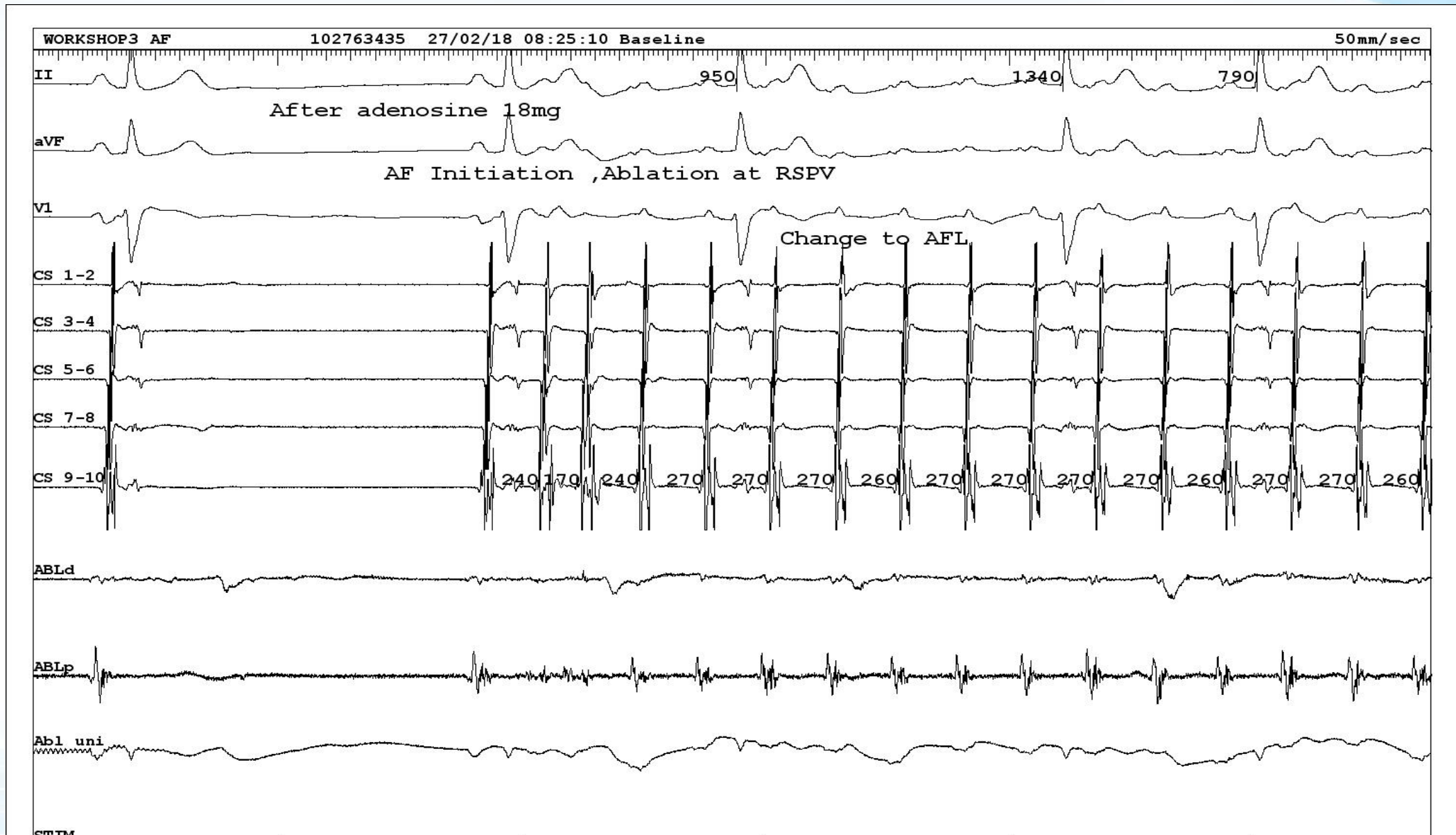




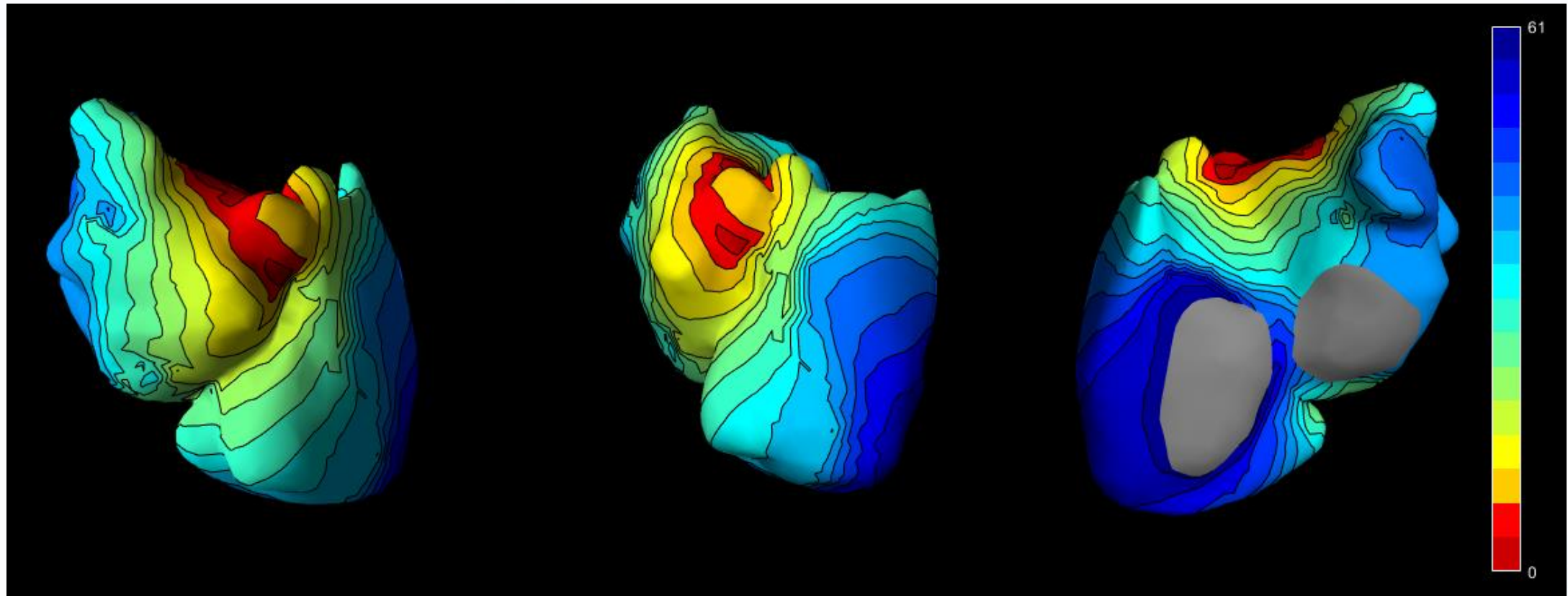


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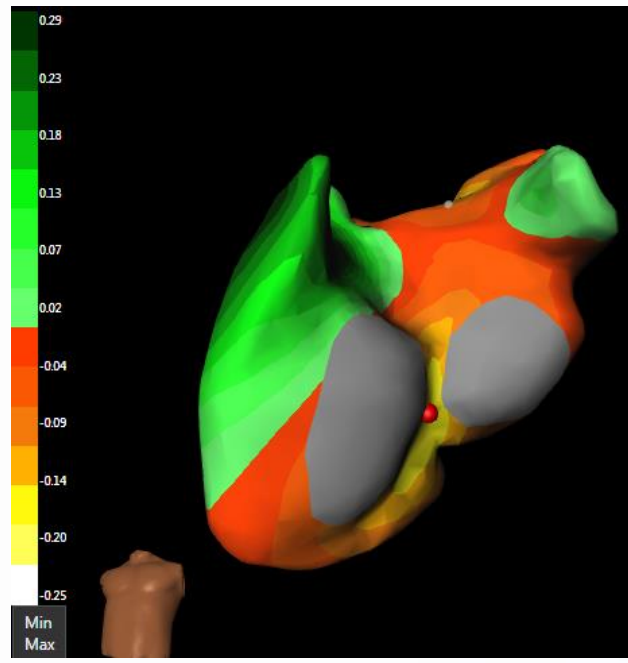
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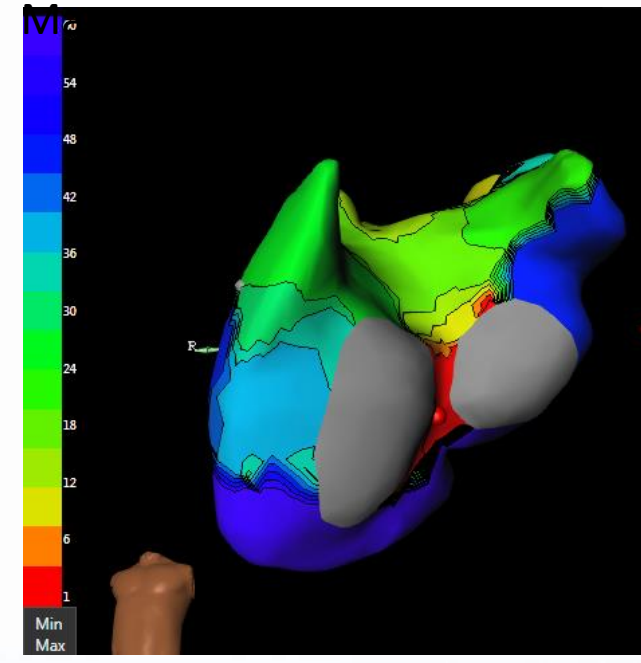
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Potential Map

