XVII Jornadas SOLACI
6º Región Cono Sur

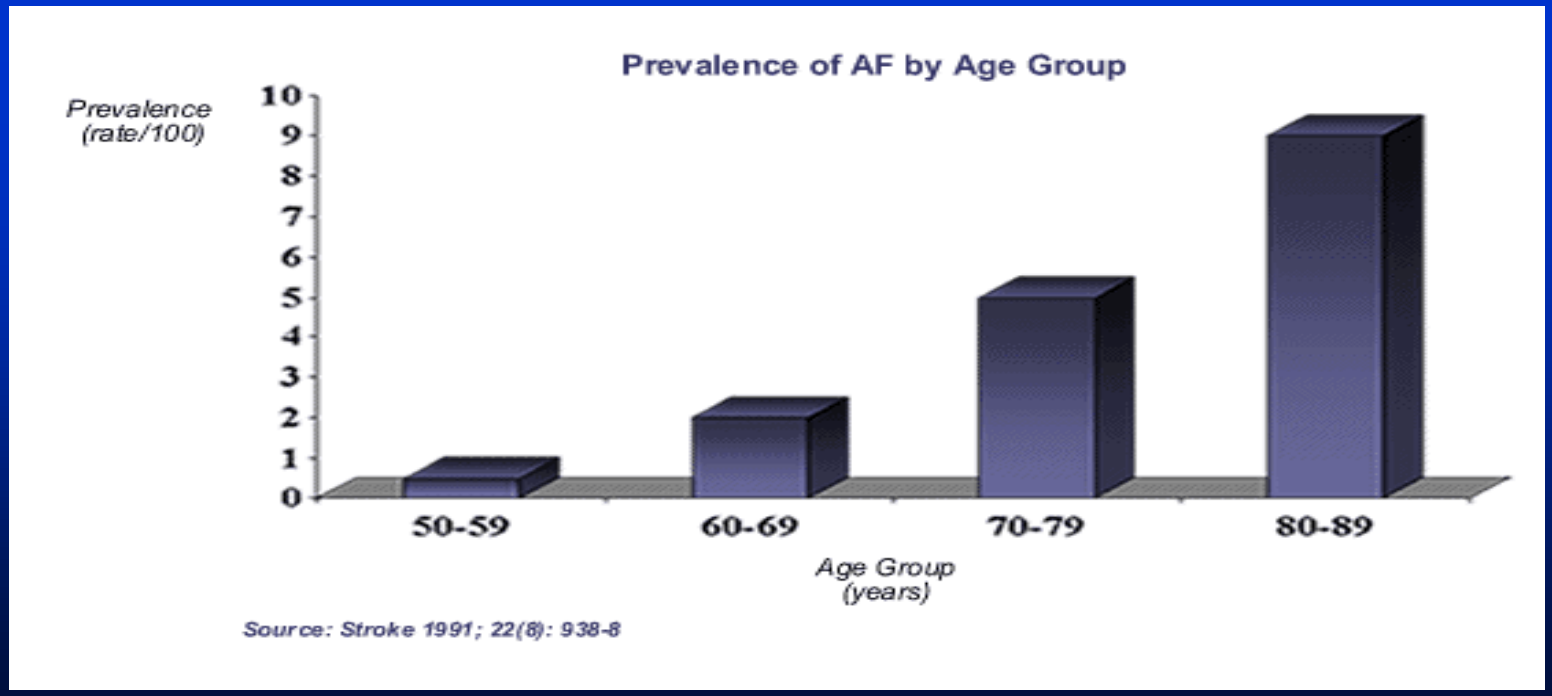
"Cierre percutáneo de la orejuela auricular izquierda para prevención del ACV cardioembólico en pacientes con fibrilación auricular"

Dr. Aníbal Damonte
Departamento de Hemodinamia y Cardiología Intervencionista
Instituto Cardiovascular de Rosario
Rosario, Argentina

ICR online
INSTITUTO CARDIOVASCULAR DE ROSARIO
Boulevard Oroño 450, 2000 Rosario Argentina, Teléfono (0341) 4203040 - Fax (0341) 4203337

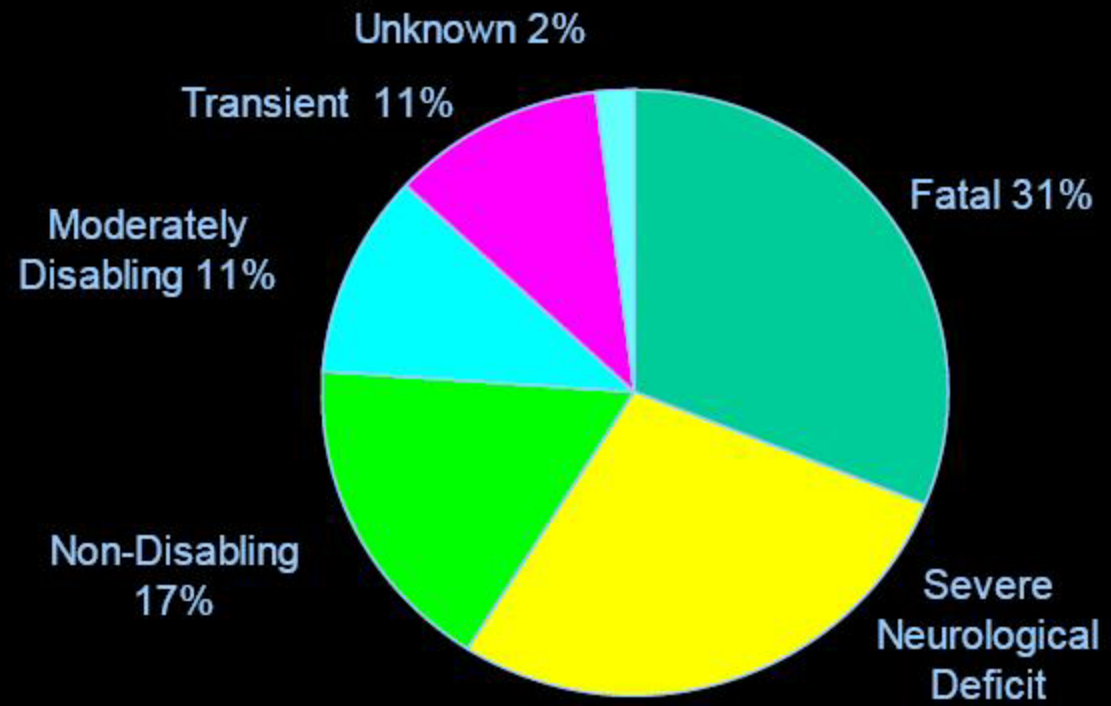
Introducción

- La FA es la arritmia cardíaca más frecuente en la práctica clínica y es causa mayor de morbilidad y mortalidad debido a stroke cardioembólico.
- FA es responsable de 15-20% de los strokes isquémicos (Fuster et al, Circ 2006)
- La incidencia de FA se incrementa con la edad.



Introducción: Stroke relacionado a FA

- 500,000 strokes per year
- 15 – 20% of strokes/year are related to AF
- Functional Impact of AF-Related Stroke:



Sources: *Neurology, 1978; Stroke, 1985; European Heart Journal, 1987; Lancet, 1987; Fisher. Geriatrics. 1979;34:59*

Introducción

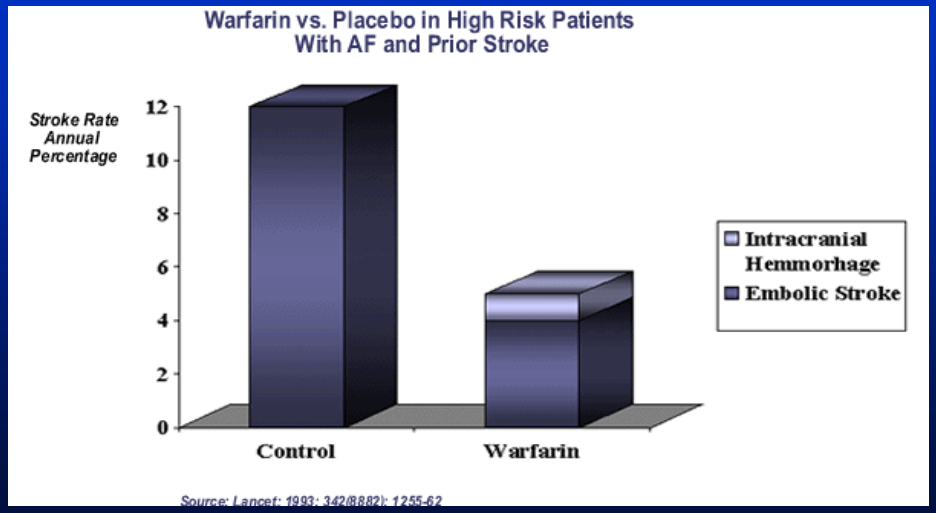
- Los ACO son actualmente el método más efectivo de prevención del stroke en pacientes con FA permanente, pero:

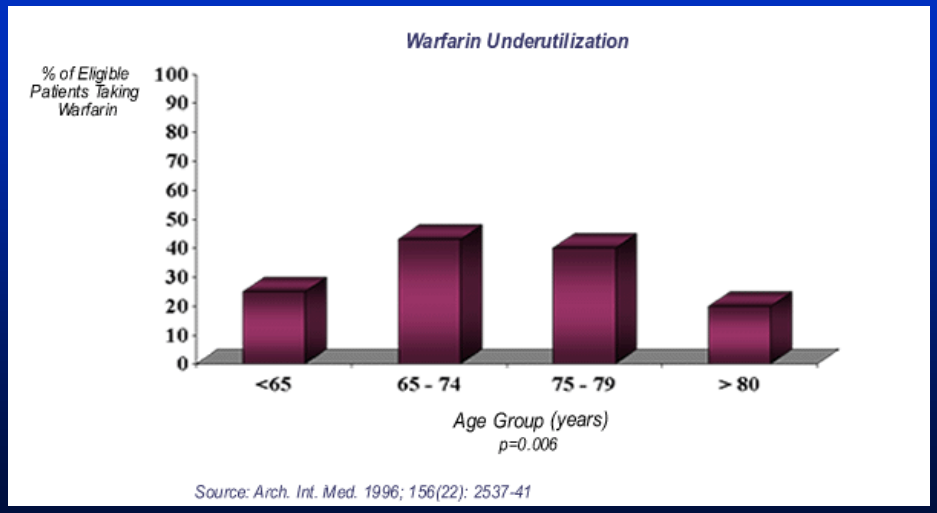
  1) Rango terapéutico estrecho – Interacciones con otros fármacos

  2) Insuficientemente controlados en alto % de pacientes

  3) Subutilizados

  4) Frecuentemente contraindicados
- A pesar de la introducción de nuevos fármacos, los beneficios siguen siendo contrarrestados por el riesgo de sangrado

