Atividade Especial da SBCCV no 73º Congresso da SBC

Mesa Redonda

Cirurgia Valvar: indicações para cirurgia e resultados atuais

Fibrilação Atrial Associada Deve Ser Tratada Sempre?

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Instituto de cardiologia
Fundação Universitária de Cardiologia

Declaração de Potencial Conflito de Interesse

Nome do Palestrante:

Renato A. K. Kalil

Título da Apresentação:

Fibrilação Atrial Associada
Deve Ser Tratada Sempre?

Não possuo nenhum conflito de interesse relacionado a esta apresentação

O PROBLEMA

Apesar das claras evidências de maior mortalidade e morbidade, inclusive AVCs, nos portadores de FA, parcela significativa dos casos sequer é tratada com anticoagulação.

Estudos em reversão a RS ou controle de FC apresentam resultados que confundem o bom entendimento.
Ensaios clínicos mal desenhados aumentam a confusão.

Na ablação por cateter e na cirurgia, a diversidade de métodos e de desfechos avaliados confunde a comparação dos resultados.

O PROBLEMA

É certo que a ablação e a cirurgia bem indicadas, em casos bem selecionados, resultam em recuperação do RS em mais de 90% e com baixo risco.

Se isto resulta em menos desfechos clínicos não está comprovado por ECR.
Na forma de investigação atual não há perspectiva de consenso a vista.

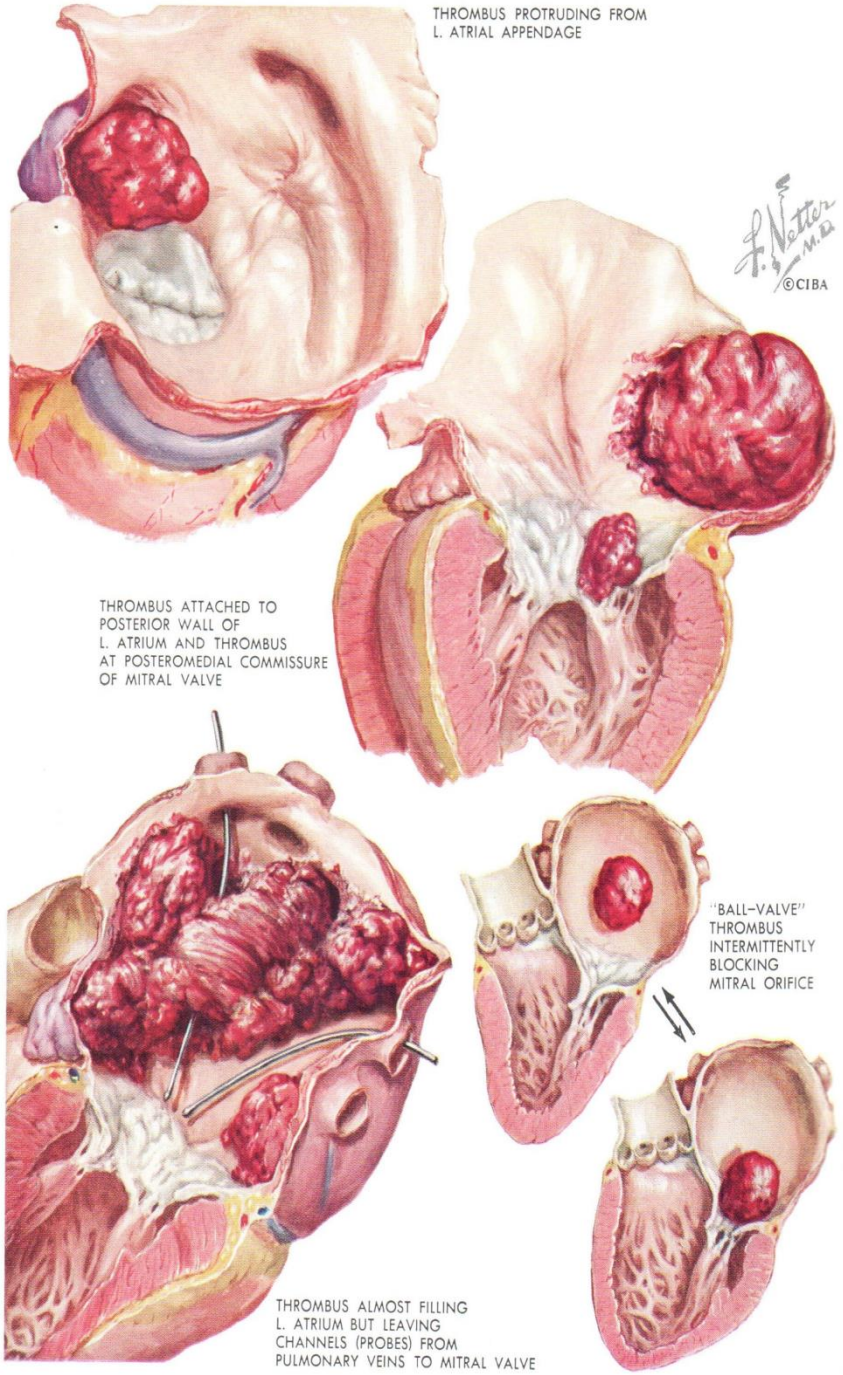
A contaminação pelas questões de mercado, em detrimento da integração entre especialidades, prejudica ainda mais o consenso.

Nesse cenário, descrever o real espaço da cirurgia é um desafio.
À exceção da doença mitral e dos centros ou cirurgiões que praticam o IVP, onde as dúvidas estão deixando de existir

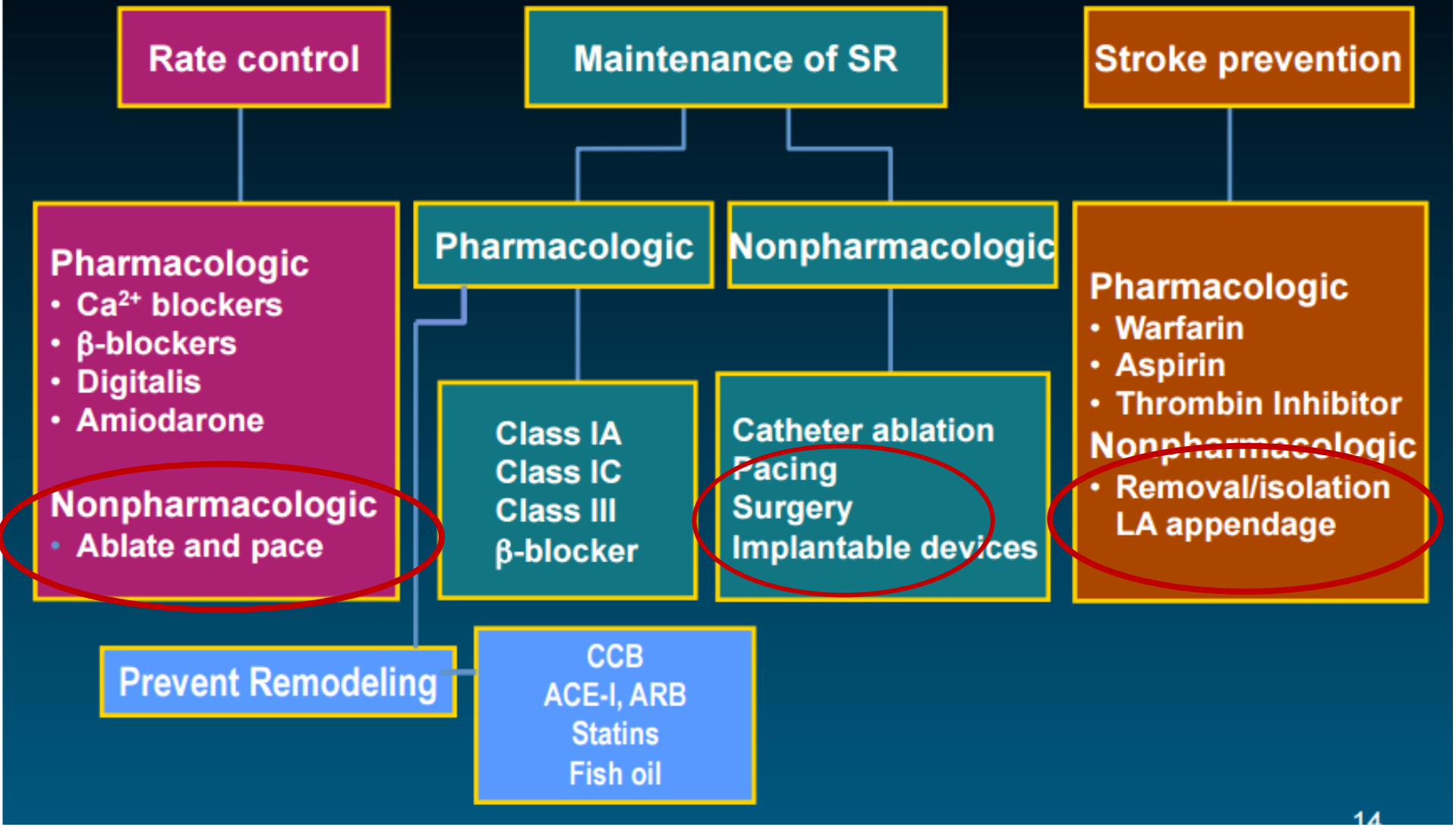
- *Cada verdade passa por 3 fases:*

na primeira é ridicularizada, na segunda é violentamente combatida, na última passa a ser aceita como evidente

Schopenhauer


THROMBUS PROTRUDING FROM
L. ATRIAL APPENDAGE
F. H. Netter M.D.
©CIBA
THROMBUS ATTACHED TO
POSTERIOR WALL OF
L. ATRIUM AND THROMBUS
AT POSTEROMEDIAL COMMISSURE
OF MITRAL VALVE
"BALL-VALVE"
THROMBUS
INTERMITTENTLY
BLOCKING
MITRAL ORIFICE
THROMBUS ALMOST FILLING
L. ATRIUM BUT LEAVING
CHANNELS (PROBES) FROM
PULMONARY VEINS TO MITRAL VALVE