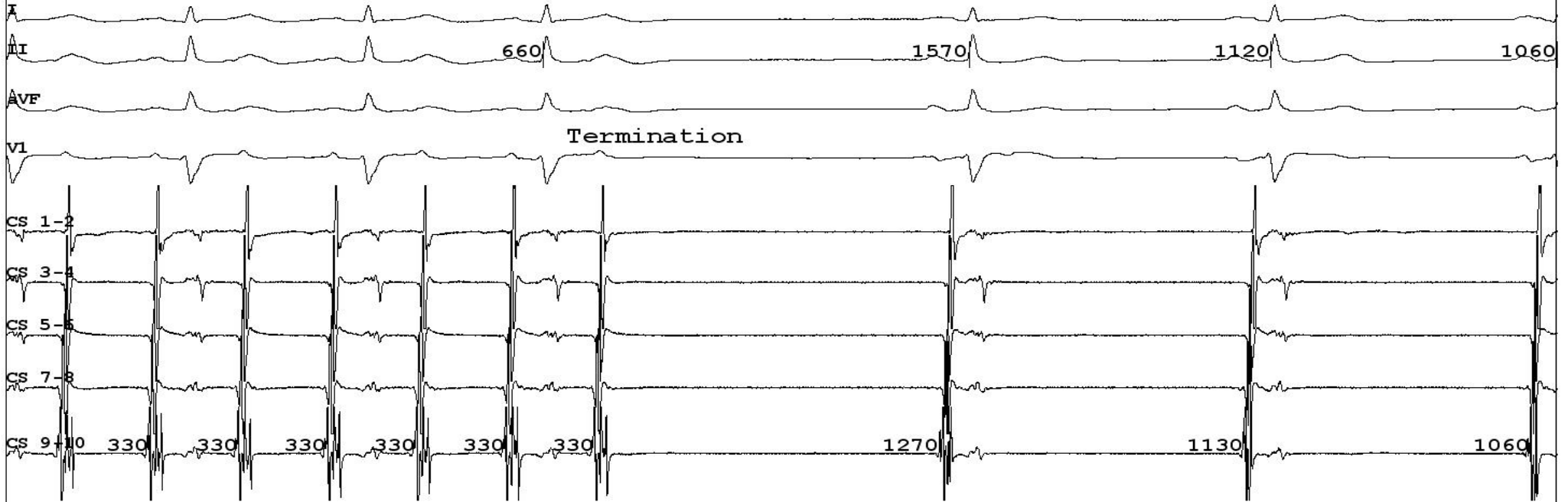


Activation





WORKSHOP3 AF 102763435 27/02/18 08:44:55 Baseline 50mm/sec



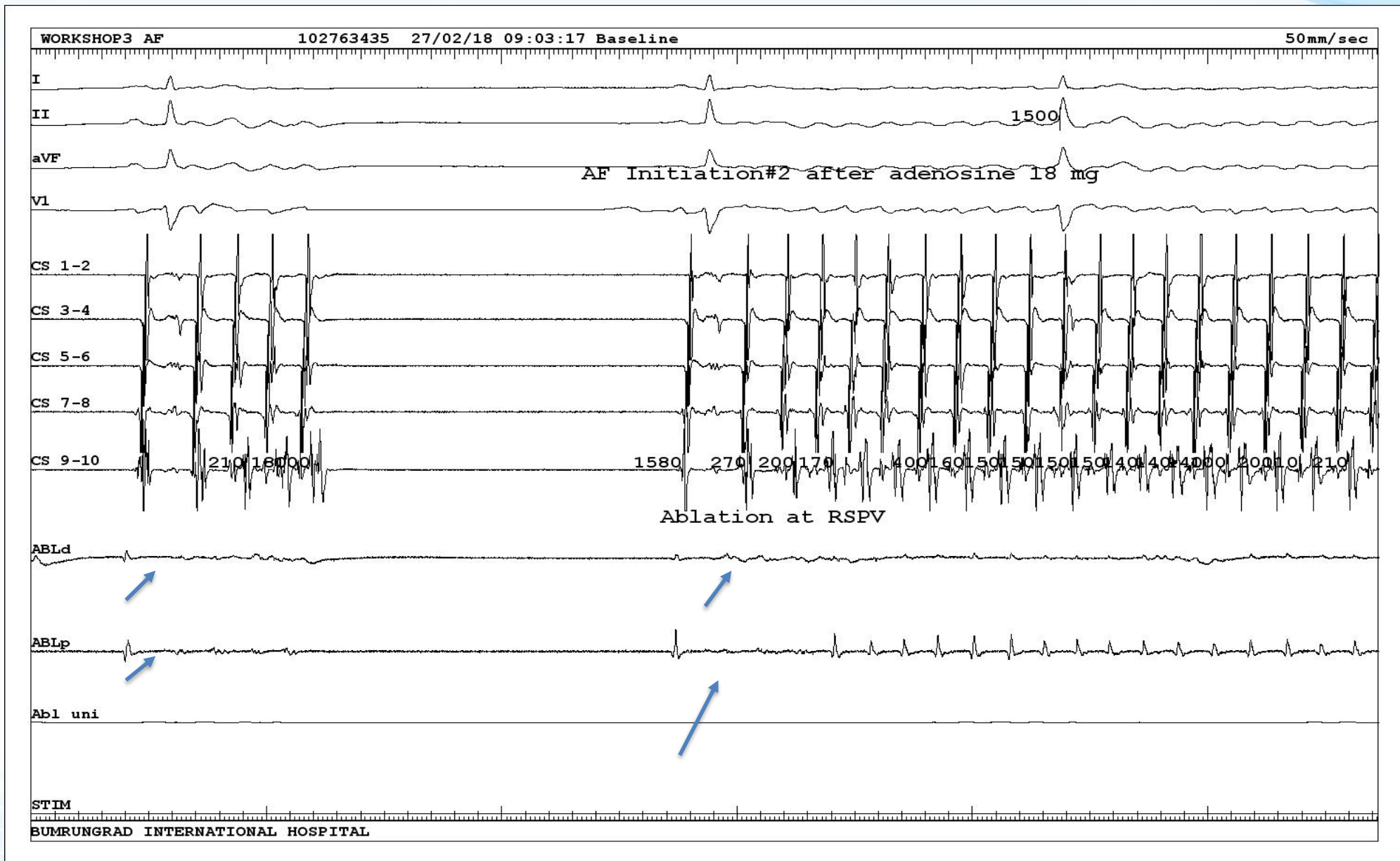
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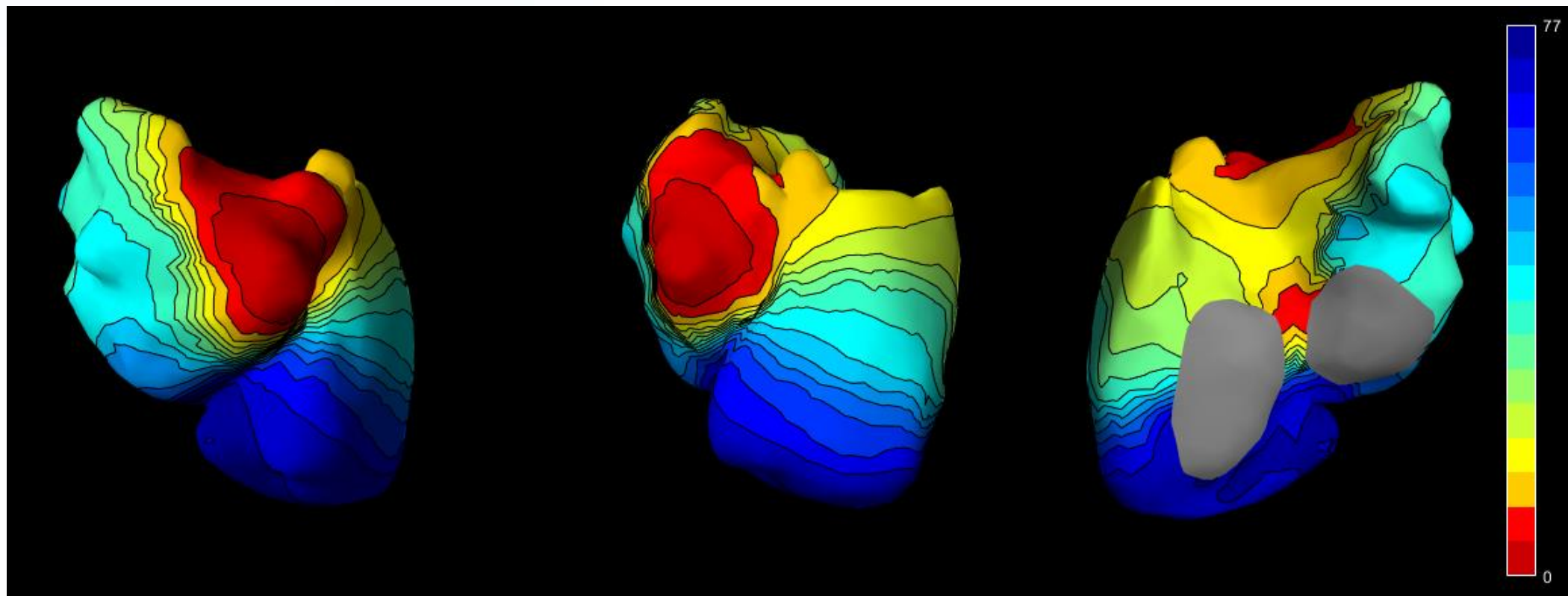
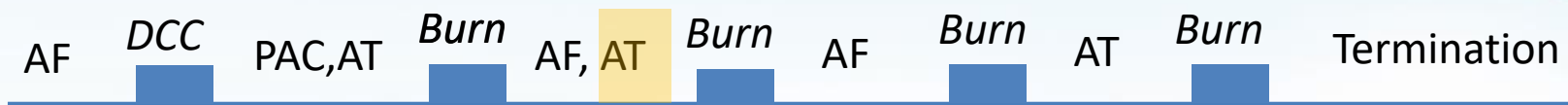
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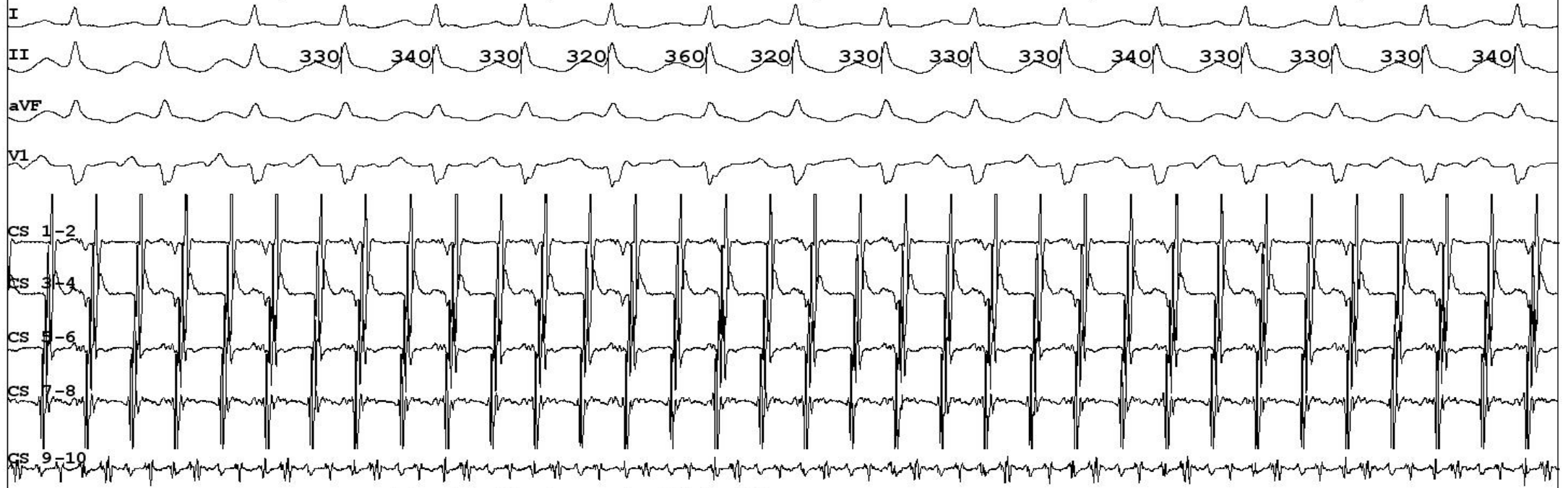
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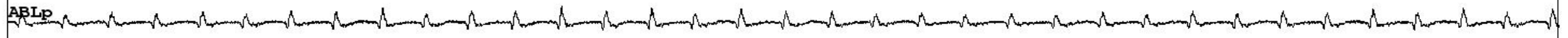
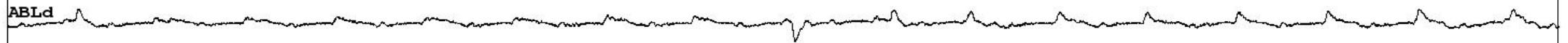