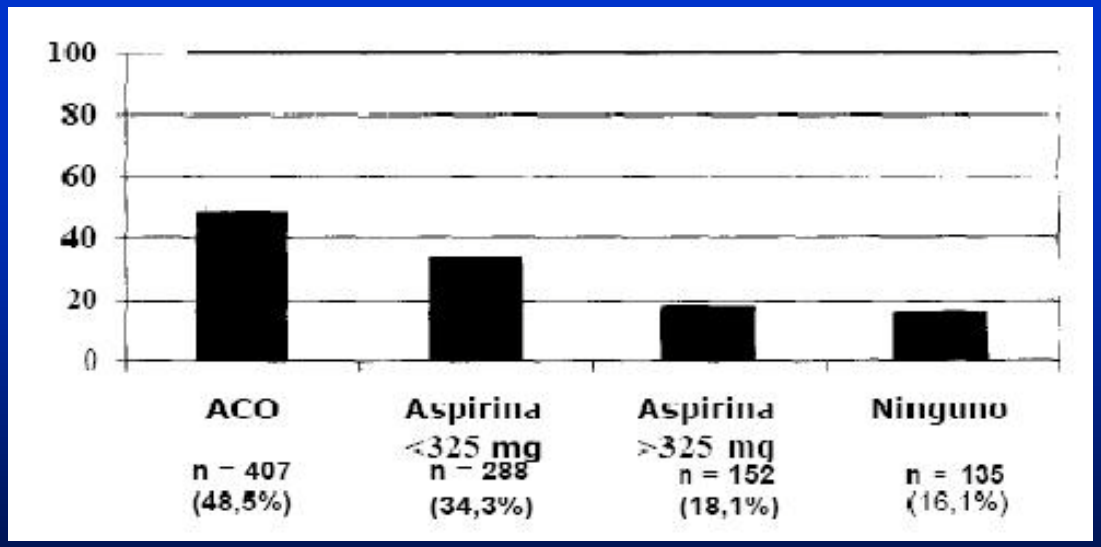




Resultados del Primer Estudio Nacional, Multicentrico y Prospectivo de Fibrilacion Auricular Cronica en la Republica Argentina

CARLOS LABADET, GUILLERMO LINIADOt, ERNESTO R. FERREIROS`, VICTOR MOLINA VIAMONTE*, DARIO DI TORO, ROMAN CRAGNOLINO, RODOLFO SANSALONE, FERNANDO CHIMINELA, ALEJANDRO VILLAMIL, ALEJANDRA FRANCESIA, BERNARDO KAISER, OSVALDO MASOLI", CARLOS BOISSONNET", RUBEN KEVORKIAN*, JUAN KRAUSS*, en representaci6n de los Investigadores del Primer Estudio Nacional, Multicentrico y Prospectivo de Fibrilaci6n Auricular Cr6nica en la Republica Argentina y del Area de Investigaci6n de la Sociedad Argentina de Cardiologia

840 p consecutivos
65 centros
Ant. Embólicos 115p (14%)
ACO/Ant Emb 20%
Contraindic ACO 144p (17%)



Rev.Argent.Cardiol 2001

Which patients benefit optimally from LAA Occlusion

3.8 Million patients with AF[1], in Europe[1]

75% are at High Risk of Stroke[2]

50% are insufficiently treated[3]

15% contraindicated for Warfarin[4]

3% severe bleeding complications. Cannot take warfarin or alternatives[5]

Europe : European Union + Western Balkan, Norway, Switzerland

1. 2.3 million patients suffer from AF in the US, 4 million in EU - Fuster et al, ACC/AHA/ESC Practice Guidelines, Circulation. 2006;114:700-752.
2. 75% of patients are at high level of stroke (Euroheart survey, Birmingham/NICE score. CHADS2 = 73% high & intermediate), Lip et al., CHEST Feb 2010 vol. 137 no. 2 263-272
3. Anticoagulant is not used (not prescribed and/or not taken), up to 60% of pts Gladstone et al, Stroke, 2009; 40:235-240
4. The prevalence of contraindications is around 15% of clinical AF patients. Nieuwlaat R. et al. Euroheart Survey, European Heart Journal (2005) 26, 2422–2434
5. Major bleeding rate 3.36%/yr in warfarin group, 2.71%/year - 110 mg of Dabigatran and 3.11%/year - 150 mg of Dabigatran.Connolly, N Engl J Medicine 2009; DOI:10.1056.NEJMoa0905561

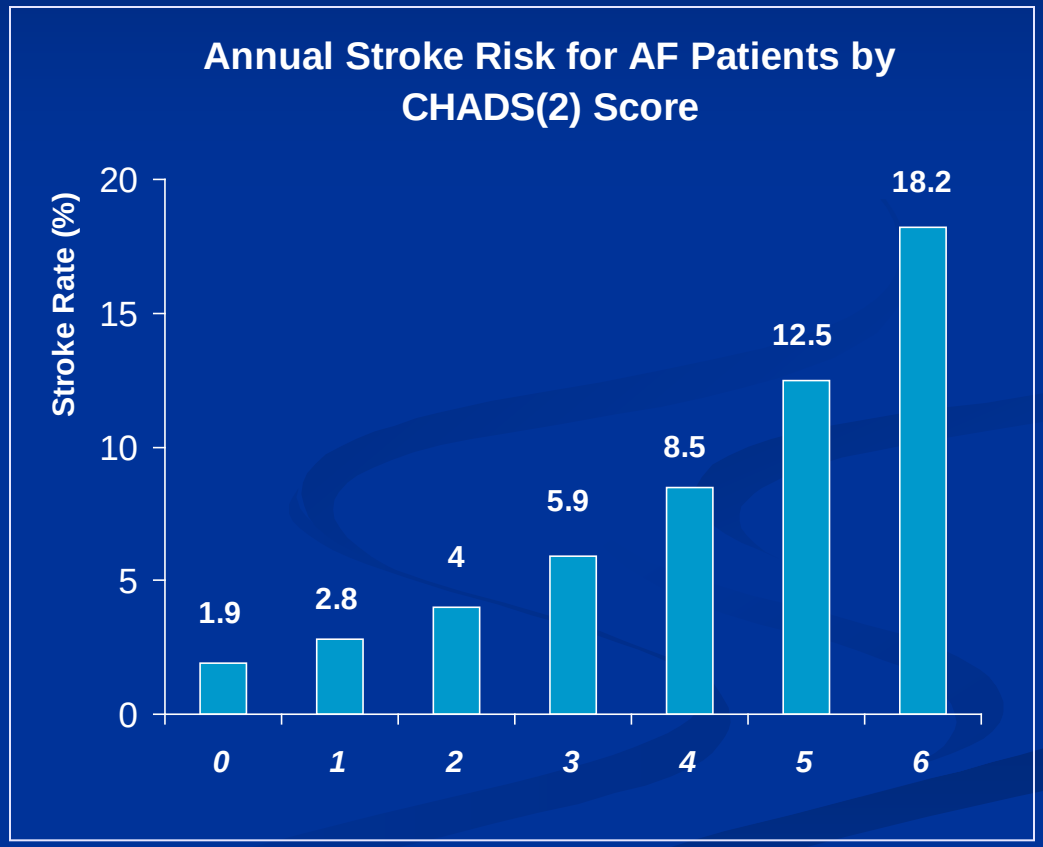
Patient Population per Country

(per 2010)	Population (million)	AF patients (x 1000)	Pts at High Risk for Stroke	Pts. NOT on Anticoagulation	Contraindicated Anticoagulation	Bleeding Complications (from total)	Bleeding complications (from treated)
US	311	2315	1736	868	260	52.1	26.0
Australia	22.6	168	126	63	19	3.8	1.9
Canada	34.4	256	192	96	29	5.8	2.9
Japan	128	953	715	357	107	21.4	10.7
EUROPE	508	3783	2837	1418	426	85	43
Austria	8.4	63	47	23	7	1.4	0.7
Belgium	10.8	80	60	30	9	1.8	0.9
Czech Republic	10.5	78	59	29	9	1.8	0.9
Denmark	5.6	42	31	16	5	0.9	0.5
Finland	5.3	39	30	15	4	0.9	0.4
France	65.8	490	367	184	55	11.0	5.5
Germany	81.8	609	457	228	68	13.7	6.8
Greece	11.3	84	63	32	9	1.9	0.9
Italy	60.6	451	338	169	51	10.1	5.1
Ireland	4.5	33	25	13	4	0.8	0.4
Netherlands	16.6	124	93	46	14	2.8	1.4
Norway	5.0	37	28	14	4	0.8	0.4
Poland	38.1	284	213	106	32	6.4	3.2
Portugal	10.6	79	59	30	9	1.8	0.9
Spain	46.2	344	258	129	39	7.7	3.9
Sweden	9.4	70	52	26	8	1.6	0.8
Switzerland	7.8	58	44	22	7	1.3	0.7
UK	62.0	461	346	173	52	10.4	5.2
West Balkan	20.9	156	117	58	18	3.5	1.8
Other	27	201	151	75	23	4.5	2.3
Percentage	Baseline	7443 pts.million-1	75%	50%	15%	3%	3%
Reference		1	2	3	4	5	5

1. 2.3 million patients suffer from AF in the US, 4 million in EU - Fuster et al, ACC/AHA/ESC Practice Guidelines, Circulation. 2006;114:700-752.
2. 75% of patients are at high level of stroke (Euroheart survey, Birmingham/NICE score. CHADS2 = 73% high & intermediate), Lip et al., CHEST Feb 2010 vol. 137 no. 2 263-272
3. Anticoagulant is not used (not prescribed and/or not taken), up to 60% of pts Gladstone et al, Stroke, 2009; 40:235-240
4. The prevalence of contraindications is around 15% of clinical AF patients. Nieuwlaat R. et al. Euroheart Survey, European Heart Journal (2005) 26, 2422–2434
5. Major bleeding rate 3.36%/yr in warfarin group, 2.71%/year - 110 mg of Dabigatran and 3.11%/year - 150 mg of Dabigatran.Connolly, N Engl J Medicine 2009; DOI:10.1056.NEJM0a0905561

Stroke risk stratification of AF patients: The $CHADS_2$ score

$CHADS_2$ Score	$CHADS_2$
Congestive heart failure	+1
Hypertension	+1
Age 75>	+1
Diabetes Mellitus	+1
Stroke or History of Cerebral Ischemia	+2



Gage, et al., Validation of clinical classification schemes for predicting stroke: results from the National Registry of Atrial Fibrillation. JAMA 2001; 285: 2864-2870

Stroke Risk Assessment:
CHA^2DS_2-VASc score

Letter	Risk factor	Points awarded
C	- Congestive heart failure/LV dysfunction	1
H	- Hypertension	1
A	- Age >75	2
D	- Diabetes mellitus	1
S	- Stroke/TIA/thrombo-embolism	2
V	- Vascular diseasea	1
A	- Age 65–74	1
Sc	- Sex-category (i.e. female sex)	1
	Maximum score	9

Camm, et al., ESC 2010 Guidelines for the management of Atrial Fibrillation; European Heart Journal doi:10.1093/eurheartj/ehq278

Adjusted stroke rate according to CHA_2DS_2-VASc score

CHA_2DS_2-VASc score	Patients (*n* = 7329)	Adjusted stroke rate (%/year)
0	1	0.0%
1	422	1.3%
2	1230	2.2%
3	1730	3.2%
4	1718	4.0%
5	1159	6.7%
6	679	9.8%
7	294	9.6%
8	82	6.7%
9	14	15.2%

Lip, et al., Identifying patients at risk of stroke despite anticoagulation. Stroke 2010;in press.

