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Adenosine in atrial fibrillation ablation: does it improve the outcome?

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Catheter Ablation for Atrial Fibrillation

Are Results Maintained at 5 Years of Follow-Up?

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Bordeaux-Pessac, France; Crawley, Western Australia; and Montreal, Quebec, Canada

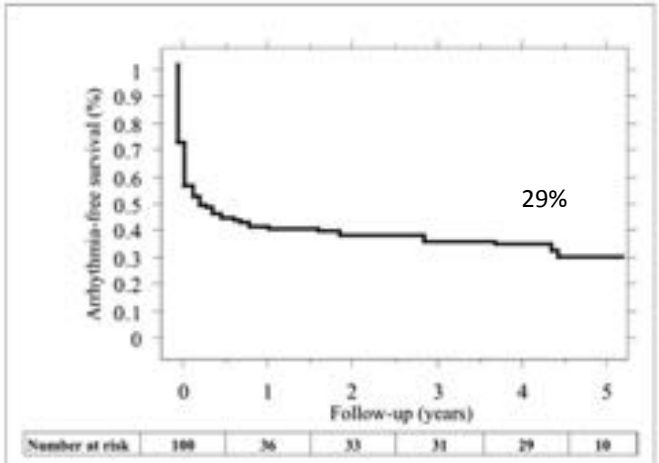


Figure 2 Single Procedure Success

Kaplan-Meier event-free survival curve after a single catheter ablation attempt.

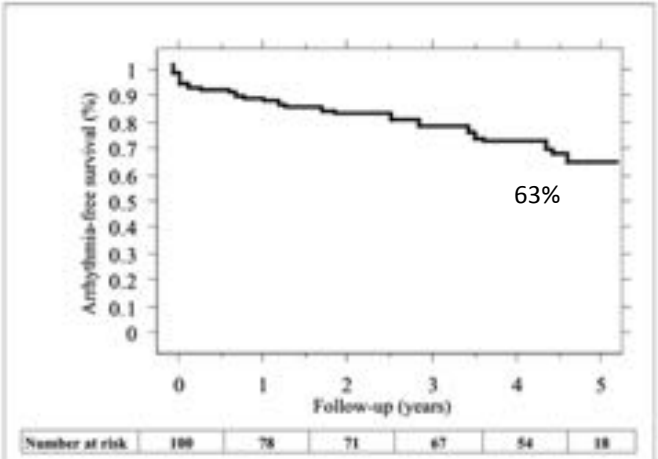


Figure 3 Multiple Procedure Success

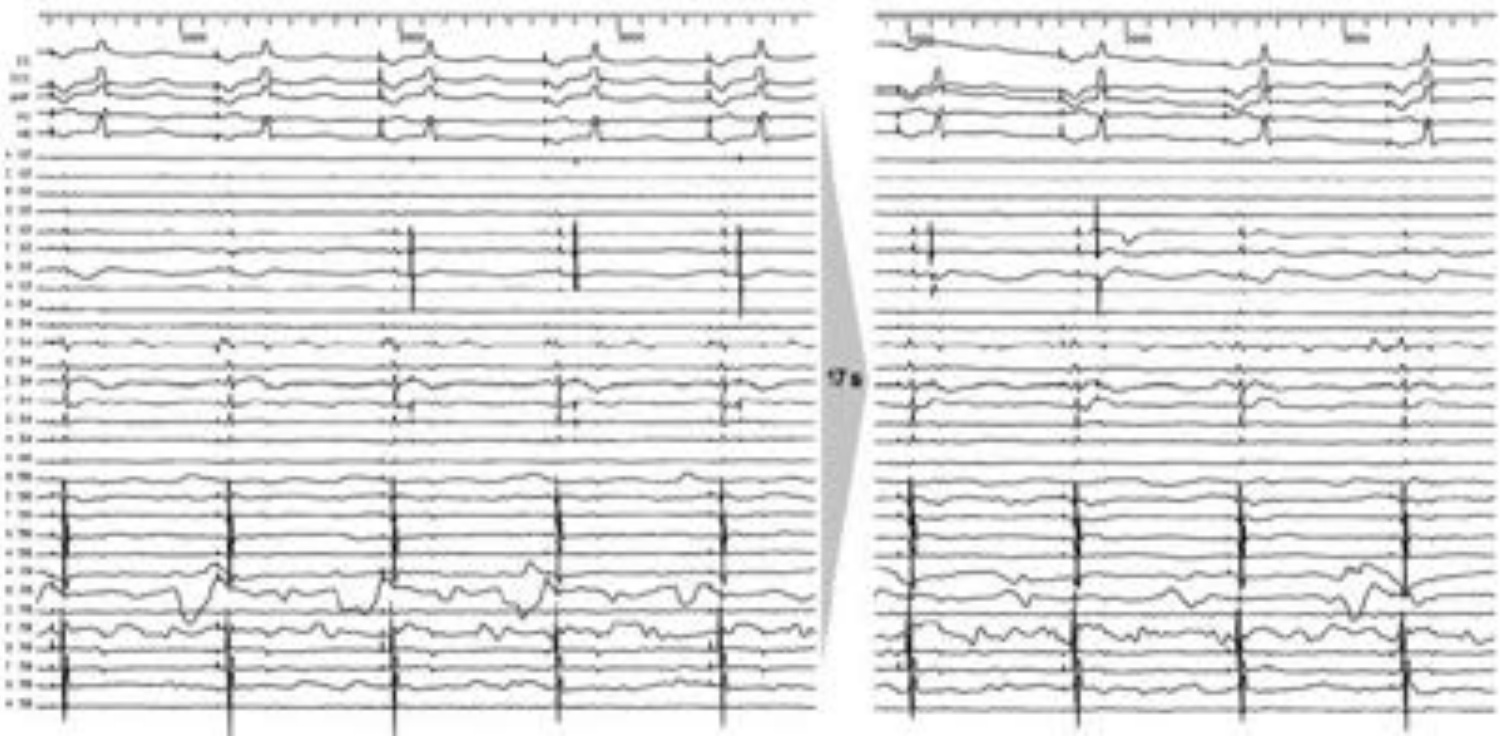
Kaplan-Meier event-free survival curve after the last catheter ablation attempt.

