Новосибирский научно-исследовательский институт патологии кровообращения

Гибридный подход в лечении фибрилляции предсердий

Актуальность

State Research Institute of Circulation Pathology

Table 18 Randomized clinical trials of catheter ablation vs. antiarrhythmic drugs or no treatment in AF

Study	Reference	Patients (n)	Age, years	Type of AF	Previous use of AAD	Ablation technique	Repeat ablation procedure in the ablation group	Crossed to ablation in the AAD group	AF free at 1 year	
									Ablation	AAD
Krittayaphong et al. 2003	Online	30	55 ± 10 (ablation) 47 ± 15 (AAD)	Paroxysmal, persistent	≥1[a]	PVI + [illegible] lines + CTI ablation + RA lines	Not stated	Not stated	79%	40%
Wazni et al. 2005 (RAAFT)	134	70	53 ± 8 (ablation) 54 ± 8 (AAD)	Mainly [illegible]	No	PVI	12%[b]	49%[c]	87%	37%
Stabile et al. 2006 (CACAF)[d]	Online	245	[illegible] (ablation) 62 ± 10 (AAD)	Paroxysmal, persistent	≥2	PVI + LA lines ± CTI ablation	No exact data	57%	56%	9%
Oral et al. 2006[e]	Online	245	57 ± 9	Persistent	≥1 (mean 2.1 ± 1.2)	CPVA	26% for AF; 6% for LA flutter	77%	74%	4%
[illegible] 2007 (APAF)	135	198	55 ± 10 (ablation) 57 ± 10 (AAD)	Paroxysmal	≥2 (mean 2 ± 1)	CPVA + CTI ablation	6% for AF; 3% for atrial tachycardia	42%	86%	22%
Jais et al. 2008 (A4 study)	133	112	51 ± 11	Paroxysmal	≥1	PVI ± LA lines ± CTI ablation	Mean 1.8 ± 0.8, median 2 per patient	63%	89%	23%
Forleo et al. 2008[f]	Online	70	63 ± 9 (ablation) 65 ± 6 (AAD)	Paroxysmal, persistent	≥1	PVI ± LA lines ± CTI ablation	Not stated	Not stated	80%	43%
Wilber et al. 2010 (Thermocool)[g]	96	167	55.5 (ablation) 56.1 (AAD)	Paroxysmal	≥1 (mean 1.3)[h]	PVI ± LA lines ± CFAEs ± CTI ablation ± RA lines	12.6% within 80 days after 1st procedure[i]	59%[c]	66%	16%
Packer et al. 2010 (STOP-AF)[j]	Online	245	56.7 (ablation) 56.4 (AAD)	Paroxysmal	≥1[k]	Cryo-PVI ± LA lines	19% within 90 days after 1st procedure	79%	69.9%	7.3%

Guidelines for the management of atrial fibrillationESC/EHRA/EACTS 2010

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Актуальность

Эффективность процедуры Maze - 81-97%

NIH Public Access
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Circ Arrhythm Electrophysiol. 2012 February 1; 5(1): 8–14. doi:10.1161/CIRCEP.111.963819.

The Cox-Maze Procedure for Lone Atrial Fibrillation: A Single Center Experience over Two Decades

Timo Weimar, MD, Stefano Schena, MD, PhD, Marci S. Bailey, RN, MSN, Hersh S. Maniar, MD, Richard B. Schuessler, PhD, James L. Cox, MD, and Ralph J. Damiano Jr., MD
Division of Cardiothoracic Surgery, Washington University School of Medicine, Barnes-Jewish Hospital, St. Louis, MO

Abstract

Background—The Cox-Maze procedure (CMP) has achieved high success rates in the therapy of atrial fibrillation (AF) while becoming progressively less invasive. This report evaluates our experience with the CMP in the treatment of lone AF over two decades and compares the original cut-and-sew CMP-III to the ablation-assisted CMP-IV, which uses bipolar radiofrequency and cryoenergy to create the lesion pattern.

Methods and Results—Data were collected prospectively on 212 consecutive patients (mean age: 53.5±10.4, 78% males), who underwent a stand-alone CMP from 1992 through 2010. Median duration of preoperative AF was 6 (IQR 2.9–11.5) years, with 48% paroxysmal and 52% persistent or longstanding persistent AF. Univariate analysis with preoperative and perioperative factors used as covariates for the CMP-III (n=112) and the CMP-IV (n=100) was performed. Overall, 30-day mortality was 1.4% with no intraoperative deaths. Freedom from AF was 93% and freedom from AF off antiarrhythmics was 82% at a mean follow-up time of 3.6 ± 3.1 years. Freedom from symptomatic AF at 10 years was 85%. Only one late stroke occurred with 80% of patients being off anticoagulation. The less invasive CMP-IV had significantly shorter cross-clamp times (41±13 vs. 92±26 minutes, p<0.001) while achieving high success rates with 90% freedom from AF and 84% freedom from AF off antiarrhythmics at 2 years.

Conclusions—The CMP, while simplified and shortened by alternative energy sources, has excellent results even with improved follow-up and stricter definition

J Thorac Cardiovasc Surg. 2003 Dec;126(6):1822-8.

The Cox maze III procedure for atrial fibrillation: long-term efficacy in patients undergoing lone versus concomitant procedures.

Prasad SM, Maniar HS, Camillo CJ, Schuessler RB, Boineau JP, Sundt TM 3rd, Cox JL, Damiano RJ Jr.
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Abstract

BACKGROUND: For the last decade, the Cox maze III procedure has been available for the treatment of atrial fibrillation. It is unknown whether the operation has similar efficacy in patients with lone atrial fibrillation compared with that in patients with atrial fibrillation associated with coronary, valve, or congenital heart disease. This study examined the long-term outcome of patients who underwent this procedure either as a lone operation or as a concomitant procedure.

METHODS: From 1988 to 2001, 198 patients underwent a Cox maze III procedure; 112 were lone operations, and 86 were concomitant procedures. Major complications included renal failure, reoperation for bleeding, mediastinitis, stroke, and balloon pump insertion. Follow-up was performed by means of mail and telephone questionnaires with both the patients and their cardiologists. All patients who had any history of arrhythmia or who were taking medication had their rhythm documented by means of electrocardiography.

RESULTS: The lone operation group was significantly younger (51.3 +/- 10.5 vs 58.8 +/- 9.9 years) and had a higher male/female ratio (4:1 vs 2:1). There was no difference in operative mortality between groups (1.8% vs 1.2%). At a follow-up of 5.4 +/- 2.9 years, 96.6% (172/178) of all patients were free of atrial fibrillation. There was no difference between the lone operation and concomitant procedure groups (95.9% vs 97.5%).

CONCLUSION: The Cox maze III procedure has equivalent operative risk and long-term efficacy in patients undergoing both lone operations and concomitant procedures. The Cox maze III procedure remains the standard against which alternative procedures for atrial fibrillation must be judged.

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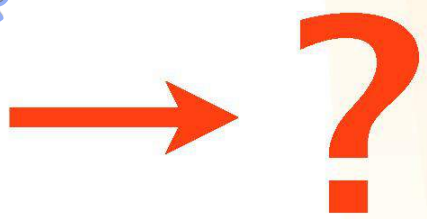
Актуальность



?

У пациентов с ФП, увеличенным ЛП, артериальной гипертензией или после не эффективной катетерной абляции, хирургическая абляция является предпочтительной методикой в течении 1 года наблюдения.

