

Experience of CARTO-ablation of atrial tachycardias in preschool children.

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**Prolonged X-ray radiation during RFA
is a risk of remote complications
especially in children of yearly age.**

It was assessed that risk of cancer increases by 0.03% as a result of every 60 minutes of fluoroscopy.

Kovoor P, Ricciardello M, Collins L, Uther JB, Ross DL (1998) Risk to patients from radiation associated with radiofrequency ablation for supraventricular tachycardia. Circulation; 98: 1534-40.

According to Wong K.T. et al. time of fluoroscopy during RFA in children is $71,0 \pm 45,3$ minutes.

Wong KT, Yung TC, Lun KS, Fan KY, Chau AKT Ten-year experience of radiofrequency catheter ablation of accessory pathways in children and young adults. HK J Pediatr 2005; 10: 257-264

Experience of 3D mapping in infants is limited.

- ***Grutter et al. presented 2 cases of drug-resistant tachycardia with WPW syndrome. Tachycardia was successfully resolved by RFA with CARTO™ System. Patients' age and weight were 17 and 18 months and 9,4 and 11kilos, correspondingly.***
 - *Grutter G., Silvetti MS, A De Santis, Bevilacqua M., Drago F. (2004) 3-D mapping and radiofrequency transcatheter ablation in infants with higly symptomatic drug resistant right accessory pathway mediated tachycardia. Ital. J. Pediatr; 30: 58-60.*
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- ***Zeng et al. used CARTO™ System to map incisional atrial tachycardia and atrial flutter in 6 patients weighted more than 10 kilos.***
 - *Zeng SY, Yang PZ, Shi JJ et al. (2003) Ablation of postoperative “incisional” reentrant atrial tachycardia and flutter in children using the CARTO system. Chinese journal of pediatrics; 41(10): 732-34.*

**Navigation mapping in such category of patients
is perspective to reduce fluoroscopy time.**

**Assess the efficiency and safety of navigation
mapping in RFA
of atrial tachycardias in children.**

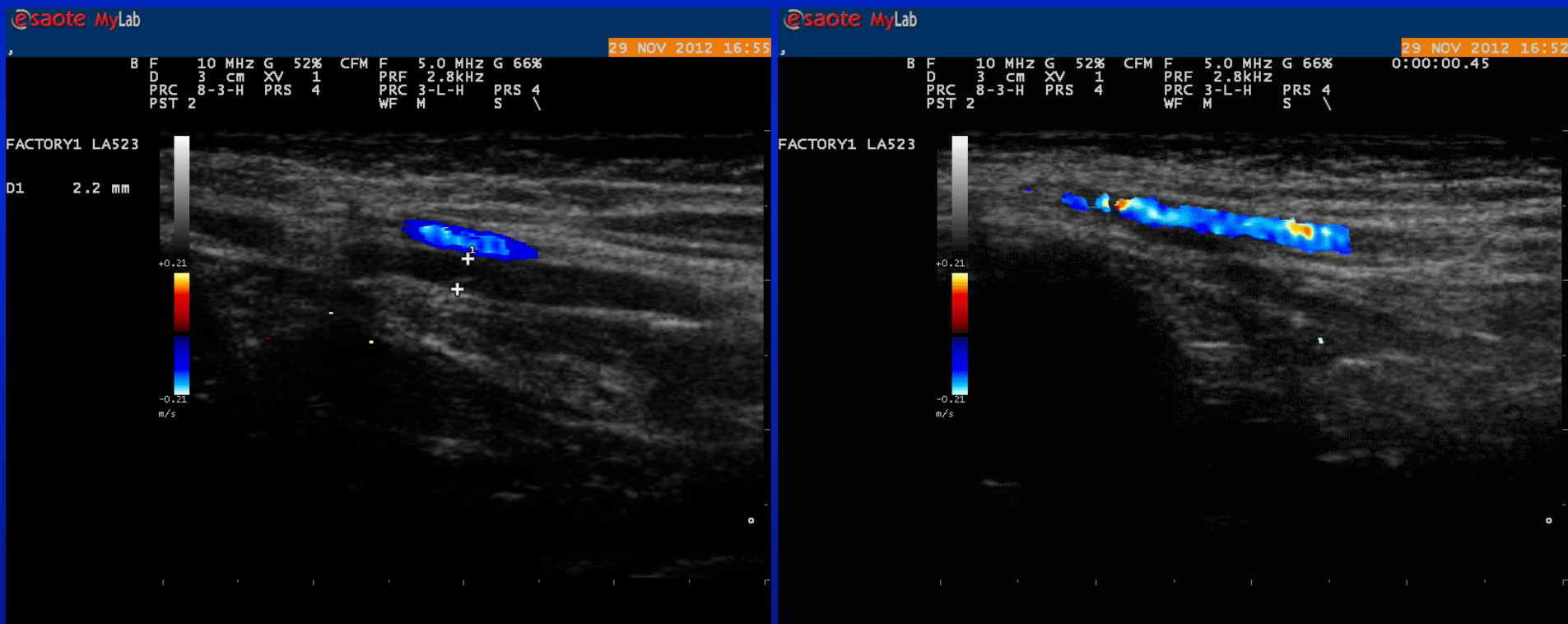
30 RFA with CARTO system were performed to 23 children with atrial ectopic tachycardias during 2006 – 2014 years.

