Techniky katetrizačních ablací u komplexních VSV

Roman Gebauer

HERZZENTRUM
LEIPZIG

Management of arrhythmias in GUCH...

... requires an inter-disciplinary collaboration of cardiologists, surgeons, and electrophysiologists with specific expertise in the care of adults with CHD

Prior to ablation…

- Check and correct hemodynamic residua
  - ✓ Catheter-based
    - choose the appropriate sequence of interventions
  - ✓ Surgery
    - consider a preoperative EP study/ablation
    - coordinate re-surgery with arrhythmia surgery
- Check the options for venous/arterial access

Catheter Ablation

Understanding of rhythm substrate

Access to the arrhythmogenic substrate

Ability to modify arrhythmogenic substrate

Understanding of rhythm substrate

- ECG recording & interpretation
  - ✓ Holter, ILR, wearables devices, …
  - ✓ Knowledge of the ECG specifics of a particular type of CHD
  - ✓ Substrate amenable to ablation?
- Detailed knowledge of CHD anatomy & physiology
- Patient's medical history (incl. surgery reports)
- Cardiac imaging before ablation (CT/CMR)

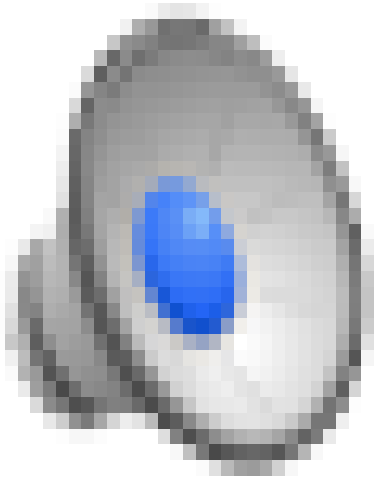
Access to the arrhythmogenic substrate

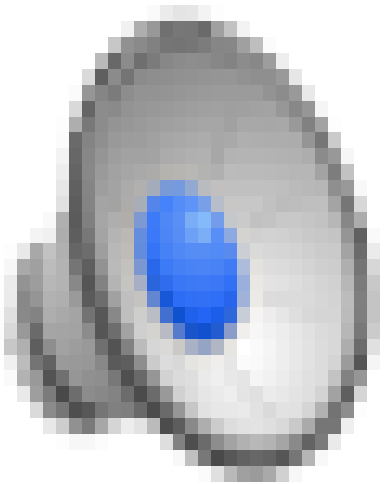
- Anatomical obstacles
  - ✓ absent IVC and (Hemi)-Azygos continuation
  - ✓ atypical location of AVN (ccTGA, AVSD)
  - ✓ Anomalies of situs
- "Surgery/cath-made" obstacles
  - ✓ atrial baffles, Fontan surgery, stents/prosthetic valves/conduits (ToF),...