Procedures/patient – median=2
65% PAF, PVI in all, lines in 90%
Reconection of PVs in all patients with "early" re-dos
Late re-dos – reconection, gaps in lines, extra PV foci

J Am Coll Cardiol 2011;57:160–6

"Dormant" Pulmonary Vein Conduction Revealed by Adenosine after Ostial Radiofrequency Catheter Ablation

THOMAS ARENTZ, M.D., LAURENT MACLE, M.D.,* DIETRICH KALUSCHE, M.D., MÉLÈZE HOCINI, M.D.,* PIERRE JAIS, M.D.,* DIPEN SHAH, M.D.,† and MICHEL HAISSAGUERRE, M.D.*



25% dormant PV conduction

(J Cardiovasc Electrophysiol, Vol. 15, pp. 1041-1047, September 2004)

Adenosine-guided pulmonary vein isolation for the treatment of paroxysmal atrial fibrillation: an international, multicentre, randomised superiority trial

*Laurent Macle, Paul Khairy, Rukshen Weerasooriya, Paul Novak, Atul Verma, Stephan Willems, Thomas Arentz, Isabel Deisenhofer, George Veenhuyzen, Christophe Scavée, Pierre Jais, Helmut Puererfellner, Sylvie Levesque, Jason G Andrade, Lena Rivard, Peter G Guerra, Marc Dubuc, Bernard Thibault, Mario Talajic, Denis Roy, Stanley Nattel, for the ADVICE trial investigators**