The patients' age was 5,0 years (IQR: 3,58-6.0), ranging from 7 months to 7 years old.

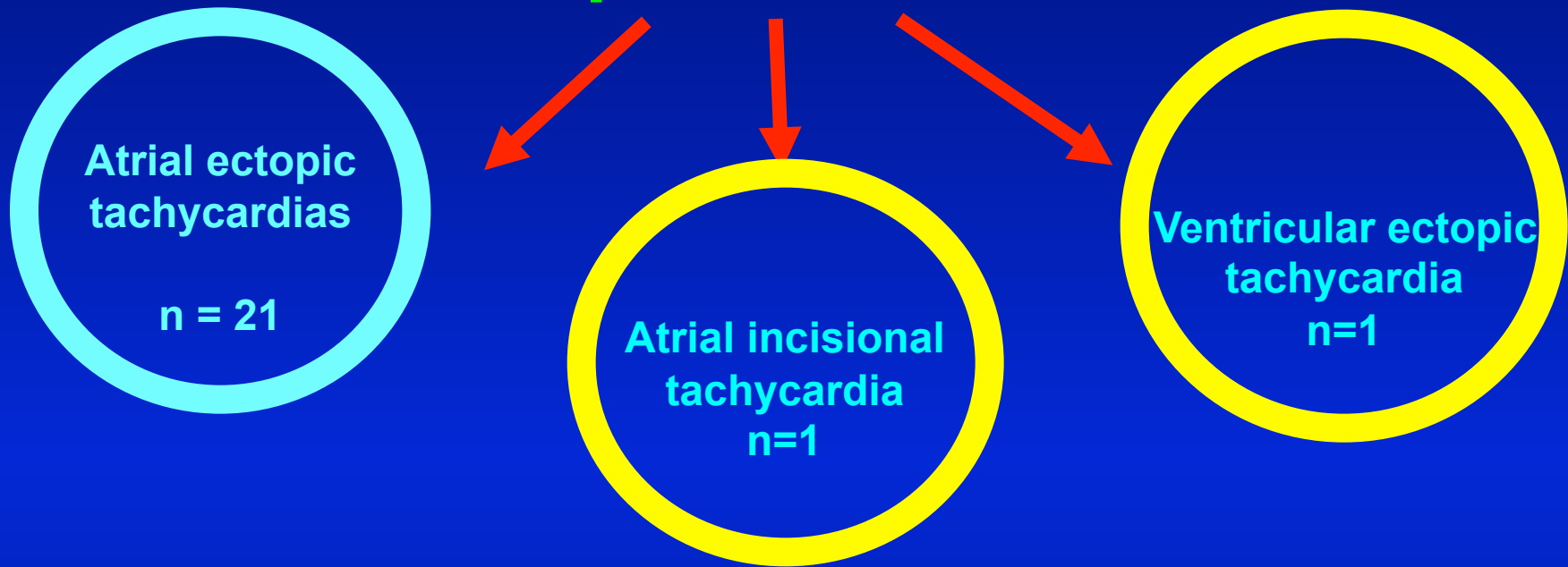
7 patients were less than 15 kilos.

The minimal age of the child who was performed CARTO was 7 months, the minimal weight – 7,4 kg.

As minimal size of the 3D mapping catheter is 7 Fr (NaviStar™), it is necessary to make a preliminary echo of femoral vessels.