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Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association
Learn and Live

Atrial Fibrillation Catheter Ablation Versus Surgical Ablation Treatment (FAST)

A 2-Center Randomized Clinical Trial

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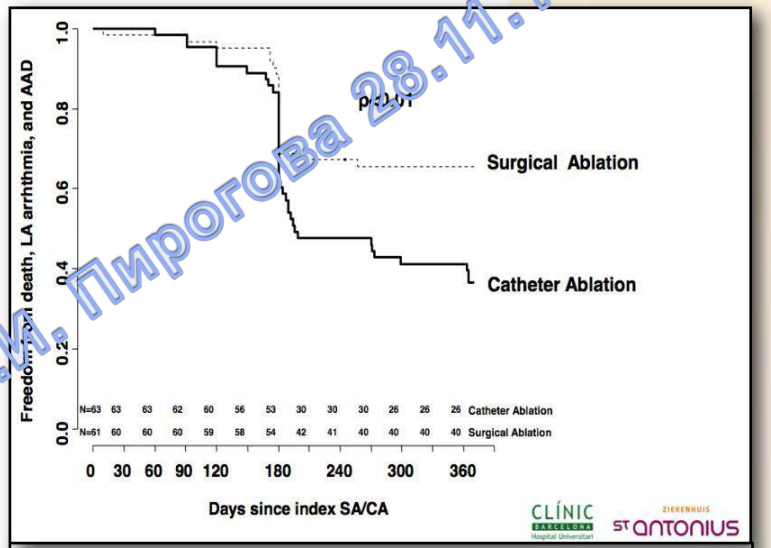
Background—Catheter ablation (CA) and minimally invasive surgical ablation (SA) have become accepted therapy for antiarrhythmic drug-refractory atrial fibrillation. This study describes the first randomized clinical trial comparing their efficacy and safety during a 12-month follow-up.

Methods and Results—One hundred twenty-four patients with antiarrhythmic drug-refractory atrial fibrillation with left atrial dilatation and hypertension (42 patients, 33%) or failed prior CA (82 patients, 67%) were randomized to CA (63 patients) or SA (61 patients). CA consisted of linear antral pulmonary vein isolation and optional additional lines. SA consisted of bipolar radiofrequency isolation of the bilateral pulmonary vein, ganglionated plexi ablation, and left atrial appendage excision with optional additional lines. Follow-up at 6 and 12 months was performed by ECG and 7-day Holter recording. The primary end point, freedom from left atrial arrhythmia >30 seconds without antiarrhythmic drugs after 12 months, was 36.5% for CA and 65.6% for SA ($P=0.0022$). There was no difference in effect for subgroups, which was consistent at both sites. The primary safety end point of significant adverse events during the 12-month follow-up was significantly higher for SA than for CA (n=21 [34.4%] versus n=10 [15.9%]; $P=0.027$), driven mainly by procedural complications such as pneumothorax, major bleeding, and the need for pacemaker. In the CA group, 1 patient died at 1 month of subarachnoid hemorrhage.

Conclusion—In atrial fibrillation patients with dilated left atrium and hypertension or failed prior atrial fibrillation CA, SA is superior to CA in achieving freedom from left atrial arrhythmias after 12 months of follow-up, although the procedural adverse event rate is significantly higher for SA than for CA.

Clinical Trial Registration—URL: http://clinicaltrials.gov. Unique identifier: NCT00662701.

(*Circulation*. 2012;125:23-30.)



Adverse Events	CA N=63	SA N=61	*P*-Value
Pericardial effusion/tamponade	1	1	
TIA/Stroke	1	1	
Pneumothorax	...	6	
Hematothorax	...	1	
Rib fracture	...	1	
Sternotomy for bleeding	...	1	
Pneumonia	...	1	
Death	...	...	
PM implant	...	2	
Total	2 (3.2%)	14 (23.0%)	*P*=0.001
Minor			
Groin hematoma/bleed	4 (6.3%)	...	

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Опыт ННИИПК

n = 98

Критерии включения:

- возраст 18-70 лет;
- пациенты с пароксизмальной формой ФП после неэффективной одной или более процедуры катетерной абляции;
- пациенты с персистирующей или длительно-персистирующей формами ФП и размерами ЛП>4 см

Критерии исключения:

- предшествующие «открытые» оперативные вмешательства на сердце и легких;
- давность ФП > 10 лет;
- размеры ЛП > 70 см.

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Первые результаты

Дооперационные характеристики пациентов

Характеристики (n=30)	
Возраст (лет)	57.6±8.6
Мужчины, %	90 (27/30)
Артериальная гипертензия, n (%)	24 (80%)
Сахарный диабет, n (%)	6 (20%)
ФВЛЖ, %	65±1.2
Продолжительность ФП (в месяцах)	79.0±63.9
Пароксизмальная ФП	38.5±9.67
Персистирующая ФП	42.0±8.9
Длительно-персистирующая ФП	90.0±61.2
Размеры ЛП, ø (мм)	50.8±3.3
Размеры ПП, ø (мм)	48.1±9.4
Предшествующая РЧА, n (%)	13 (43,3%)

Техника торакоскопической абляции ФП

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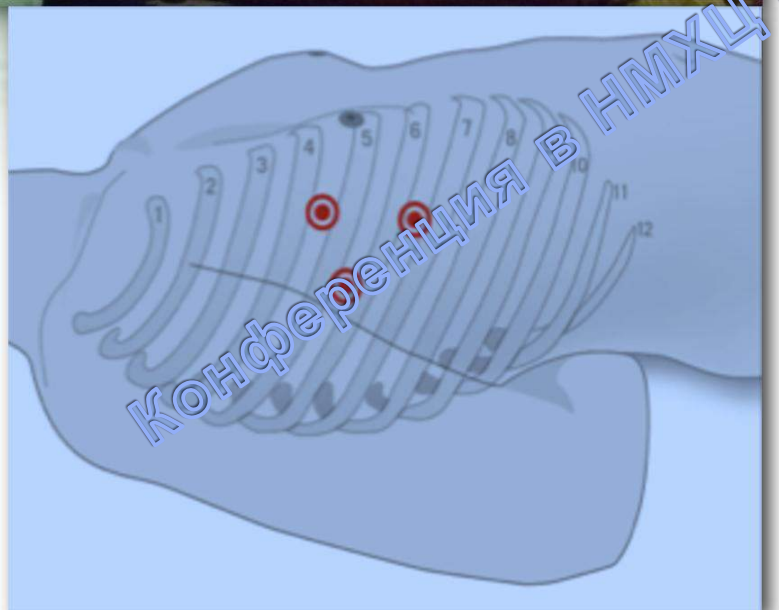