Stereotaxis (magnetic navigation) via retrograde approach

Puncture of everything in the way ☺

Absent IVC and V. azygos cont. after Senning procedure

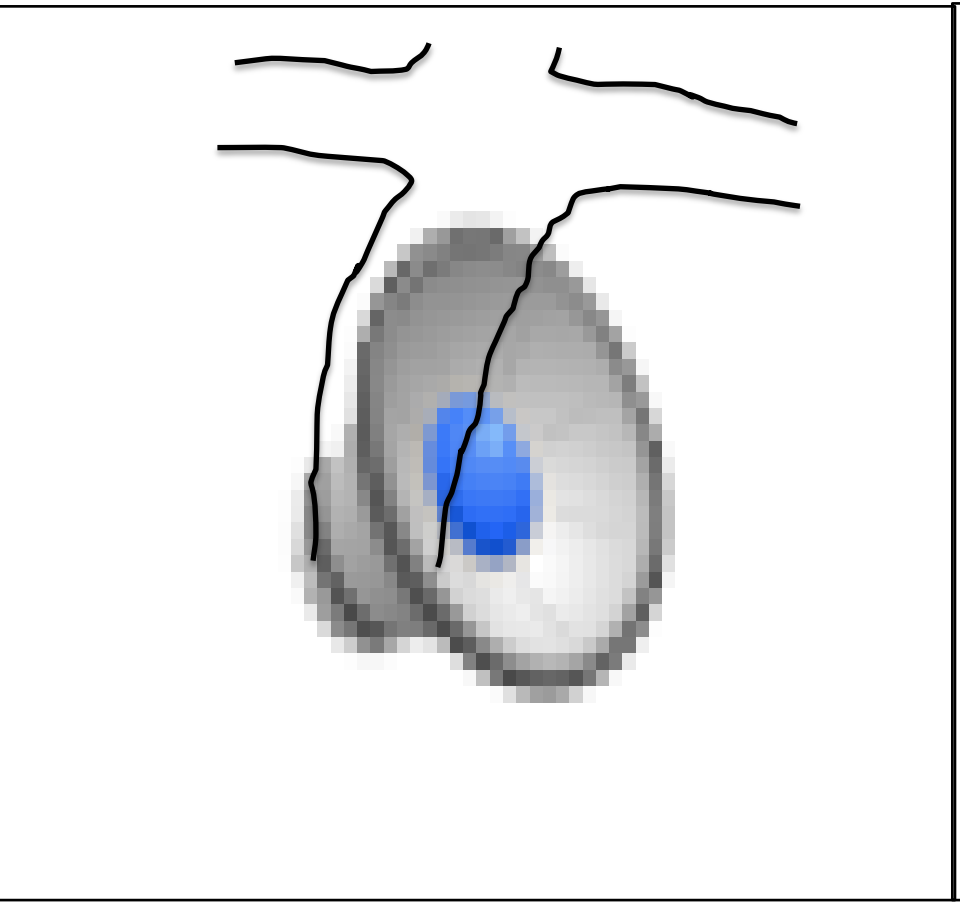


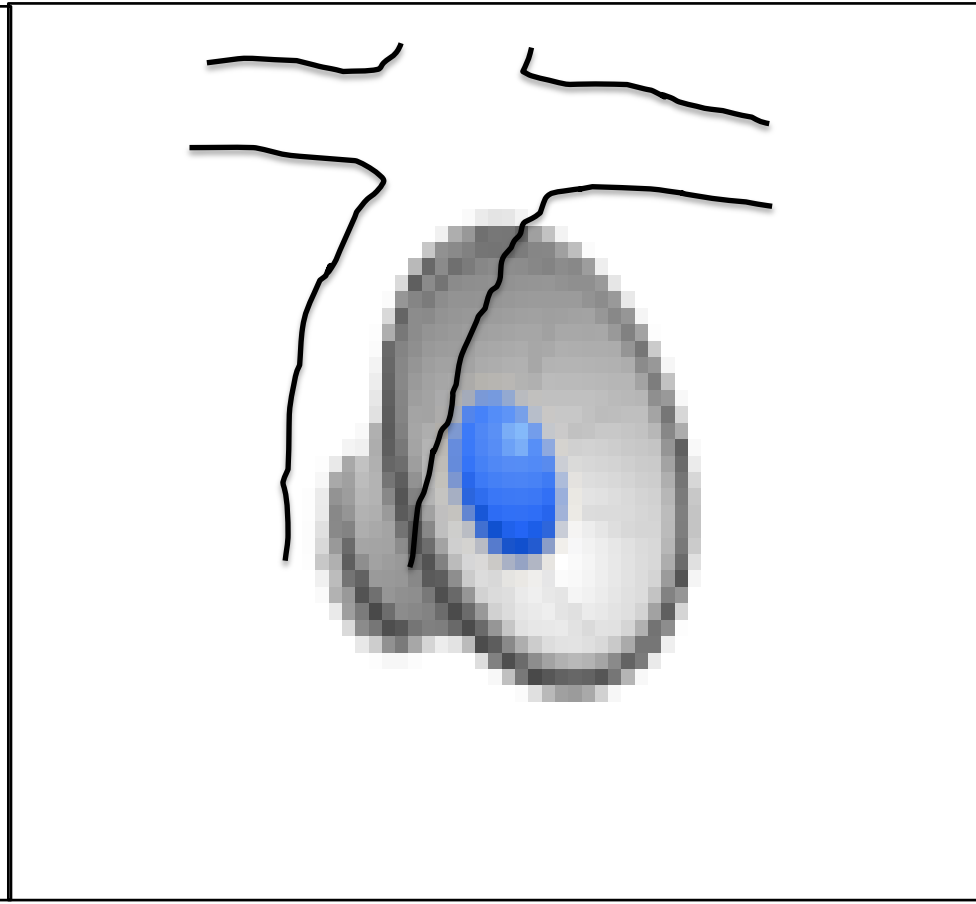


CMR preprocedural

Baffle puncture via V. jug. dx

Access to the RA – puncture of an extracardiac TCPC conduit





Ability to modify arrhythmogenic subtrate - potential barriers

- Thickness/calcification of target tissue
- Proximity to coronaries

Irrigated catheter, contact force, PFA cryoenergy