Risk assessment 1 yr bleeding

HAS-BLED score

Letter	Clinical characteristic	Points awarded
H	- Hypertension (systolic blood pressure > 160 mmHg)	1
A	- Abnormal renal & liver function (1 point each)	1 or 2
S	- Stroke	1
B	- Bleeding	1
L	- Labile INRs	1
E	- Elderly (age > 65 yrs)	1
D	- Drugs or alcohol (1 point each)	1 or 2
	Maximum	9 points

Lip, et al., Refining clinical risk stratification for predicting stroke and thromboembolism in AF using a novel risk factor-based approach: the Euro Heart Survey on atrial fibrillation. Chest 2010;137:263–272.

Points system HAS-BLED score

HAS-BLED	0	1	2	3	4	5	Any score
n	798	1286	744	187	46	8	3071
No of bleeds	9	13	14	7	4	1	48
Bleeds per 100 pts	1.13	1.02	1.88	3.74	8.7	12.5	1.56

- Score of ≥3 indicates 'high risk'
  - Some caution and regular review of the patient is needed following the initiation of antithrombotic therapy (VKA or Asparin)

[1] Pisters et al …. :Lip A novel User-frienndly score to assess one-year risk of major bleedign in AF patients; Chesst 2010; DOI 10.1378/Chest 10-0134
[2] Khoo, Lip Initiation and persistence of warfarin or aspirin as thromboprophylaxis in chronic AF - J Thromb Haemost 2008; 6: 1622

Dabigitran as substitute for warfarin?

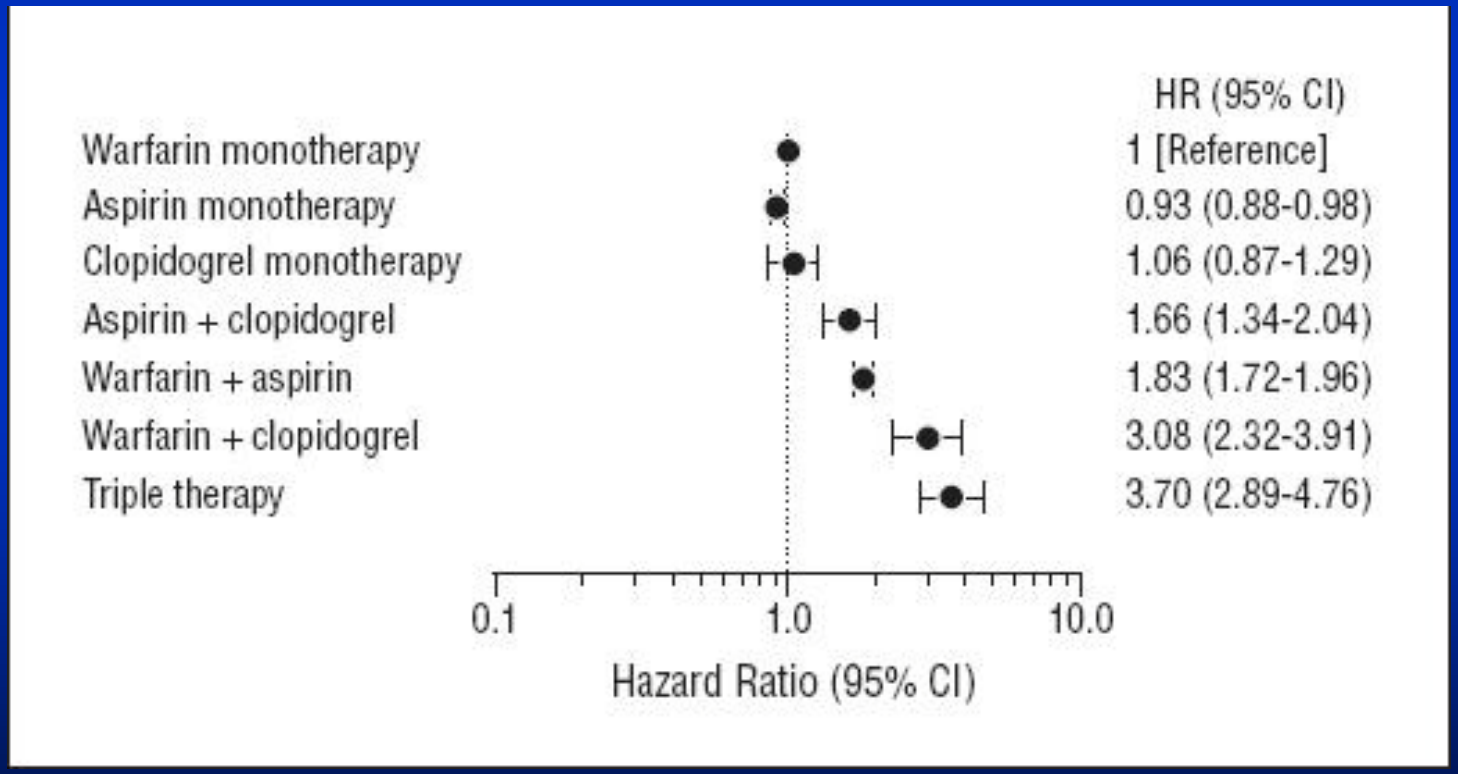
- The Good News for Dabigatran (Pradaxa)
  - Reduced the annualized risk stroke/peripheral embolic events, by 34% ($p<0.001$)
  - Reduced risk of hemorrhagic stroke by 74% ($p<0.001$) compared with warfarin.
  - Patients don't require any form of monitoring
- The Not All Good News
  - Although the primary safety outcome is statistically significant better, in clinical practice Dabigatran may not prove better than warfarin. Patients still have bleeding complications.
  - At 1 year, in the RE-LY trial, 15% of pts were off Dabigatran vs. 10% for warfarin: GI Symptoms, Bleeding and Adverse Events
  - Reimbursement: patients have to pay up to €10 per day (> € 3500 Euro per year)

	Condition	Dabigatran 220mg		Dabigatran 300mg		Warfarin	
Primary Study Outcome	Stroke/ systemic embolism /year	1.53%	182 pts	1.11%	134pts	1.69%	199pts
Primary Safety Outcome	Major Haemorrhage/yr	2.71%	322pts	3.11%	375pts	3.36%	397pts
	Life threatening/yr	1.22%	145pts	1.45%	175pts	1.80%	212pts
	Non life threatening/yr	1.66%	198pts	1.88%	226pts	1.76%	208pts
	Gastro intestinal /yr	1.12%	133pts	1.51%	182pts	1.02%	120pts
	Intracranial Bleeding	0.23%	27pts	0.30%	36pts	0.74%	87pts
	Extracranial Bleeding	2.51%	299pts	2.84%	342pts	2.67%	315pts

1 Connolly, et al., RE-LY Dabigatran versus warfarin in patients with atrial fibrillation. N Engl J Medicine 2009; DOI:10.1056.NEJM0a0905561

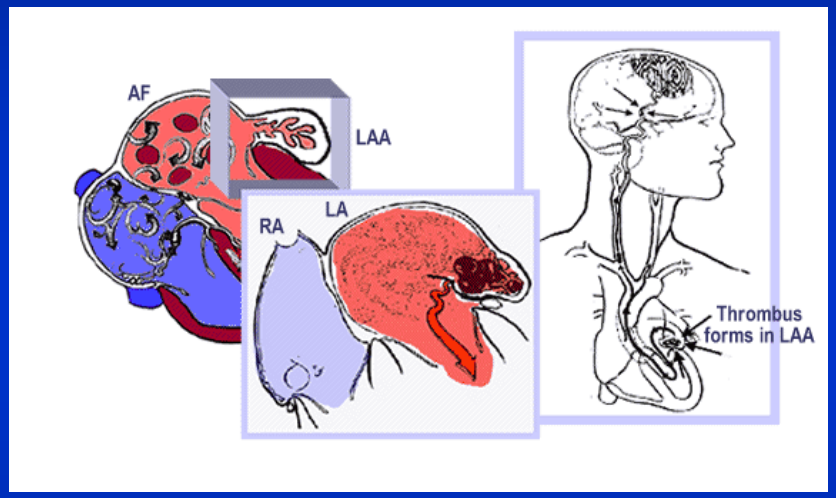
Efecto de múltiples antitrombóticos sobre el riesgo de sangrado

Estudio de cohorte de 82854 pac en Dinamarca (13573 presentaron sangrado fatal o no fatal en el seguimiento a 2,6 años)



Hansen M et al. Arch Intern Med 2010

Cuál es la fuente embolígena en pacientes con FA crónica no reumática?

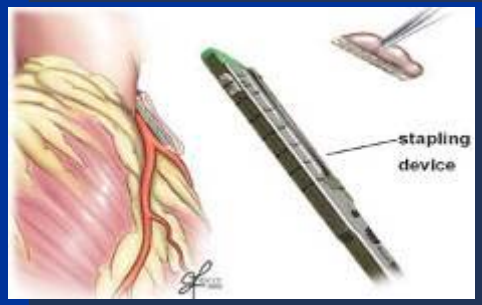


Setting	No. of Patients	Thrombus Location (n, %) LA Appendage	LA Cavity	Total
TEE†	317	66 (20.8)	1 (0.3)	67 (21.1)
TEE	233	34 (14.6)	1 (0.4)	35 (15.0)
Autopsy	506	35 (6.9)	12 (2.4)	47 (9.3)
TEE	52	2 (3.8)	2 (3.8)	4 (7.7)
TEE	48	12 (25.0)	1 (2.1)	13 (27.1)
TEE and operation	171	8 (4.7)	3 (1.8)	11 (6.4)
ACUTE	549	67 (12.2)	9 (1.6)	76 (13.8)
TEE	272	19 (7.0)	0 (0)	19 (7.0)
TEE	60	6 (10.0)	0 (0)	6 (10.0)
Total	2208	249 (11.3)	29 (1.3)	278 (12.6)

90% de los trombos localizaron en orejuela auricular izquierda

Onalan O; Stroke 2007

Options for Stroke Prevention



- Pharmacological Management: Anticoagulants[1]
  - Effective: 67% stroke risk reduction
  - Management of narrow therapeutic window
  - Major complication: bleeding
- Surgical Excision of LAA[2] (Appendectomy)
  - Residual shunt: 10%
  - Inconsistent outcomes due to incomplete exclusion
  - Can create pouch with stagnant blood flow
  - High invasiveness
- Transcatheter Device Closure
  - Minimally invasive nature
  - Designed for percutaneous closure of the LAA in prevention of clot embolization that may form in the LAA
  - Intended as an alternative to warfarin therapy for patients with non-valvular atrial fibrillation

[1] Mobius-Winler, et al., Interventional treatments for stroke prevention in atrial fibrillation, Curr Opin Neurol 2008; 21(1): 64-69
[2] Dawson, et al., Should patients undergoing cardiac surgery with AF have LAA exclusion? Interactive Card.Vasc and Thoracic Surgery 10 (2010) 306–311