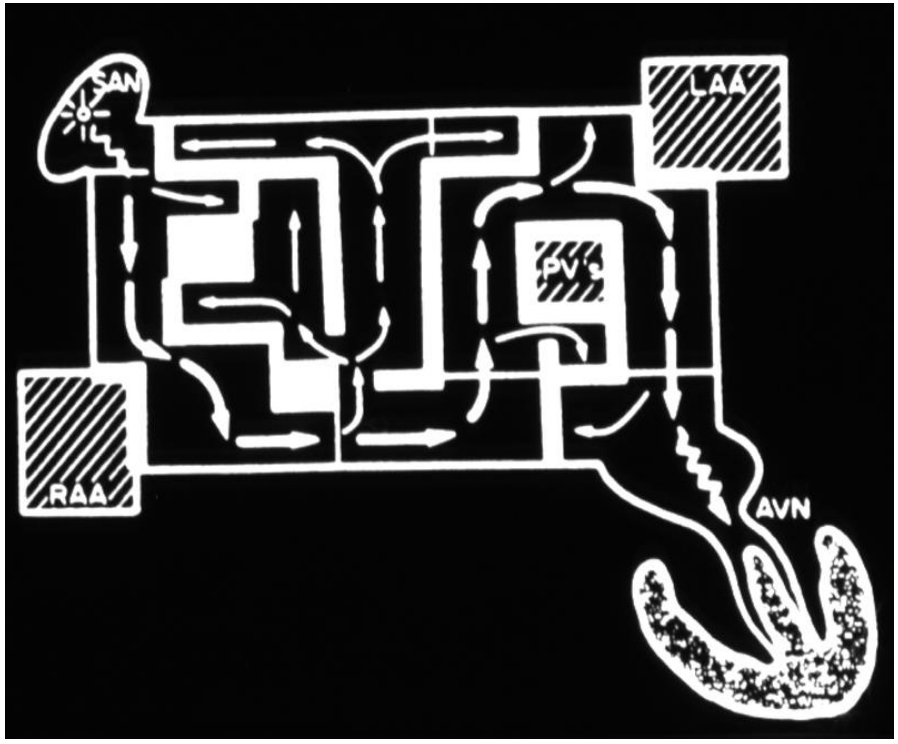
Treatment Goals and Strategies



Hugh Calkins, Johns Hopkins Medical Institutions

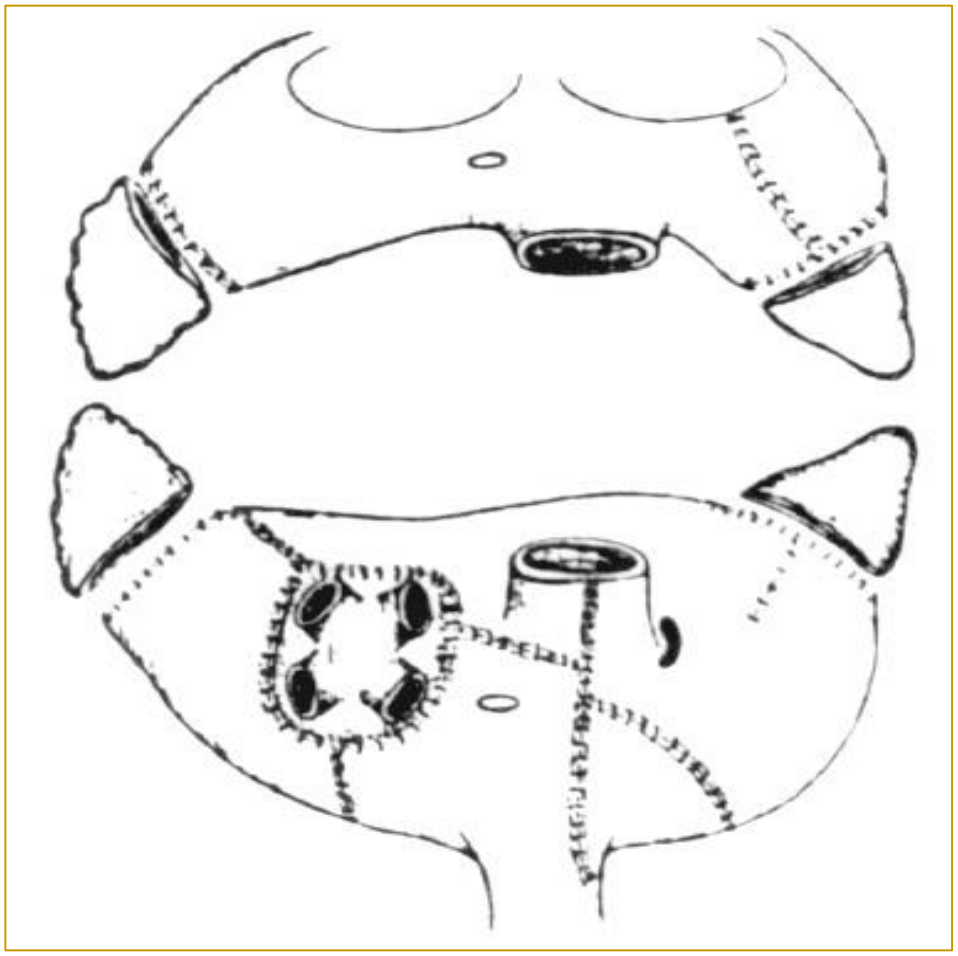
The Cox-Maze: A landmark procedure

James L. Cox



- 1987 - Barnes Hospital, Washington University St. Louis, Mo

Cox: Maze Procedure for Atrial Fibrillation



Ann Thorac Surg 1993;55:578-80

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

TABLE 2. Patient demographics

	Lone Maze procedure	Concomitant maze procedure	*P* value
Age (y)	51.3 ± 10.5	58.8 ± 9.9	<.001
Sex (M:F)	90:22	53:33	.003
PAF:PTAF	72:40	45:41	.08
Pump time (min)	162 ± 35	201 ± 42	<.001
Crossclamp time (min)	93 ± 34	122 ± 37	<.001
Mortality	2/112, 1.8%	1/86, 1.2%	.99
Median ICU stay (d)	2	3	.007
Median LOS (d)	9	12	.01

PAF, Paroxysmal atrial fibrillation; *PTAF,* persistent atrial fibrillation; *LOS* length of stay.

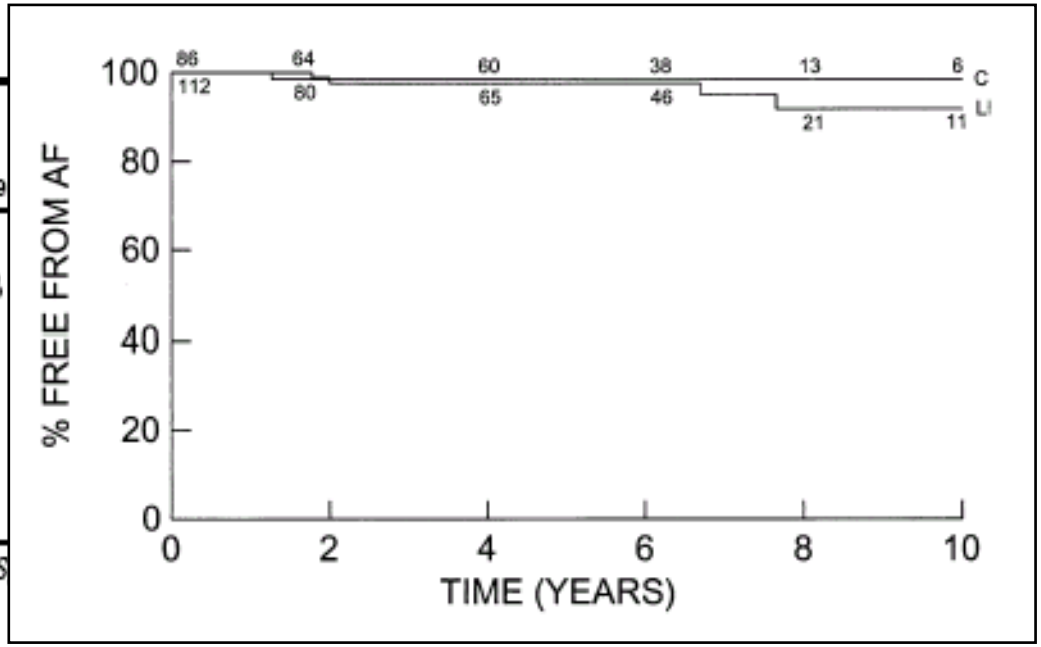
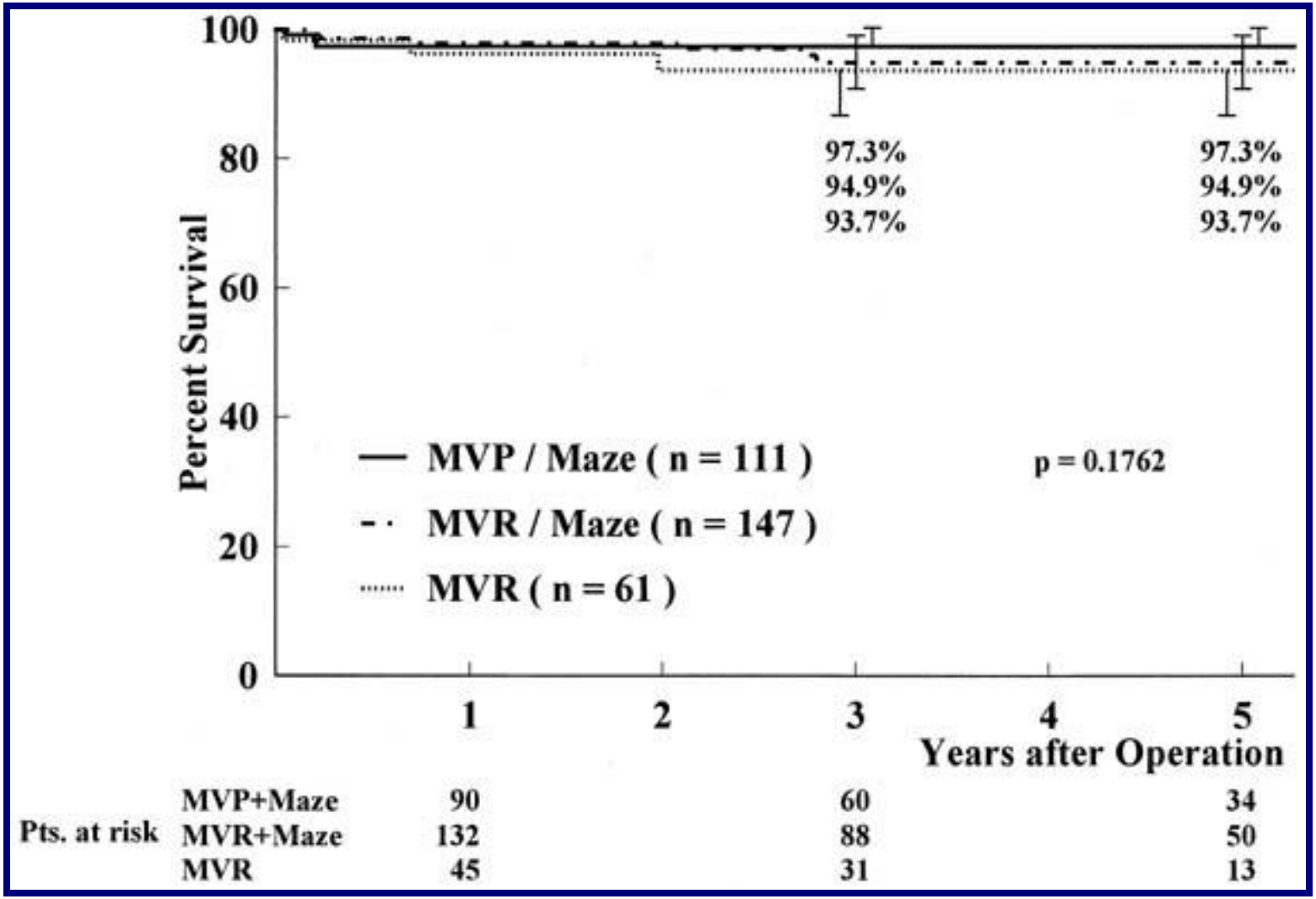
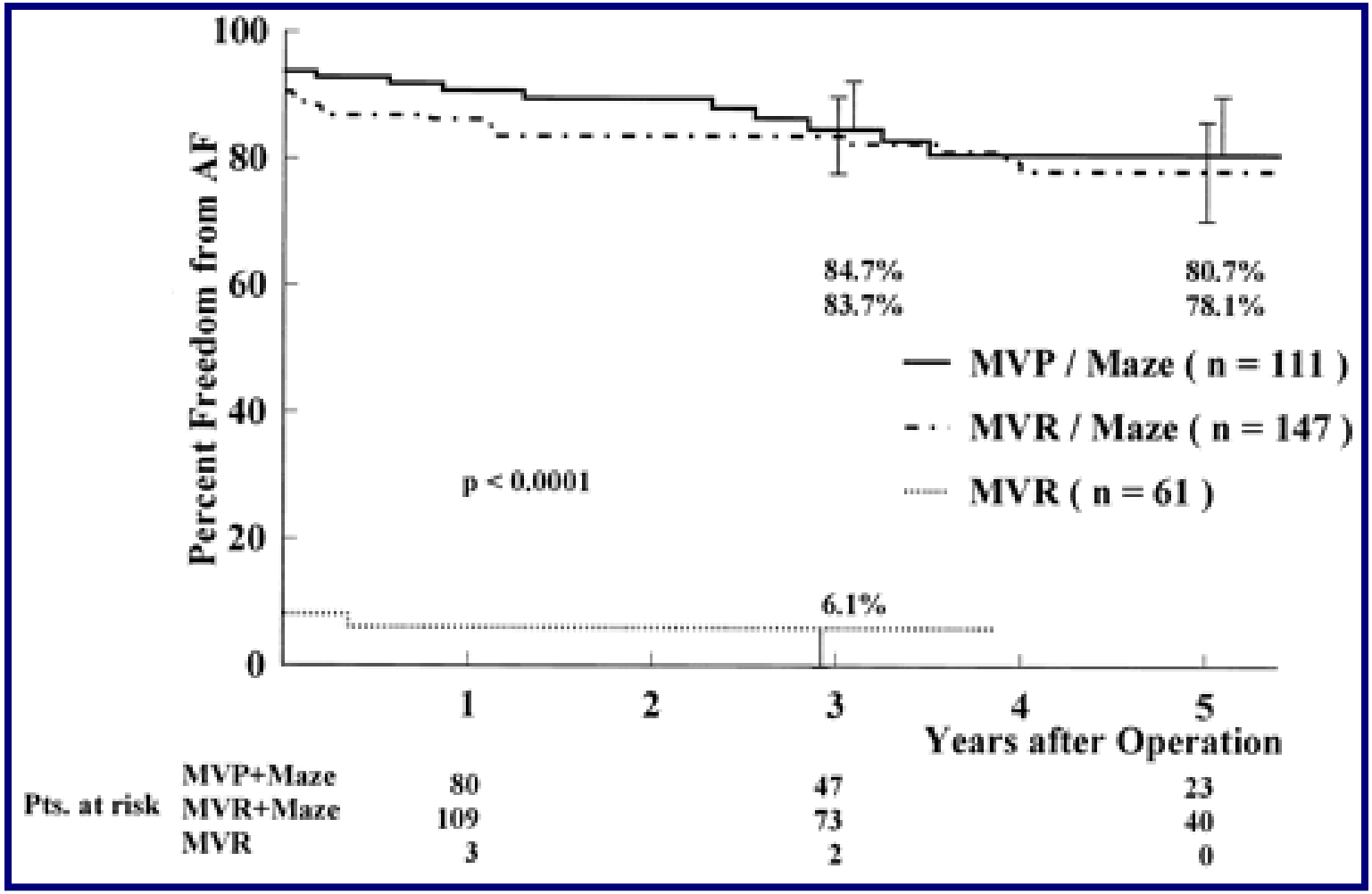