23 patients in all



right atrial n = 18

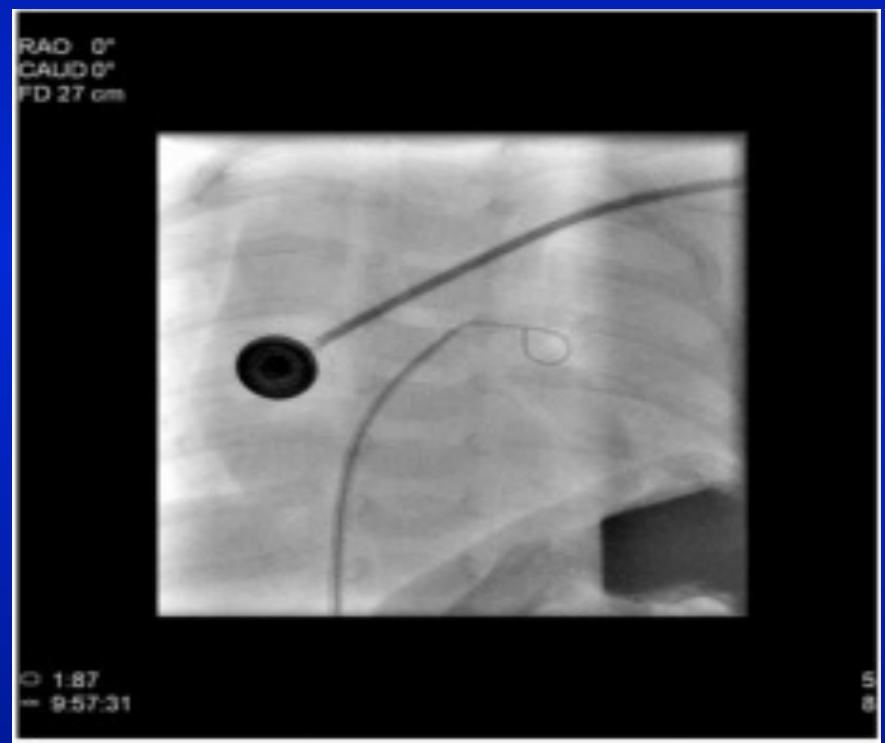
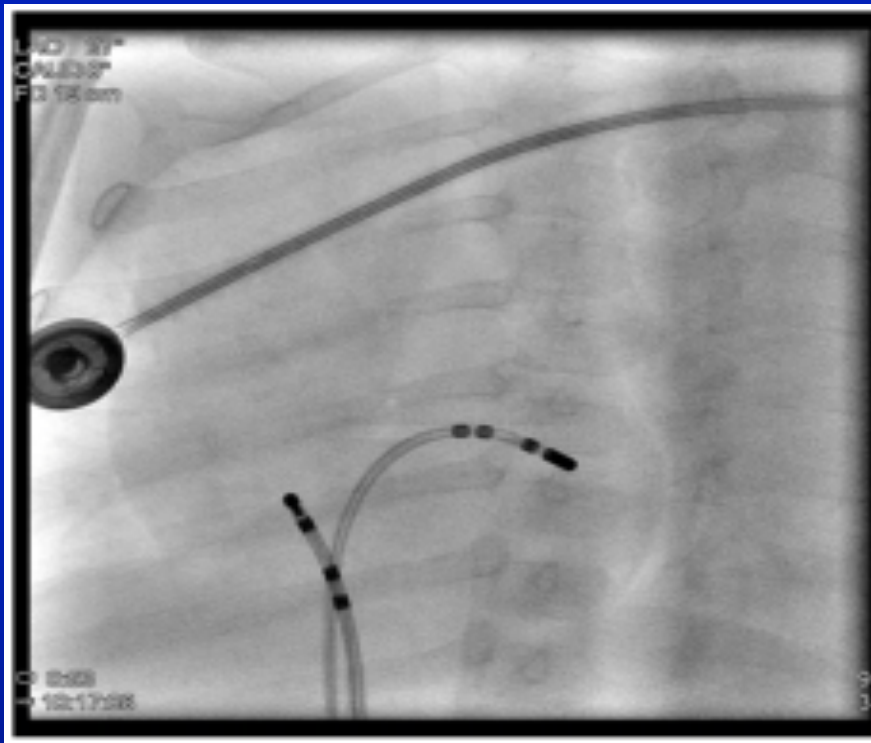
- Triangle of Koch n = 11
 - Isthmus n = 3
- RA appendage n = 2
- Crista terminalis n = 2