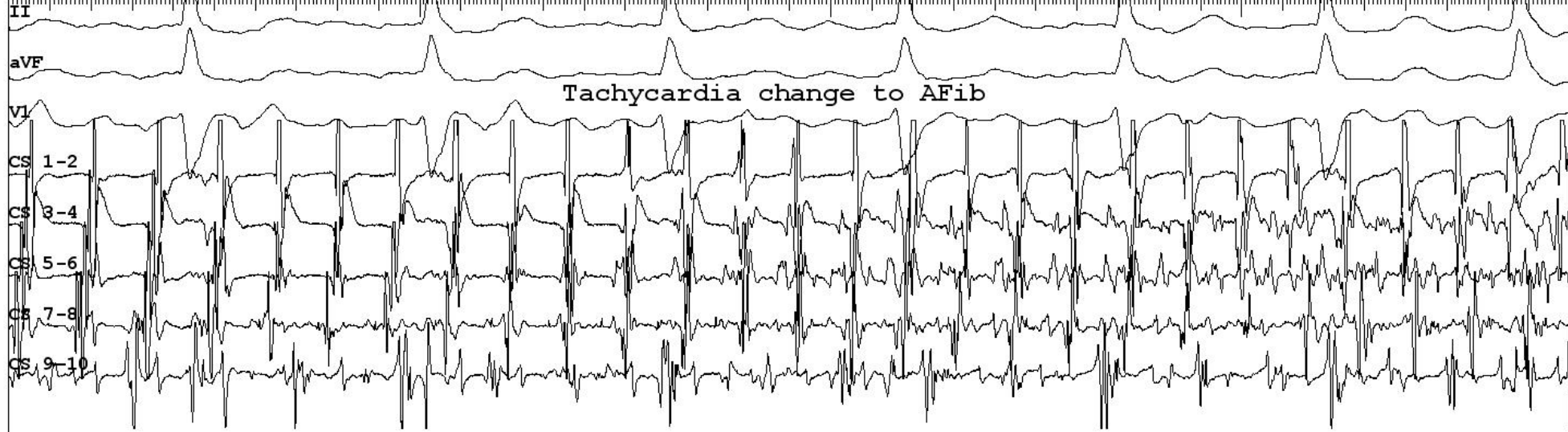
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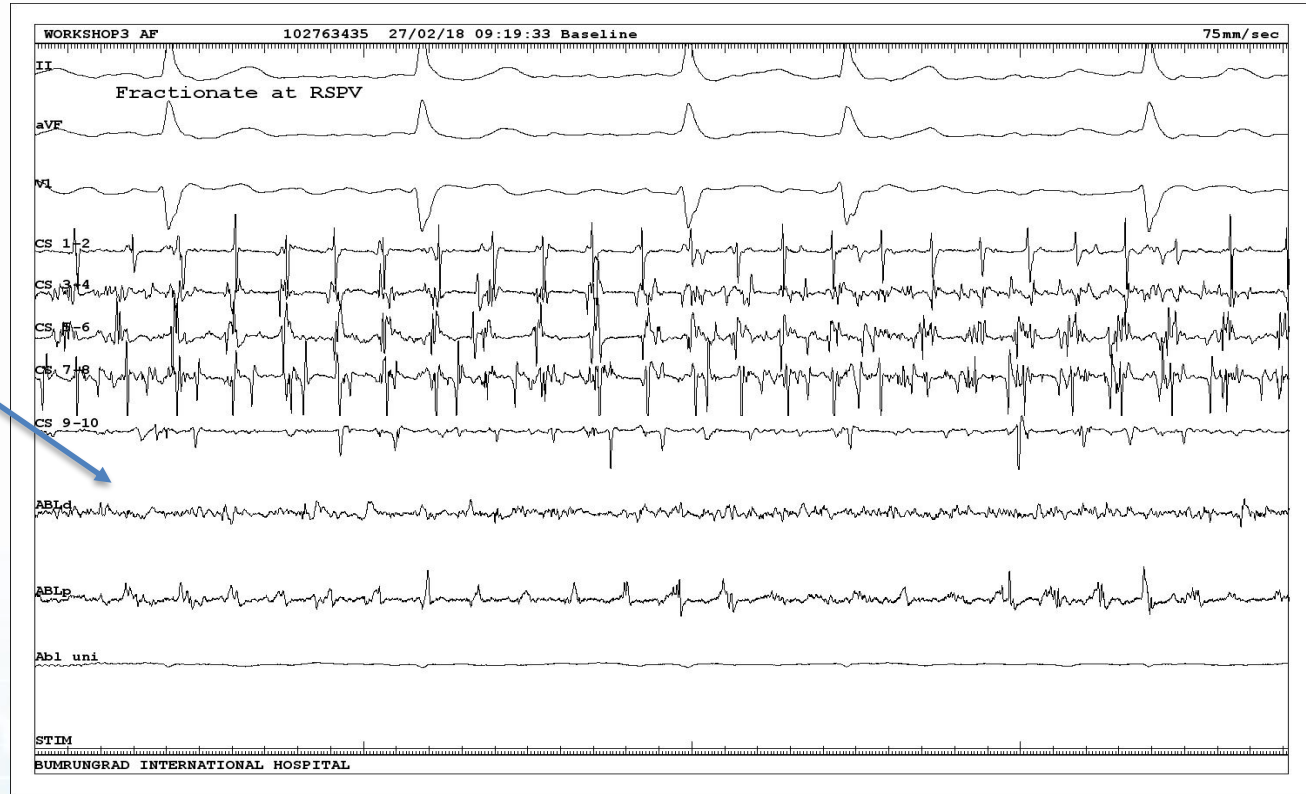
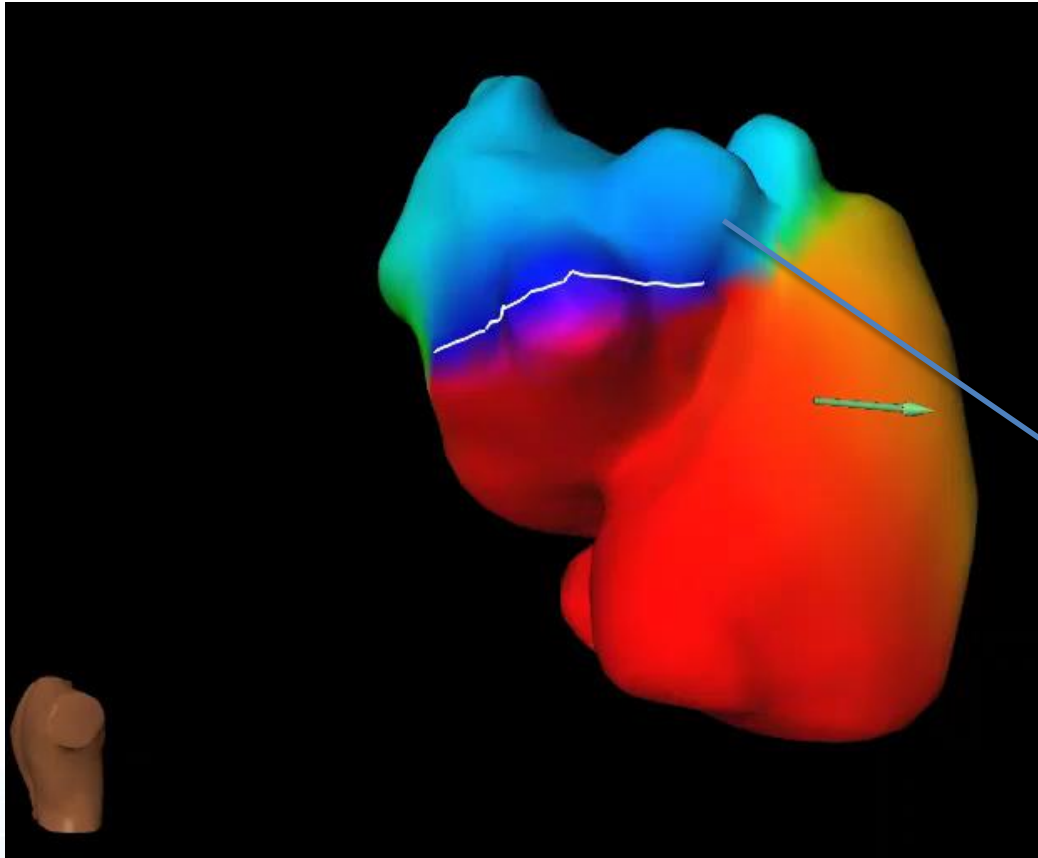
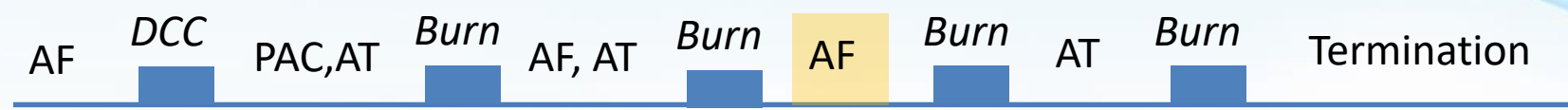


Rapid firing at CS 9-10

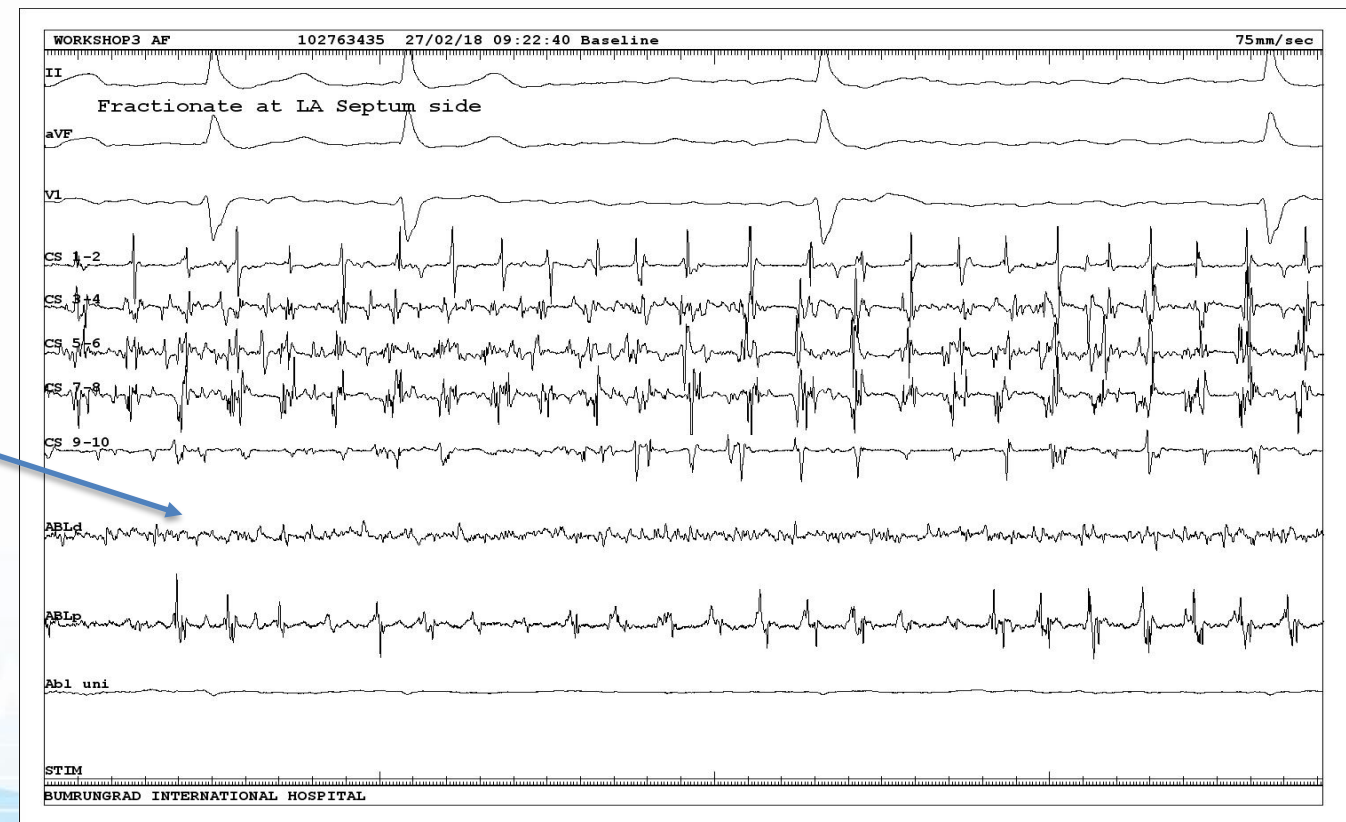
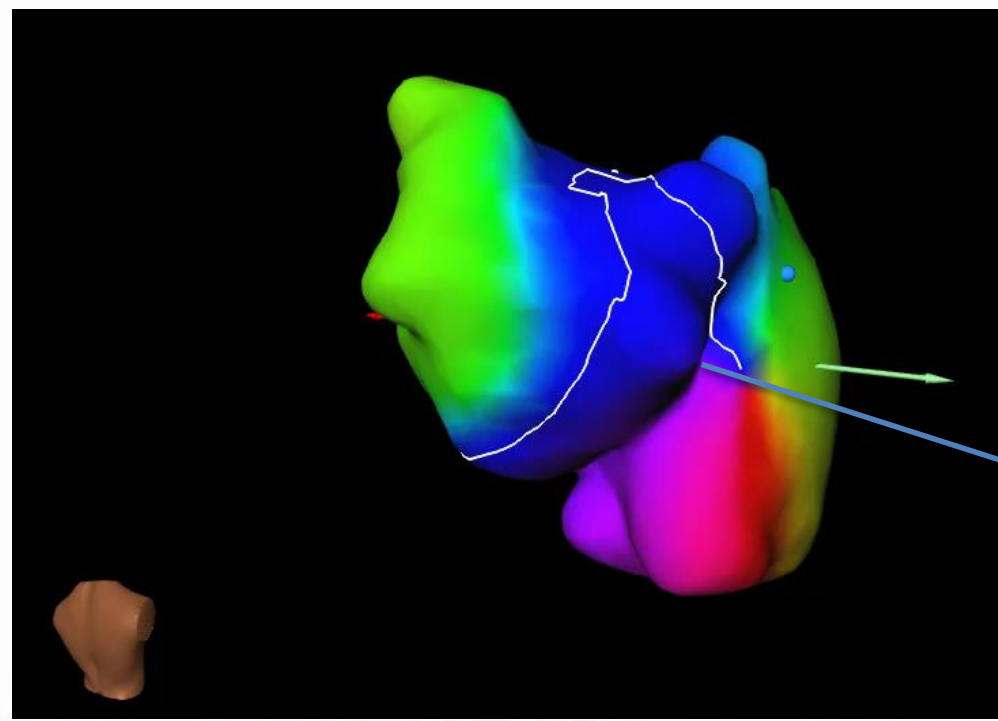
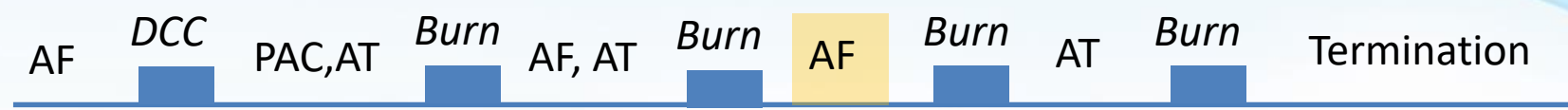