New algorithms
High density mapping, voltage/activation mapping

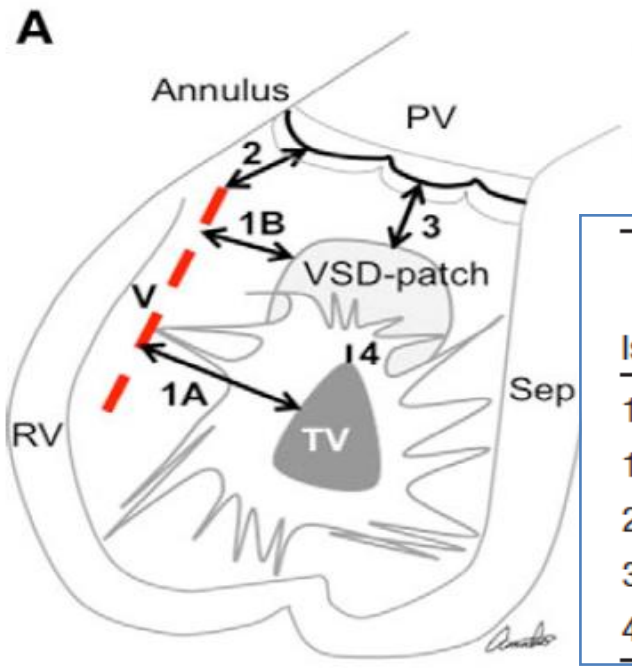
Multiple & complex re-entry circuits

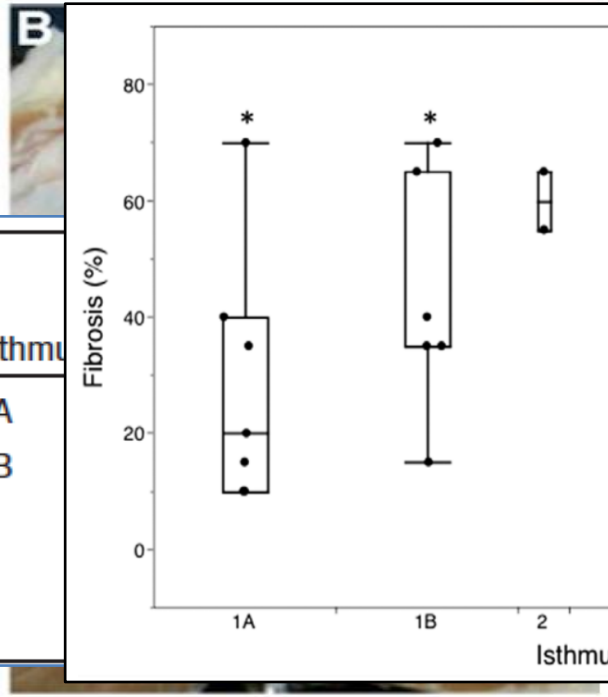
Limited catheter range of movement

Balloon dilatation of puncture, additional sheaths

Characterization of Anatomic Ventricular Tachycardia Isthmus Pathology After Surgical Repair of Tetralogy of Fallot

Jeremy P. Moore, MD; Atsuko Seki, MD; Kevin M. Shannon, MD;
Ravi Mandapati, MD, FHRS; Roderick Tung, MD, FHRS; Michael C. Fishbein, MD