Cierre de orejuela auricular izquierda - Dispositivos

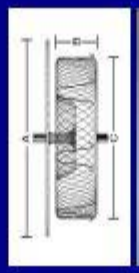
WATCHMAN

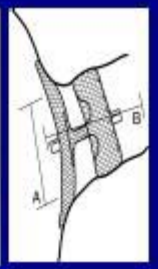
½-Rugbyball type

PLAATO

Soccerball type

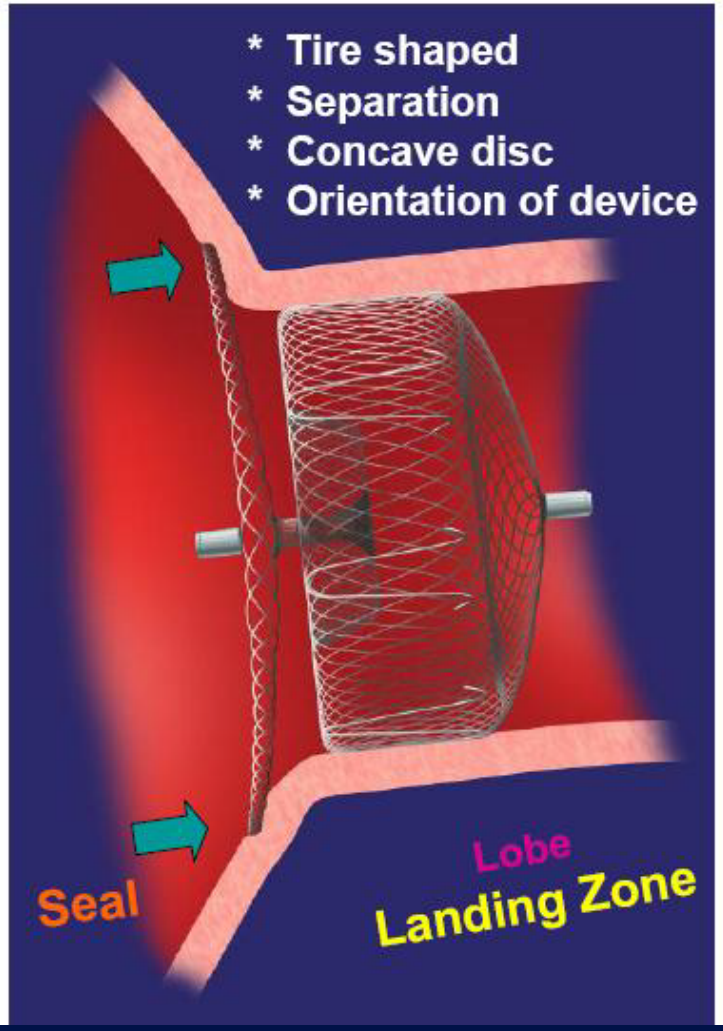
ACP





Puck&Disc type

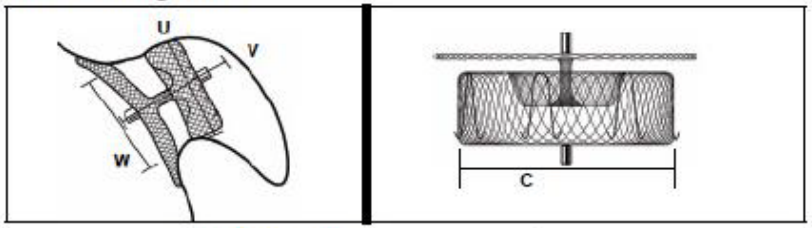
ACP: Mecanismo de acción y determinación del tamaño de dispositivo



Device design:

- Sealing the LAA ostium
- Independent from body shape
- Not attempting to "fill" the LAA

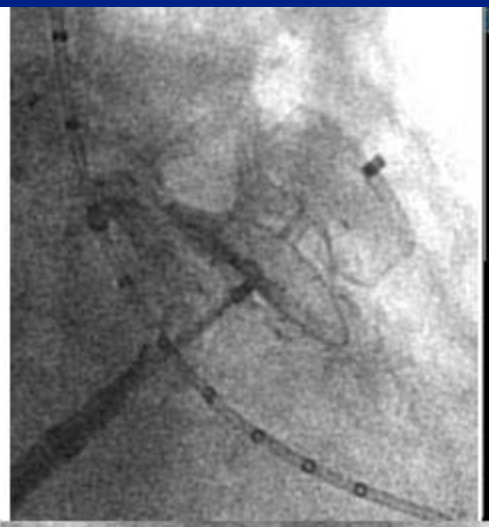
Table 2. Sizing chart

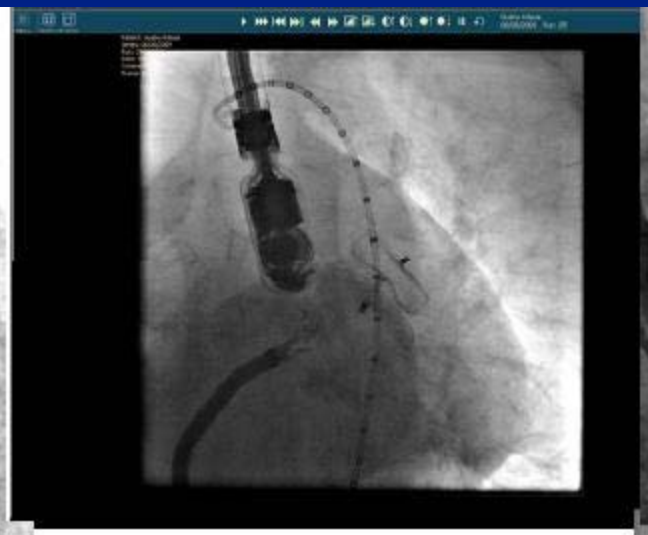


Landing Zone[a] U	Distance from Orifice V	Device Size C	Device Order Number
mm	mm	mm	
12.6 - 14.5	≥ 10	16	9 – ACP – 007 – 016
14.6 - 16.5	≥ 10	18	9 – ACP – 007 – 018
16.6 - 18.5	≥ 10	20	9 – ACP – 007 – 020
18.6 - 20.5	≥ 10	22	9 – ACP – 007 – 022
20.6 - 22.5	≥ 10	24	9 – ACP – 007 – 024
22.6 - 24.5	≥ 10	26	9 – ACP – 007 – 026
24.6 - 26.5	≥ 10	28	9 – ACP – 007 – 028
26.6 - 28.5	≥ 10	30	9 – ACP – 007 – 030

a. The landing zone is where the lobe of the device will be placed in the left atrial appendage.

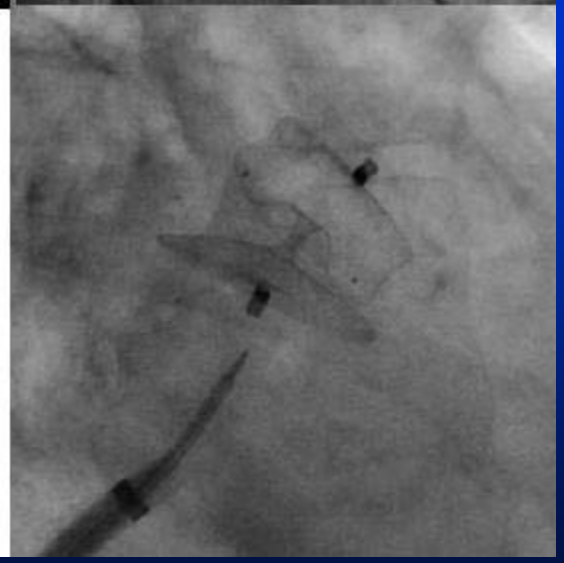
Evaluación de posicionamiento: Angio



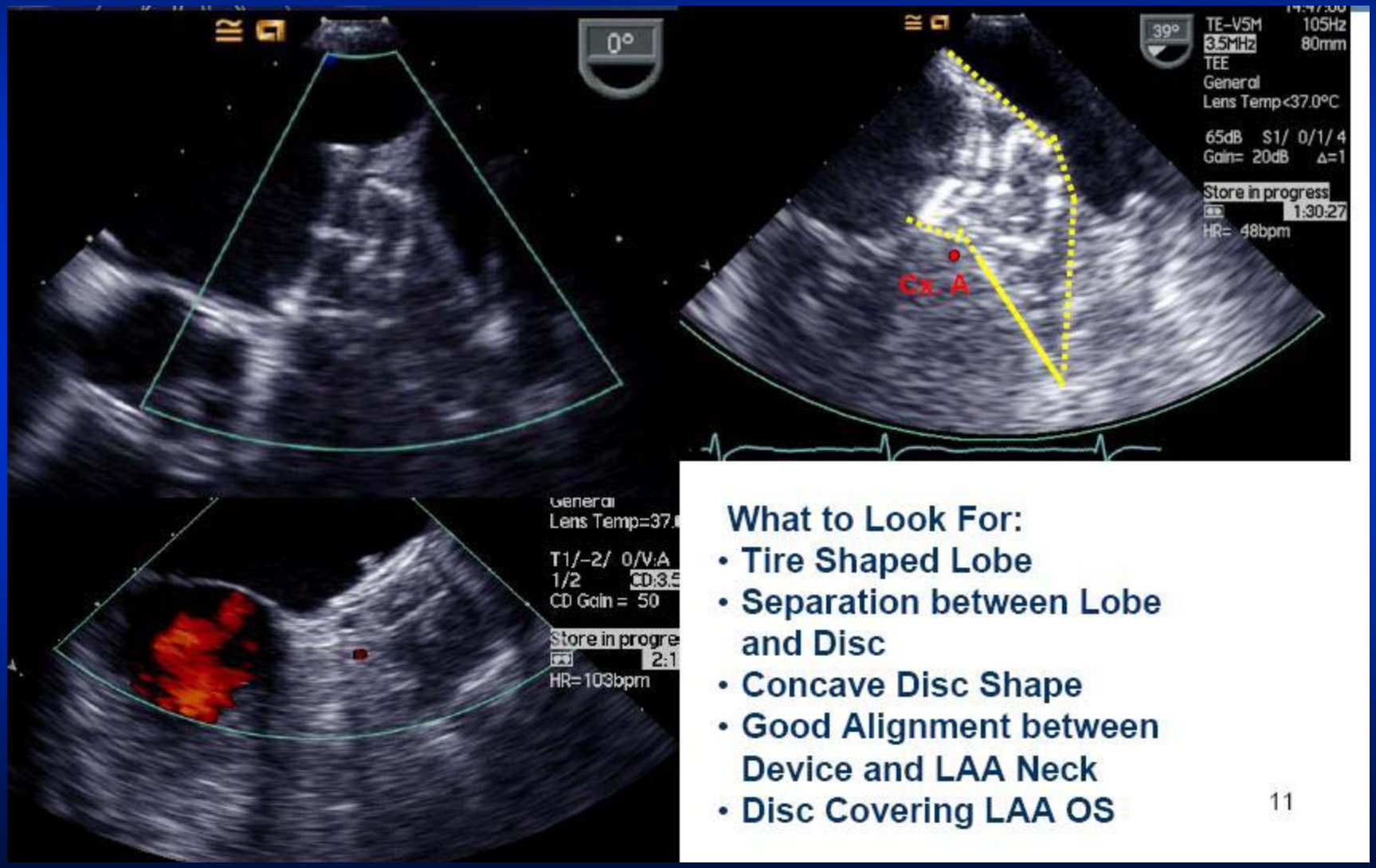


What to Look For:

- Tire Shaped Lobe
- Separation between Lobe and Disc
- Concave Disc Shape
- Good Alignment between Device and LAA Neck
- Disc Covering LAA OS



Evaluación de posicionamiento: ETE



Cierre percutáneo de la orejuela auricular izquierda para prevención del ACV cardioembólico en pacientes con fibrilación auricular:

Resultados de los Estudios Clínicos

Journal of the American College of Cardiology
Vol. 46, No. 1, 2005
ISSN 0735-1097/05/$30.00
doi:10.1016/j.jacc.2005.03.042

Published by Elsevier Inc.