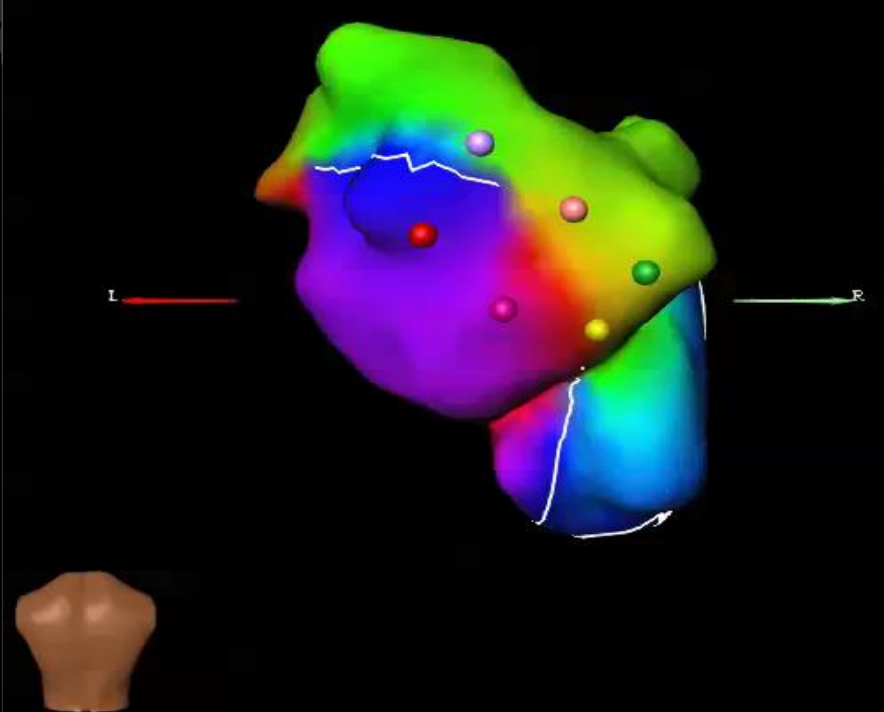
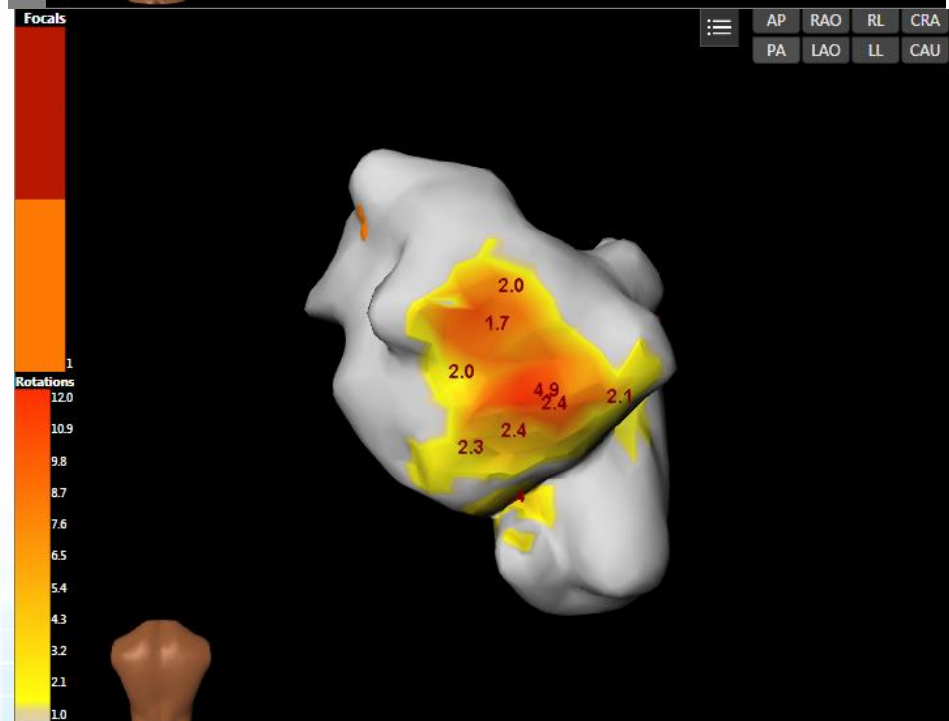
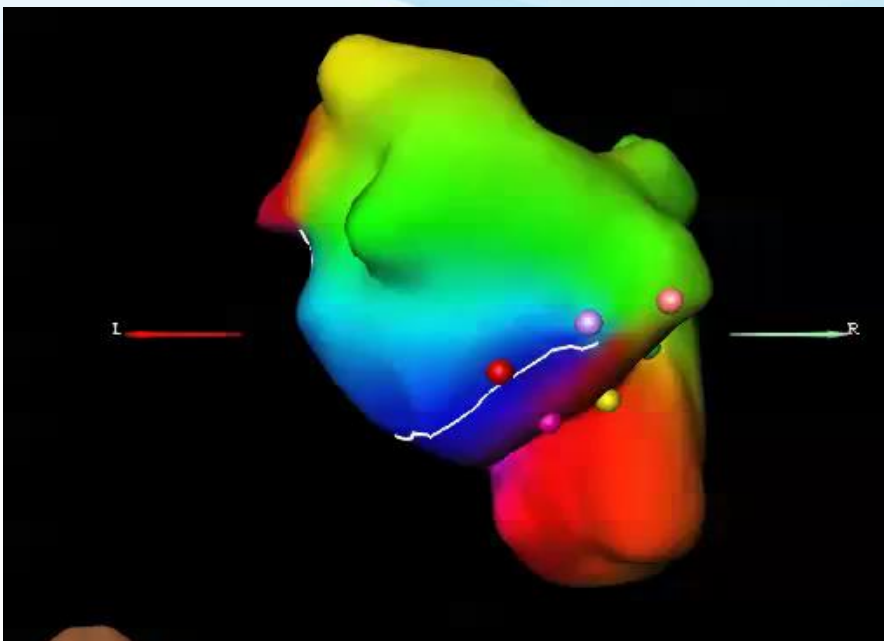
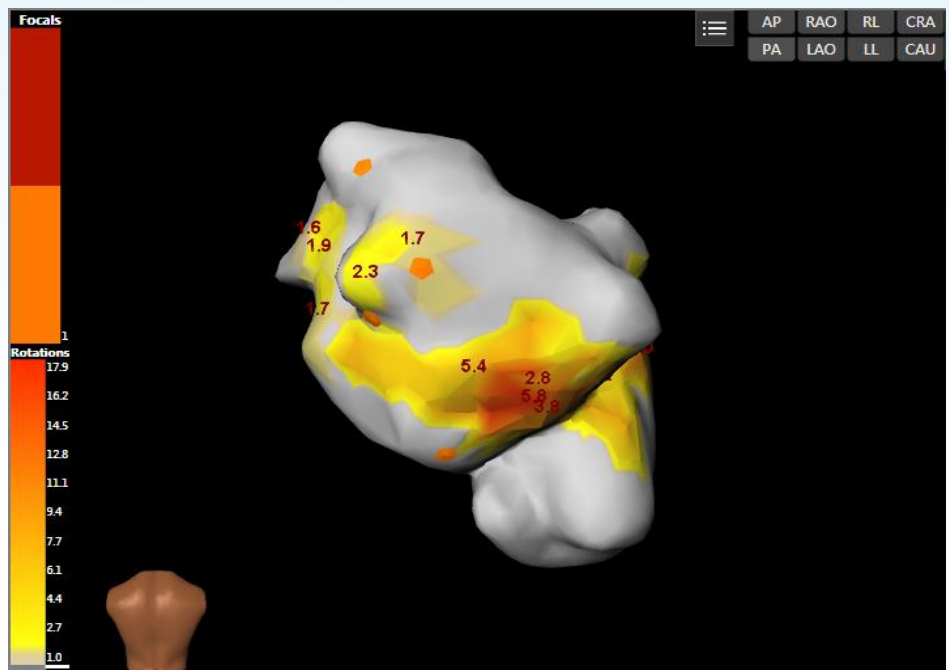