Figure 1. Kaplan-Meier survival analysis of freedom from recurrent AF. The numbers on each line indicate the number of patients at risk. There was no difference in the long-term estimate of freedom from AF between the lone maze group *(L)* and the concomitant group (*C*; *P* = .64).

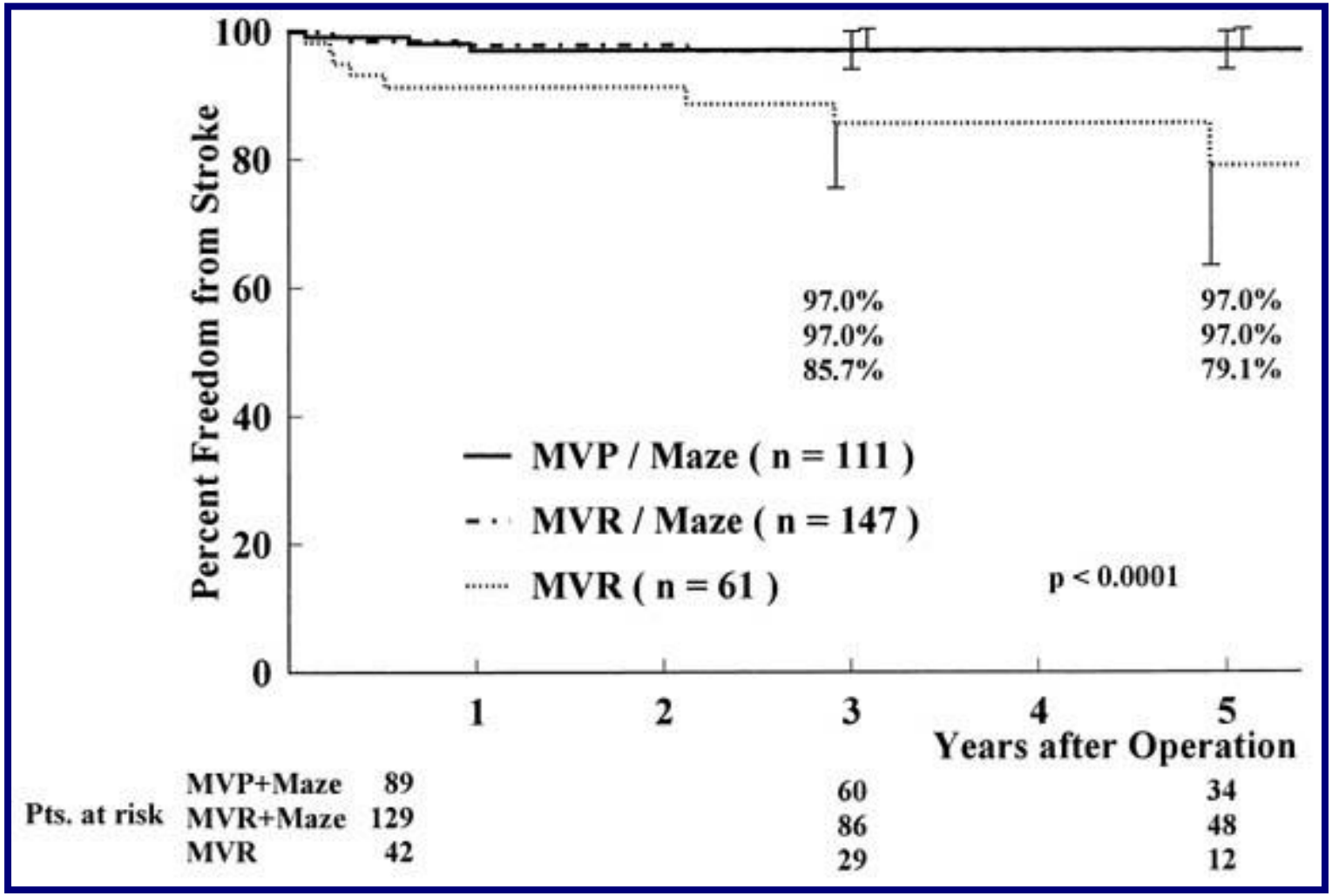
J Thorac Cardiovasc Surg 2003;126:1822-8



Actuarial survival curves for MVP/maze (*solid line*, n = 111), MVR/maze (*long and short dashed line*, n = 147), and MVR (*dotted line*, n = 61) groups. *Error bars* indicate 95% confidence interval. *P* = .1762 by log-rank test. *Impact of Cox maze procedure on outcome in patients with atrial fibrillation and mitral valve disease. Bando, Ko. et col. J Thorac Cardiovasc Surg, 2002;(3) 124:575-583*



Freedom from recurrence of atrial fibrillation *(AF)* curves for MVP/maze (*solid line*, n = 111), MVR/maze (*long and short dashed line*, n = 147), and MVR (*dotted line*, n = 61) groups. *Error bars* indicate 95% confidence interval. *P* < .0001 by log-rank test.
Impact of Cox maze procedure on outcome in patients with atrial fibrillation and mitral valve disease. Bando, Ko. et col. J Thorac Cardiovasc Surg, 2002;(3) 124:575-583



Freedom from late stroke curves for MVP/maze (*solid line*, n = 111), MVR/maze (*long and short dashed line*, n = 147), and MVR (*dotted line*, n = 61) groups. *Error bars* indicate 95% confidence interval. *P* < .0001 by log-rank test. *Impact of Cox maze procedure on outcome in patients with atrial fibrillation and mitral valve disease. Bando, Ko. et col. J Thorac Cardiovasc Surg, 2002;(3) 124:575-583*

Long-term outcomes after surgery for rheumatic mitral valve disease:
valve repair versus mechanical valve replacement

n=540
Repair =122
Replacement =418

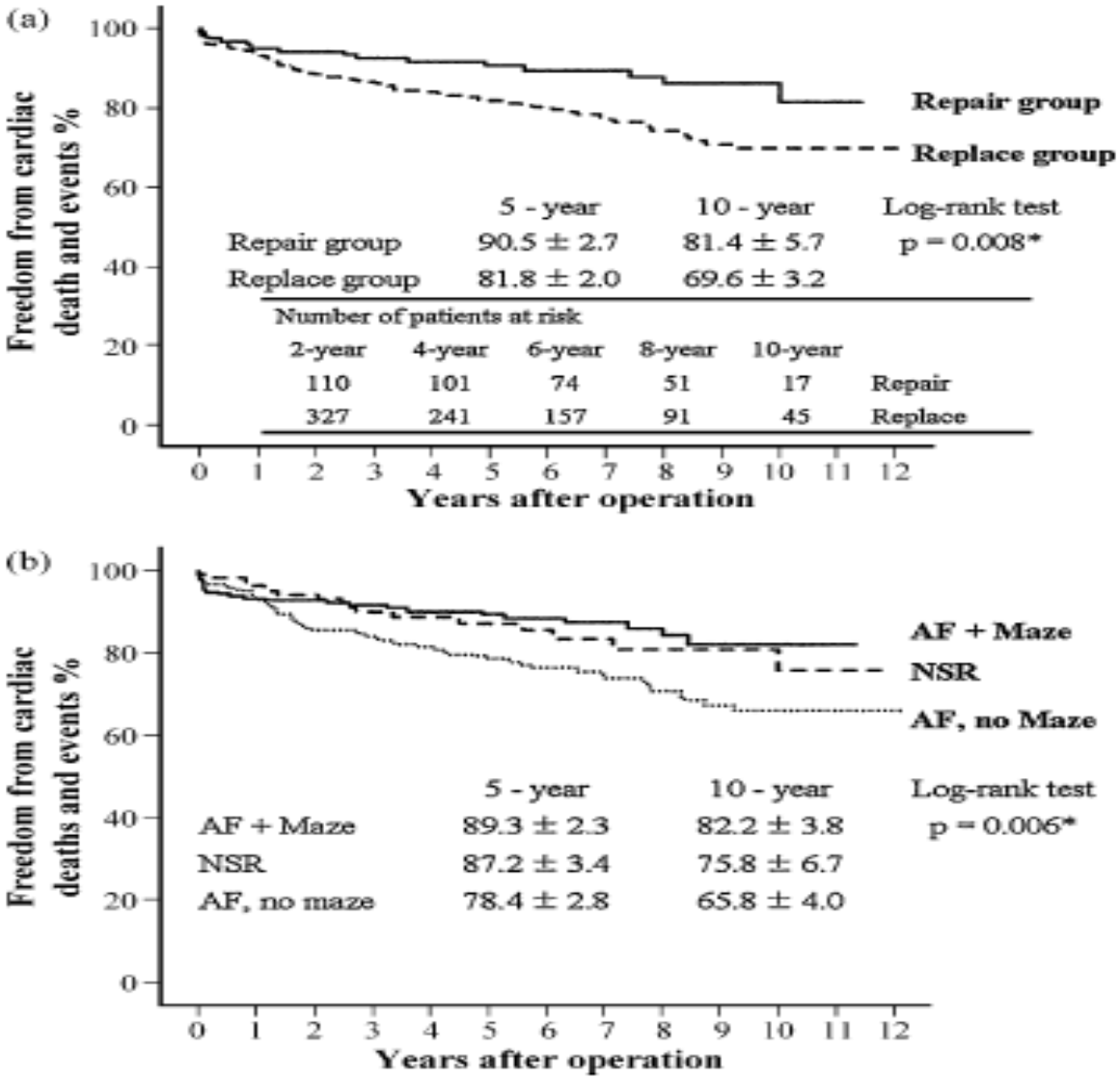
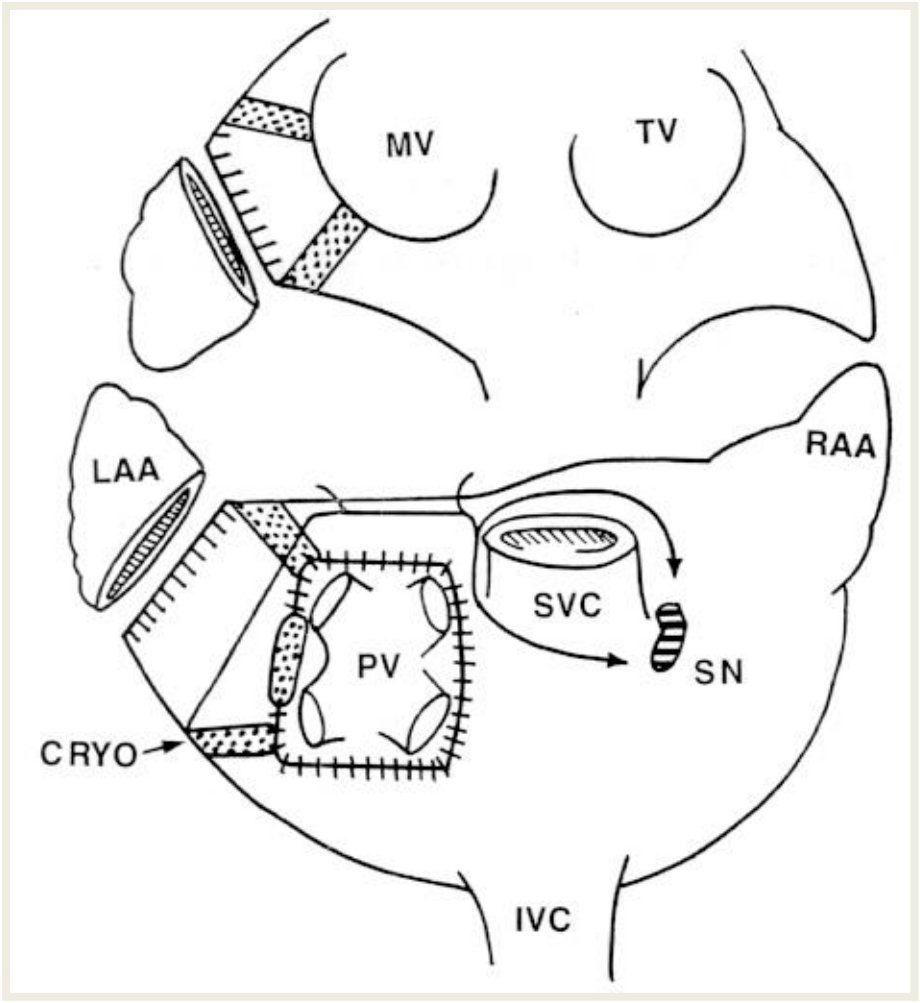