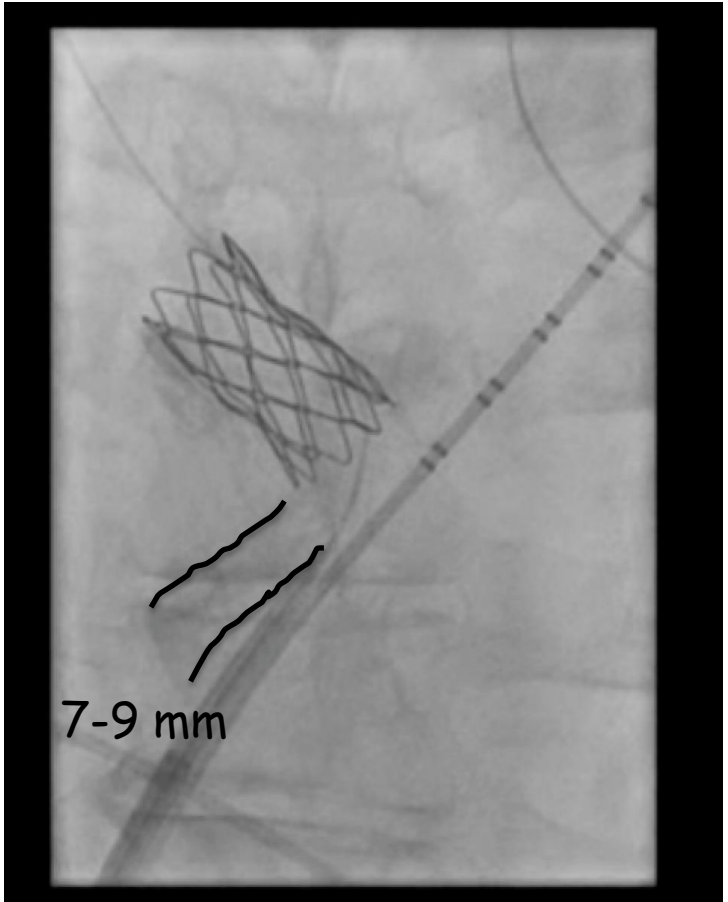




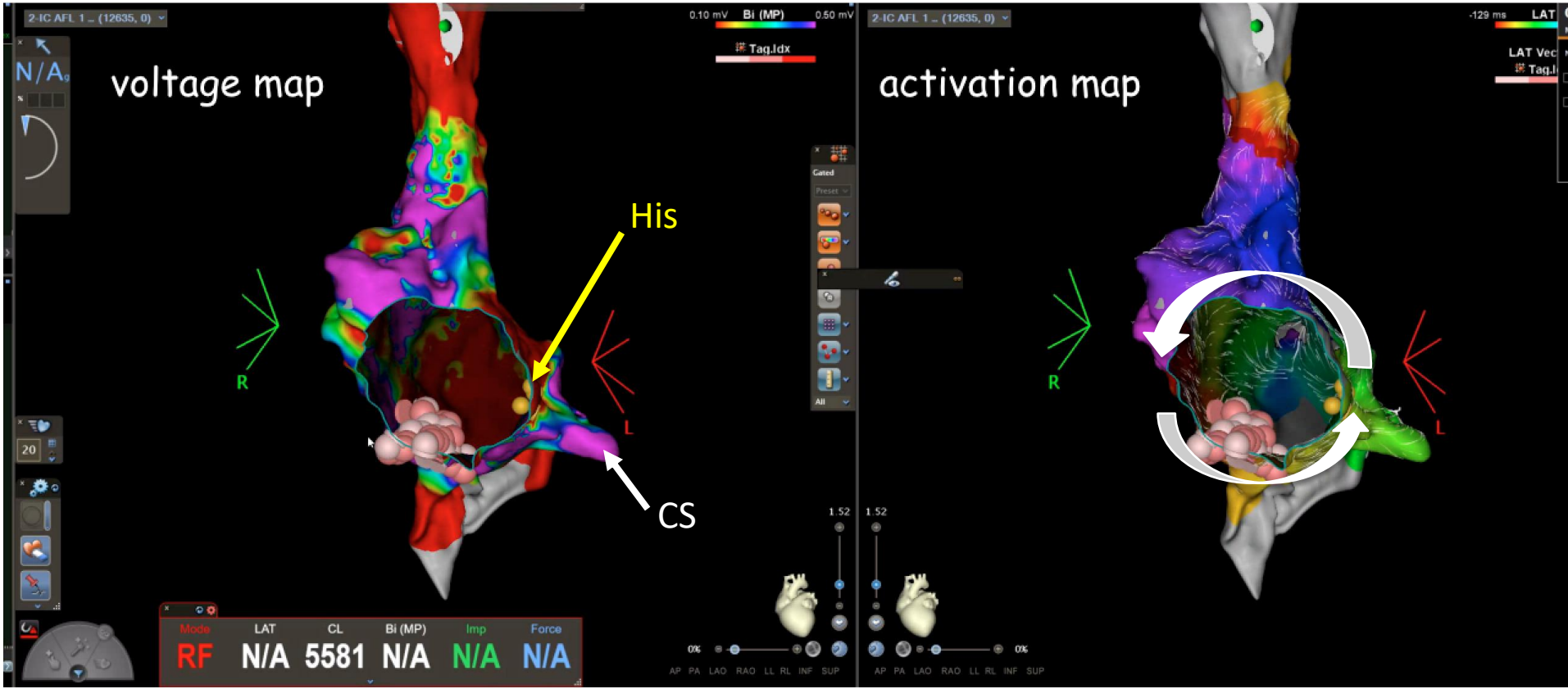
Isthmu
1A
1B
2
3
4

Circ Arrhythm Electrophysiol,2013

Puncture of atrial baffle in TGA after Mustard surgery



63yo, AVSD/I (ASD I/patch & Suture of MV-Cleft), Re-Op with replacement of MV. ***IART (HD Mapping, Carto)***