left atrial n = 3

- upper left pulmonary vein n=2
- LA posterior wall n=1

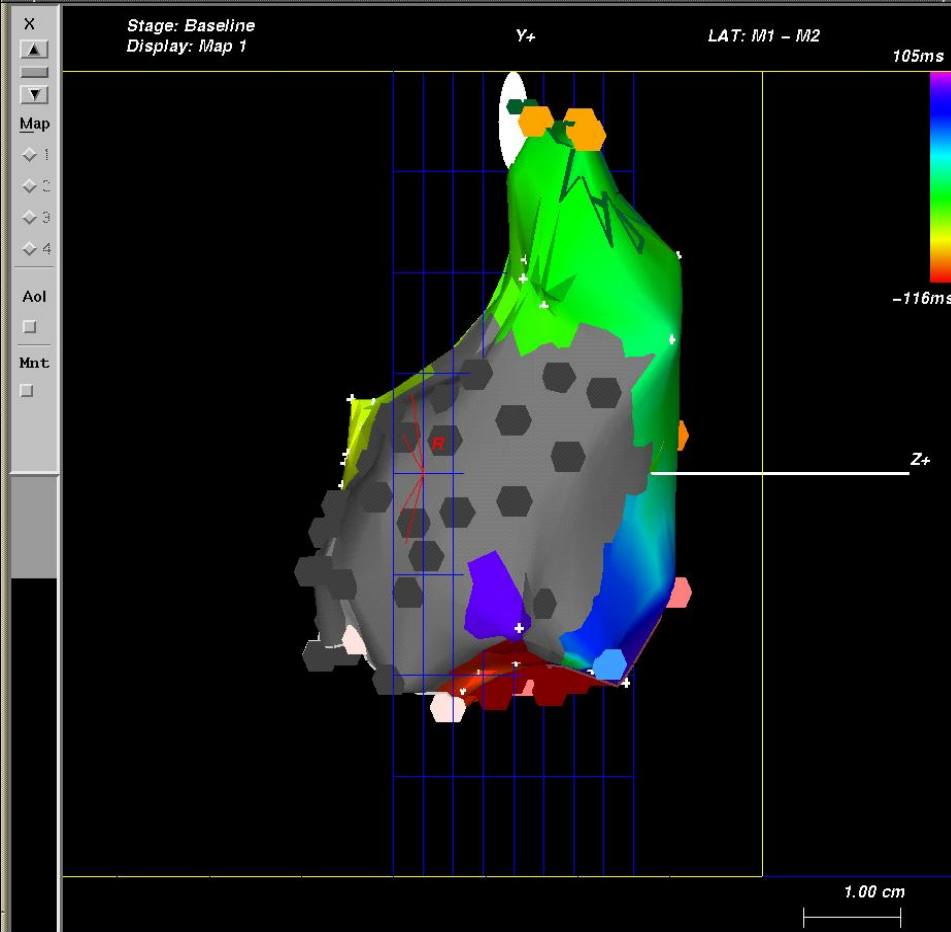
ventricular tachycardia –
RV outflow tract

In two cases the approach to left atrium was performed by transseptal puncture, in one case – through patent foreman ovale.

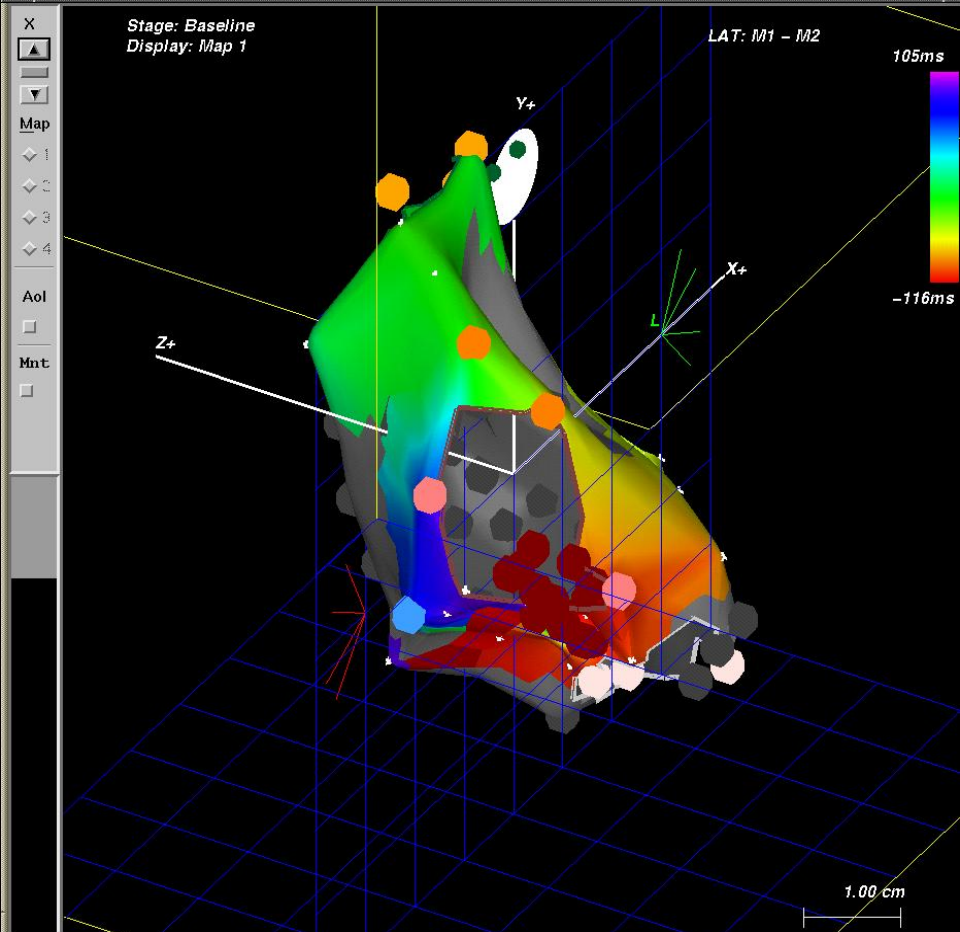


Carto-ablation of incisional tachycardia

Patient Name: Fedorov A Study: study_1 Date performed: 13 November 2006 Time:06:23:36