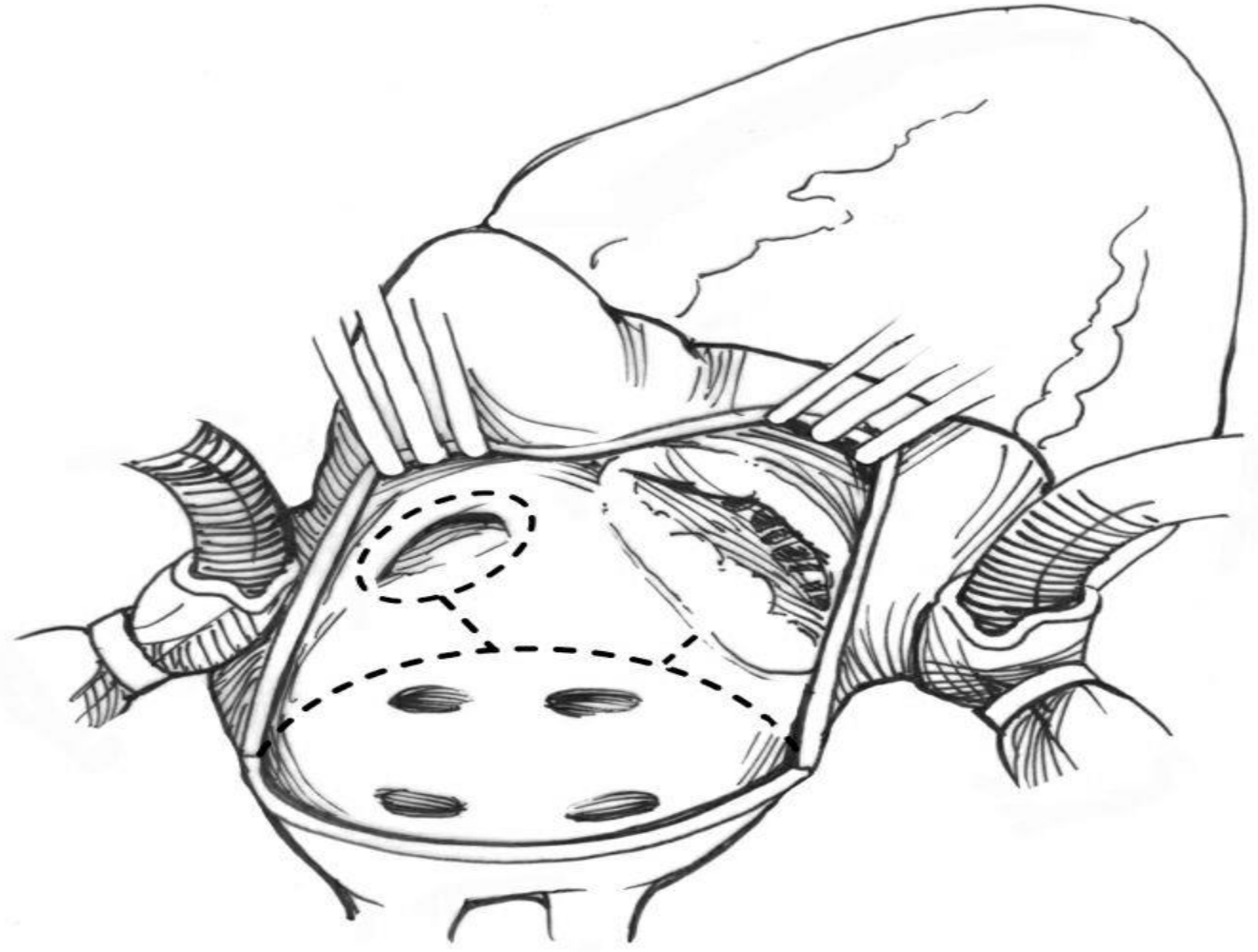
Fig. 2. Unadjusted Kaplan–Meier curves for freedom from cardiac death and major events. (a) Outcomes following MV repair versus replacement. (b) Outcomes according to the presence of atrial fibrillation and undergoing a maze procedure.

J.B. Kim et al. (Seoul)
European Journal of Cardio-thoracic Surgery 37 (2010) 1039—1046



Left Atrial Procedure for Atrial Fibrillation.
Sueda, T. et al. Ann Thorac Surg 1996;62:1796-800.

Mini-Maze Procedure



Técnica cirúrgica simplificada pode ser eficaz no tratamento da fibrilação atrial crônica secundária a lesão valvar mitral?

Renato A. K. KALIL*, Gustavo G. LIMA*, Rogério ABRAHÃO*, Márcio L. STÜRMER*, Álvaro ALBRECHT*, Paulo MORENO*, Tiago L. L. LEIRIA*, Leonardo M. PIRES*, João Ricardo M. SANT'ANNA*, Paulo R. PRATES*, Ivo A. NESRALLA*

IVP n=7 **Labirinto n=57**

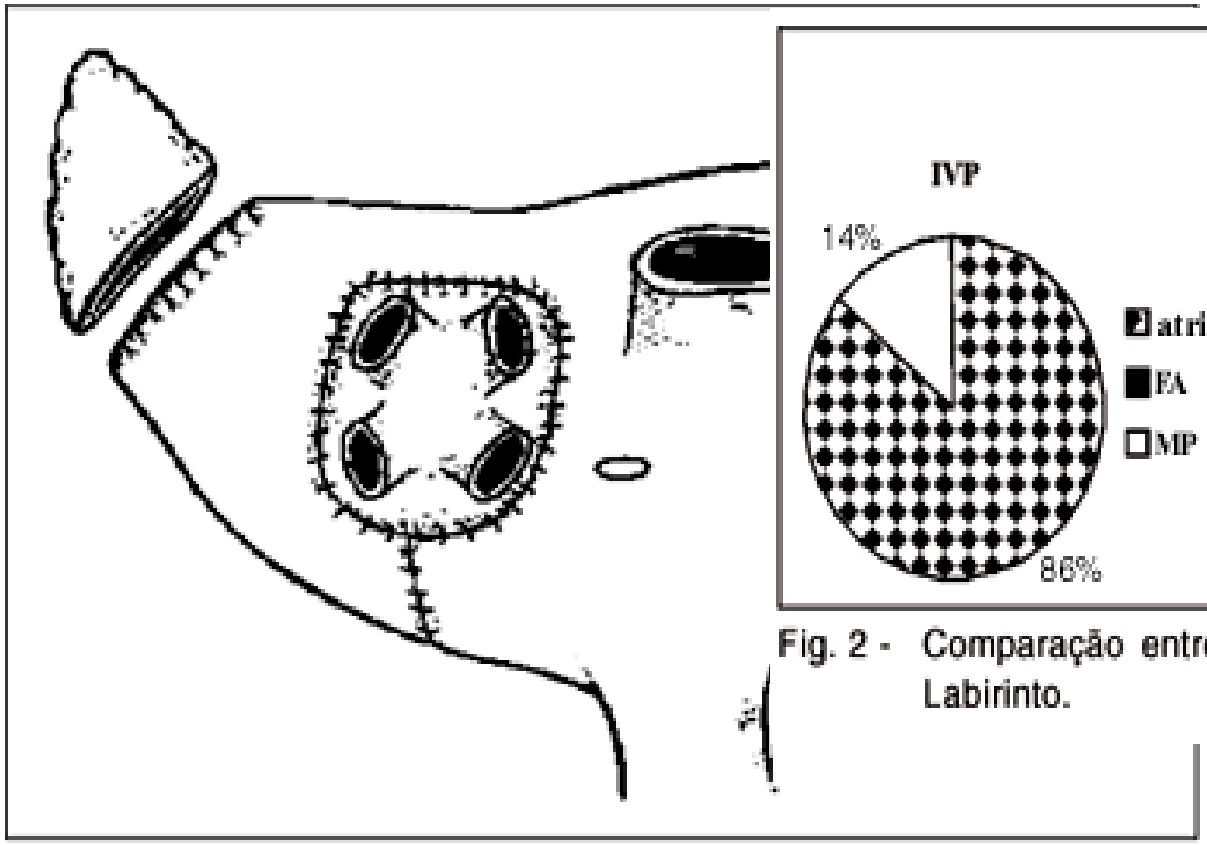


Fig. 1 - IVP visão anatômica e esquemática.