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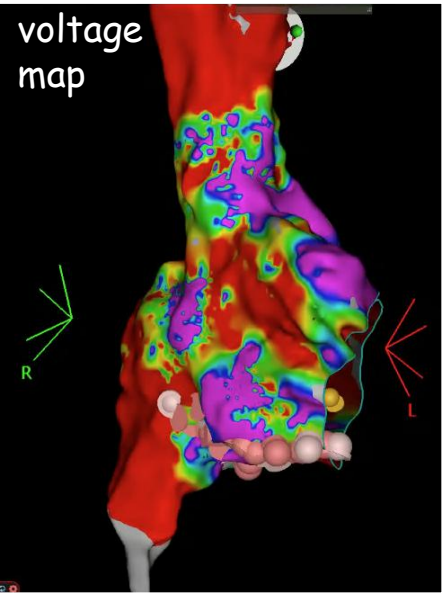
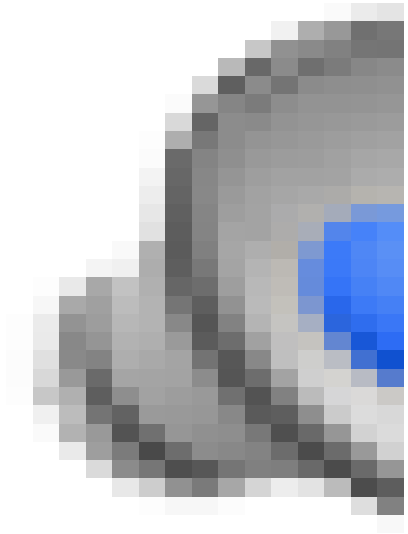


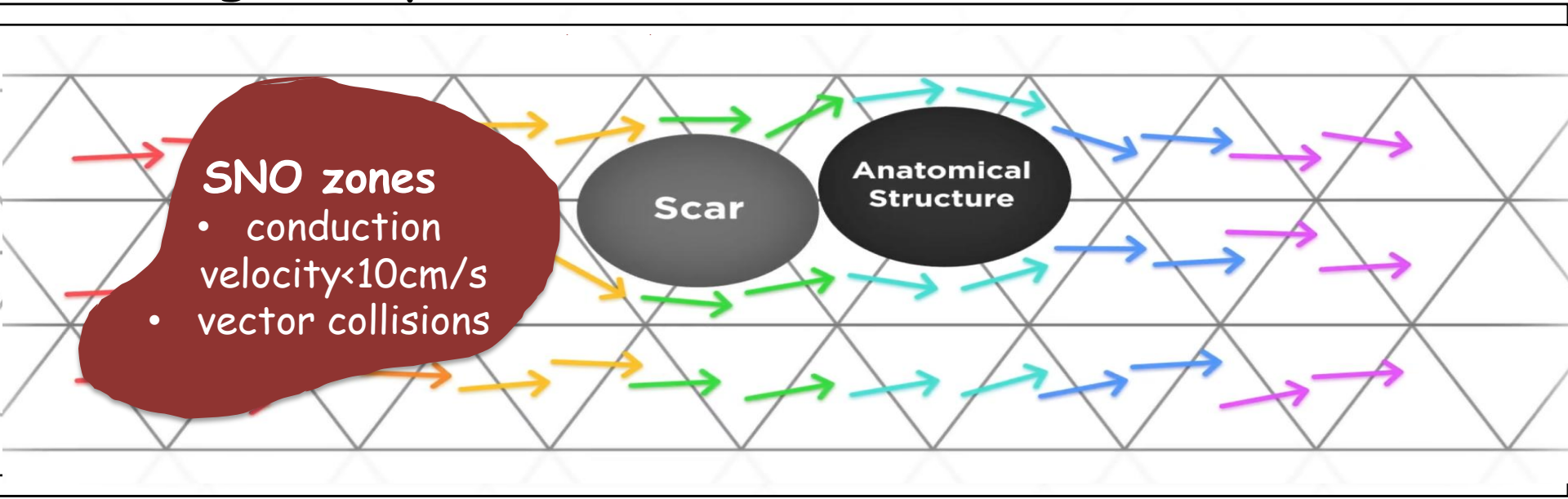


Conduction Velocity Vectors

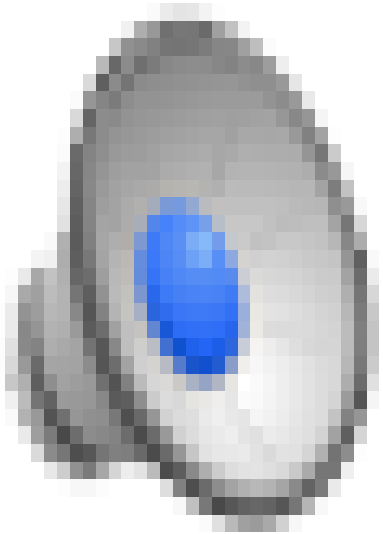
-> direction and speed of electrical signal propagation

Coherent mapping

- anatomical & LAT data of **all collected points**
  -> global pattern of activation



43yo, surg. corrected TOF, Stp. RF ablation of RA assoc. atrial flutter. Reccurence of ***IART (HD Mapping, Carto)***