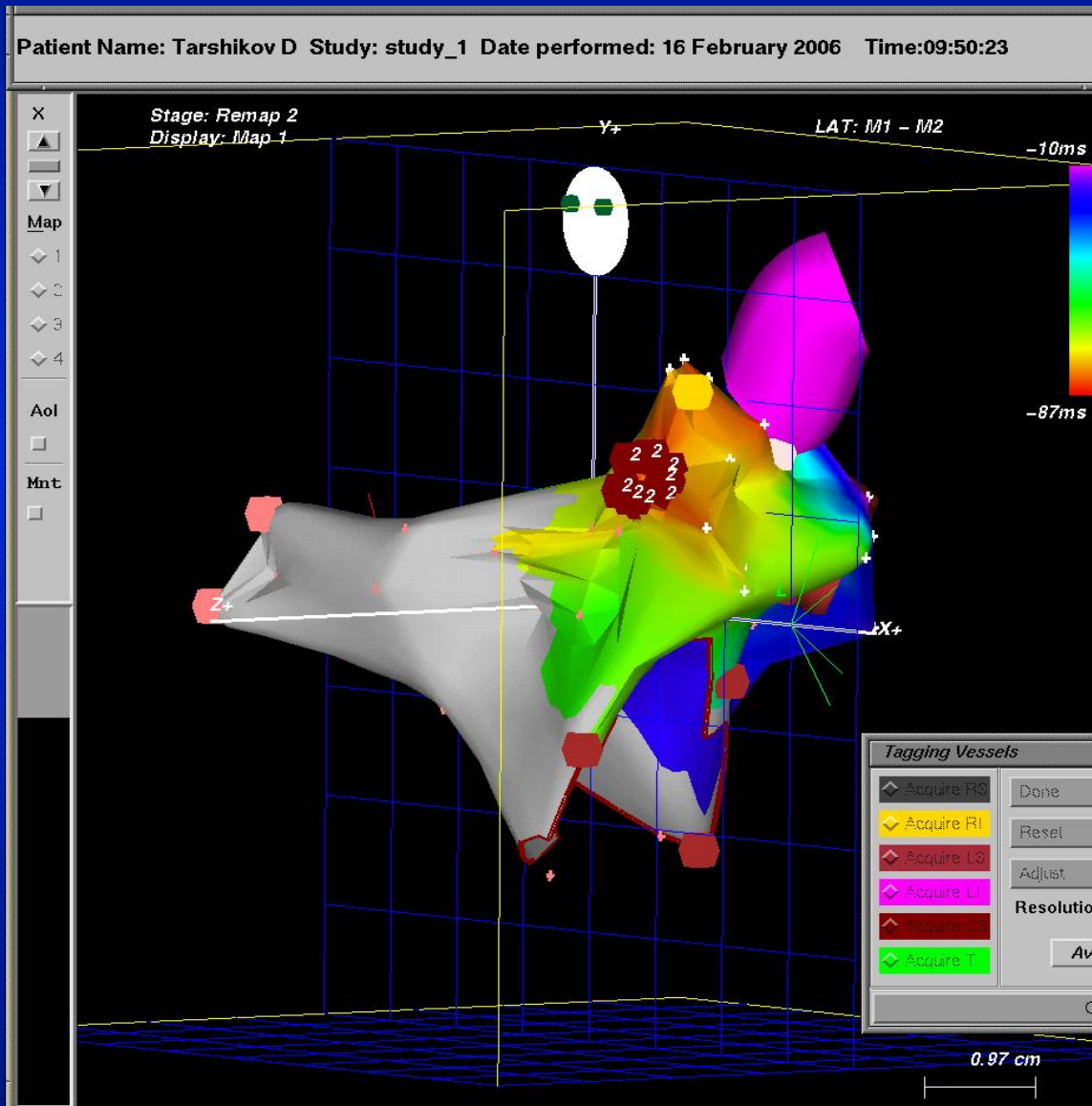


Patient Name: Fedorov A Study: study_1 Date performed: 13 November 2006 Time:06:23:36



Scar at RA free wall. RF application – cavotricuspid isthmus. Isthmus dependent AF.
Tachycardia terminated.
Fluoroscopy time – 2 min.