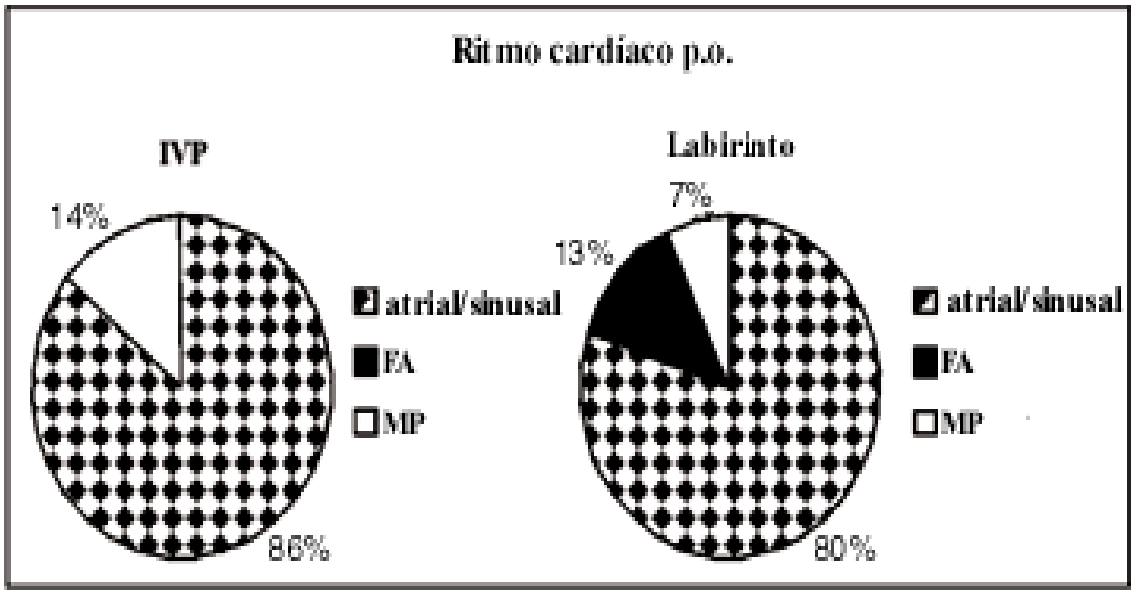


Fig. 2 - Comparação entre os ritmos cardíacos das séries IVP e Labirinto.

Rev Bras Cir Cardiovasc vol.15 n.2 São Paulo Apr./June 2000

Simple Surgical Isolation of Pulmonary Veins for Treating Secondary Atrial Fibrillation in Mitral Valve Disease

Renato A. K. Kalil, MD, PhD, Gustavo G. Lima, MD, MSc, Tiago L. L. Leiria, MD, Rogério Abrahão, MD, Leonardo M. Pires, MD, Paulo R. Prates, MD, and Ivo A. Nesralla, MD, PhD

Instituto de Cardiologia do Rio Grande do Sul, Fundação Universitária de Cardiologia, Porto Alegre, Brazil

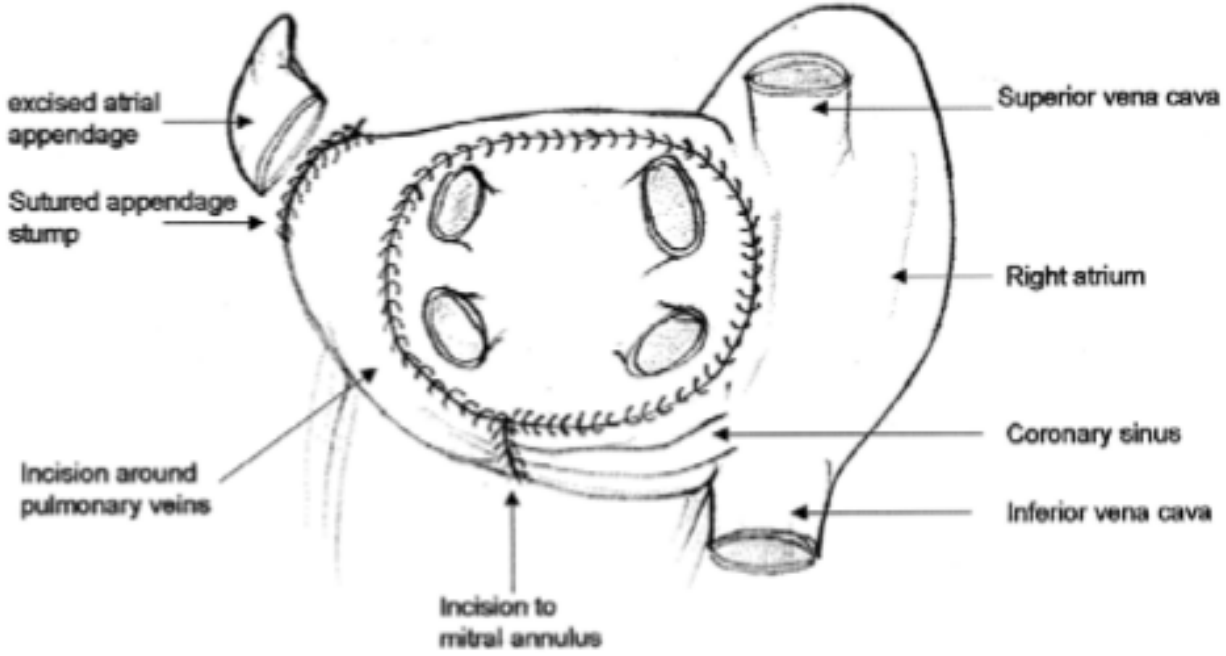
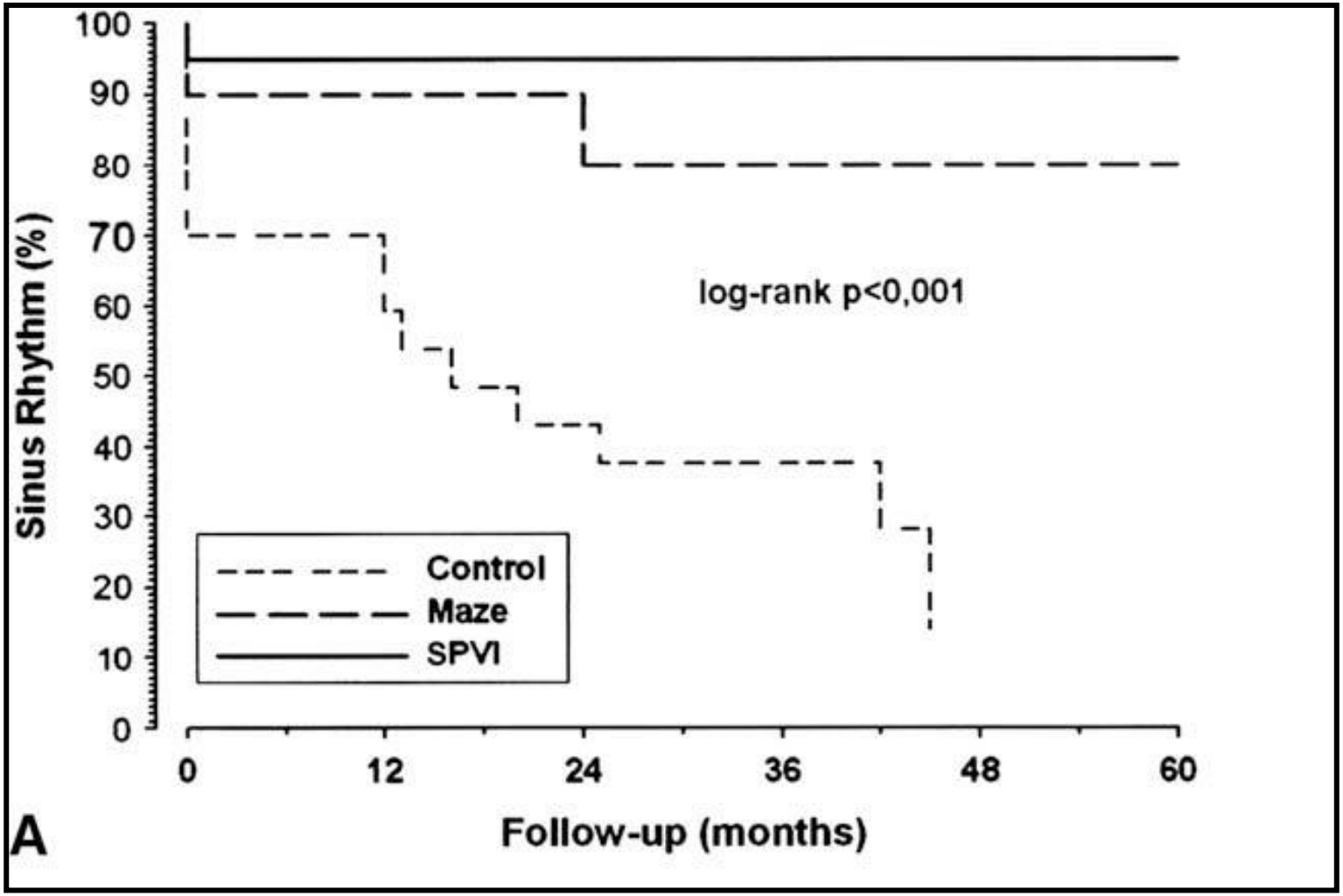


Fig 1. Three-dimensional posterior view of the heart after the procedure showing the suture line around the four pulmonary veins, exclusion of left atrial appendage, and perpendicular incision directed into the mitral annulus. (Reprinted from Kalil RAK, et al, Ann Thorac Surg; 2002;73:1022, with permission.)

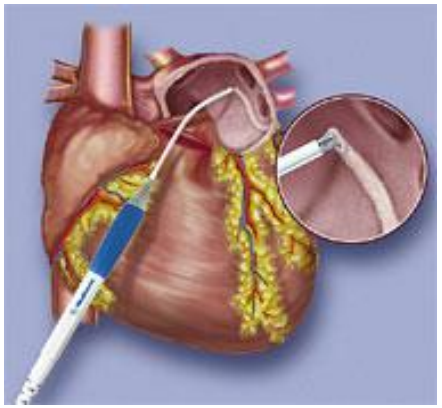
Ann Thorac Surg 2002;73:1169-1173.



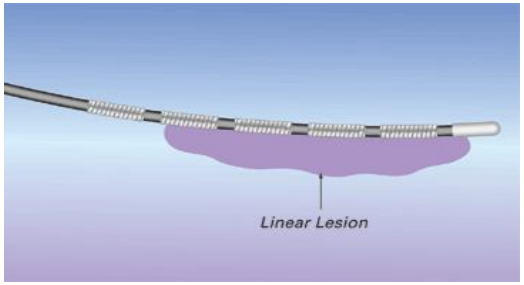
Randomized study of surgical isolation of the pulmonary veins for correction of permanent atrial fibrillation associated with mitral valve disease

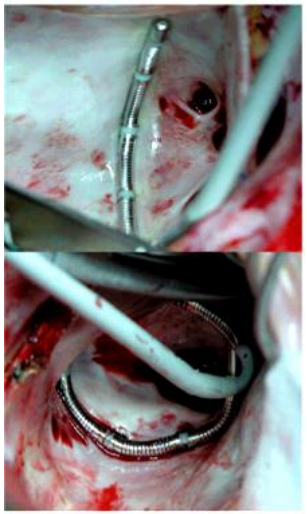
Alvaro Albrecht, MD, Renato A. K. Kalil, MD, PhD, Luciana Schuch, MD, Roge´rio Abraha˜o, MD, Joao Ricardo M. Sant'Anna, MD, PhD, Gustavo Lima, MD, PhD, FACC, and Ivo A. Nesralla, MD, PhD

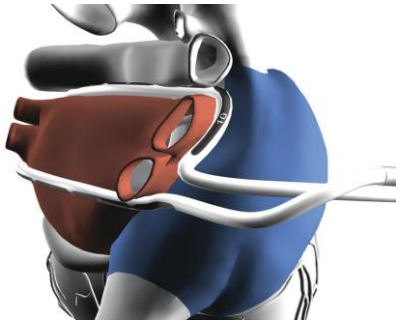
J Thorac Cardiovasc Surg. 2009 Aug;138(2):454-9.