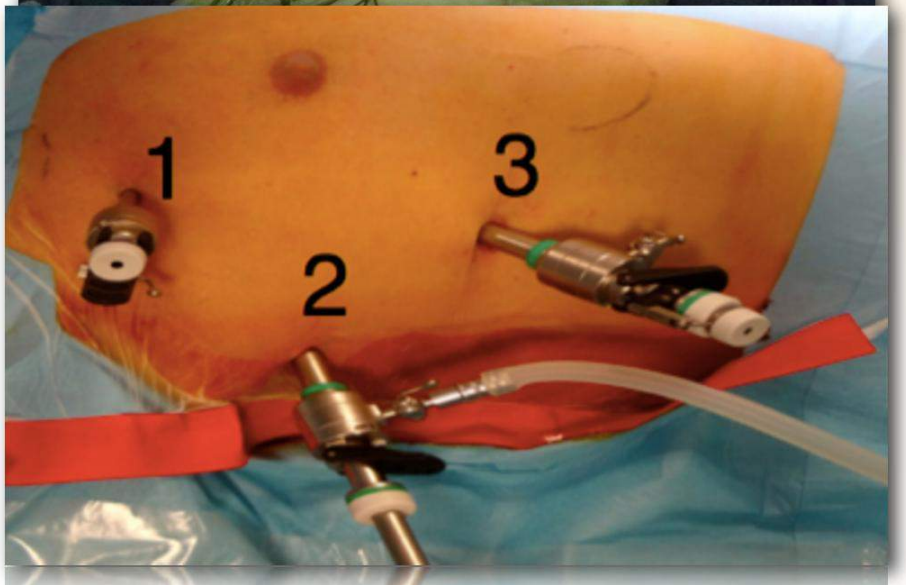

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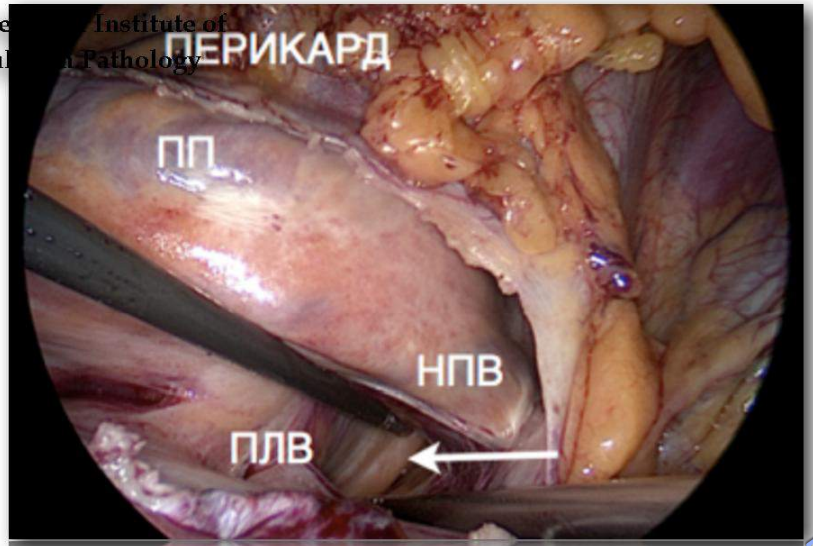

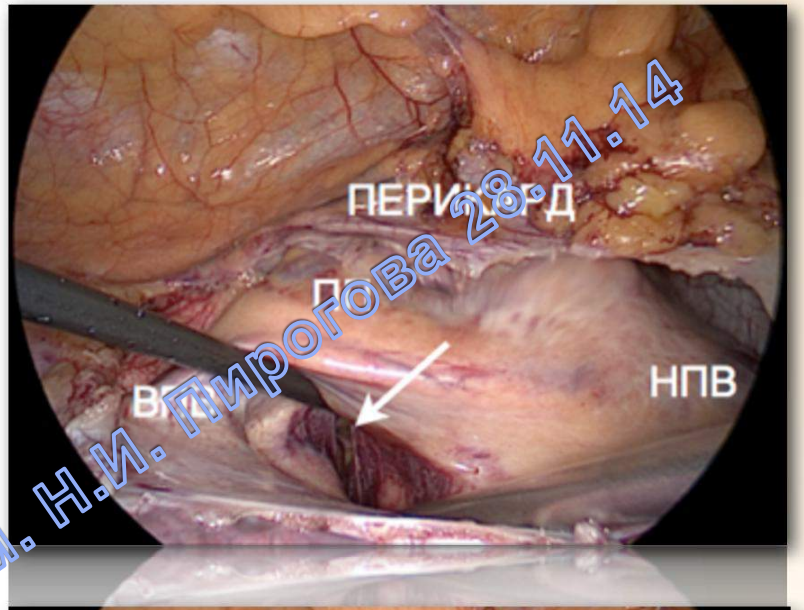

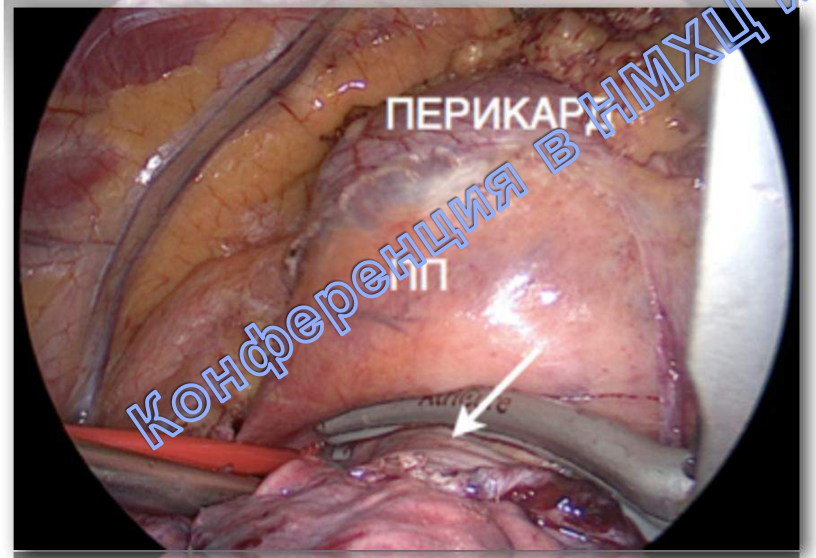

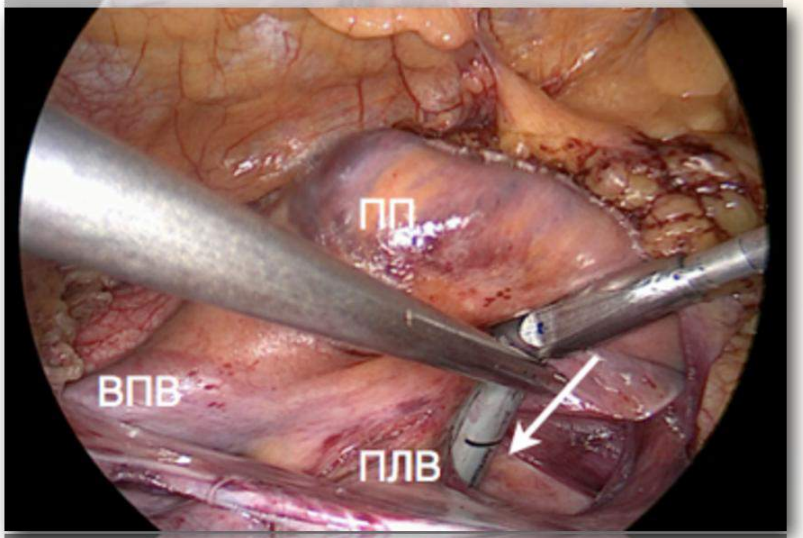

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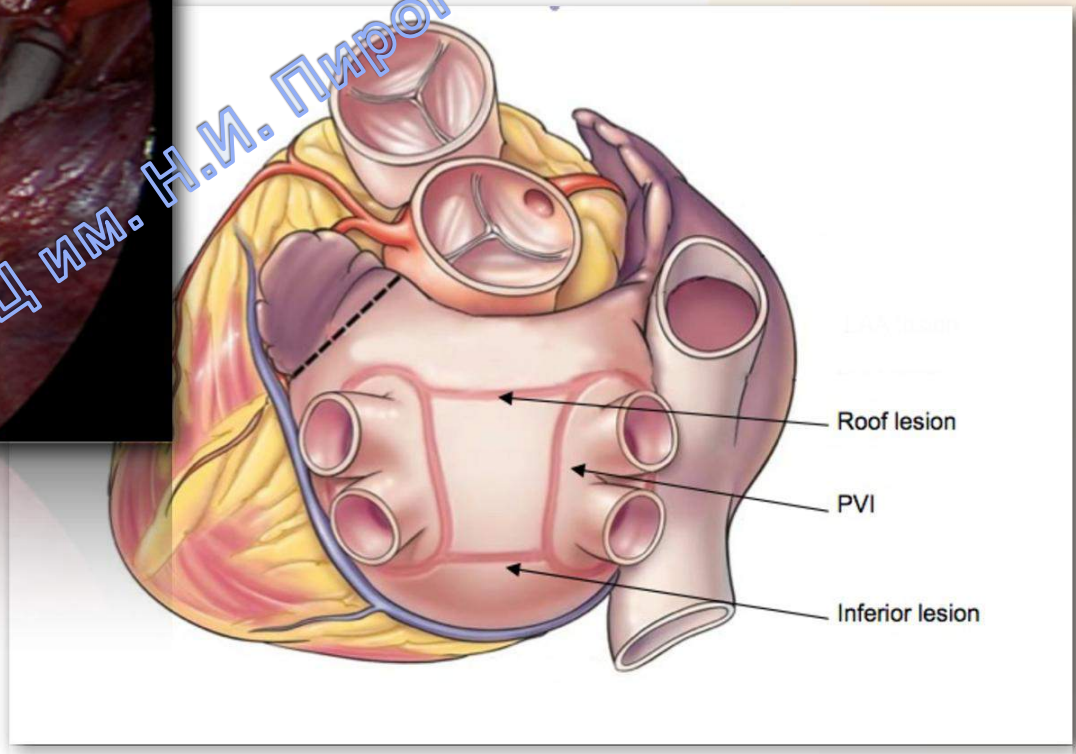