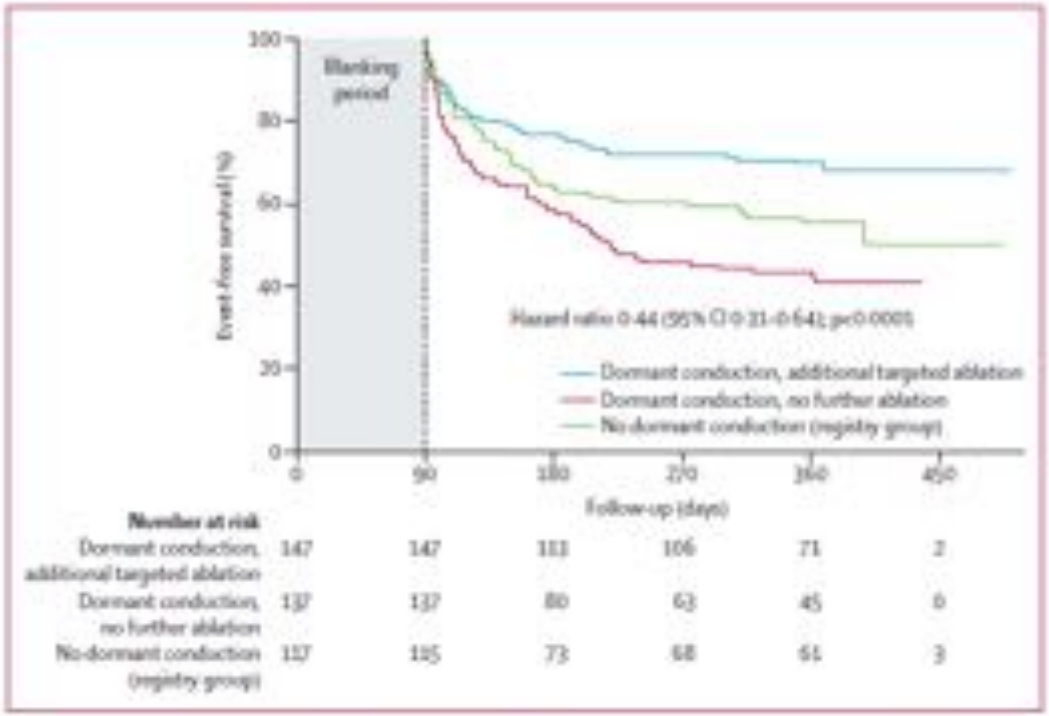


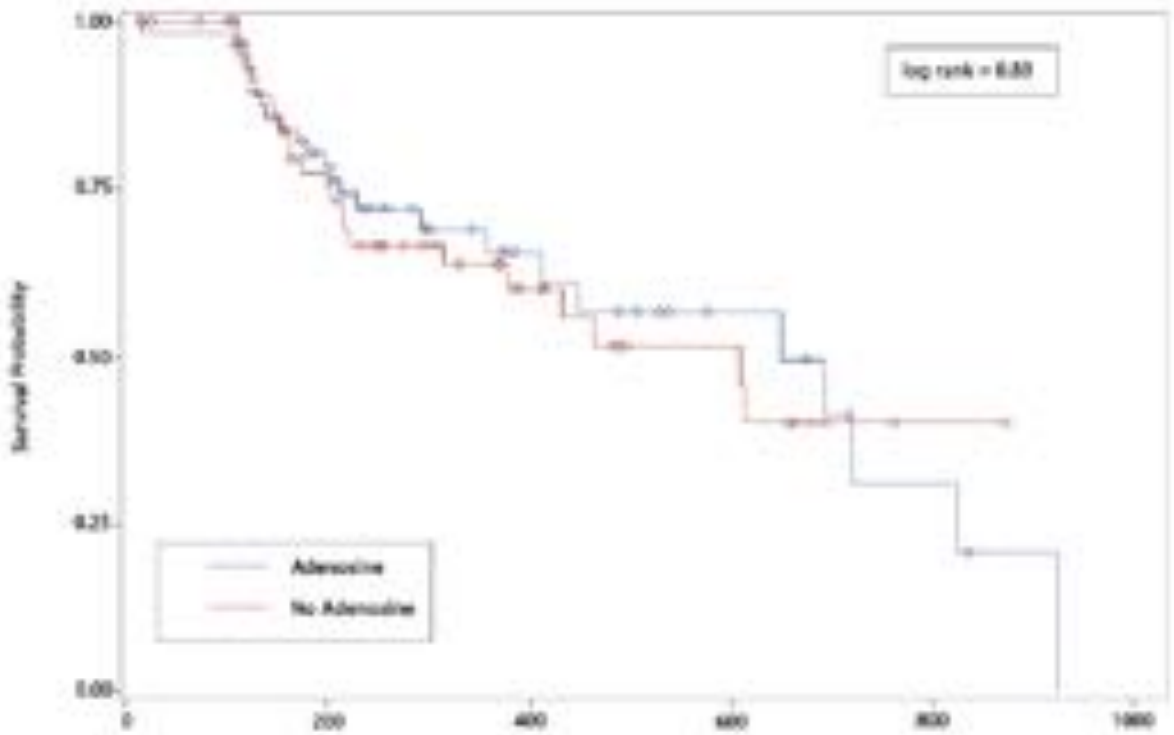
Figure 2: Freedom from symptomatic atrial tachyarrhythmia after a single ablation procedure (primary endpoint)
The hazard ratio is for the comparison between dormant conduction, additional targeted ablation versus dormant conduction, no further ablation.