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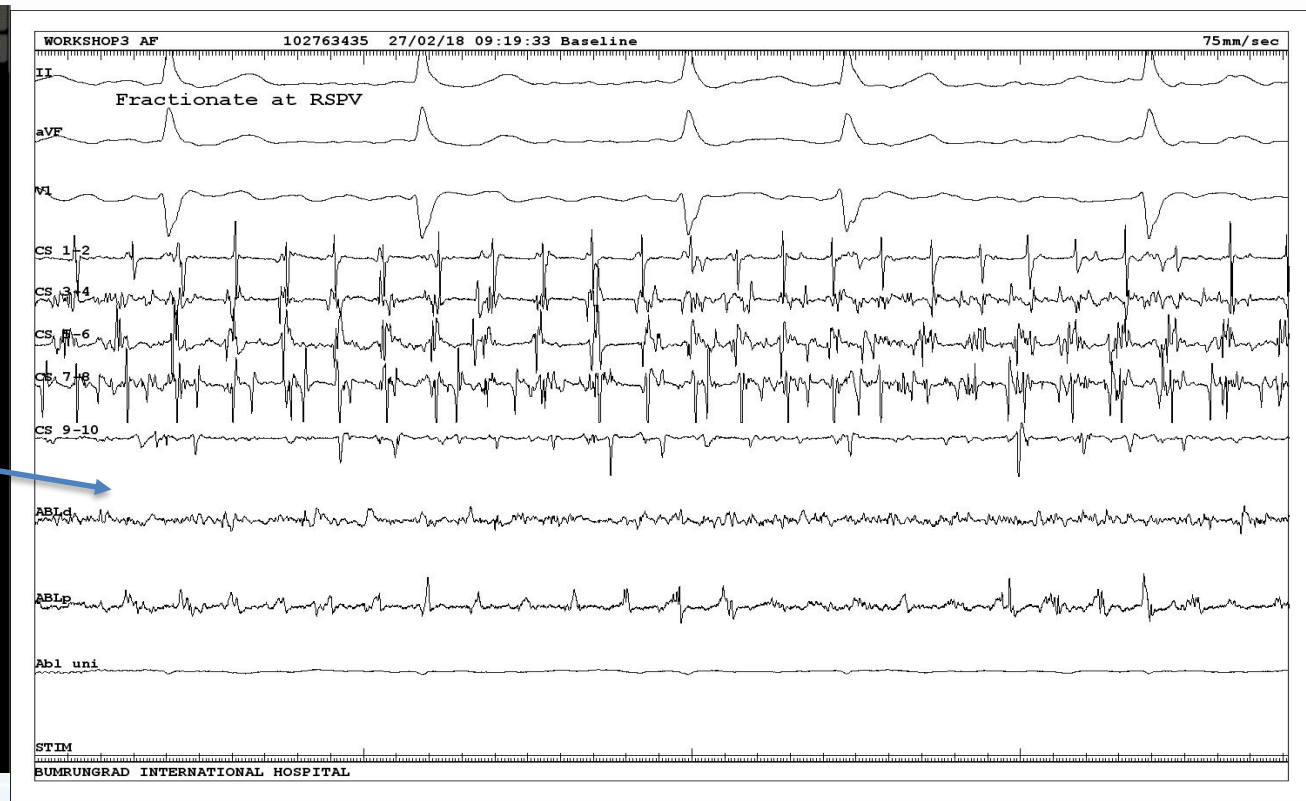
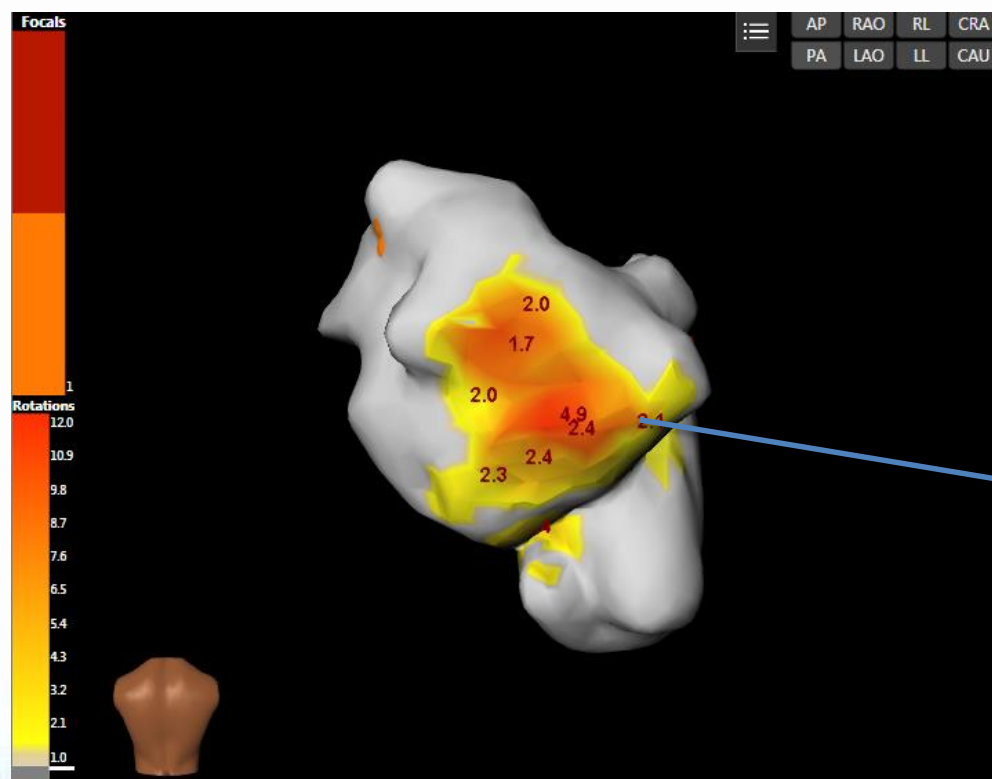
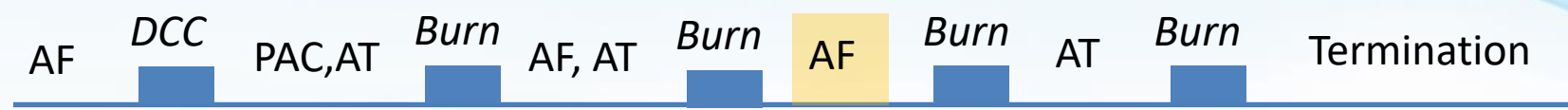


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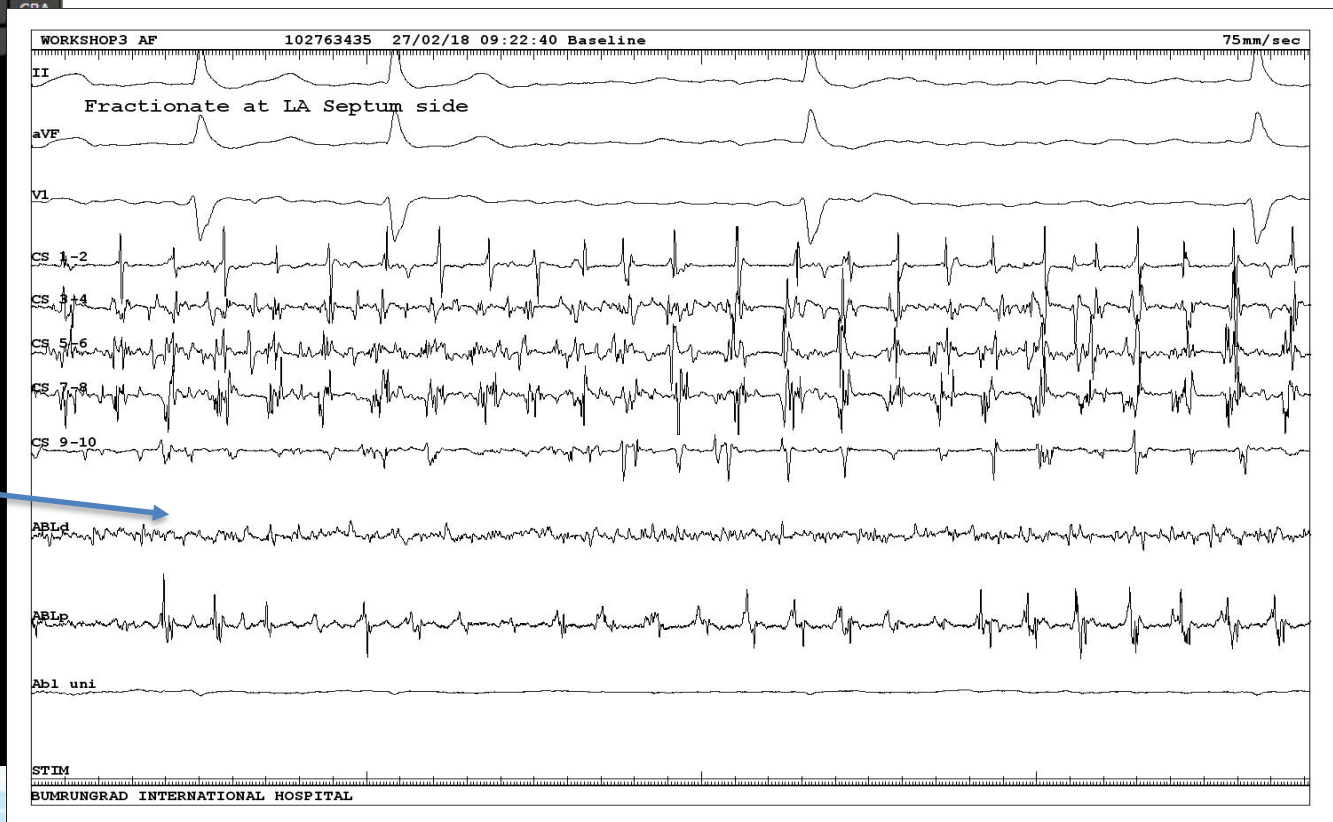
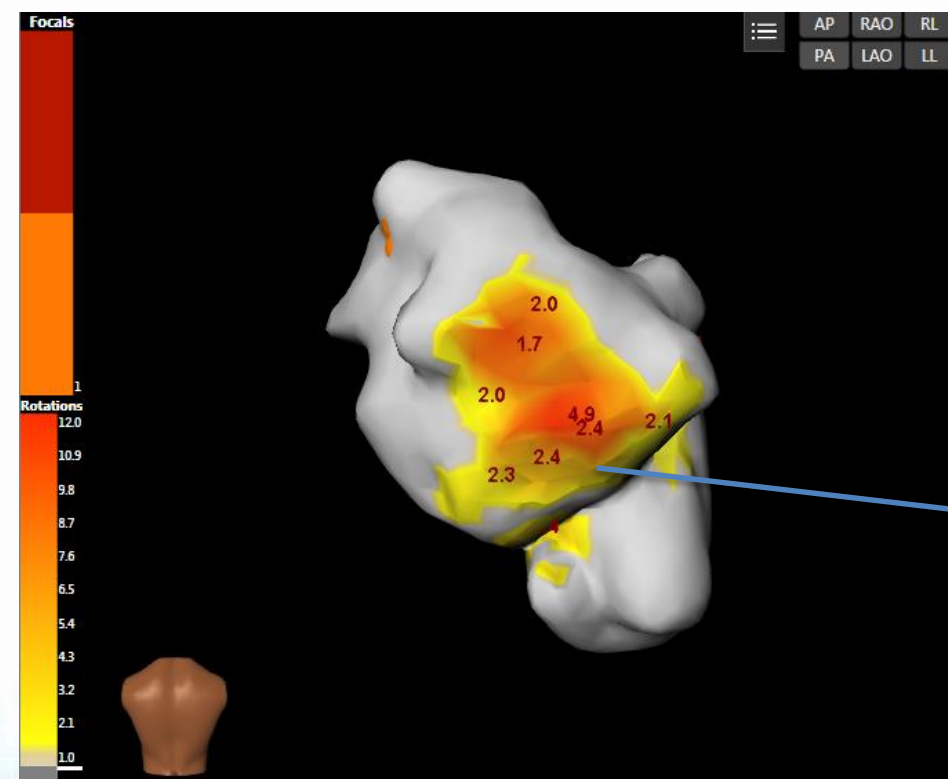
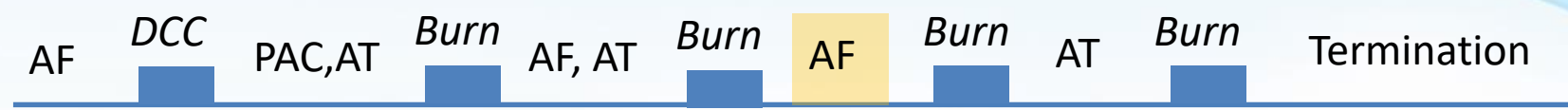