CLINICAL RESEARCH **Clinical Trials**

Percutaneous Left Atrial Appendage Transcatheter Occlusion (PLAATO System) to Prevent Stroke in High-Risk Patients With Non-Rheumatic Atrial Fibrillation

Results From the International Multi-Center Feasibility Trials

Stefan H. Ostermayer, MD,* Mark Reisman, MD, FACC,† Paul H. Kramer, MD, FACC,‡
Ray V. Matthews, MD, FACC,§ William A. Gray, MD, FACC,† Peter C. Block, MD, FACC,‖
Heyder Omran, MD,¶ Antonio L. Bartorelli, MD, FACC,# Paolo Della Bella, MD,#
Carlo Di Mario, MD, FACC,** Carlo Pappone, MD,†† Paul N. Casale, MD, FACC,‡‡
Jeffrey W. Moses, MD, FACC,§§ Athena Poppas, MD, FACC,‖‖ David O. Williams, MD, FACC,‖‖
Bernhard Meier, MD, FACC,¶¶ Allan Skanes, MD,## Paul S. Teirstein, MD, FACC,***
Michael D. Lesh, MD,††† Toshiko Nakai, MD,††† Yves Bayard,* Kai Billinger, MD,*
Thomas Trepels, MD,* Ulrike Krumsdorf, MD,* Horst Sievert, MD, FACC*

Frankfurt and Bonn, Germany; Seattle, Washington; Shawnee Mission, Kansas; Los Angeles, La Jolla, and San Francisco, California; Atlanta, Georgia; Milan, Italy; London, United Kingdom; Lancaster, Pennsylvania; New York, New York; Providence, Rhode Island; Bern, Switzerland; and London, Ontario, Canada

PLAATO - Resultados

- Implante exitoso → 108 / 111 (97%)
- Tiempo de procedimiento → 68 minutos
- Tiempo de fluoroscopía → 18 ± 9 minutos
- Complicaciones :
  - Mortalidad → 1 (0.9%)
  - ACV → 0
  - T. Cardíaco → 3 (2.7%)
  - Vasculares → 3

Ostermayer S; JACC 2005

PLAATO - Resultados

Results: Stroke risk reduction

Mean $CHADS_2$ score	2.5
Expected annual risk of stroke	5.5%
Strokes after PLAATO™ procedure (n)	2
Annual stroke rate in PLAATO™ patients	2.2%
Risk reduction by PLAATO™	**60%**

Ostermayer S; JACC 2005

JACC: CARDIOVASCULAR INTERVENTIONS
VOL. 2, NO. 7, 2009

ISSN 1936-8798/09/$36.00
PUBLISHED BY ELSEVIER INC.
DOI: 10.1016/j.jcin.2009.05.005

CLINICAL RESEARCH

Percutaneous Left Atrial Appendage Occlusion for Patients in Atrial Fibrillation Suboptimal for Warfarin Therapy

5-Year Results of the PLAATO (Percutaneous Left Atrial Appendage Transcatheter Occlusion) Study

Peter C. Block, MD,* Steven Burstein, MD,† Paul N. Casale, MD,‡ Paul H. Kramer, MD,§ Paul Teirstein, MD,‖ David O. Williams, MD,¶ Mark Reisman, MD#

Atlanta, Georgia; Los Angeles and San Diego, California; Lancaster, Pennsylvania; Shawnee, Kansas; Providence, Rhode Island; and Seattle, Washington

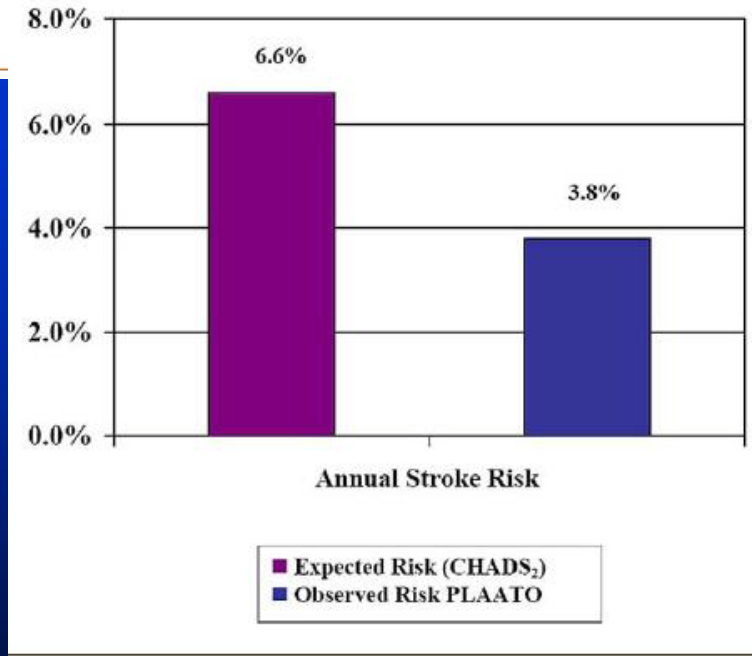


Figure 1. Difference Between the Expected Versus Observed Stroke/TIA Rates in the PLAATO U.S. Feasibility Study

64 pacientes
Estudio observacional
Multicéntrico
Prospectivo
No randomizado

PLAATO - Resultados

Proof of Concept: The PLAATO Studies – Long Term + Initial Experience

Author	# patients	Follow Up	Est. ann. stroke rate (w/o device)	Act. ann. stroke rate (w/ device)
Block[1]	64	5 years	6.6%	3.3%
Park[2]	73	2 years	5.0%	0.0%
Ussia[3]	20	40 ±10 mths	6.4%	0.0%
De Meester[4]	10	3 ±47 mths	7.1%	0.0%
Ostermeyer[5]	111	9.8 mths	6.3%	2.2%

Programa de investigación - Watchman

STUDY	PATIENTS	SITES	COMMENTS
Pilot	66	8	• 318 patient years of follow-up • 30 patients with 5+ years of follow-up
PROTECT AF	800	59	• 1,500 patient years of follow-up • 27 months average follow-up per patient
Continued Access Registry (CAP)	567	26	• Significantly improved safety results
ASAP	83	4	• Treat patients contra-indicated for warfarin
EVOLVE	25	3	• Evaluate next generation WATCHMAN
Total	1,540		

PROTECT - AF

In- & Exclusion

Major inclusion criteria

- Non valvular AF with Chads2 score ≥ 1
- No contraindications to coumadin
- No co-morbidities mandating chronic warfarin use other than AF

Major exclusion criteria

- LAA thrombus
- Large PFO with significant atrial septal aneurysm
- Mobile aortic atheroma
- Symptomatic carotid artery disease

Holmes D; Lancet 2009

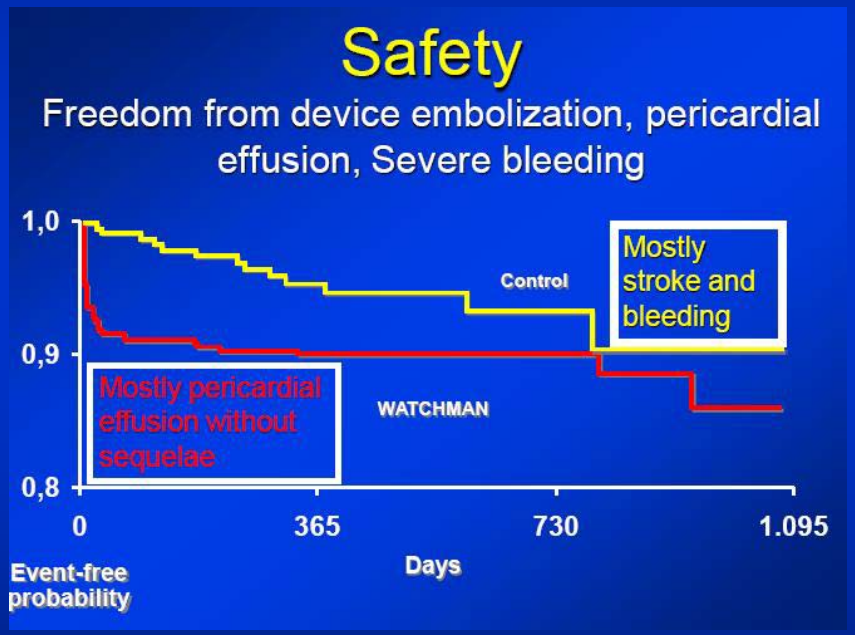
PROTECT - AF

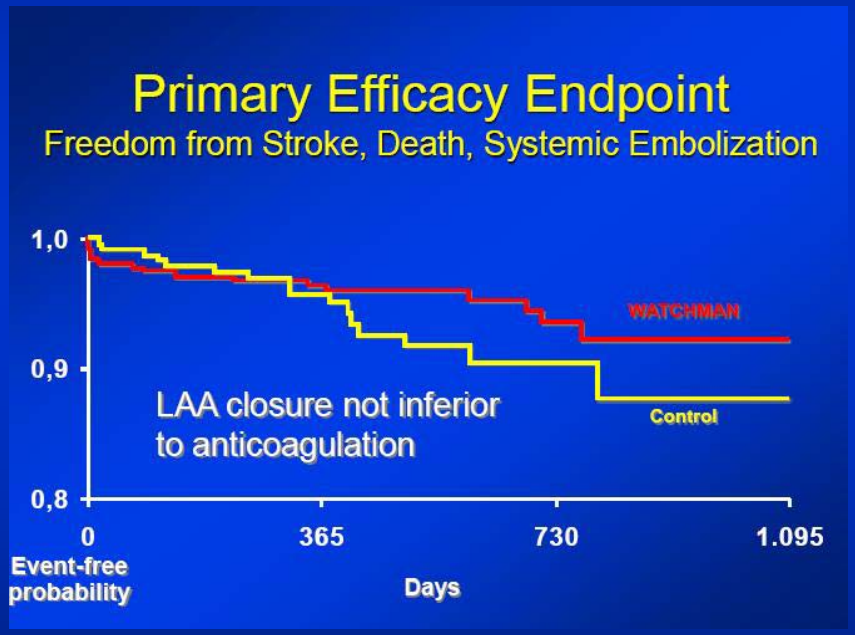
PROTECT AF Trial Endpoints

- Primary Efficacy Endpoint
  - All stroke
  - Cardiovascular and unexplained death
  - Systemic embolization
- Primary Safety Endpoint
  - Device embolization requiring retrieval
  - Pericardial effusion requiring intervention
  - Cranial bleeds and gastrointestinal bleeds
  - Any bleed that requires ≥ 2uPRBC