Interpretation Adenosine testing to identify and target dormant pulmonary vein conduction during catheter ablation of atrial fibrillation is a safe and highly effective strategy to improve arrhythmia-free survival in patients with paroxysmal atrial fibrillation. This approach should be considered for incorporation into routine clinical practice.

Lancet, 2015

Role of Adenosine After Antral Pulmonary Vein Isolation of Paroxysmal Atrial Fibrillation: A Randomized Controlled Trial

Figure 4



Conclusion: Adenosine can reveal dormant conduction in a more than one-third of the patients with paroxysmal AF undergoing PVI. However, adenosine administration, and additional ablation of the resultant connections, does not improve long-term outcomes with a protocol that includes isoproterenol infusion.

Chugh et al; Heart Rythm 2015

AIM

Our goal was to access if adenosine usage during percutaneous pulmonary vein isolation improved atrial fibrillation recurrence during follow up.

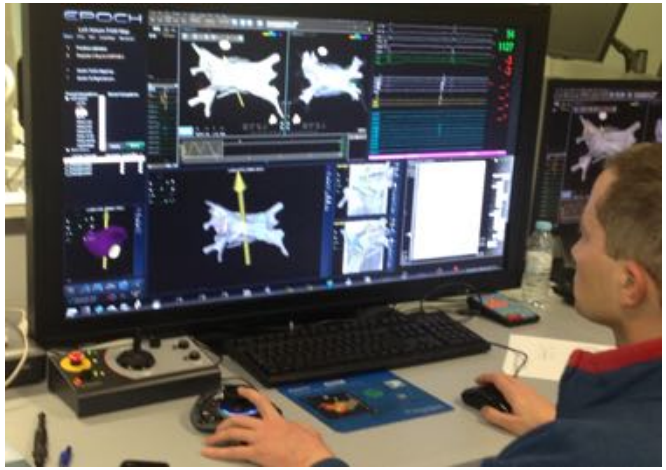
Methods

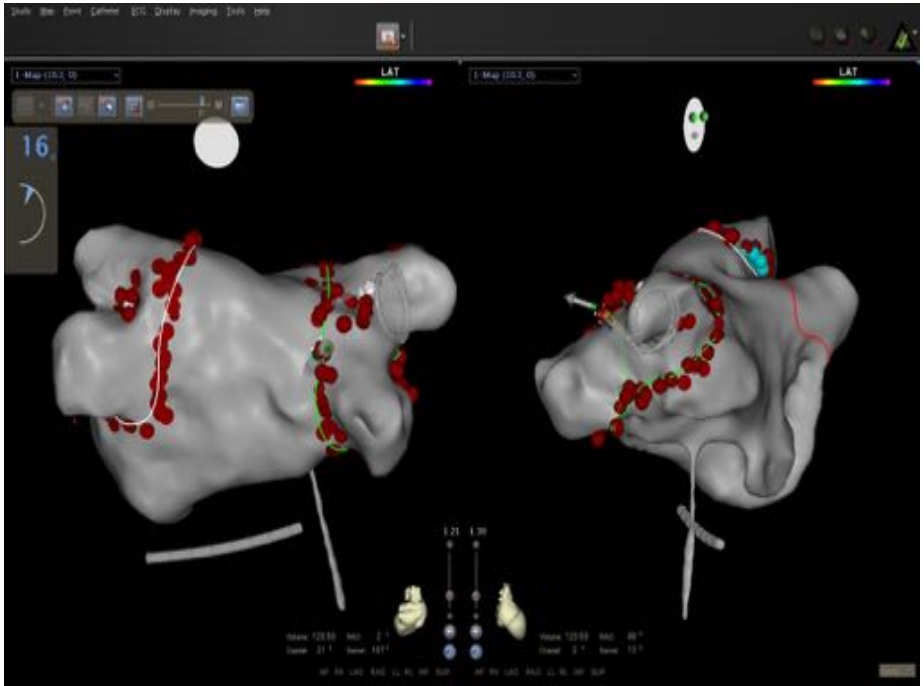
Methods – Pulmonary Vein Isolation

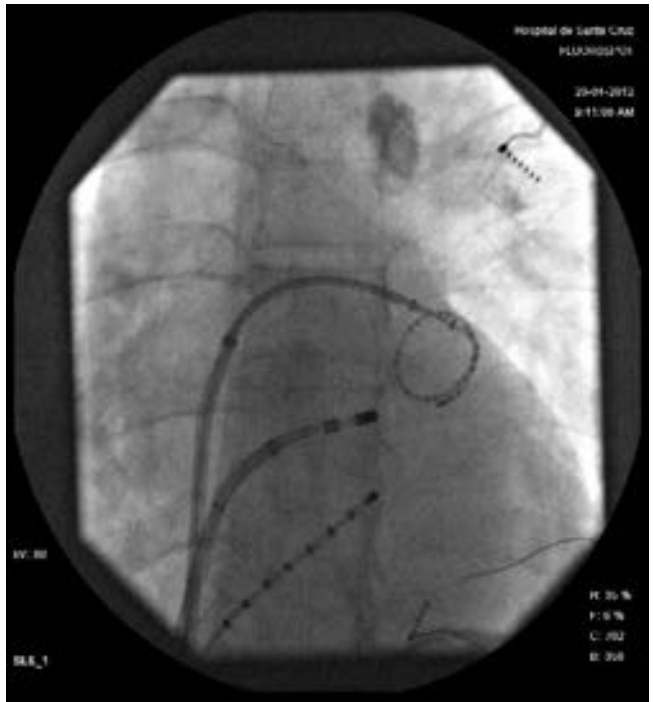
Consecutive patients refered to PVI since 1st January 2013 in our center

- Angio-CT to exclude LA thrombus and to evaluate LA anatomy