COBRA Adhere™
Creates epicardial lesions
Cooled probe increases lesion depth
Suction Technology
– Optimizes adhesion to tissue for hands-free use on beating heart
– Protects surrounding tissue from inadvertent heating
COBRA Adhere XL™
Designed for minimally invasive approach
Ensures continuous box lesion with no gaps while providing tissue shielding


Linear Lesion



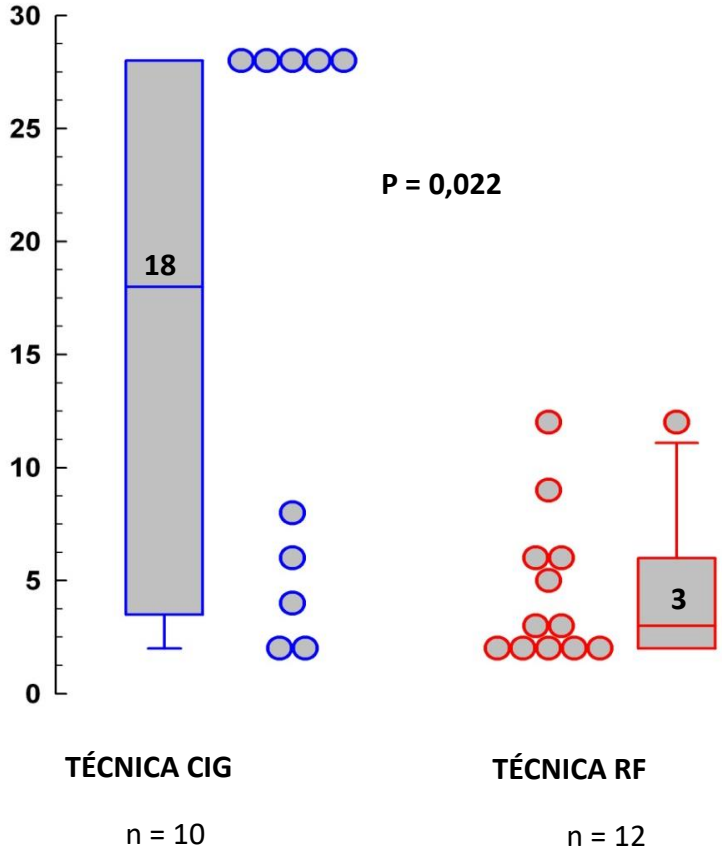


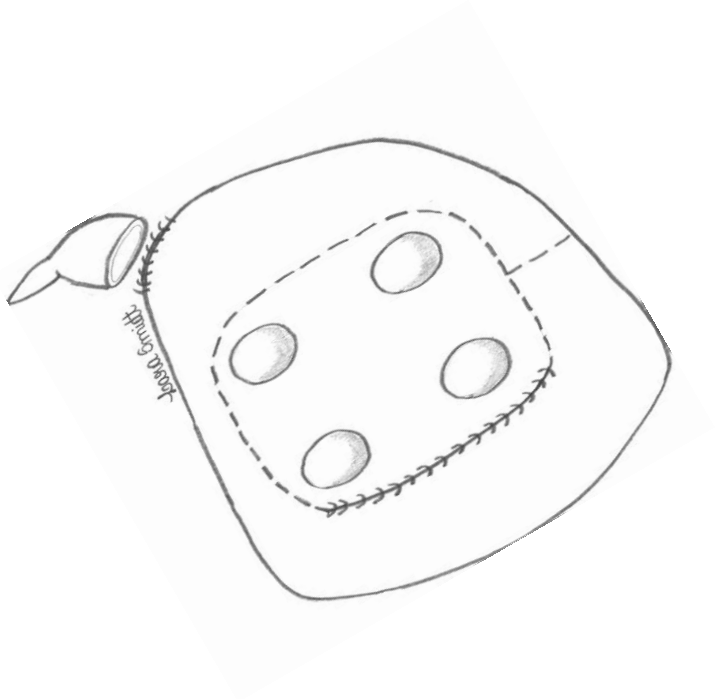

AtriCure


One System for Complete Lesion Sets
COBRA Surgical Probe
Creates adjustable linear endocardial lesions in a single application
Flexible, malleable shaft allows user to shape ablation
No dragging required — prevents gaps
Creates uniform lesion
COBRA Bipolar Clamp
Creates rapid transmural lesions
Reusable clamp design allows user to create desire lesion formation
COBRA Electrosurgical Unit
Patented temperature control
-Reproducible and effective lesions
-Maximum safety
Monopolar and bipolar system

Efetividade das linhas de bloqueio cirúrgico e por radiofrequência

•	TÉCNICA CIG n=10	TÉCNICA RF n=12	P
Ritmo Sinusal	8	7	0,38
Uso de Amiodarona	1	11	<0,001





Pires LM et al (PACE 2010; 33:1249–1257)

(n = 4), roof-dependent left AT (n = 1), focal AT arising from the coronary sinus (n = 1), and right-sided ATs (n = 2). All spontaneously running ATs were successfully eliminated using EAM and subsequent RF catheter ablation. No major complications were noted. Minor complications included 5 large groin hematomas (7.1%), defined as coloration of the skin covering an area larger than a clenched fist, and 1 atrioventricular fistula (1.4%),

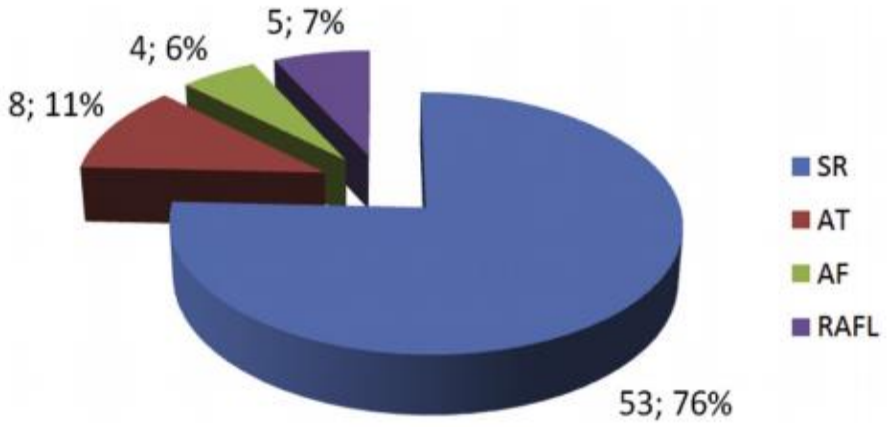


Fig 1. Cardiac rhythm in patients after epicardial surgical ablation at beginning of electrophysiologic examination: atrial fibrillation (AF, green); atrial tachycardia (AT, red); right atrial flutter (RAFL, purple); and sinus rhythm (SR, blue).

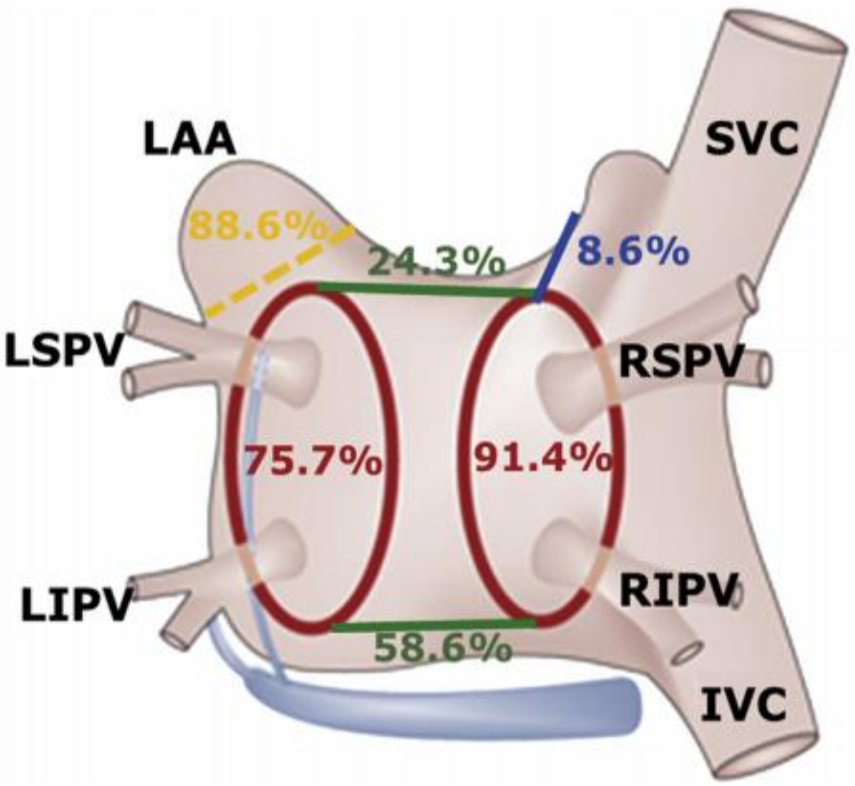


Fig 2. Success rate of epicardially created circumferential and linear lines as assessed a median of 87 days after index procedure. (IVC = inferior vena cava; LAA = left atrial appendage; LIPV = left inferior pulmonary vein; LSPV = left superior pulmonary vein; RIPV = right inferior pulmonary vein; RSPV = right superior pulmonary vein; SVC = superior vena cava.)

Bulava et al. Ann Thorac Surg 2017; 104:2024-9

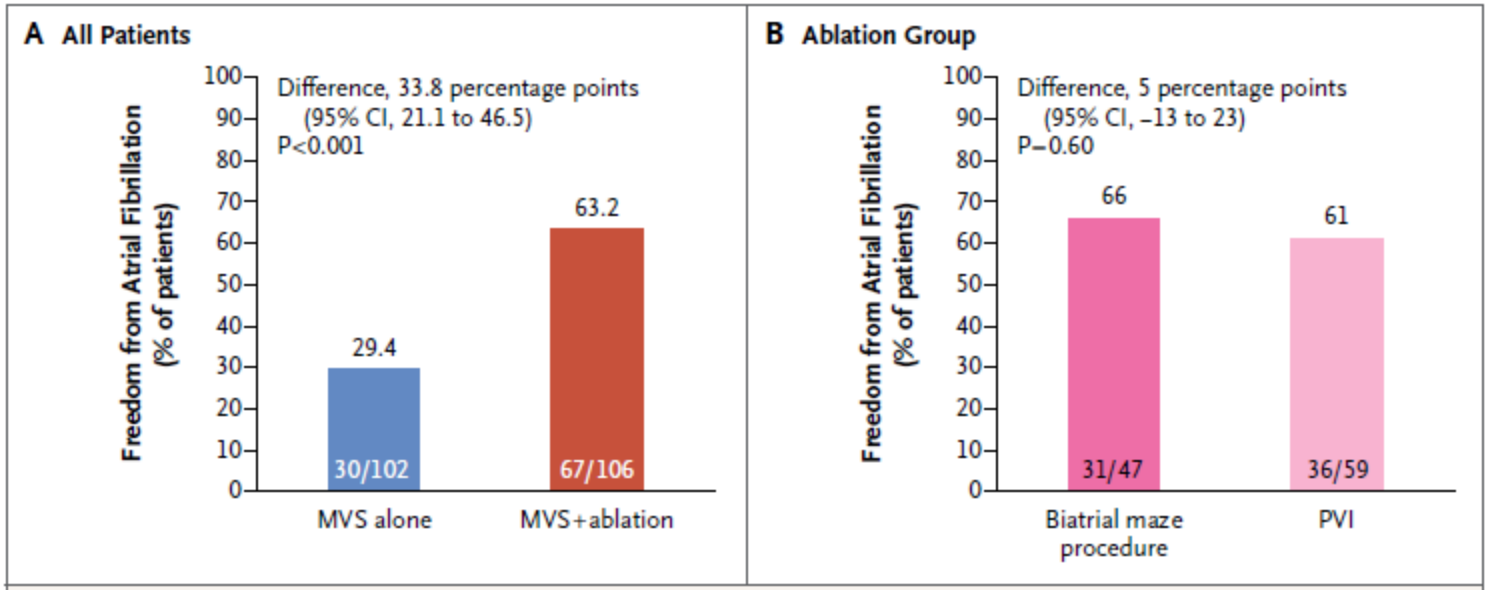


Figure 1. Freedom from Atrial Fibrillation.