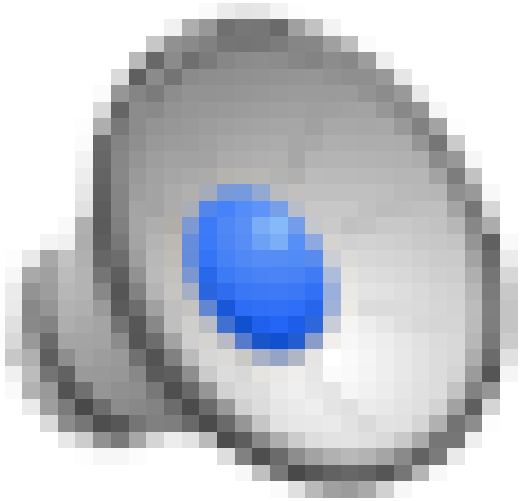
Coherent mapping

anatomical & LAT data of **all collected points** -> global pattern of activation in a chamber of interest

3D mapping system CARTO (HD Mapping)

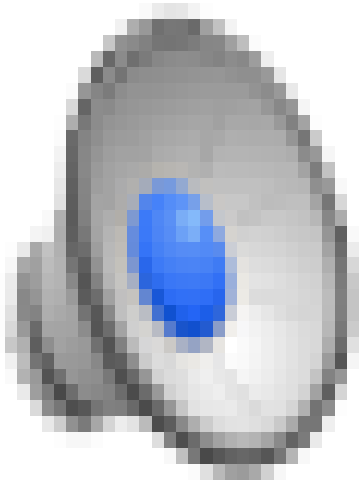
Coherent map

49 yo, TGA/Senning, CTI dependent IART



Check of conduction block on cavotricuspid isthmus after ablation

49 yo male,
TGA/Senning, IART



ESC European Society of Cardiology

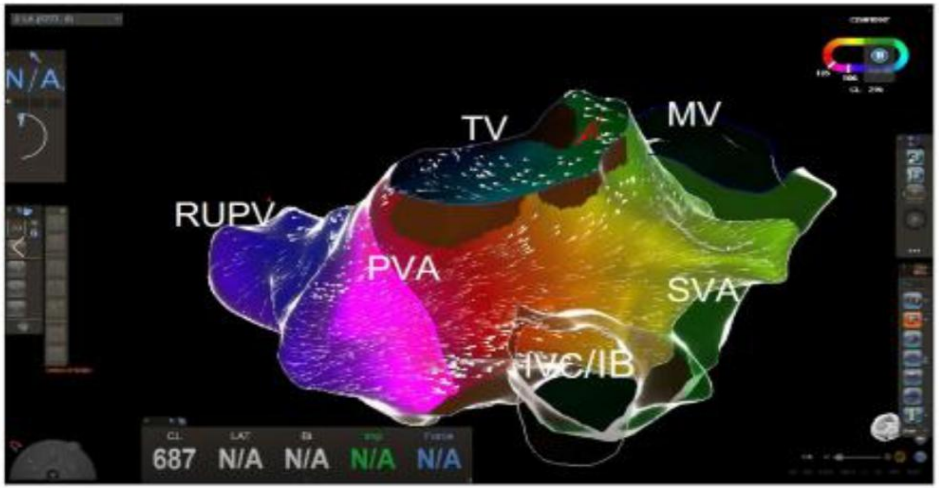
Europace (2023) **25**, 1475–1481
https://doi.org/10.1093/europace/euad024

CLINICAL RESEARCH
Congenital Heart Disease

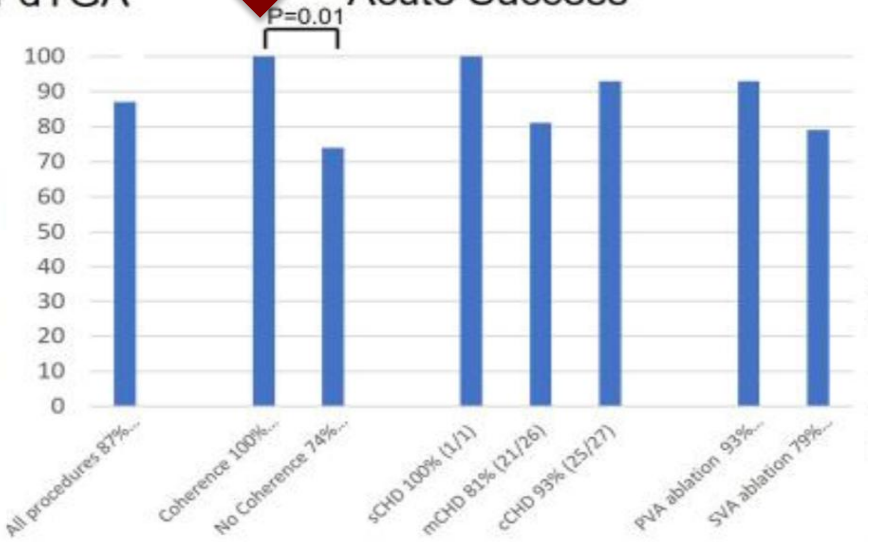
Coherent mapping of atrial tachycardias in patients with congenital heart disease