- Transeptal puncture to acess LA
- CARTO® 3D mapping system
- Lasso® circular catheter and
- Magnetic navigation (Stereotaxis®)

Methods – Pulmonary Vein Isolation







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Adenosine at the end of the procedure – 2 U iv bolus

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Reisolation of reconected veins

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Methods

- Two groups:
  - Group A - Control (No adenosine)
  - Group B - Adenosine 2units iv bolus
    - If re-conduction proceed to re-isolation of reconnected veins
    - If not re-conduction – end of procedure

- Fup protocol
  - Scheduled ECG and Holter (3rd; 6th and 12th months) and also driven by symptoms
  - 3 months blanking period

Results

Results

	n = 305
Female (%)	27.7
Age (years)	60 ± 11
Hypertension (%)	47.5
Paroxismal AF (%)	80.3
LA Volume (ml)	101 ± 28
Adenosine (% / n)	64,5 % / 162
Recurrence (%)Fup 173± 128 days	7.8

Results

n = 305	Control n= 143 (35,5%)	Adenosine n = 162 dts (64,5%)	p
Age	64 ± 11	59 ± 10	<0,001
Hypertension (%)	49,0	47,2	0,432
Paroxismal AF (%)	71,6	85,4	0,004
LA Volume (ml)	106 ± 30	97±25	<0,001

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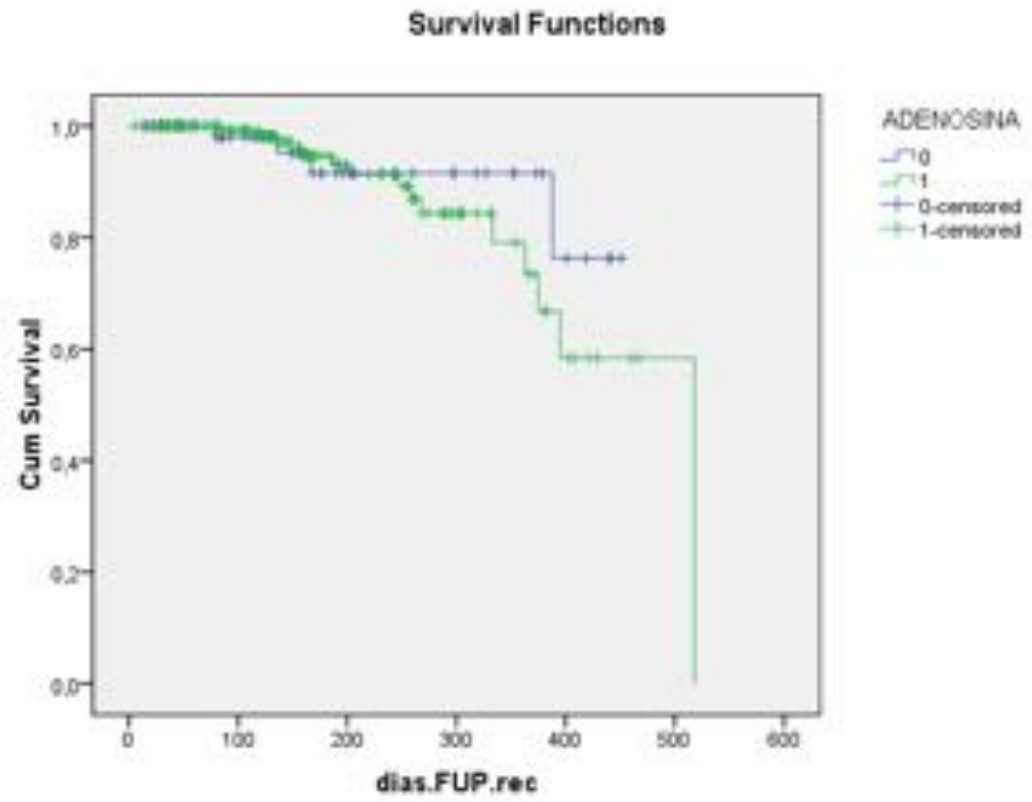
Recurence free during Fup