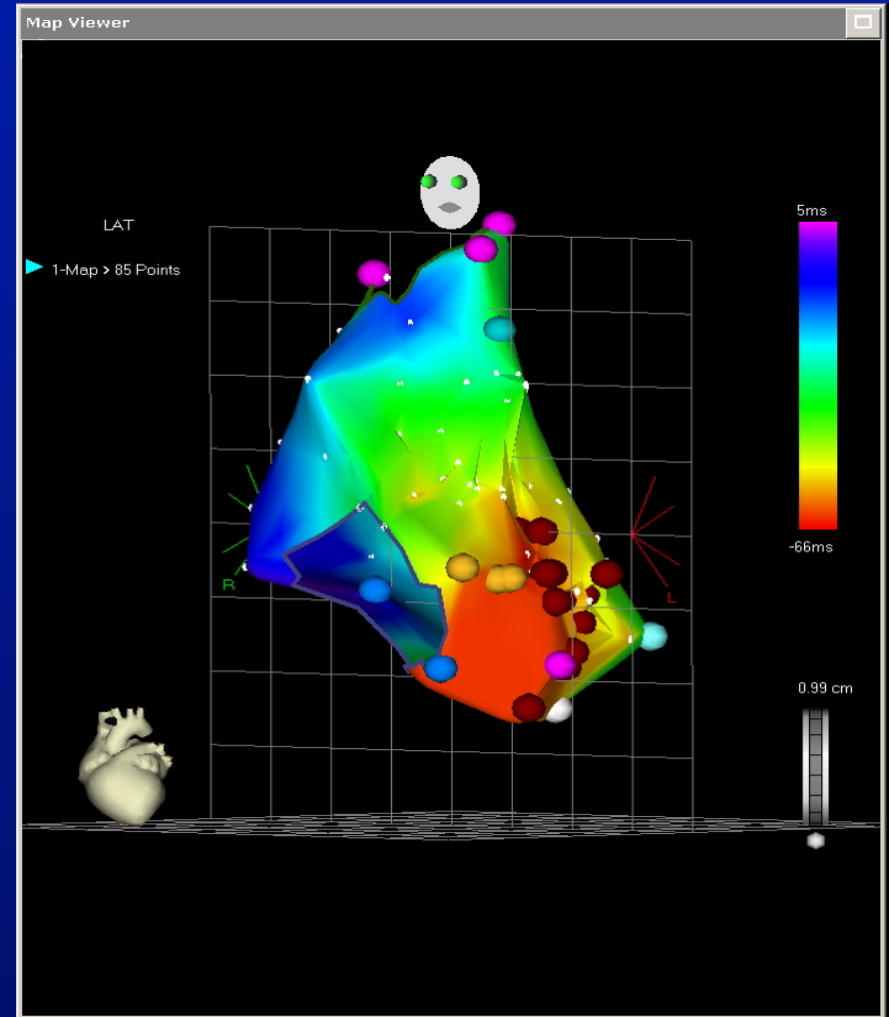
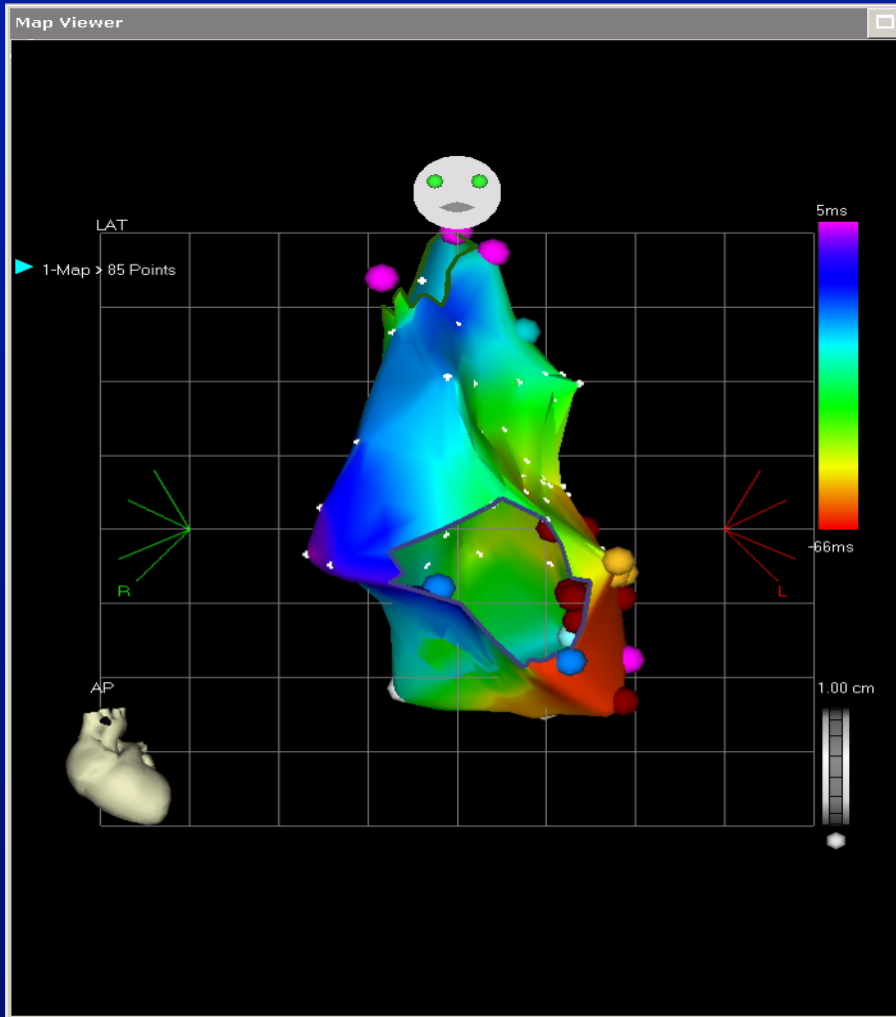
LA Carto-reconstruction



Patient T., 5 years old,
persistent form of
tachycardia.