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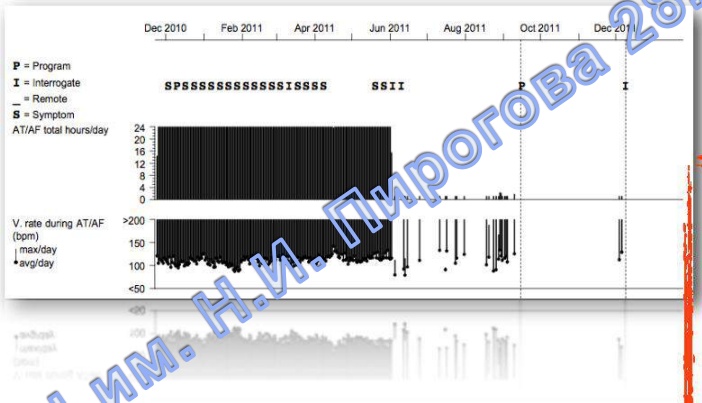
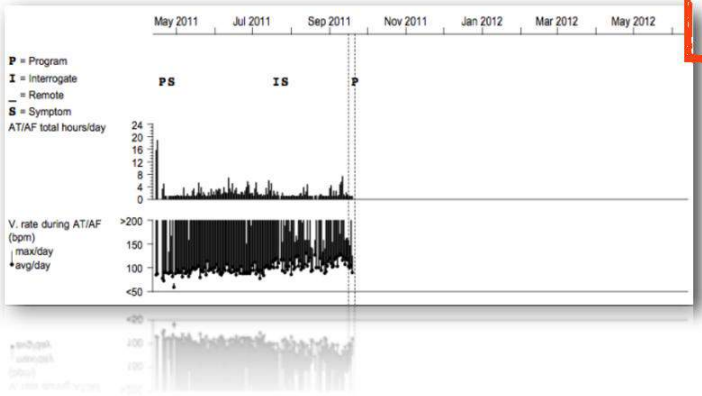
Аппарат длительного мониторирования ЭКГ

✓ Респондеры: AF%<0,5%



✓ Нереспондеры: AF%>0,5%



✓ Процент фибрилляции предсердий (0,5%) соответствует 99,5% времени сохранения синусового ритма

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Интраоперационные данные и данные послеоперационного периода

Результаты	n=30
Летальность, n (%)	0 (0%)
Стернотомия, n (%)	2(6,7%)
Время процедуры, минуты	150.4±28.7
Госпитальная ФП, n (%)	22(73%)
Выписано с ФП, n (%)	3(10%)
Длительность пребывания в стационаре (дней)	6.1±1.8
Имплантация ЭКС, n (%)	0(0%)

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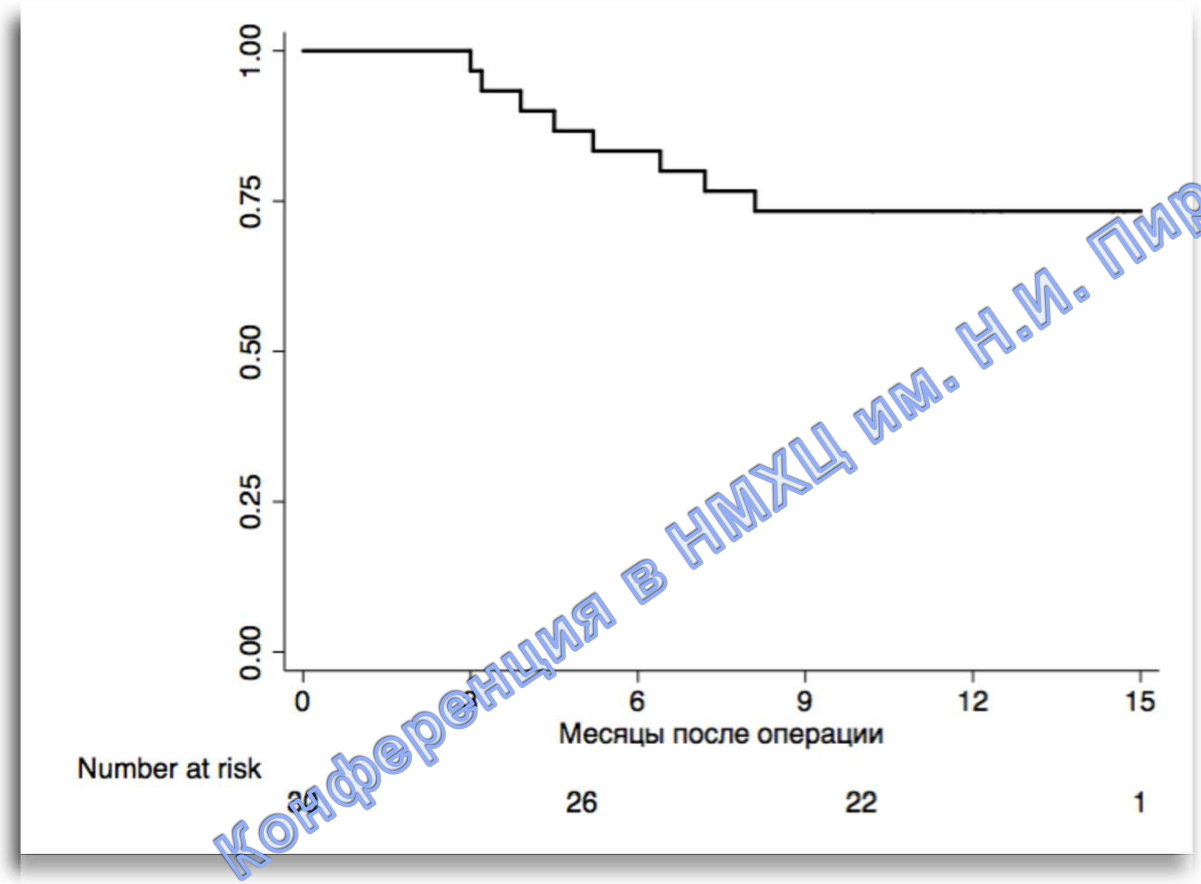
Результаты



Синусовый ритм сохранился у 73,3% пациентов в течение 12-ти месячного периода наблюдения

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Сравнение катетерной и торакоскопической аблации ФП

Catheter Versus Surgical Ablation of Atrial Fibrillation After a Failed Initial Pulmonary Vein Isolation Procedure: A Randomized Controlled Trial

EVGENY POKUSHALOV, M.D., PH.D.,* ALEXANDER ROMANOV, M.D.,* DMITRY ELESIN, M.D.,* ALEXANDER BOGACHEV-PROKOPHIEV, M.D.,* DENIS LOSIK, M.D.,* SEVDA BAIRAMOVA, M.D.,* ALEXANDER KARASKOV, M.D., PH.D.,* and JONATHAN S. STEINBERG, M.D.†

From the *State Research Institute of Circulation Pathology, Novosibirsk, Russia; and †The Valley Health System and Columbia University College of Physicians & Surgeons, New York, New York, USA

Catheter Versus Surgical Ablation. *Introduction:* The aim of this prospective randomized study was to compare the efficacy and safety of catheter ablation (CA) versus surgical ablation (SA) in the treatment of paroxysmal and persistent AF after failed initial pulmonary vein isolation procedure.