Holmes D; Lancet 2009

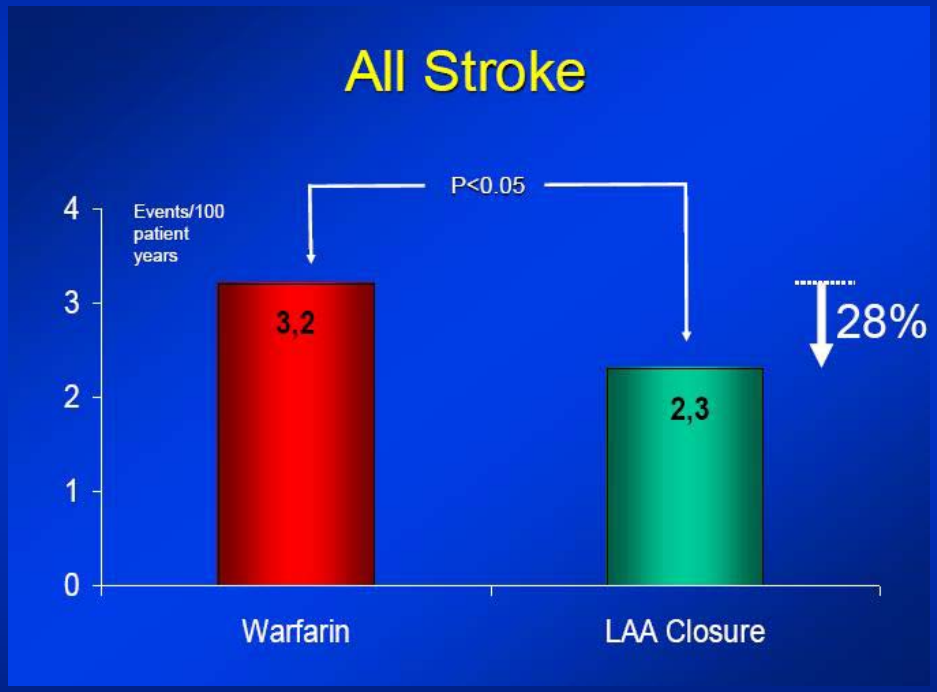
PROTECT - AF

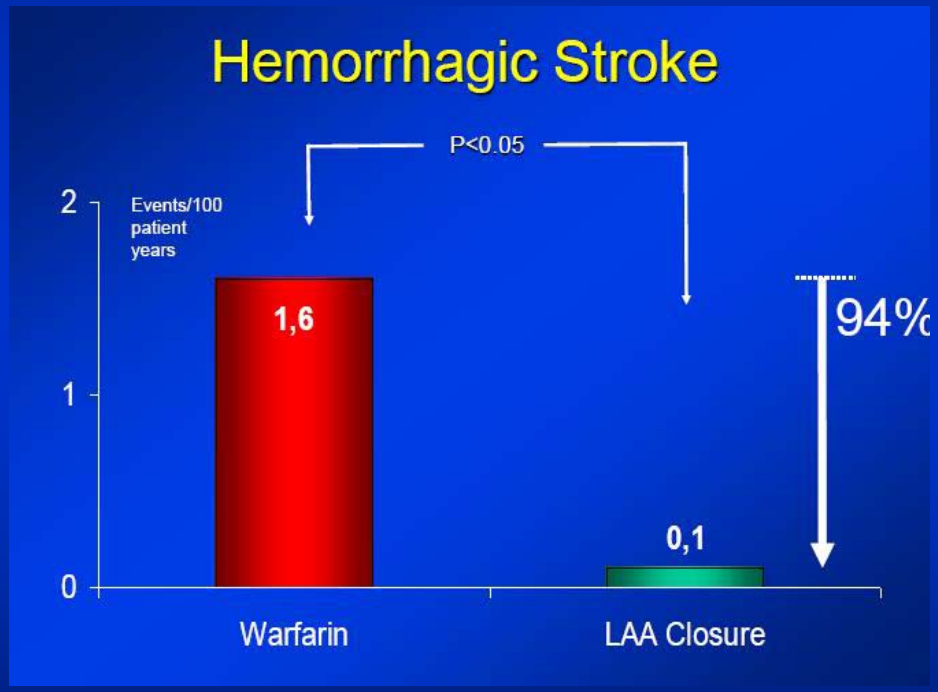




Holmes D; Lancet 2009

PROTECT - AF





Holmes D; Lancet 2009

PROTECT - AF

Performance Metrics
PROTECT AF vs CAP

	PROTECT AF	PROTECT AF		CAP	p-value*	p-value
		Early	Late			
Procedure Time (Mean SD)	62 ± 34	67 ± 36	58 ± 33	50 ± 21	<0.001	<0.001
Implant Success	485/542 (89.5%)	239/271 (88.2%)	246/271 (90.8%)	437/460 (95.0%)	0.001	0.001
45-day Warfarin Discontinuation Among Implanted	414/478 (86.6%)	194/235 (82.6%)	220/243 (90.5%)	352/371 (94.9%)	<0.001	<0.001

*From tests comparing the PROTECT AF cohort with CAP
From tests for differences across three groups (early PROTECT AF, late PROTECT AF, and CAP)

- Improvements seen over time in PROTECT AF
  - Shorter implant time, higher implant success rate, higher warfarin discontinuation rate
- Trends confirmed in CAP

Safety Event Rates

PROTECT AF vs CAP

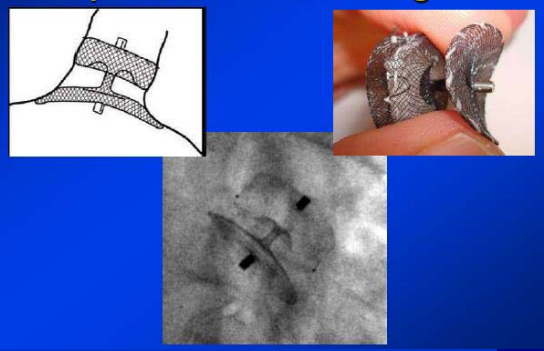
	PROTECT AF	PROTECT AF		CAP	p-value*	p-value
		Early	Late			
Procedure/Device Related Safety Adverse Events within 7 Days	42/542 (7.7%)	27/271 (10.0%)	15/271 (5.5%)	17/460 (3.7%)	0.007	0.006
Serious Pericardial Effusions within 7 Days	27/542 ***(5.0%)***	17/271 (6.3%)	10/271 (3.7%)	10/460 **(2.2%)**	0.019	0.018
Procedure Related Stroke	5/542 ***(0.9%)***	3/271 (1.1%)	2/271 (0.7%)	0/460 ***(0.0%)***	0.039	0.039

*From tests comparing the PROTECT AF cohort with CAP ±From tests for differences across three groups (early PROTECT AF, late PROTECT AF, and CAP)

Reddy et al;Circulation 2011

Dispositivo - ACP

Concept of
Amplatzer Cardiac Plug ACP



Initial ACP European Experience

Implant Attempted
N=137

Device Implanted
N=132

Unable to Implant
N=5

Device Embolism
N=2

Adverse Anatomy
N=3

Implant Successful in 96.4%
(132/137) of Attempts

Park J; EuroPCR 2010

Dispositivo - ACP

Initial ACP European Experience N=143

24-h Procedure Related Complications

Serious complications

Serious Pericardial Effusion*	N=5 (3.5%)
Device Embolization	N=2 (1.4%)
Ischaemic Stroke (Embol. of air or thrombus?)	N=3 (2.1%)

Minor complications

Trivial Pericardial effusion	N=4 (2.8%)
Transient Myocardial Ischemia (Air Embolism)	N=2 (1.4%)
Device snared from femoral vein	N=1 (0.7%)

Park J; EuroPCR 2010

Dispositivo - ACP

euro PCR

Learning curve confirmed

	Initial European Registry[1]	EU Post Market Observational Study
Number of patients (Follow-up period)	N = 143 (Discharge or < 24 hrs)	N = 204 (< 7 days)
Enrollment Period	December 2008 – December 2009	August 2009 – September 2011
Stroke	N = 3 (2.1%)	N = 0 (0.0%)
Serious Pericardial Effusion	N = 5 (3.5%)	N = 3 (1.5%)
Device Embolization	N = 2 (1.4%)	N = 3 (1.5%)
Device Related Thrombus	N= 0 (0.0%)	N = 0 (0.0%)
Total reported Safety Events	**N = 10 (7%)**	**N = 6 (2.9%)**

[1]Park, J.-W. et al. (2011), Left atrial appendage closure with Amplatzer Cardiac Plug in Atrial Fibrillation: Initial European experience. Catheterization and Cardiovascular Interventions, 77: 700–706. doi: 10.1002/ccd.22764

CL06181 Rev2

PCR EAPCI

Walsh K, EuroPCR2012

Dispositivo - ACP

euro PCR

Stroke Risk

	Total Patients	Total Patient years	$CHADS_2$ Score	Estimated Stroke Rate per $CHADS_2$	Actual annual stroke rate (number of events)
ACP EU Observational	204	101 yrs	2.6	5.6%*	1.98% (N=2)

- Patients had an expected annual stroke risk of 5.6%
- With 101 patient years the actual stroke rate was 1.98%
- 65% reduction in stroke risk from estimated stroke rate

1. Wann LS, Curtis AB, Ellenbogen K a, et al. 2011 ACCF/AHA/HRS focused updates incorporated into the ACC/AHA/ESC 2006 guidelines for the management of patients with atrial fibrillation: a report of the American College of Cardiology Foundation/American Heart Association Task Force on practice guidel. *Circulation*. 2011;123(10):e269-367.

PCR EAPCI EACTS

Walsh K, EuroPCR2012

euro PCR 2012 YEAR OF THE TEXTBOOK

SOLACI

"SOLACI@EuroPCR"

Interventional Treatment for Structural heart disease in Latin-America

"Left Atrial Appendage Closure LATAM Registry"

Dr. Aníbal Damonte
Department of Interventional Cardiology
Instituto Cardiovascular de Rosario
Rosario, Argentina

PCR EAPCI EUROPEAN SOCIETY OF CARDIOLOGY® EACTS

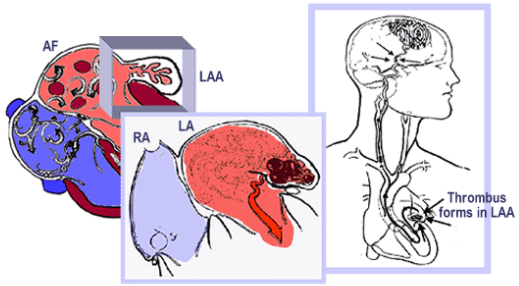
"Percutaneous Closure of the LAA with the Amplatzer Cardiac Plug: Initial Experience in Latin America"

Coauthors and Participating Hospitals

- Dr. C Pedra, Dra. L Armaganijan; Instituto Dante Pazzanese, San Pablo, Brasil
- Dr. C Costantini, Hospital Cardiológico Costantini, Curitiba, Brasil
- Dr. M Montenegro, Dr. E Quintella, Instituto Estadual de Cardiología, Río de Janeiro, Brasil
- Dr. Alejandro Martinez, Universidad Católica de Chile, Santiago, Chile
- Dr. Fabio Brito, Dr. M Perin, Hospital Albert Einstein, San Pablo, Brasil
- Dr. José Condado, Hospital Perez Carreño, Caracas, Venezuela
- Dr. Daniel Aguirre, Clínica Alemana, Santiago, Chile
- Dr. Horacio Faella, Dr. Germán Henestrosa, Instituto FLENI, Buenos Aires, Argentina
- Dr. León Valdivieso, Dr. Oscar Mendiz, Fundación Favaloro, Buenos Aires, Argentina
- Dr. C Pincetti, Dr. L Romero, Hospital Regional de Temuco, Chile
- Dr. C Deck, Dr. Polentzi Uriarte, Instituto Clínico del torax, Santiago, Chile
- Dr. Miguel Ballarino, Dr. Alejandro Peirone, Hospital Privado, Córdoba, Argentina
- Dr. Fernando Cura, Dr. Sebastian Peralta, Instituto Cardiovascular de Buenos Aires, Argentina
- Dr. Alejandro Fernandez, Dr. Daniel Berrocal, Hospital Italiano, Buenos Aires, Argentina
- Dr. Alejandro Palacios, Dr. Juan Arellano, Sanatorio de la Trinidad, Buenos Aires, Argentina
- Dr. R LLuberas, Dr. Alvaro Rivara, Hospital de Clínicas, Montevideo, Uruguay
- Dr. Aníbal Damonte, Dr. Eduardo Picabea, Instituto Cardiovascular de Rosario, Argentina.

euro PCR 2012

Background



- Atrial fibrillation (AF) is the most common cardiac arrhytmia and a major cause of morbidity and mortality secondary to cardioembolic stroke.