(Fup 173± 128 days)

Adenosine – 90,5% vs no adenosine – 95,3% (p=0,76, multivariate)



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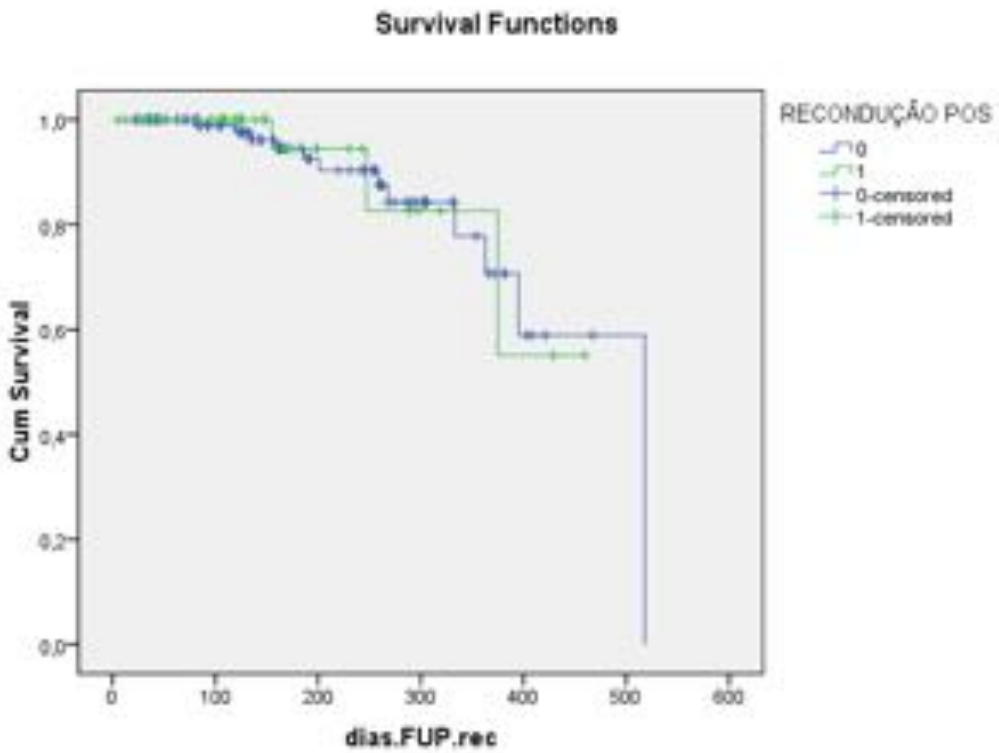
Adenosine – 24.6% reconnection

Recurence free during Fup (Fup 173± 128 days)

Adenosine with reconnection – 93% vs Adenosine without reconnection– 89,6% (p=0,5 multivariate)



Independent Predictors of recurrence

- Female sex– HR 1,55; 95%CI 1,19-2,03; p=0,001
- Non Paroxysmal AF – HR 1,31; 95%CI 1,01 – 1,69; p=0,039
- LA Volume – HR 1,16; 95%CI 1,09 – 1,23; p<0,001

Conclusions

Conclusion

In our series of patients submitted to pulmonary vein isolation:

- Adenosine usage revealed dormant conduction in 24.6% of patients
- Ablation strategy based on adenosine dormant conduction was not associated with lower recurrence rate during follow up.
- Independent predictors of recurrence were female sex, non paroxysmal AF and LA volume.
- We need more data regarding how to establish long lasting pulmonary vein isolation and improve recurrence rates after ablation

Thank you