Ectopy location - upper
left pulmonary vein.

Fluoroscopy time – 30
min.

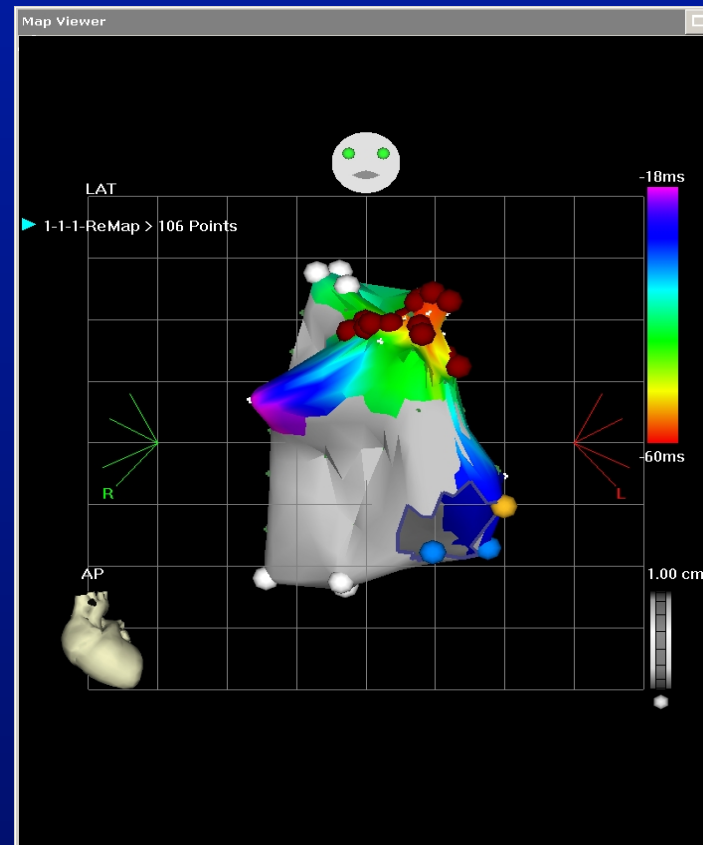
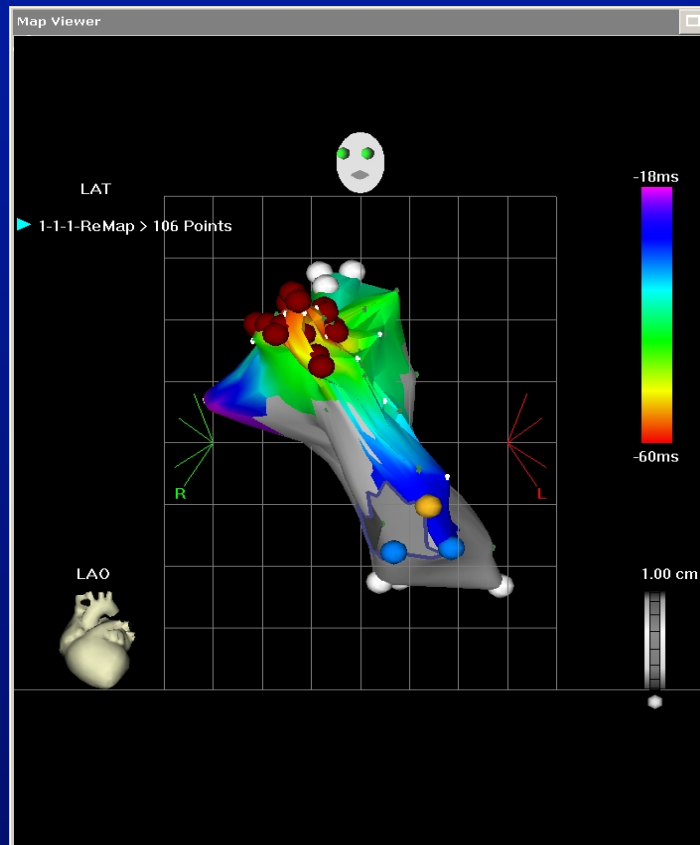


Right atrium. Earliest activation in Koch's triangle.

RFA set: 50° C and 25 W/.

Fluoro: 5 min.