Methods and Results: Patients with a history of symptomatic AF after a previous failed first ablation procedure were eligible for this study. Patients were randomized to CA (n = 32) or SA (n = 32) redo ablation. The primary endpoint was recurrence of atrial tachyarrhythmia at 1 year of follow-up. At the 12-month follow-up, 26 (81%) of the 32 SA group patients and 15 (47%) of the 32 CA group were AF/AT-free on no antiarrhythmic drugs (P = 0.004, log-rank test). In patients with PAF, 17 (85%) patients of the 20 in SA group and 10 (56%) patients of the 18 in CA group were AF-free (P = 0.04, log-rank test). In patients with PersAF, 9 (75%) patients of the 12 in SA group and 5 (36%) patients of the 14 in CA group were AF-free (P = 0.04, log-rank test). The number of the serious adverse event in the SA group was significantly higher (1 CA group vs 7 SA group; P = 0.02).

Conclusion: In patients with PAF and PersAF after failed initial CA, SA is superior to CA for maintenance of sinus rhythm, although serious adverse event rate is significantly higher for SA. *(J Cardiovasc Electrophysiol, Vol. pp. 1-6)*

atrial fibrillation, catheter ablation, pulmonary vein isolation, surgical ablation

Introduction

Atrial fibrillation (AF) represents an important public health problem. Patients with AF have an increased long-term risk of stroke, heart failure, and all-cause mortality. Catheter ablation has proved effective in highly symptomatic patients with AF.[1] It is known that ablation of AF may be associated with a high rate of arrhythmia recurrence. The single-procedure success rate of catheter ablation is approximately 60% for paroxysmal AF (PAF) and 40% for persistent AF (PersAF).[2-4] Electrical reconnection of one or more pulmonary veins (PVs) is an almost universal finding among patients who return for a second AF ablation procedure following an initial catheter ablation (CA) or surgical ablation (SA) procedure.[1] There are no clinical markers that can reliably indicate the most appropriate approach for patients with recurrent AF. Recently, it was demonstrated that the efficacy of antiarrhythmic drug versus reablation in patients after failed initial ablation within the first year of follow-up by implantable loop recorder (ILR) was 27% and 58%, respectively.[5,6] The value of SA in this setting has not been evaluated. There is only one randomized study comparing CA and SA as the initial procedure for AF with very encouraging results, that is, efficacy rates of 36.5% and 65.6%, respectively.[7]

The aim of this prospective randomized unblinded study was to compare the efficacy and safety CA versus SA in the treatment of PAF and PersAF after failed initial pulmonary vein isolation procedure.

Целью данного проспективного рандомизированного исследования явилось сравнение эффективности и безопасности катетерной и хирургической аблации у пациентов с пароксизмальной и персистирующей ФП после первичной неэффективной эндокардиальной изоляции легочных вен.

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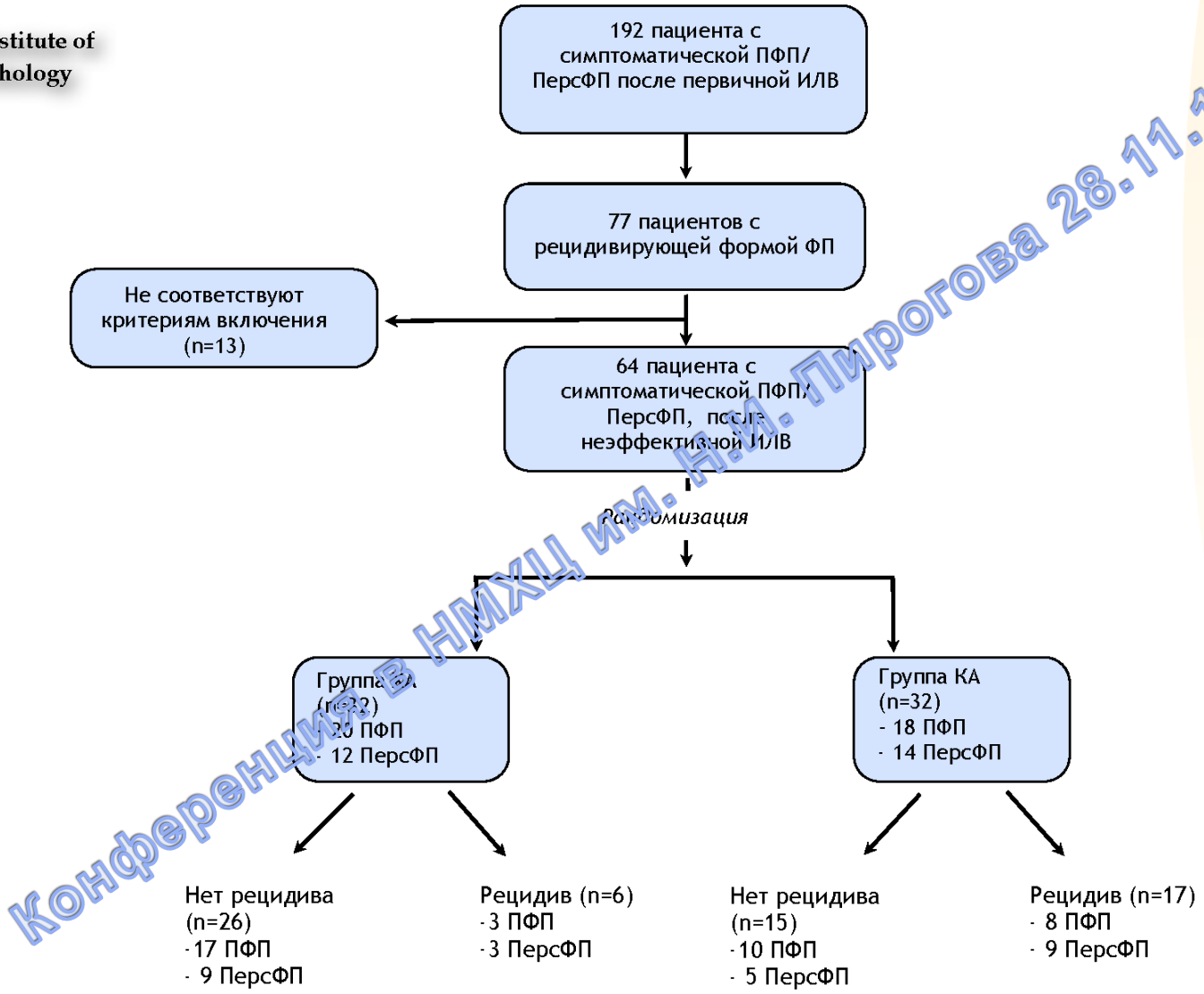
Дизайн иссследования



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Дооперационные характеристики пациентов

	ХА (n=32)	КА (n=32)	p
Возраст, лет	56 ± 7	57 ± 7	0.58
Пол (М/Ж), n	23/9	25/7	0.60
ПФП/ПерсФП	20/12	18/14	0.18
Гипертензия, n (%)	13 (40%)	11 (34%)	0.32
Сахарный диабет, n (%)	3 (9%)	4 (12%)	0.60
Перенесенный инсульт, n (%)	3 (9%)	2 (6%)	0.52
ФВ ЛЖ, %	55 ± 5	57 ± 6	0.36
ДЛП,мм	46 ± 5	45 ± 7	0.48
Продолжительность ФП, лет	5.2 ± 2.1	4.9 ± 1.9	0.12
Количество принимаемых ААП, n	1.7 ± 0.9	1.6 ± 0.8	0.62
ИМТ,кг/м2	28 ± 6	28 ± 5	0.83
Процент ФП (AF burden), %	35.1±33.7	39.1±32.1	0.62
CHADS2 score	0.6 ± 0.8	0.6 ± 0.9	0.58