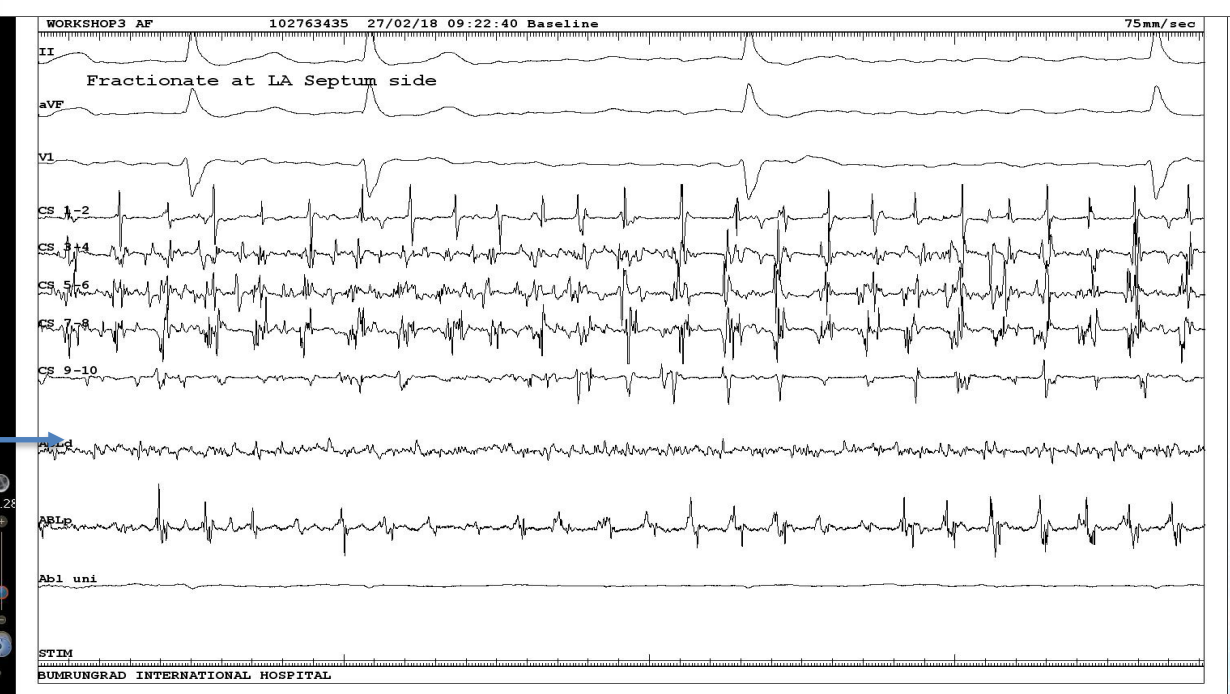
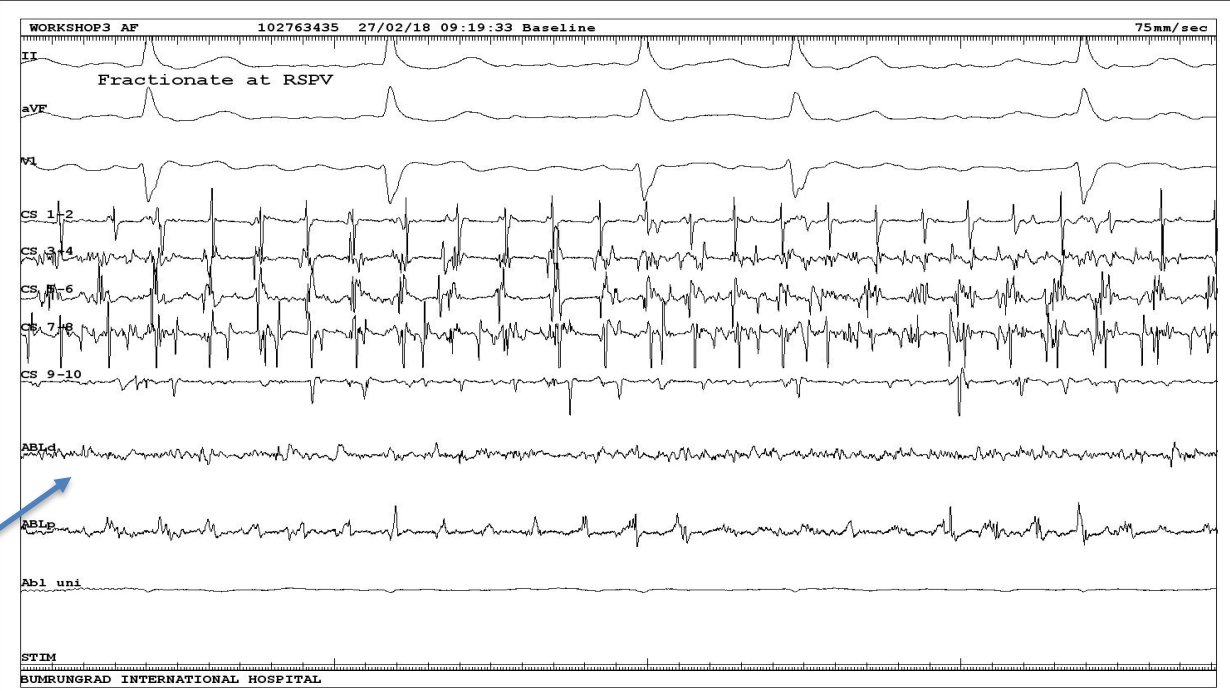
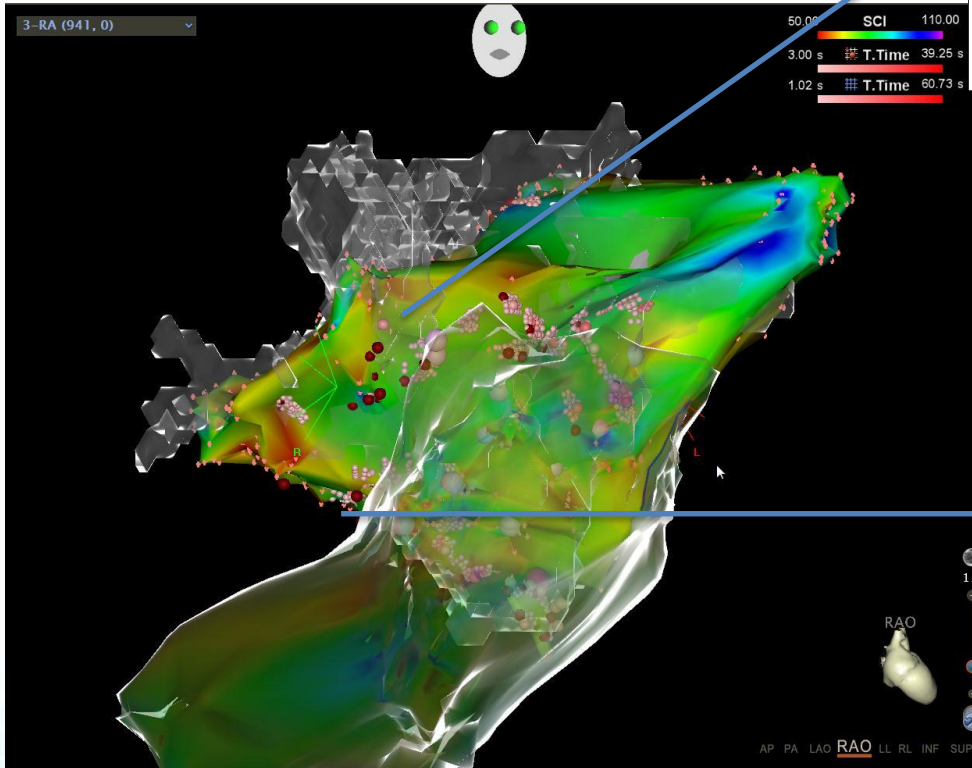