- In patients with non valvular AF 90% of intracavitary thrombi form in the LAA[1].

- Percutaneous closure of the LAA has emerged as a potential alternative to anticoagulation therapy for the prevention of cerebrovascular events in patients with AF and contraindications or difficulties for oral anticoagulation.

(1)Onalan, et al. Stroke 2007;38:624-630

euro PCR 2012

Objectives

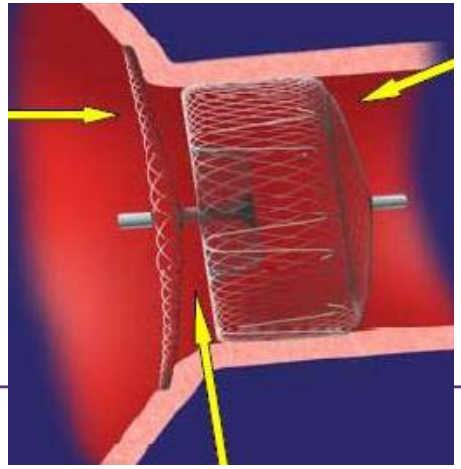
- This experience describes the feasibility, in hospital and 30 days follow up results of the transcatheter closure of the LAA with the Amplatzer Cardiac Plug (St. Jude Medical) in an initial Latin American experience.

euro PCR 2012

Methods

- Physician initiated, voluntary, retrospective registry, including 54 consecutive patients with AF at high risk for cardioembolic stroke, from different Latin American hospitals that were treated with the ACP from August 2009 to April 2012.

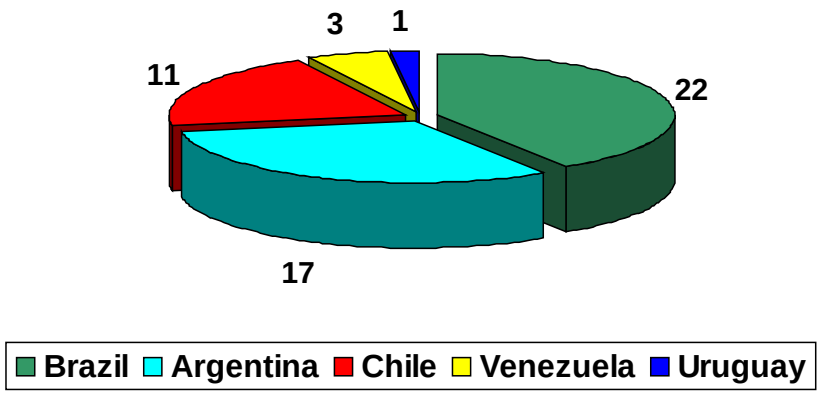
- The procedures were performed under general anesthesya, transesophageal ecocardiography (TEE), fluroscopic and angiographic guidance.



"Left Atrial Appendage Closure LATAM Registry"

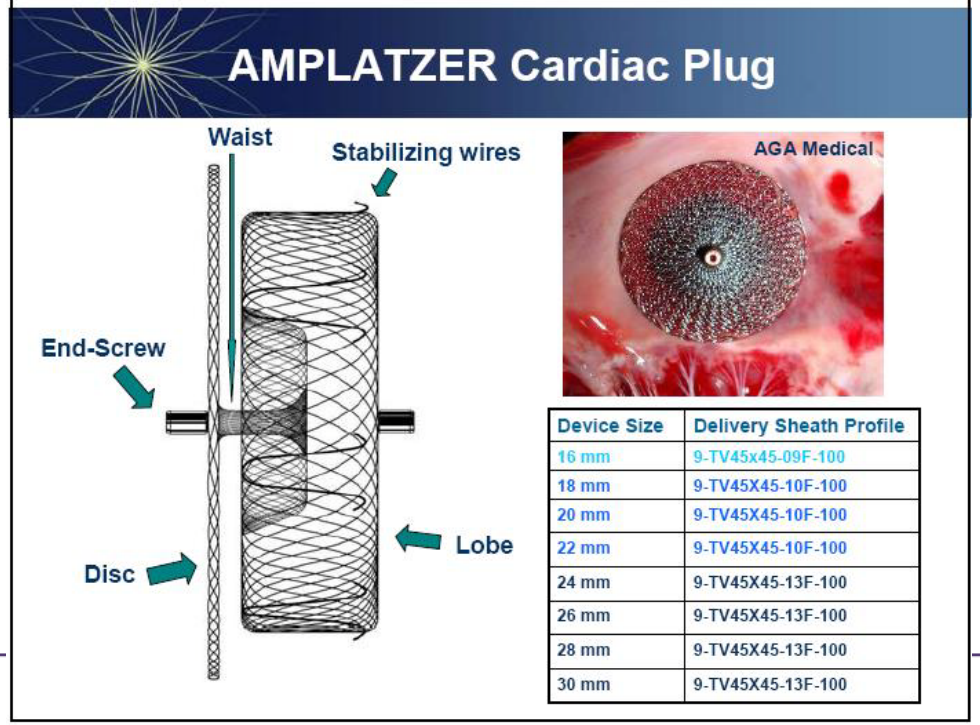
N=54 April 2012

Procedures / Country



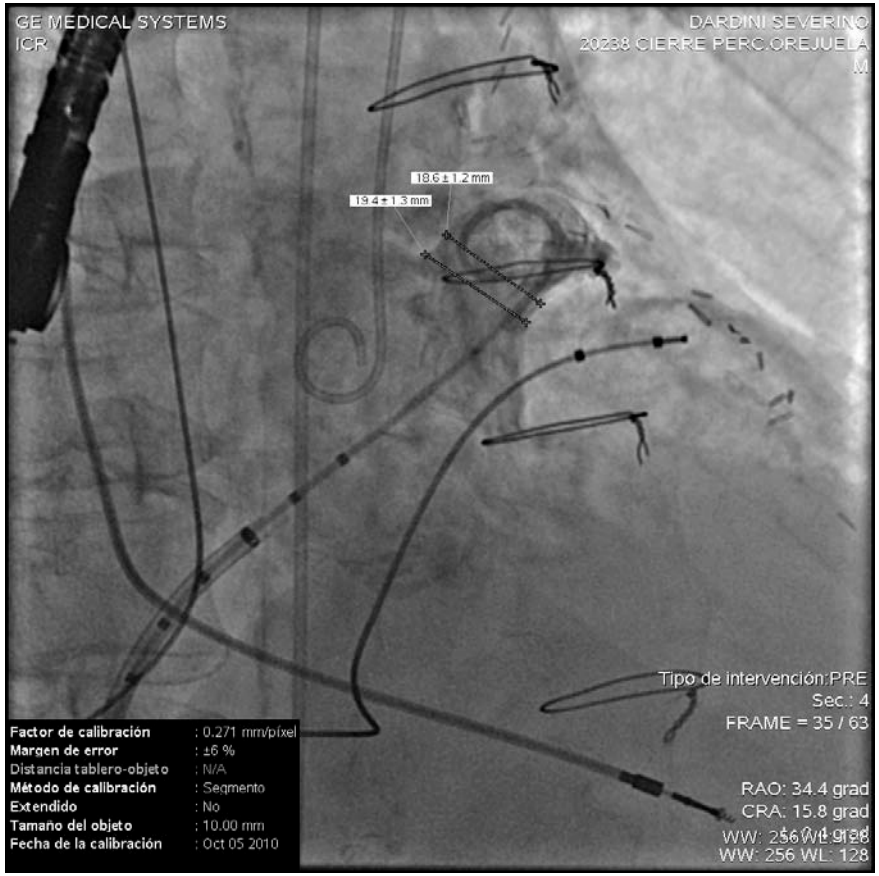
Methods

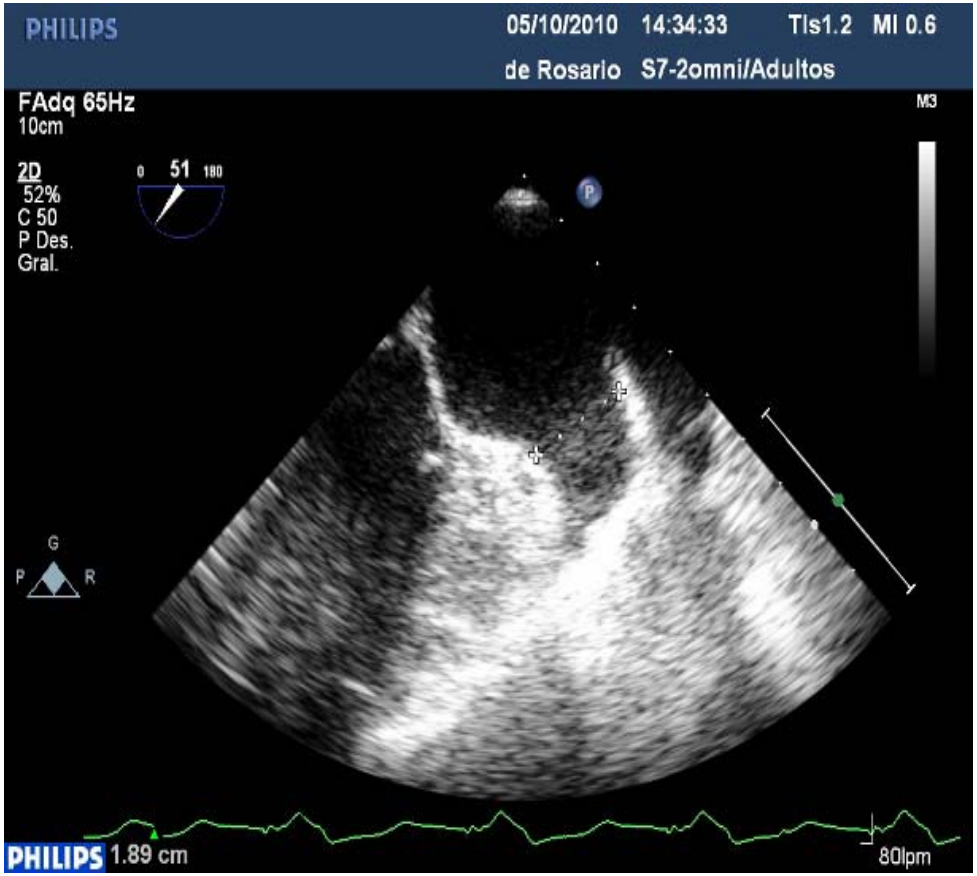
- The ACP is a self expandable nitinol mesh device specifically designed for the transcatheter closure of the LAA.
- It consists of a lobe with stabilizing wires to assure retention and a disc connected by a central waist.