Аблация ФП

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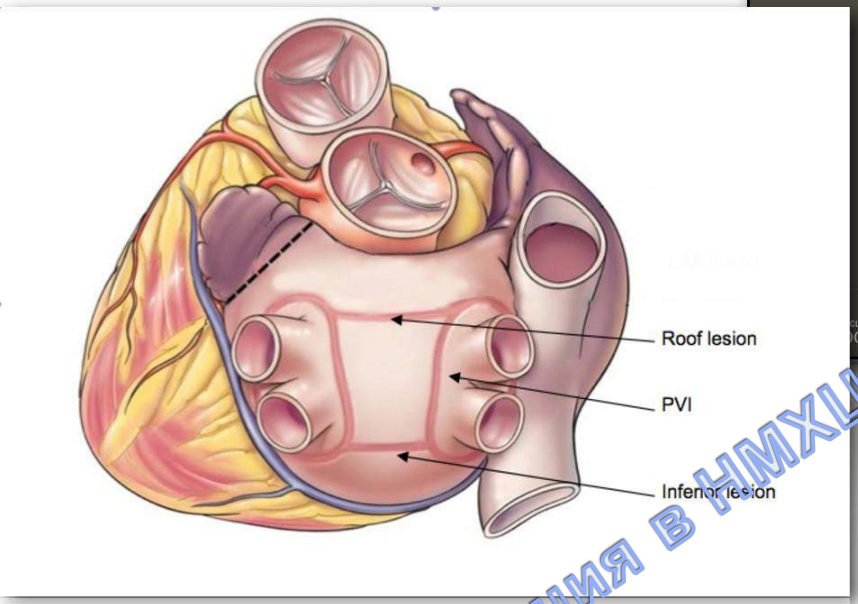
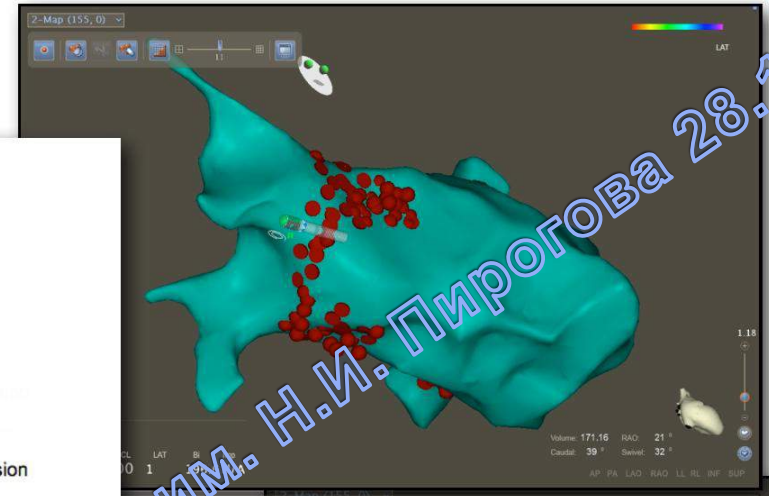
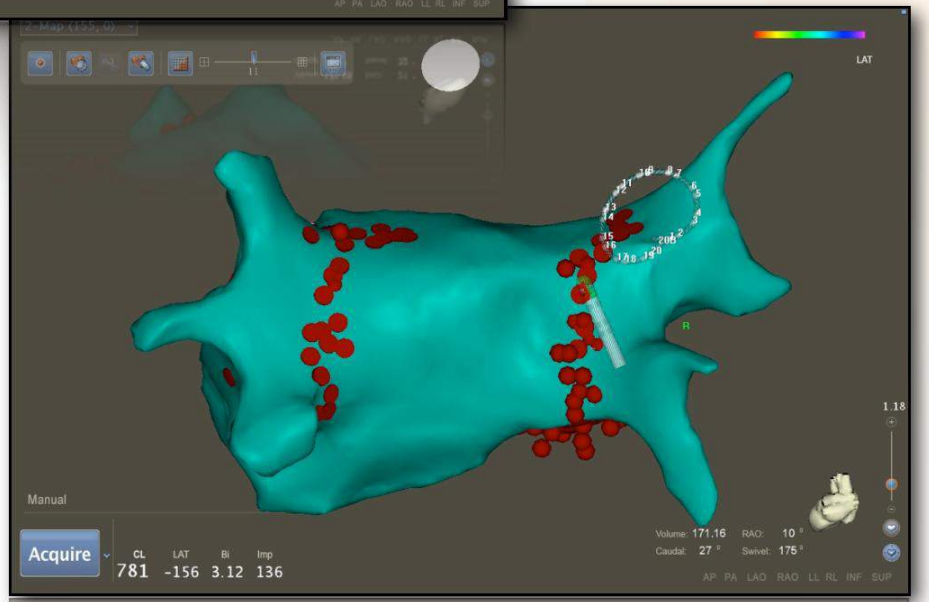
Катетерная аблация

Торакоскопия







Конференция в НМХЦ им. Н.И. Пирогова 28.11.14

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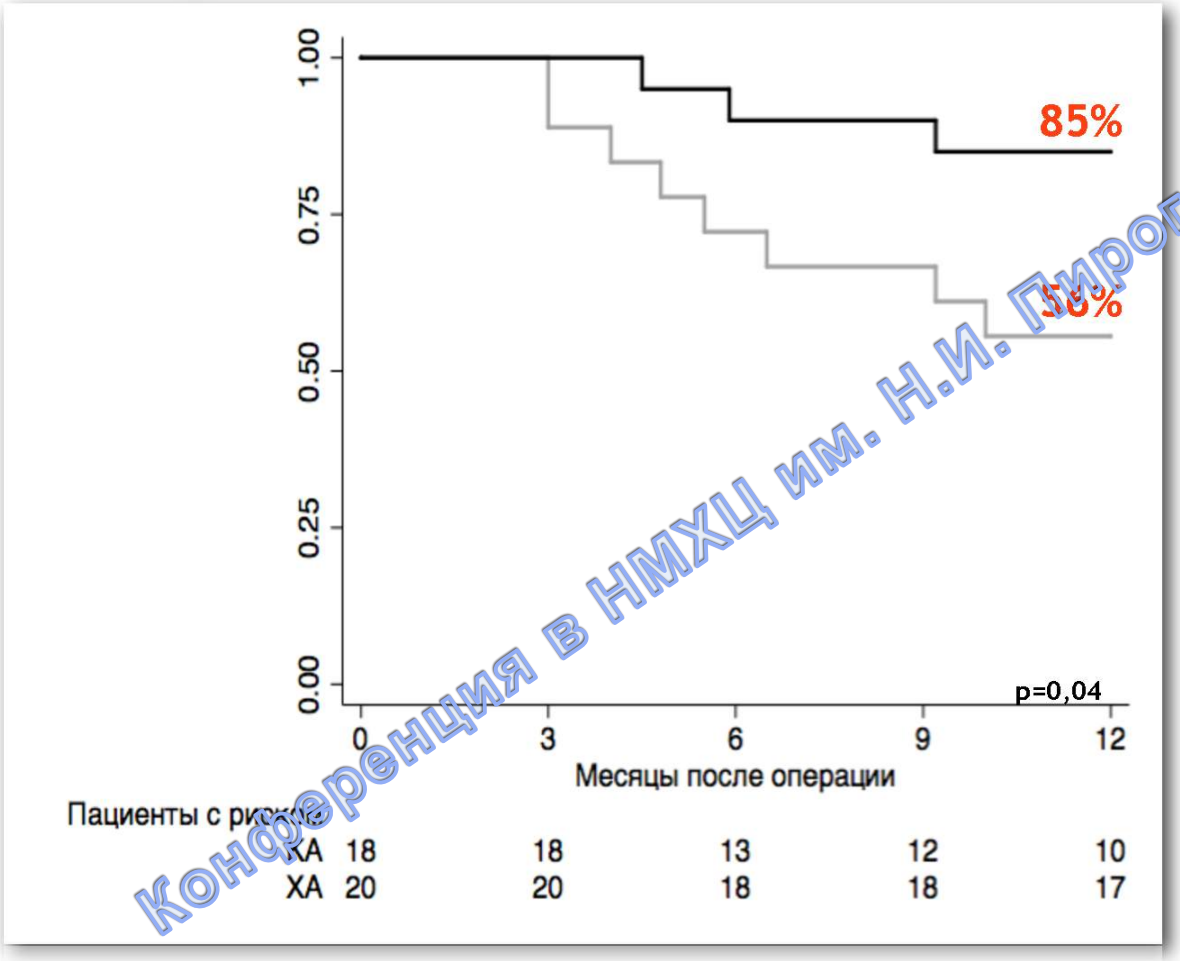
Результаты