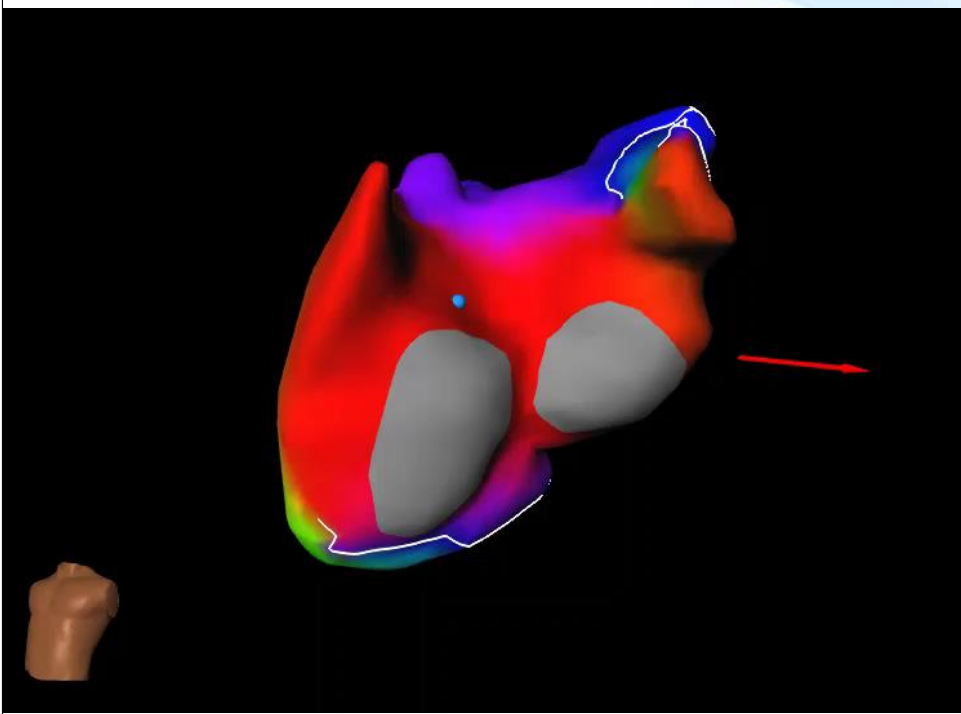
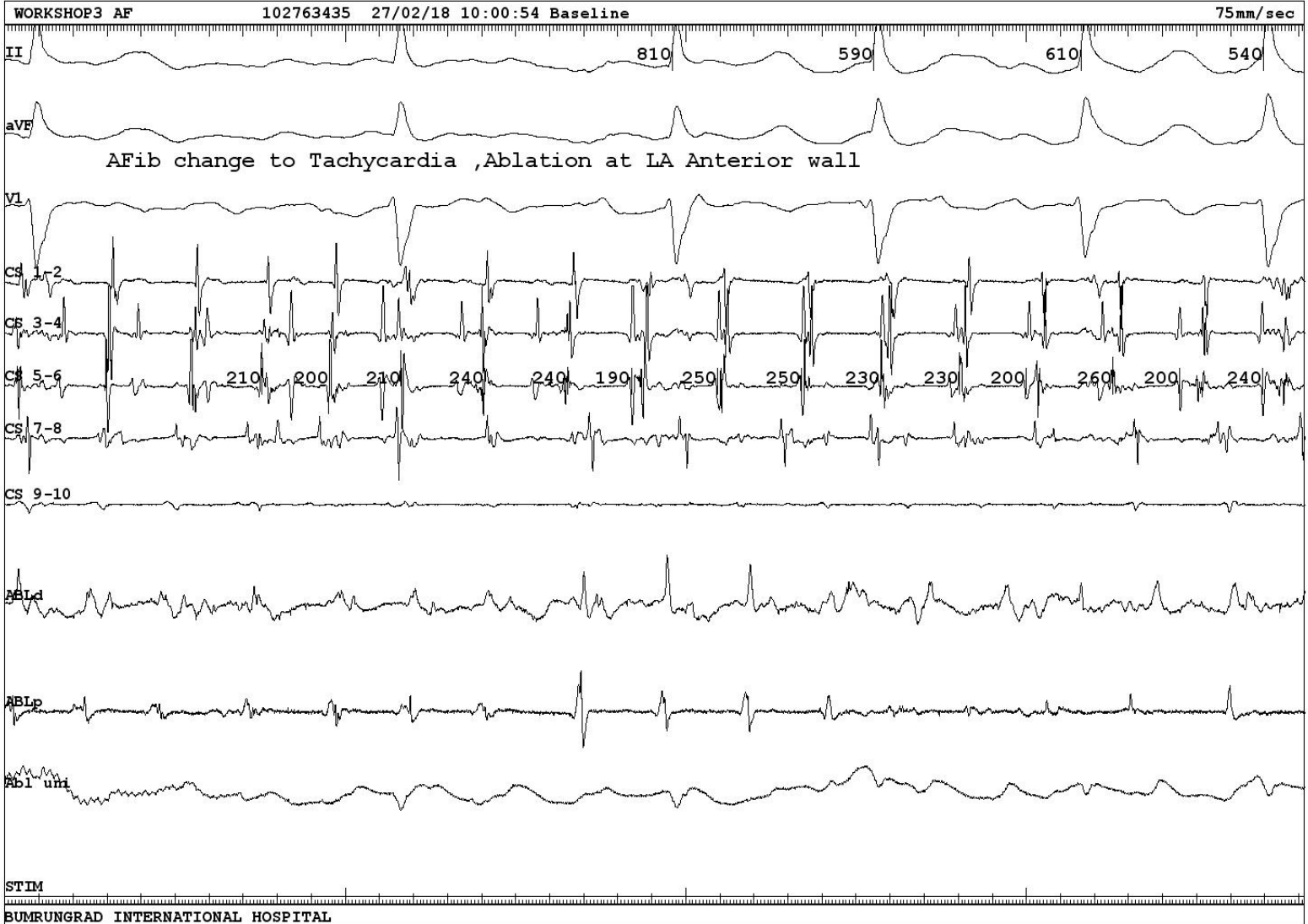
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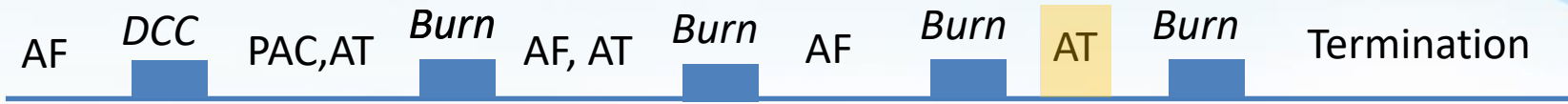
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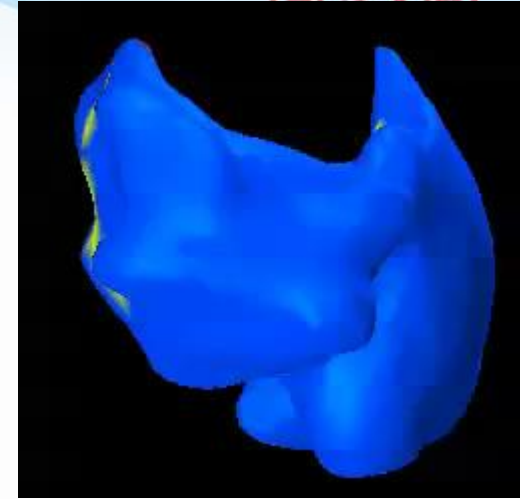
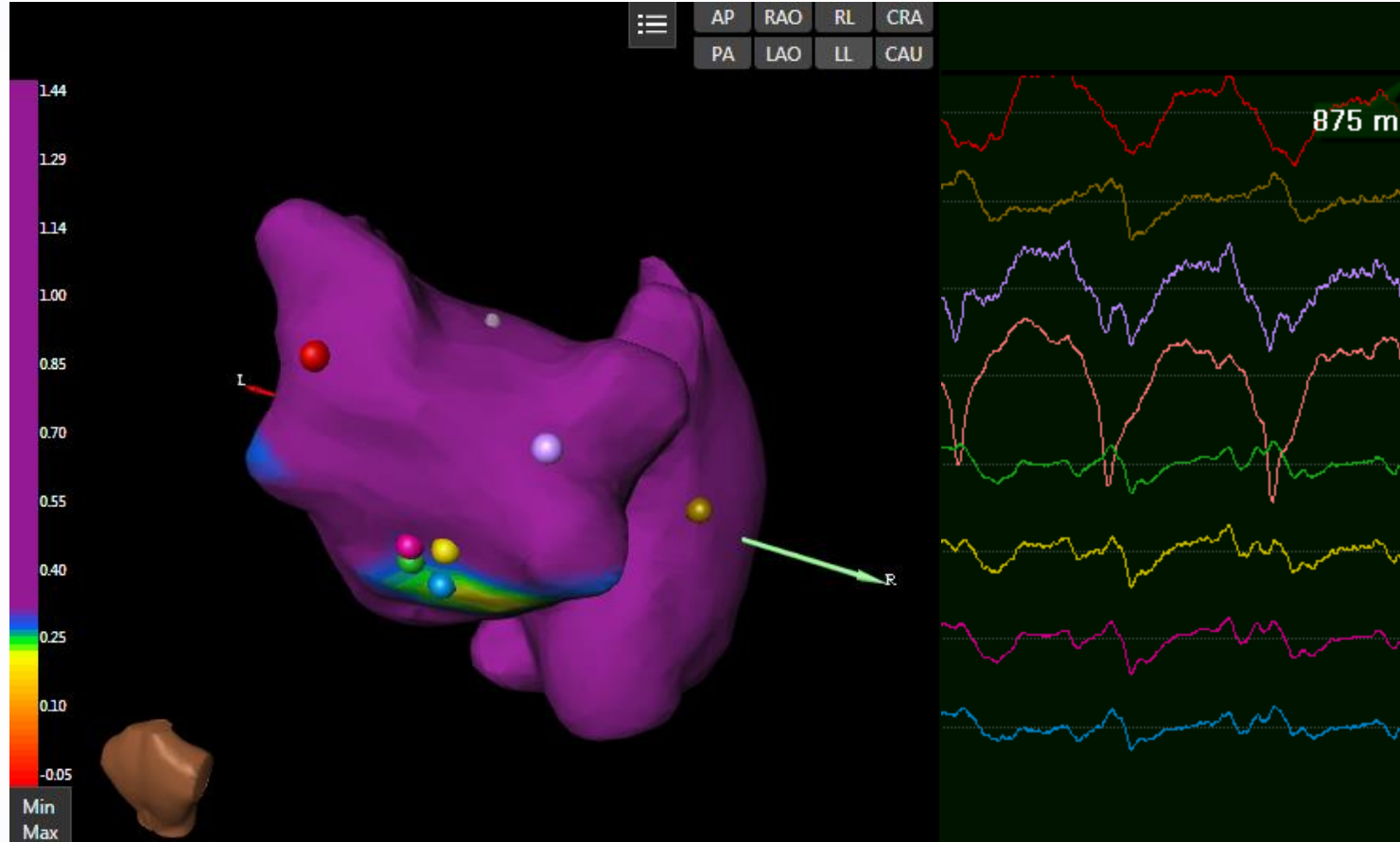


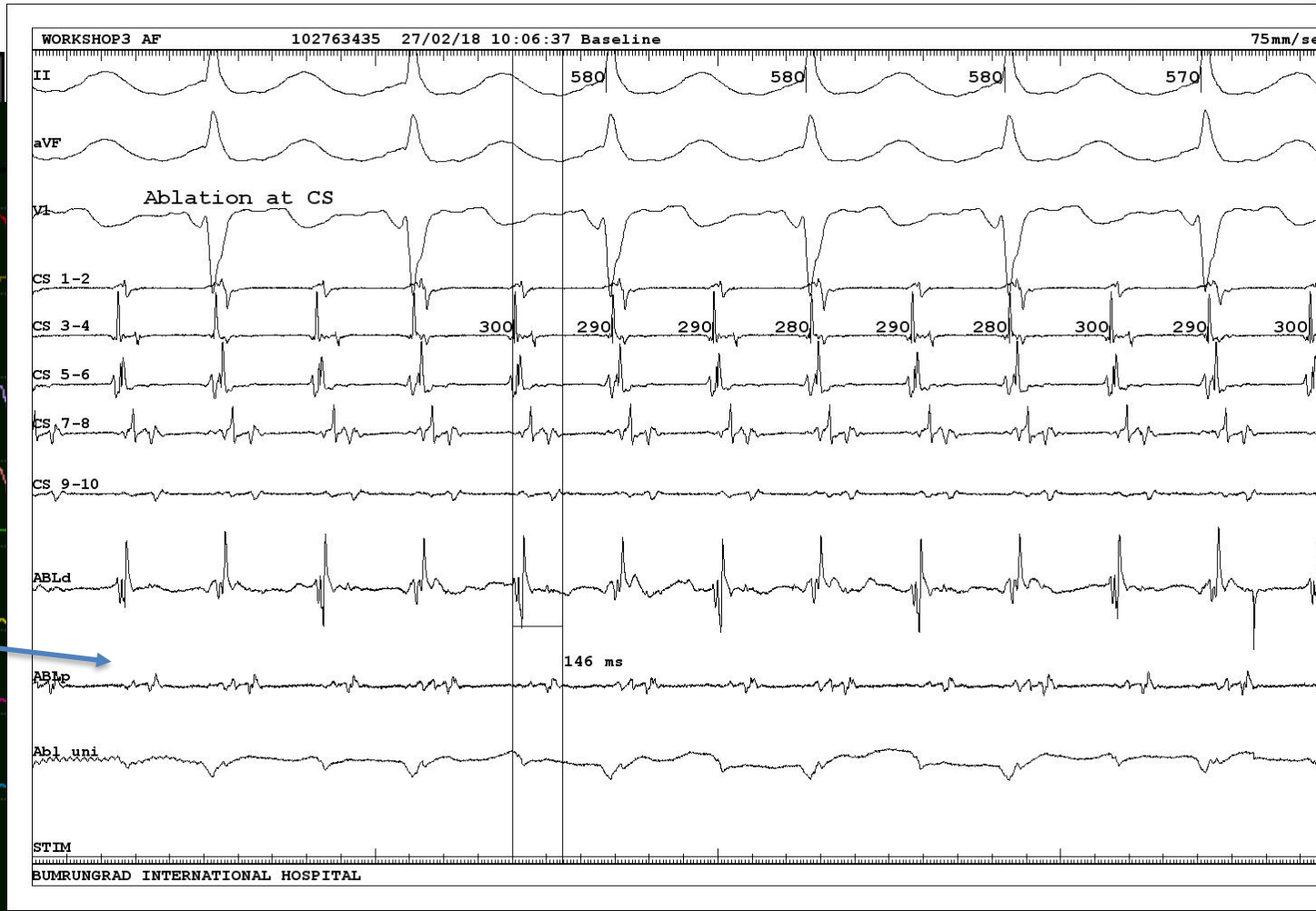
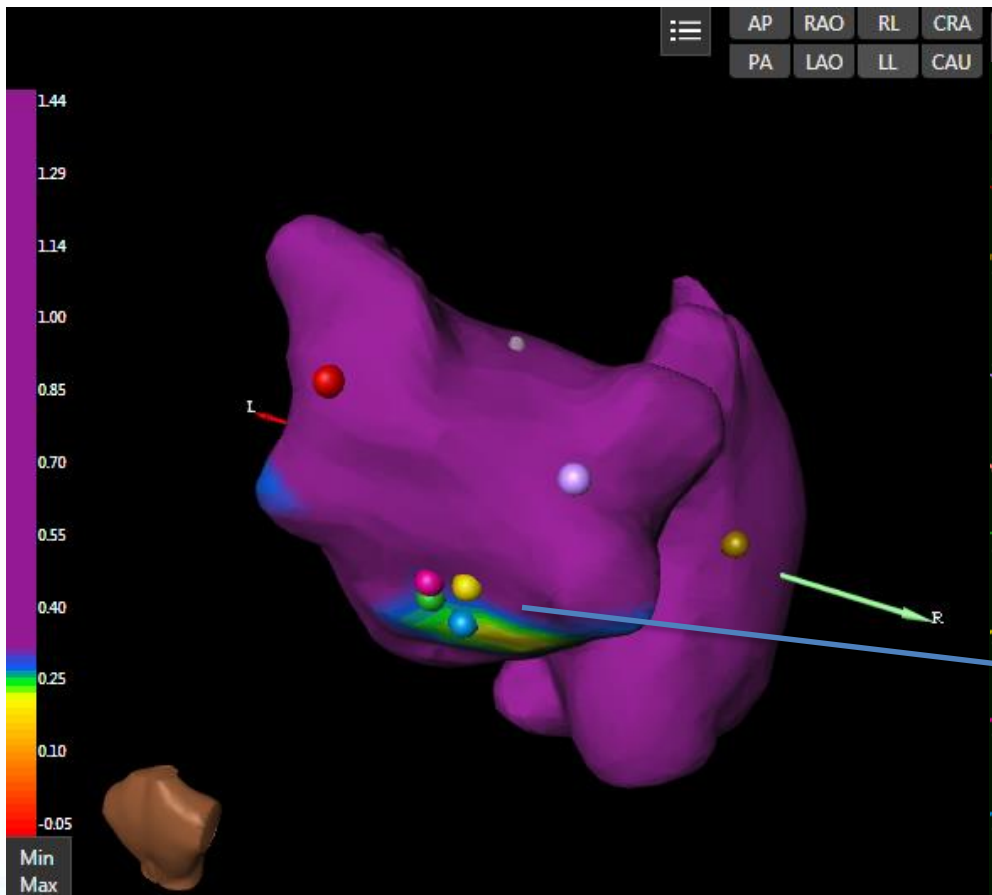