Freedom from atrial fibrillation was defined as the absence of the condition at both 6 months and 12 months, as assessed by means of 3-day Holter monitoring. MVS denotes mitral-valve surgery, and PVI pulmonary-vein isolation.

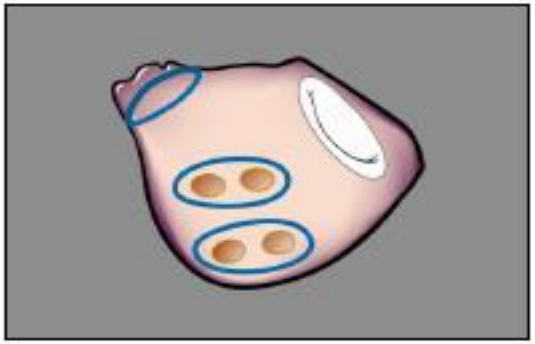
Gillinov M et al. N Engl J Med 2015;372:1399-409.

Table 2. Clinical End Points, Serious Adverse Events, and Hospitalizations at 1 Year.

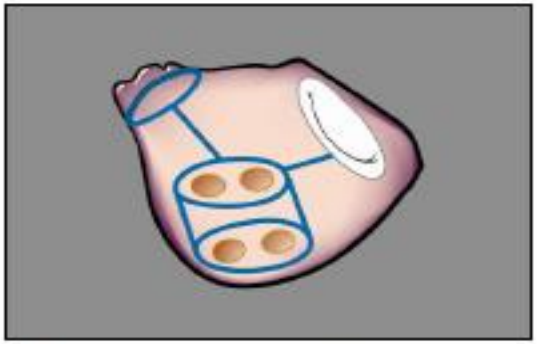
End Point or Event	Mitral-Valve Surgery Alone (N=127)	Mitral-Valve Surgery plus Ablation (N=133)	P Value
	no. of patients (%)		
Clinical end points			
Death	11 (8.7)	9 (6.8)	0.57
Stroke	2 (1.6)	4 (3.0)	0.68
Increase of one or more classes in NYHA classification*	4 (3.9)	7 (6.1)	0.46
Rehospitalization for heart failure	7 (5.5)	12 (9.0)	0.28
Mitral-valve reoperation	2 (1.6)	1 (0.8)	0.62
Composite end point†	26 (20.5)	31 (23.3)	0.58
	no. of events (no./100 patient-yr)		

Gillinov M et al. N Engl J Med 2015;372:1399-409.

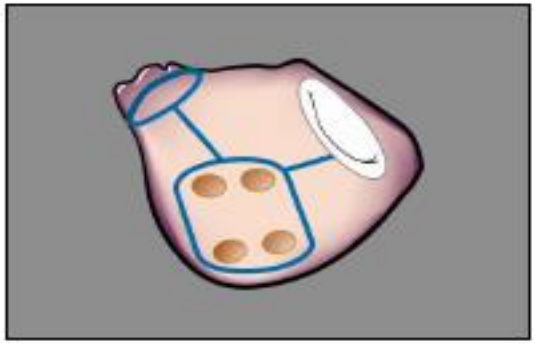
Figure S1. Depiction of Lesion Sets in Ablation Arm



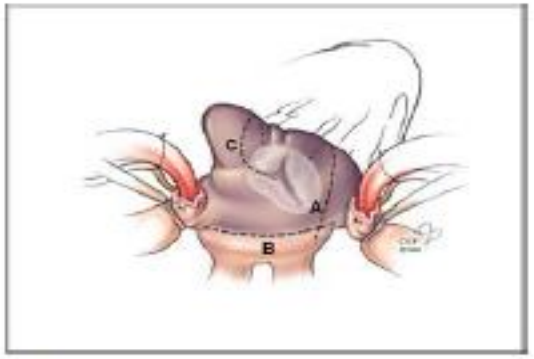
PVI lesion set with bipolar device. White oval depicts mitral valve. Four orange circles depict pulmonary vein orifices.



Left atrial component of biatrial lesion set with bipolar device. White oval depicts mitral valve. Four orange circles depict pulmonary vein orifices.

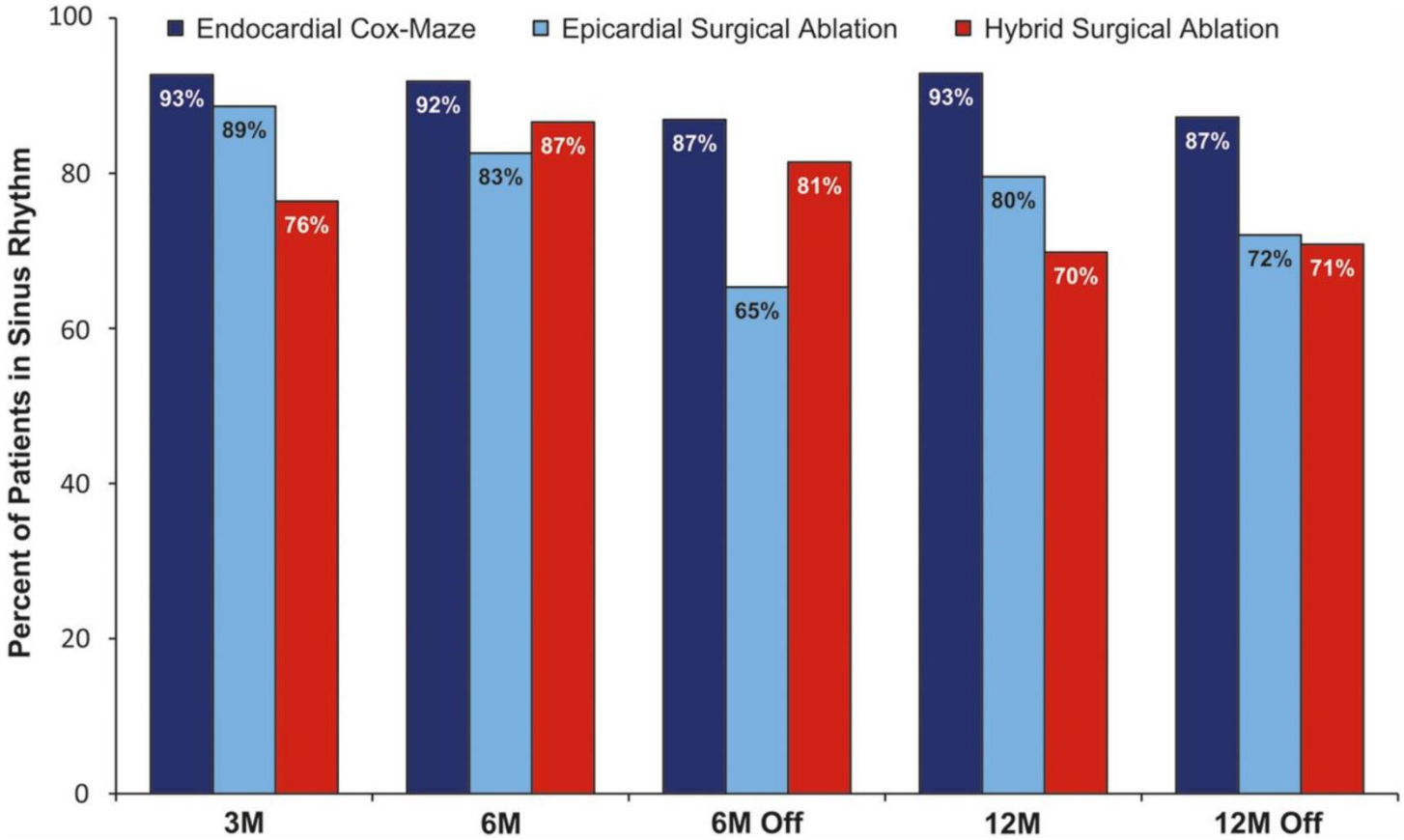


Biatrial lesion set with unipolar device. White oval depicts mitral valve. Four orange circles depict pulmonary vein orifices.



Right atrial lesions in those receiving biatrial lesion set. White oval represents the tricuspid valve. Dashed lines represent ablation lines.

Supplement to: Gillinov AM, Gelijns AC, Parides MK, et al. Surgical ablation of atrial fibrillation during mitralvalve surgery. N Engl J Med. DOI: 10.1056/NEJMoa1500528



A systematic review of minimally invasive surgical treatment for atrial fibrillation: a comparison of the Cox-Maze procedure, beating-heart epicardial ablation, and the hybrid procedure on safety and efficacy †

n= 1877 in 37 selected reports

Eur J Cardiothorac Surg. 2015;48(4):531-541. doi:10.1093/ejcts/ezu536

SPECIAL REPORT

The Society of Thoracic Surgeons 2017 Clinical Practice Guidelines for the Surgical Treatment of Atrial Fibrillation

Vinay Badhwar, MD, J. Scott Rankin, MD, Ralph J. Damiano, Jr, MD, A. Marc Gillinov, MD, Faisal G. Bakaeen, MD, James R. Edgerton, MD, Jonathan M. Philpott, MD, Patrick M. McCarthy, MD, Steven F. Bolling, MD, Harold G. Roberts, MD, Vinod H. Thourani, MD, Rakesh M. Suri, MD, DPhil, Richard J. Shemin, MD, Scott Firestone, MS, Niv Ad, MD

Division of Cardiothoracic Surgery, West Virginia University, Morgantown, West Virginia (VB, JSR, NA); Division of Cardiothoracic Surgery, Washington University, St. Louis, Missouri (RJD); Division of Thoracic and Cardiovascular Surgery, Cleveland Clinic, Cleveland, Ohio (AMG, FGB, RMS); Department of Cardiothoracic Surgery, Baylor Plano Heart Hospital, Plano, Texas (JRE); Department of Cardiothoracic Surgery, Sentara Heart Hospital, Norfolk, Virginia (JMP); Division of Cardiac Surgery, Northwestern University Feinberg School of Medicine, Chicago, Illinois (PMM); Department of Cardiac Surgery, University of Michigan, Ann Arbor, Michigan (SFB); Department of Cardiovascular Services, Florida Heart and Vascular Care at Aventura, Aventura, Florida (HGR); Division of Cardiothoracic Surgery, Emory University, Atlanta, Georgia (VHT); Division of Cardiothoracic Surgery, University of California Los Angeles David Geffen School of Medicine, Los Angeles, California (RJS); and The Society of Thoracic Surgeons, Chicago, Illinois (SF)

Fig 1. Left atrial lesion sets for Cox maze IV procedure. (A) Most linear lesions are created with bipolar radiofrequency clamps; shaded in blue are cryolesions at the mitral isthmus (and left pulmonary veins for minimally invasive approach). (B) Linear lesions also can be created with cryoablation if required for minithoracotomies or reoperations [64]. (Figure 1B © [2014] Beth Croce.)