Отсутствие рецидивов ФП/ТП/ ПТ у пациентов с пароксизмальной ФП

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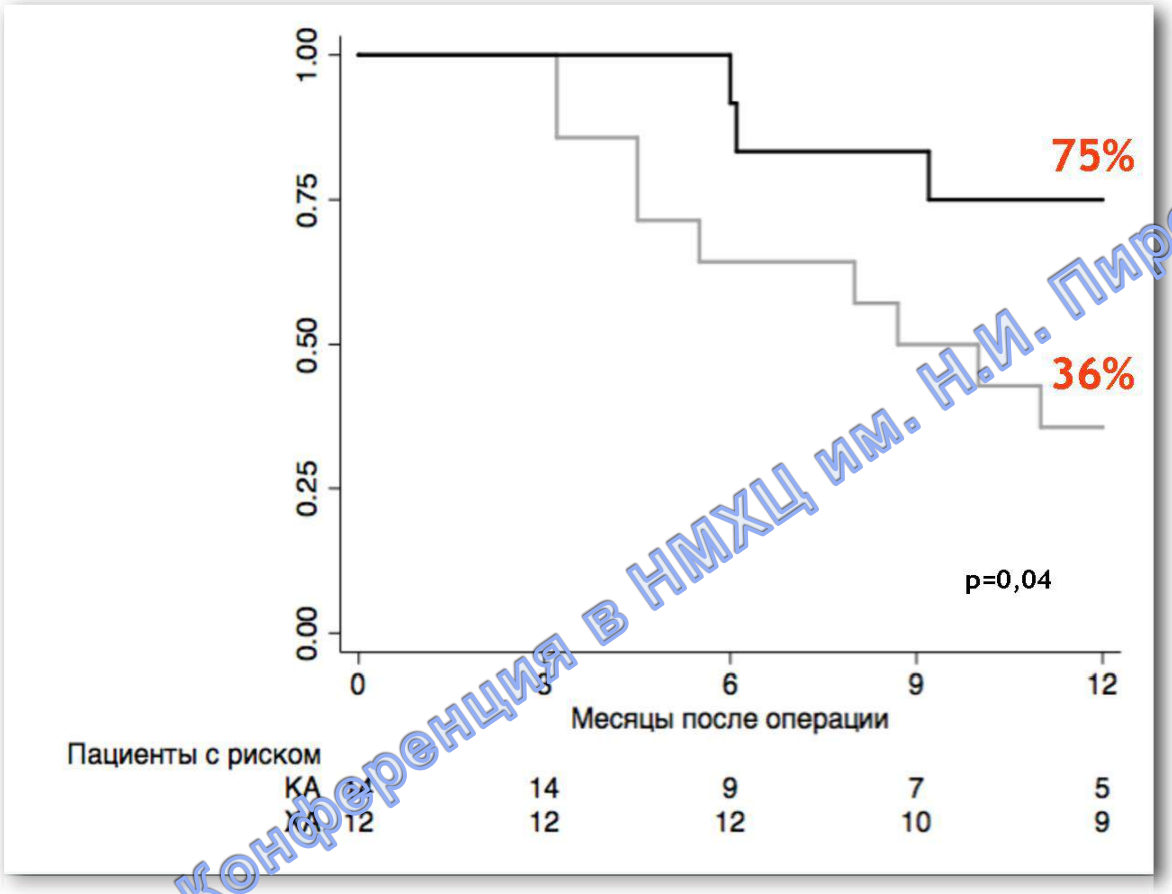
Результаты



Отсутствие рецидивов ФП/ТП/ ПТ у пациентов с персистирующей ФП

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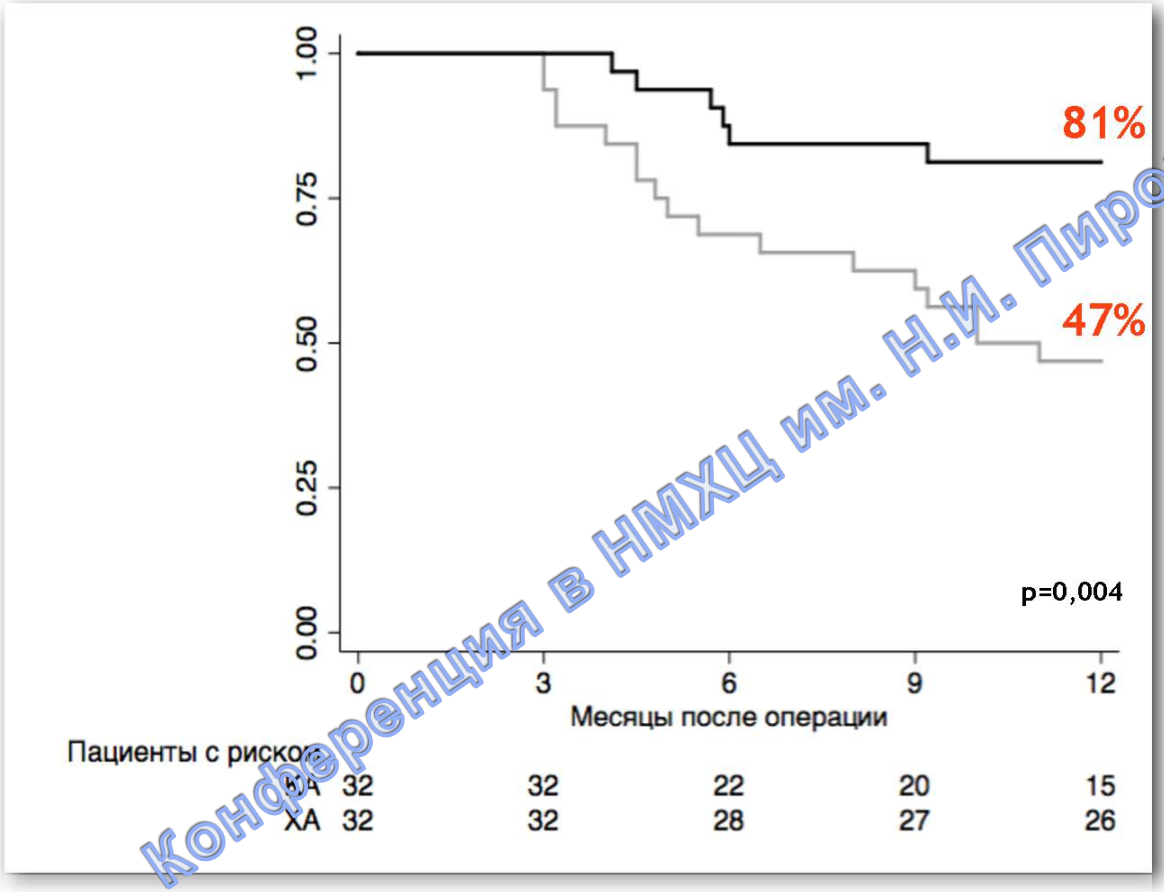
Результаты