Sophia Klehs [1]*, Christian Paech [1], Livio Bertagnolli [2], Franziska Markel [1], Ingo Dähnert [1], and Roman Gebauer[1]

Coherent map of an AT in a patient with Senning for dTGA



Acute Success



ESC European Society of Cardiology
European Heart Journal (2025) **00**, 1–12
https://doi.org/10.1093/eurheartj/ehaf343

CLINICAL RESEARCH
Congenital heart disease

Catheter ablation in congenital heart diseases: a French nationwide study

Waldmann V et al.

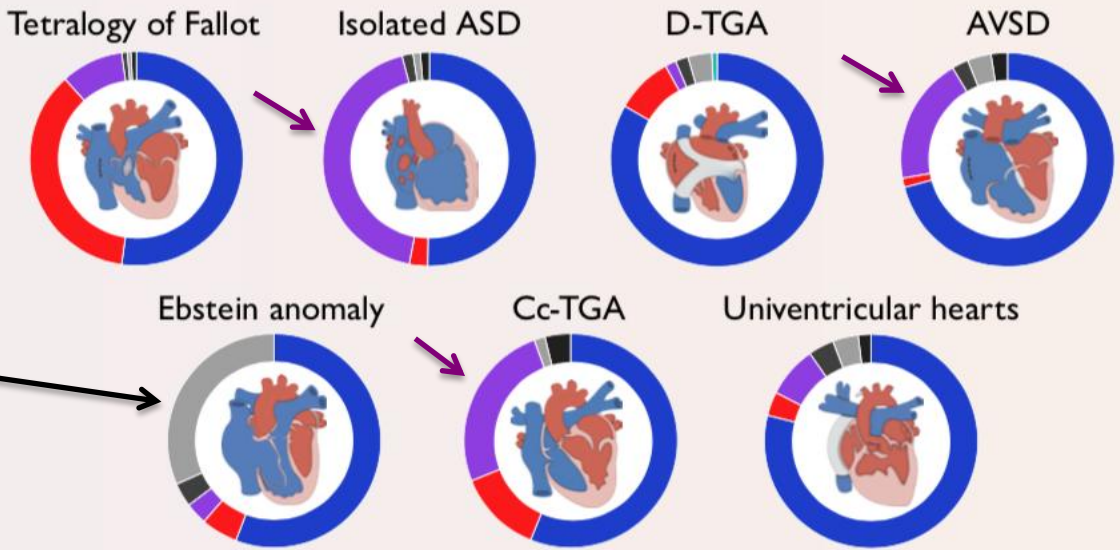
- 28 centres (2020-2024)
- 1135 procedures in 998 pts.
- mean age 46.1 ± 16.1 yrs
- 67 pts < 18 yrs

Main arrhythmias targeted

1.5±0.7 arrhythmias per procedure

IART/FAT 60%
AF 17%
PVC/VT 17%
AVRT 3%
AVNRT 2%

Significant variations of patterns according to CHD



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	IART/FAT *n* = 677	AF *n* = 195	PVC/VT *n* = 188	AVRT *n* = 38	AVNRT *n* = 22
Energy, *n* (%)	contact-force catheter in 85.9%				