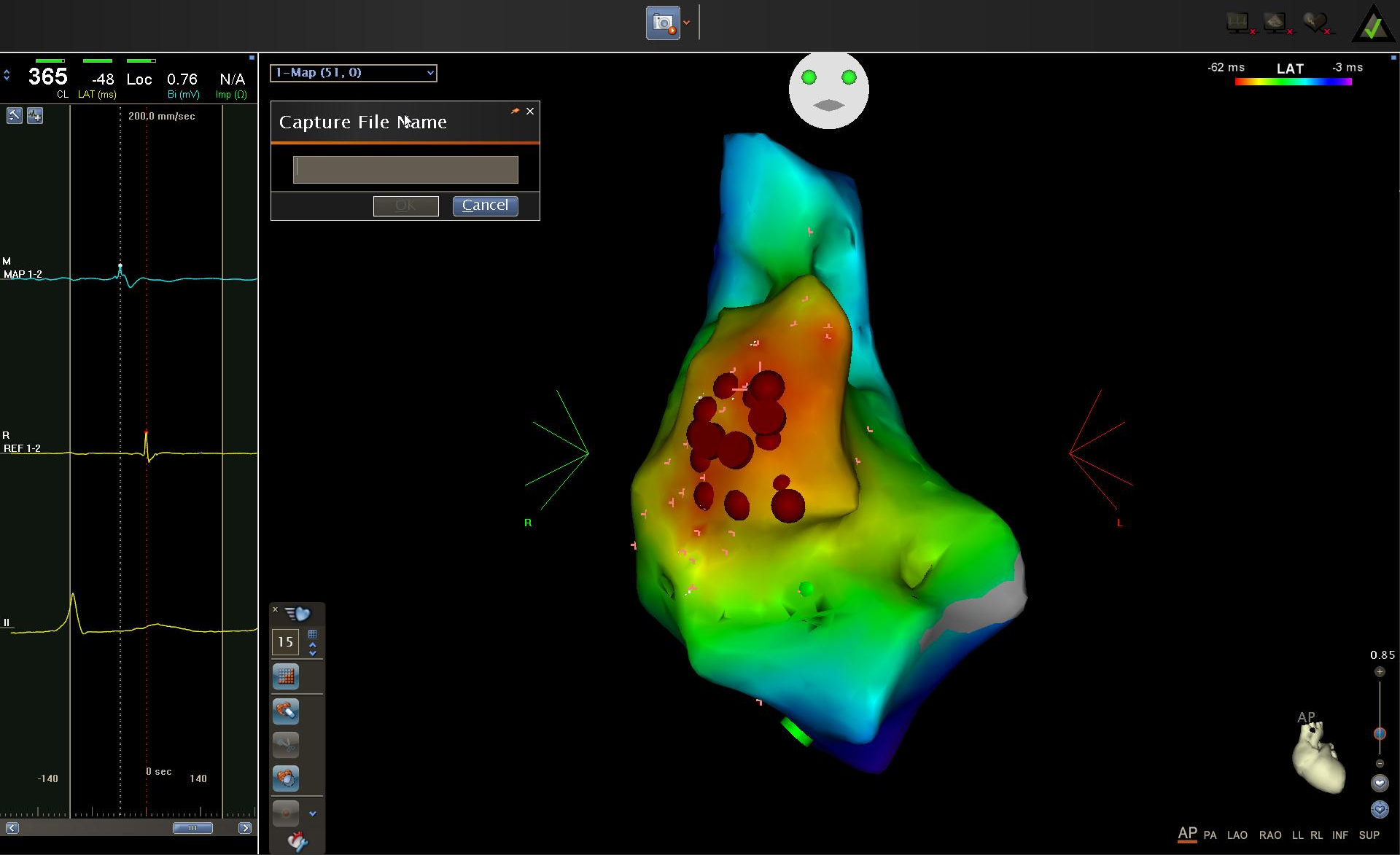
Electroanatomic RA CARTO reconstruction in a 7-month-old patient.



Zone of early activation (indicated red) – in the area of RA auricle.
RFA series was applied (50C – 25 W).
Fluoroscopy time – 6 min.

4 yol, RA appendage, 3 recurrence

Study Map Point Catheter ECG Display Imaging Window Tools Help



EFFICACY

Success rate of CARTO ablation considering recurrences and retreatments was 91,3%.

The only failure factor was parahisian location

RECURRENCES

In 6 patients (6/23; 26,1%), 4 of which were performed repeated effective procedures.

Two patients shown ectopic activity lesser than 10% with normal average heart rate.

COMPLICATIONS

There were no complications.

As a result of navigation mapping usage we discovered decrease of fluoroscopy time in 2,3 times ($p < 0,001$).

Time of fluoroscopy

With CARTO

2 - 31 min

(12,5 ± 8,3)

Without CARTO

5 - 100 min

(28,1 ± 23,5)

Conclusion:

- RFA with 3D mapping is effective and safe in children overweighting 7 kilos.
- Use of 3D mapping reduce radiation exposure.
- In small children it is recommended to assess femoral vessels before procedure.