- Отсутствие рецидивов ФП/ТП/ПТ у пациентов после повторной аблации в течение 12 месяцев послеоперационного наблюдения

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Неблагоприятные события в группе катетерной и хирургической аблации

	КА (n=32)	ХА (n=32)	P
Эксудативный перикардит/ тампонада	0	1	0.32
ТИА/инсульт	1	0	0.32
Пневмоторакс	0	3	0.08
Гематоракс/гидроторакс	0	3	0.08
Бедренная гематома	2	0	0.08
Левопредсердные тахикардии	3	1	0.30
Всего	6	8	0.5

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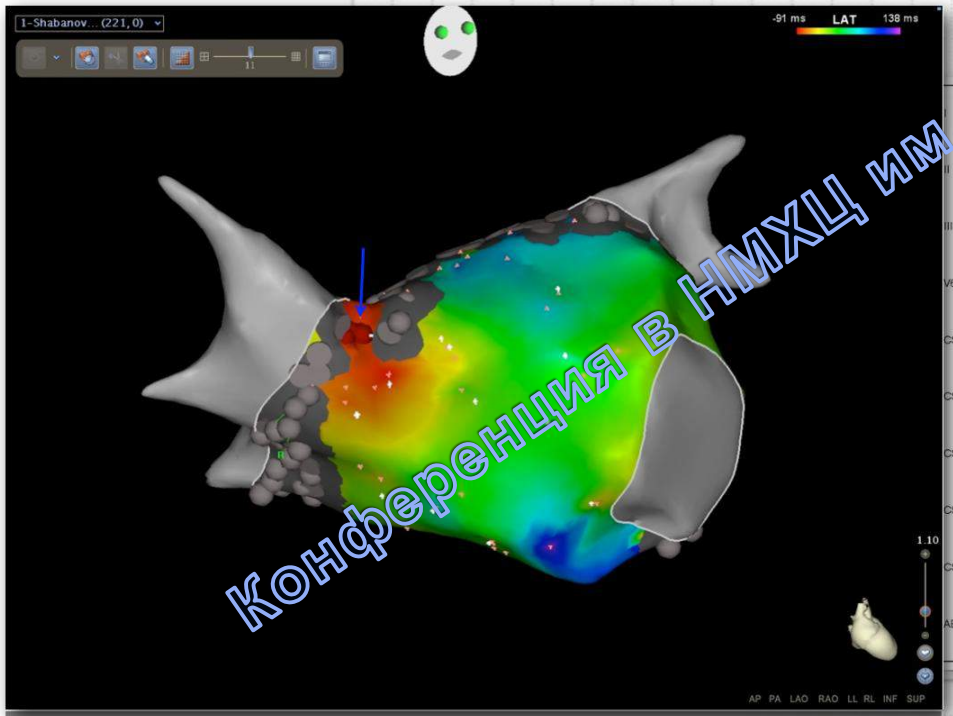
Клинический пример

Пациент Н. 59л.



Конференция в НМХЦ им. Н.И. Пирогова 28.11.14

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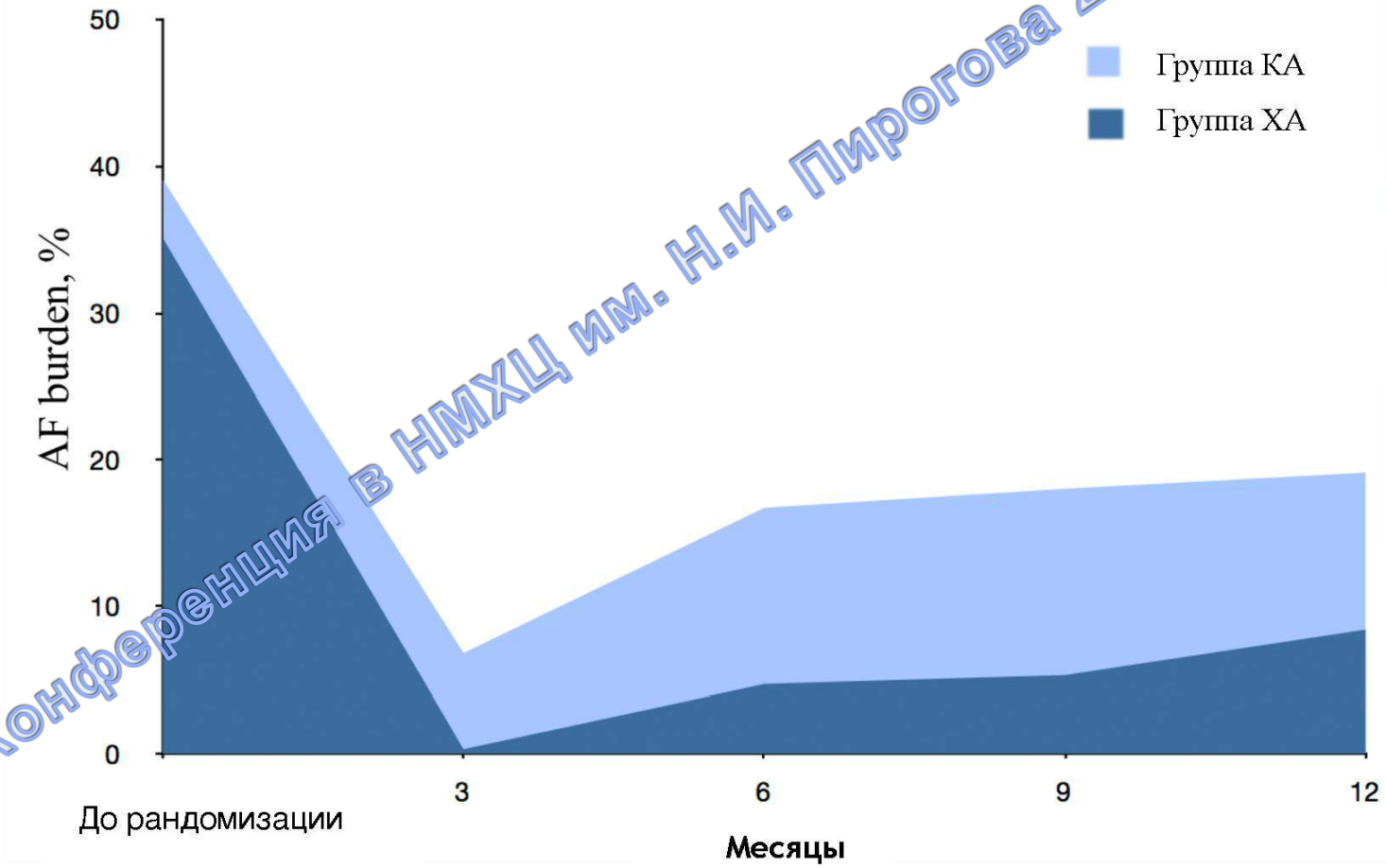
AF burden у пациентов каждой группы по данным ИКМ



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Заключение

Малоинвазивная торакоскопическая процедура абляции ЛП является безопасной и эффективной процедурой в лечении ФП.

У пациентов с пароксизмальной и персистирующей ФП после первичной неэффективной, эндокардиальной, радиочастотной катетерной абляции, торакоскопическая хирургическая абляция превосходит по эффективности катетерную абляцию.

EUROPEAN SOCIETY OF CARDIOLOGY®

EUROPEAN Heart Rhythm ASSOCIATION

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НОВОСИБИРСК

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