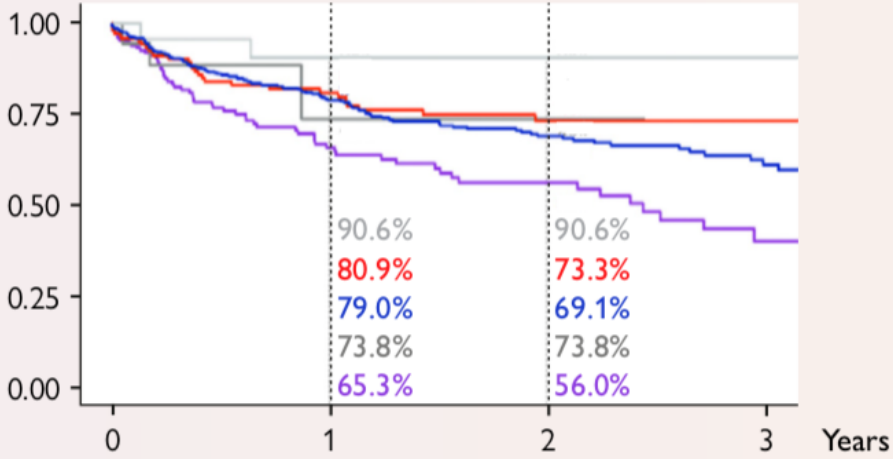
Excellent acute outcomes

Overall acute success rate 94%

IART/FAT 95%
AF 97%
PVC/VT 87%
AVRT 95%
AVNRT 91%

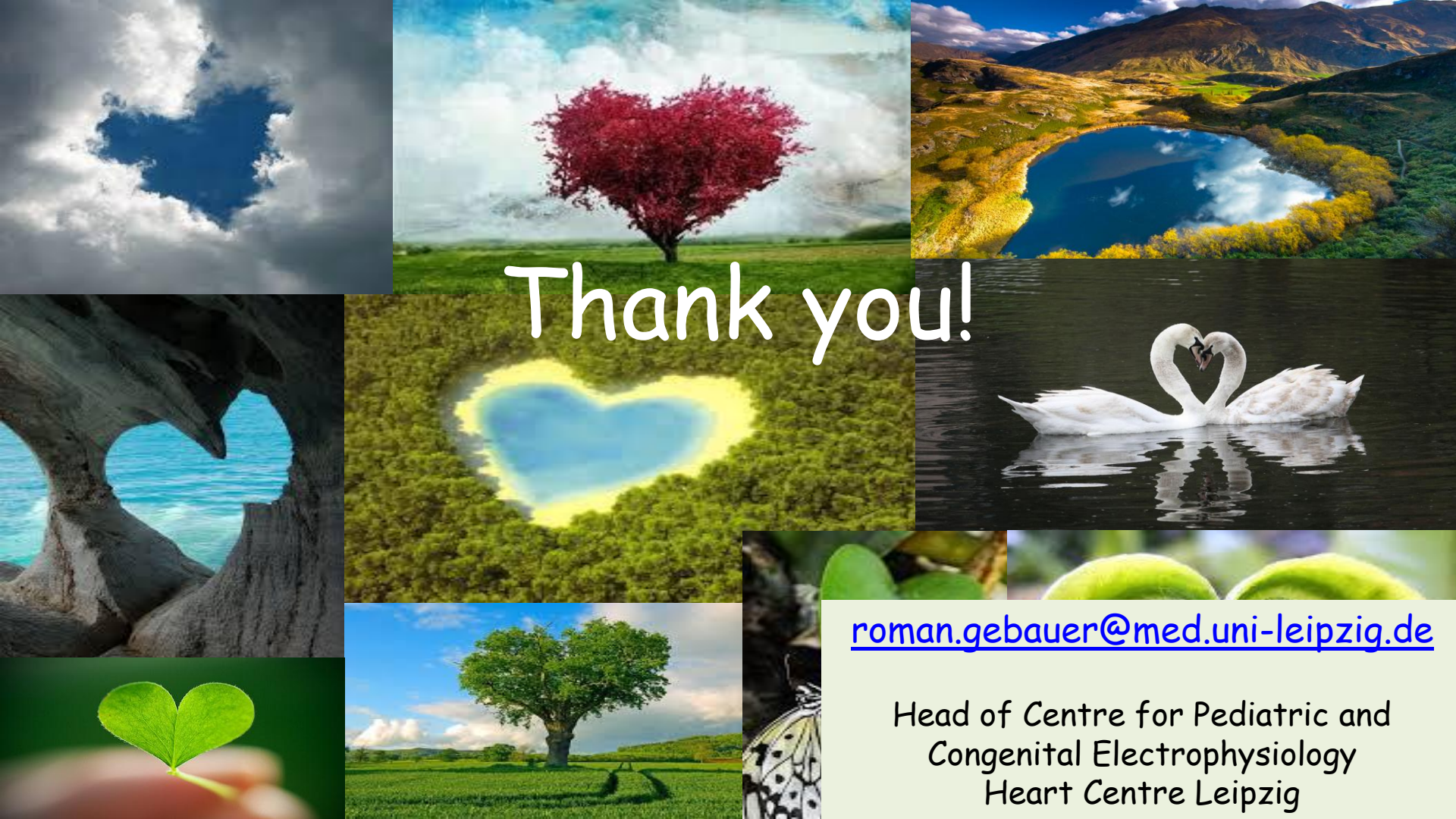
3.8% complications (0.1% death, n = 1)

Heterogeneous recurrence rates based on arrhythmia and CHD



Summary – *CA in CHD pts.*

- Correct hemodynamic residua first!
- Pre-procedural preparation necessary
  - ✓ Knowledge of CHD pathophysiology & EP
  - ✓ Imaging (incl. venous access)
  - ✓ Surgical/Cath reports, etc.
- 3D mapping (new algorithms), HD, irrigated/contact force catheters
- Still midterm a high recurrence rate!!!
  - ✓ new energy sources? PFA?...?



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