BIH086



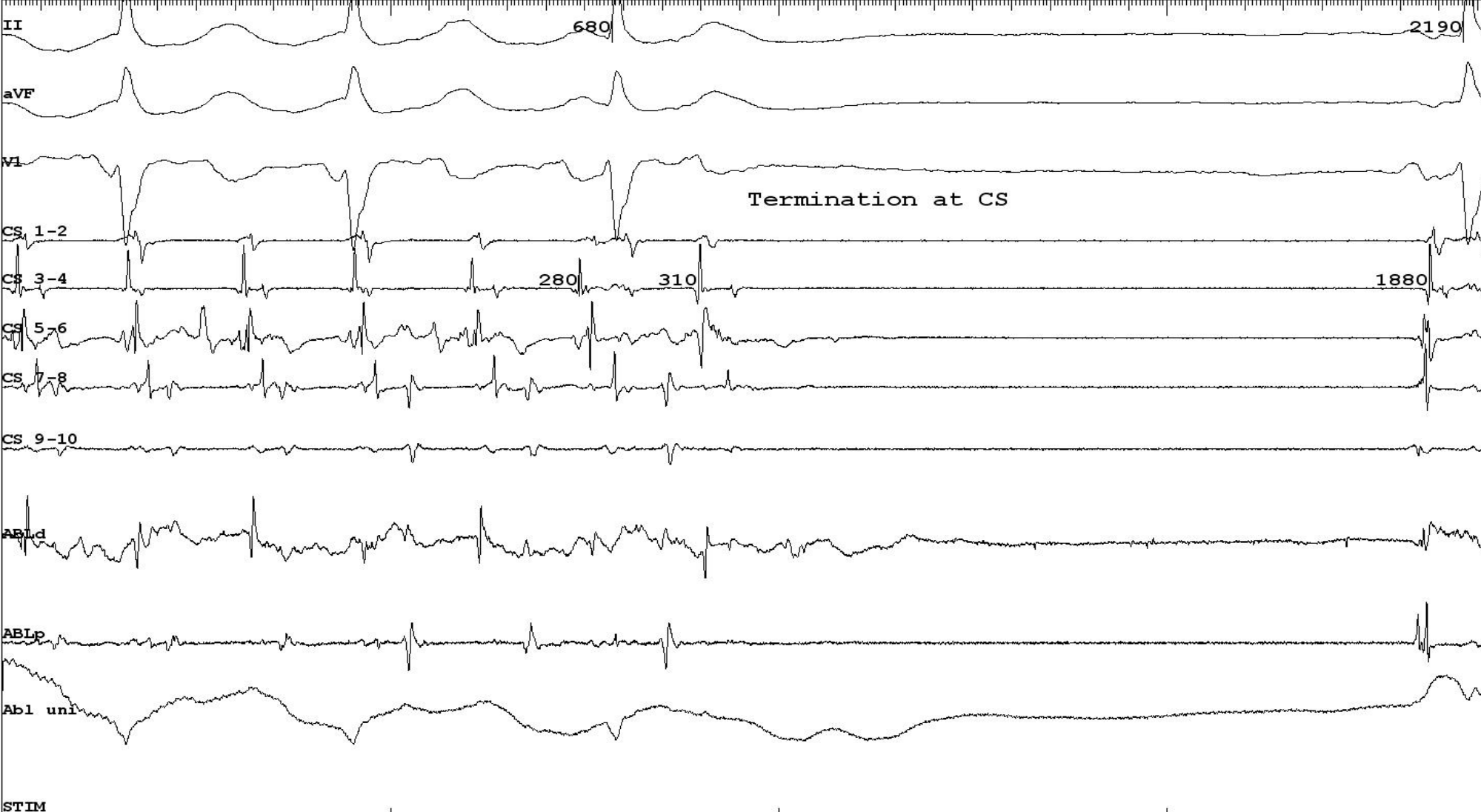
Low voltage and fractionated signal

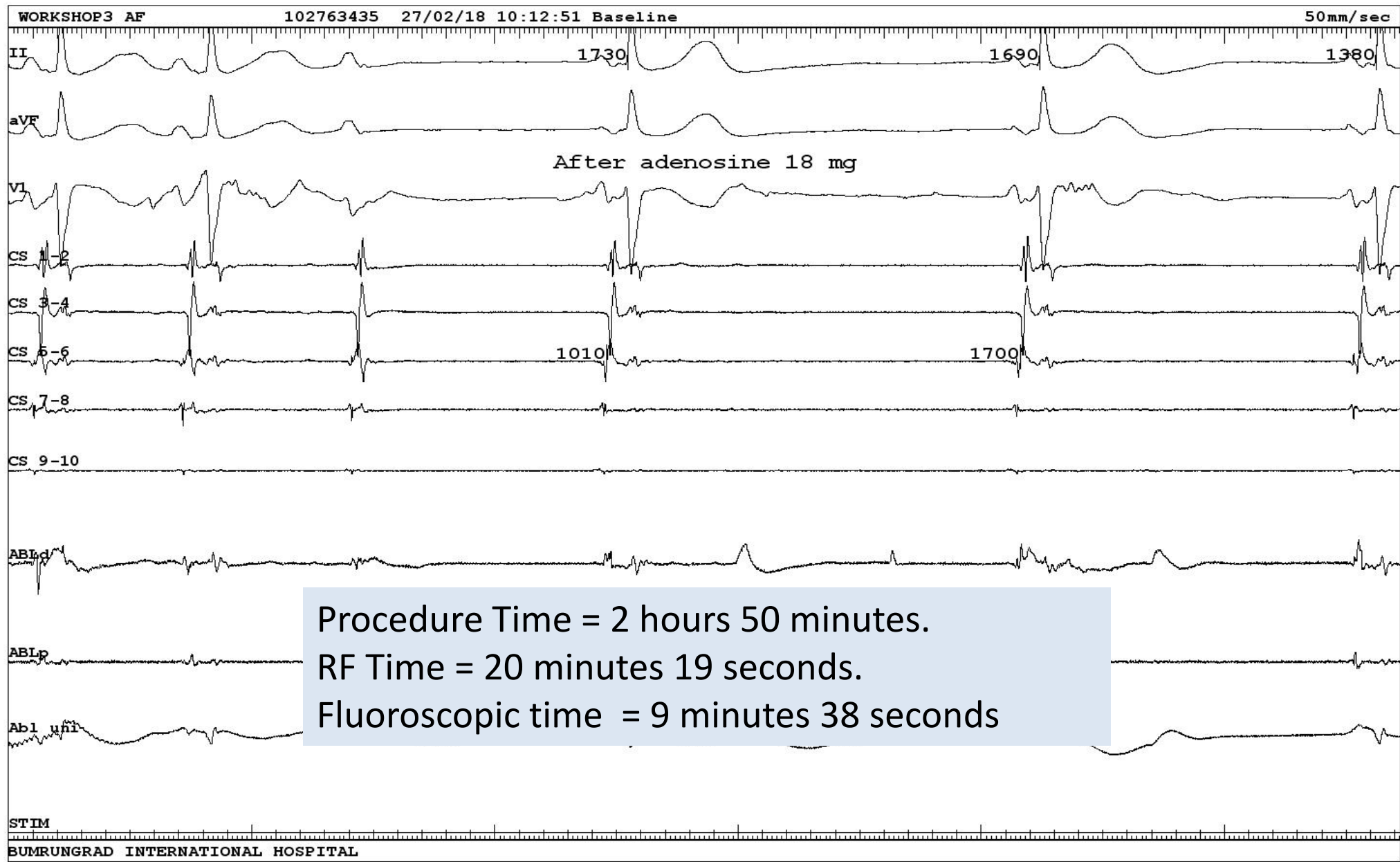






WORKSHOP3 AF 102763435 27/02/18 10:06:42 Baseline 75mm/sec





Procedure Time = 2 hours 50 minutes.
RF Time = 20 minutes 19 seconds.
Fluoroscopic time = 9 minutes 38 seconds

Conclusions



- Low voltage, short-cycle length CFAE correlates very well with atrial dispersion during AF and AF drivers, rotors & Focal activity.
- Atrial activity with cycle length < 100 msec represent AF drivers and/or perpetuators that sustained AF.

Conclusions



- Ablations at the primary CFAE sites remove AF substrate and terminate AF.
- Substrate ablation does not usually result in converting AF to sinus rhythm but often first change the rhythm into atrial flutter or atrial tachycardia that require further mapping and ablation before converting to sinus rhythm.
- Once sinus rhythm is achieved and AF is no longer inducible, Long-term outcome is excellent.