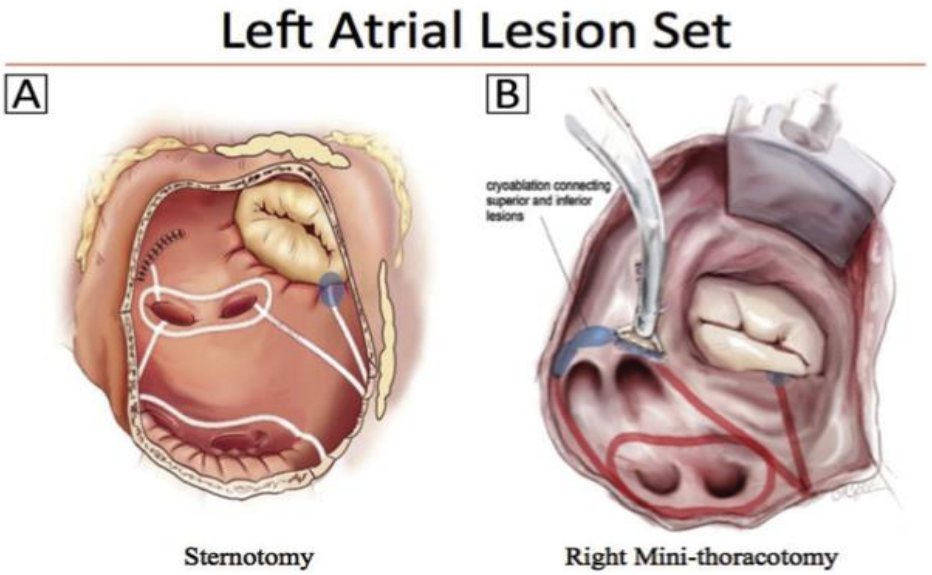
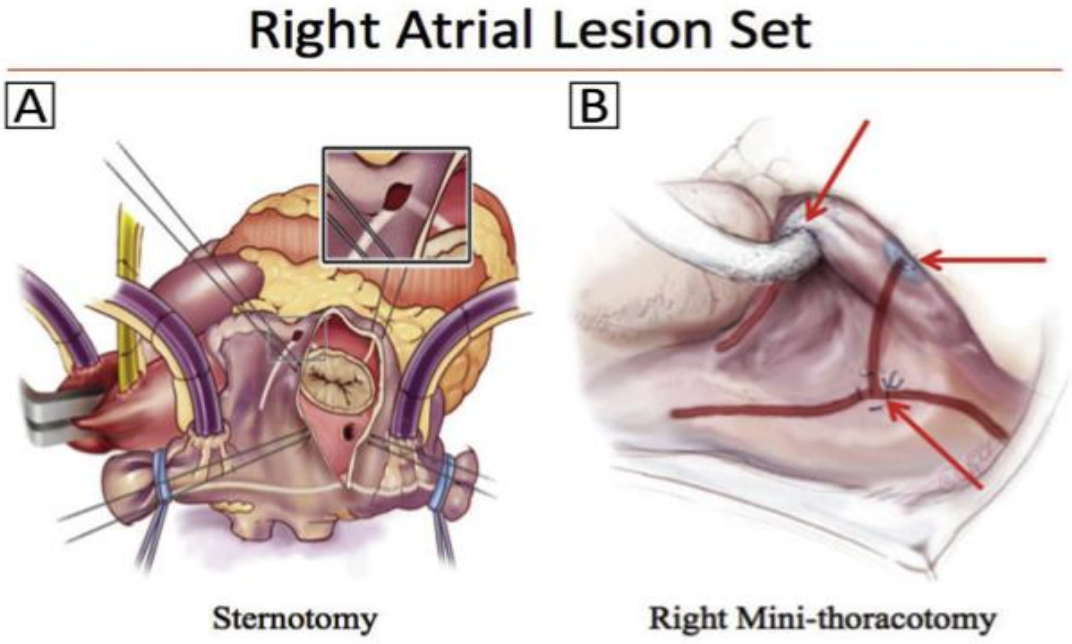


Fig 2. Right atrial lesion sets for Cox maze IV procedure. (A) Most linear lesions are created with bipolar radiofrequency clamps, and cryolesions are placed at two points on the tricuspid annulus through direct vision or small pursestring sutures (red arrows). (B) Linear lesions also can be created with cryoablation if required for minithoracotomies or reoperations [64]. (Figure 2B © [2014] Beth Croce.)



Obs.: No mention to "cut and sew" techniques in this guideline

Contemporary Outcomes of Surgical Ablation in USA

N= 86,941

48.3% (42,066) underwent surgical ablation

Mitral valve repair or replacement (MVRR) operations at 68.4% (14,693 of 21,496)

Isolated CABG at 32.8% (9,156 of 27,924).

Badhwar V, Rankin JS, Ad N, et al. Surgical ablation of atrial fibrillation in the United States: trends and propensity matched outcomes. Ann Thorac Surg 2017;104:493–500.

Brazilian ByPass Registry: AF + Valve = 12/1722 = 0.7%

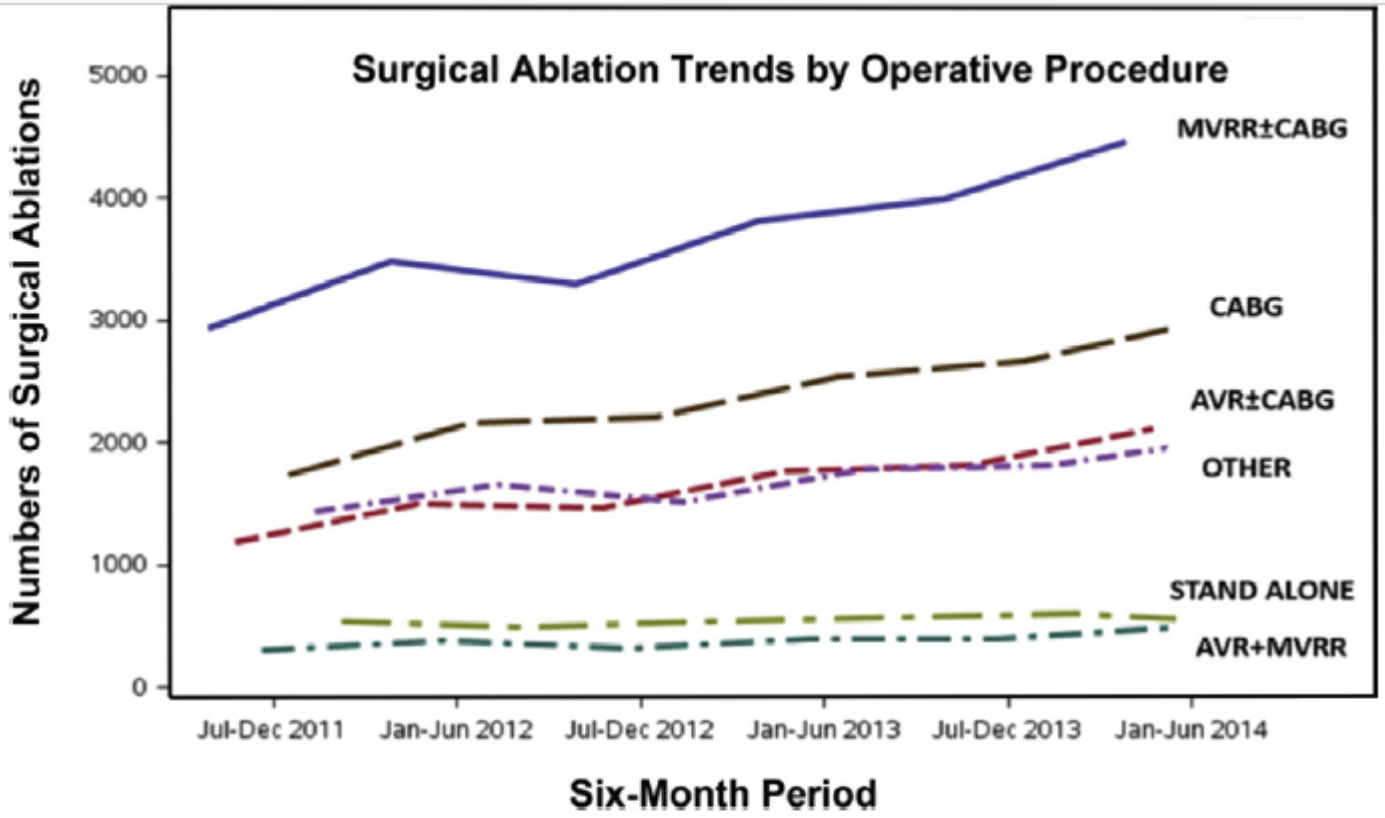


Fig 1. Trends of surgical ablation in the United States by operative procedure. (Reproduced from [7] with permission from The Society of Thoracic Surgeons.) (AVR = aortic valve replacement; CABG = coronary artery bypass graft surgery; MVRR = mitral valve repair/replacement.)

Badhwar V, Rankin JS, Ad N, et al. Surgical ablation of atrial fibrillation in the United States: trends and propensity matched outcomes. Ann Thorac Surg 2017;104:493–500.

Quoted in Ann Thorac Surg 2018;106:8–13

Table 1. Relative Risks of Performing Concomitant Surgical Ablation in Propensity Matched Patients With Atrial Fibrillation[a]

Outcome	Overall (n = 57,478)	No Ablation (n = 28,739)	Ablation (n = 28,739)	Relative Risk (95% CI)	*p* Value
Mortality	4.31 (2,480)	4.5 (1,292)	4.13 (1,118)	0.92 (0.85–1.00)	0.0422
Reoperation for bleeding	3.61 (2,075)	3.73 (1,073)	3.49 (1,002)	0.93 (0.86–1.02)	0.1195
Permanent stroke	1.96 (1,124)	2.13 (612)	1.78 (512)	0.84 (0.74–0.94)	0.0028
Transient ischemic attack	0.38 (218)	0.42 (121)	0.34 (97)	0.80 (0.61–1.05)	0.1064
Prolonged ventilation >48 hours	16.31 (9,373)	16.75 (4,813)	15.87 (4,560)	0.95 (0.90–0.99)	0.0224
Renal failure	4.62 (2,585)	4.35 (1,219)	4.88 (1,366)	1.12 (1.03–1.22)	0.0107
Pacemaker	6.87 (3,946)	5.89 (1,693)	7.84 (2,253)	1.33 (1.24–1.43)	<0.0001
Phrenic nerve injury	0.06 (33)	0.06 (16)	0.06 (17)	1.06 (0.53–2.14)	0.8655
Readmission 30 days	13.36 (7,347)	12.79 (3,511)	13.92 (3,836)	1.09 (1.03–1.15)	0.0011

Conclusions.
Contemporary utilization of SA is increasing across all operative categories.
Performance of SA is accompanied by a 30-day reduction in mortality and stroke.
These findings further refine our understanding of the role of SA in the treatment of AF.

Badhwar V, Rankin JS, Ad N, et al. Surgical ablation of atrial fibrillation in the United States: trends and propensity matched outcomes. Ann Thorac Surg 2017;104:493–500.

STS 2017 Guidelines Surgical Ablation AF

Class

I, A - ***at mitral valve surgery, to restore SR***
I, B - ***at Ao, CABG, Ao+CABG, to restore SR***

IIa, B – ***for lone symptomatic AF refractory to drugs and catheter***
IIa, B – ***Cox-Maze III/IV lesion set is reasonable as compared to PVI alone***

III – ***PVI alone is not recommended in LA>4.5cm or moderate MR***

IIa, C – LAA exclusion in conjunction to ablation, for embolism prevention
IIa, C – LAA exclusion in AF patients at time of cardiac surgery

I, C – ***Multidisciplinary assessment, planning and follow up are beneficial***

Ann Thorac Surg 2017; 103: 329-41

Surgical Efficacy

- *Depends on transmurality and lesions design*
- *"Cut &Sew" warrants transmurality*
- *RF, cryo, microwaves, diathermy, ultrasound, etc are associated to variable success indices*
- *Complete PV isolation in a "box lesion" like design confers > 90% SR (similar to Cox-Maze III/IV) in all AF modalities, being lone or associated to structural disease, paroxysmal or long term.*

Conclusões

- *A cirurgia é eficaz para reversão a RS em FA refratária, com redução da mortalidade e do risco de AVC, com melhora na qualidade de vida.*
- *Indicação é necessária na FA permanente em pacientes que vão a cirurgia cardíaca. Mandatória na mitral.*
- *Ablação com RF e outras energias é eficaz quando apropriadamente aplicadas. Corte e sutura garante transmuralidade e eficácia*

UFCSPA

HOSPITAL MOINHOS DE VENTO

Instituto de cardiologia

Atividade Especial da SBCCV no 73º Congresso da SBC

Mesa Redonda

Cirurgia Valvar: indicações para cirurgia e resultados atuais

Fibrilação Atrial Associada Deve Ser Tratada Sempre?

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