Device Size	Delivery Sheath Profile
16 mm	9-TV45x45-09F-100
18 mm	9-TV45X45-10F-100
20 mm	9-TV45X45-10F-100
22 mm	9-TV45X45-10F-100
24 mm	9-TV45X45-13F-100
26 mm	9-TV45X45-13F-100
28 mm	9-TV45X45-13F-100
30 mm	9-TV45X45-13F-100

LAA Measurements (Angio and TEE)





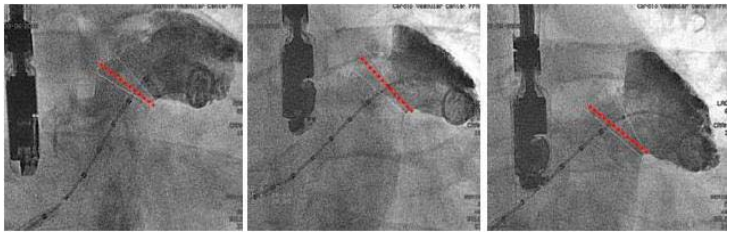
euro PCR 2012

Results

• Age	72 ± 8,7
• Male	70 %
• HTA	78 %
• DBT	17 %
• CHF	32,17 %
• Contraindic. ACO	64,29 %
• **CHADS2 score**	3,15 ± 1,12

Results

- LAA neck (TEE) 20,3 ± 3,8 mm
- LAA neck (Angio) 22,6 ± 3,2 mm



- LAA Orifice (TEE) 21,4 ± 4,3 mm
- LAA Orifice (Angio) 24,2 ± 4,6 mm
- LAA 1 lobe 38 (70%)
- LAA 2+ lobes 16 (30%)
- Trans septal 51 (94%)
- Vía PFO/ASD 3 (6%)
- Selected ACP device 25 ± 2,9 mm

In Hospital and 30d FU Results

Successfull Implant	54	(100%)
Simultaneous PFO/ASD Closure	3	(5.5%)

- In hospital Complications:

5 patients (9.2%)
1 embolization (retrieved surgically)
4 severe pericardial effussions – pericardiocentesis (7.4%)
No death, stroke or myocardial ischaemia.

- No new events reported at 30 days clinical FU.

euro PCR 2012

Results

	Protect AF[1] N= 463	Protect AF(early)[1] N=271	ACPIn.Eu.Ex[2] N= 143	ACP LatAm N= 54
Successfull implant (%)	90.9	88.2	96.4	100
Severe peric. effussion (%)	5.0	6.3	3.5	7.4
Emboliztion of device (%)	0.2	N/A	1.4	1.8
Stroke/TIA (%)	0.9	1.1	2.1	0
Major complic. (%)	7.7	10	7.0	9.2

[1]*Reddy V, et al. Circ 2011;123:417-424* [2]*Park J, et al. CCI 2011;77:701-706*

euro PCR 2012

Conclusions

- Left atrial appendage closure is a new transcatheter procedure, and a learning curve is expected.

- In this initial experience, percutaneous closure of the LAA with the ACP in patients with AF at high risk of stroke, was feasible, with a high rate of technical success and a complications rate similar to previous reports with this and other devices during the learning phase of the procedure.

- We are commited with the continous access to this registry of each patient performed in Latin America, and with their long term clinical and TEE follow up, to generate a valuable body of clinical information from our region of this new therapeutic alternative

1er Paciente ICR

76 años, masculino, HTA

Aleteo auricular en 2005

Implante de MCP definitivo en 2005

Fibrilación auricular recurrente desde 2007 en tto ACO crónico.

Presentó en Abril de 2009 episodio de amaurosis izquierda con secuela mínima.

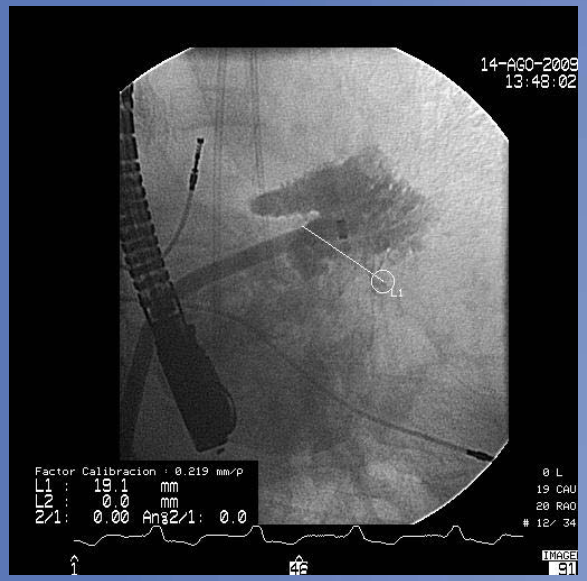
CHADS2 score 3

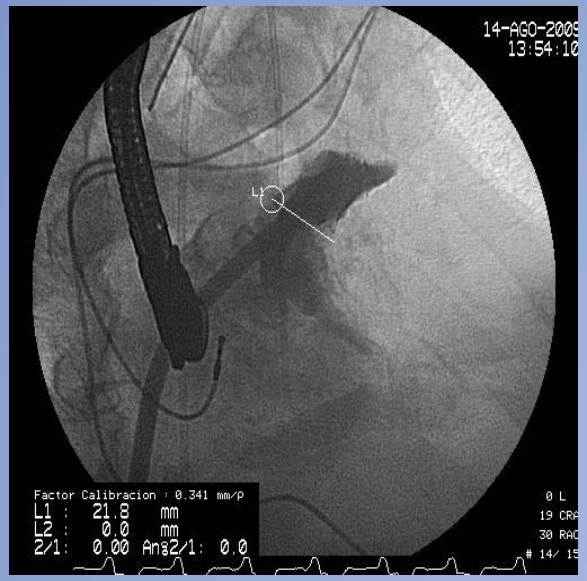
Estudios realizados:

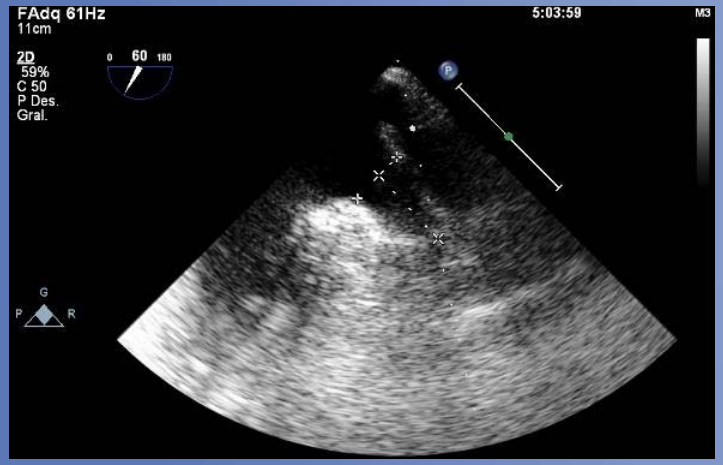
Doppler de vasos de cuello: Sin lesiones significativas

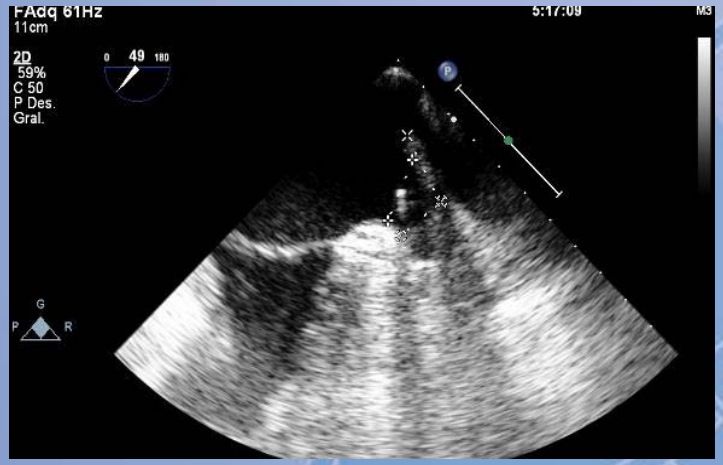
- Tomografía de cráneo: Lesión isquémica antigua en hemisferio izq.
- ETE: HVI, agradamiento AI, deterioro moderado de FSVI con FE 45%, orejuela auricular izq sin imágenes de trombo en el momento del estudio.

Derivado a nuestra institución para oclusión percutánea de orejuela auricular izquierda.


14-AGO-2009
13:48:02
L1
Factor Calibracion : 0.219 mm/P
L1 : 19.1 mm
L2 : 0.0 mm
2/1: 0.00 Ang2/1: 0.0
0 L
19 CAU
20 RAO
12/ 34

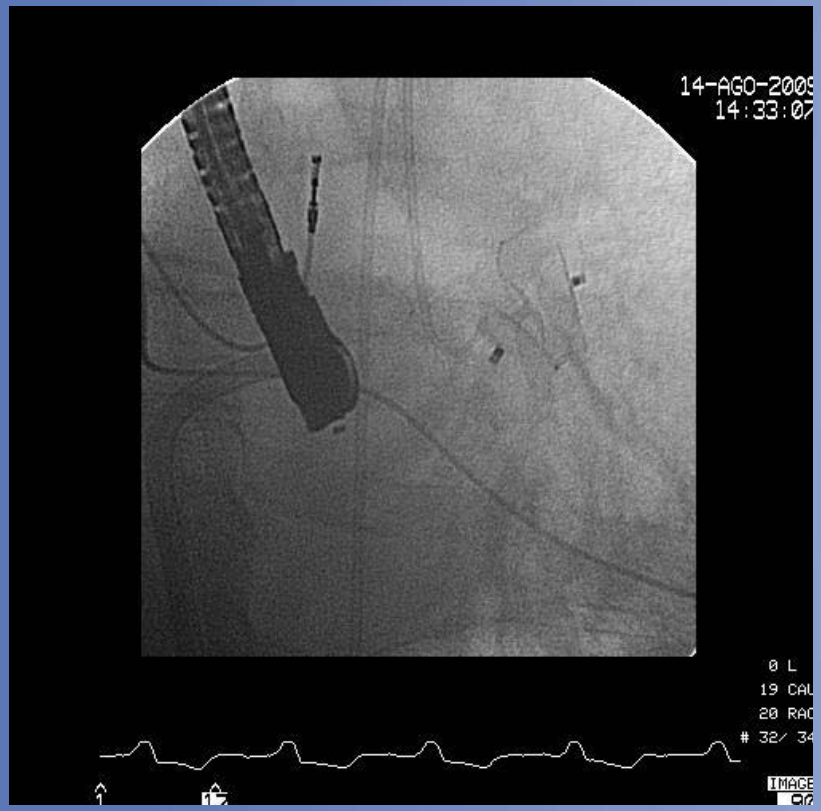

14-AGO-2009
13:54:10
L1
Factor Calibracion : 0.341 mm/P
L1 : 21.8 mm
L2 : 0.0 mm
2/1: 0.00 Ang2/1: 0.0
0 L
19 CRA
30 RAO
14/ 15

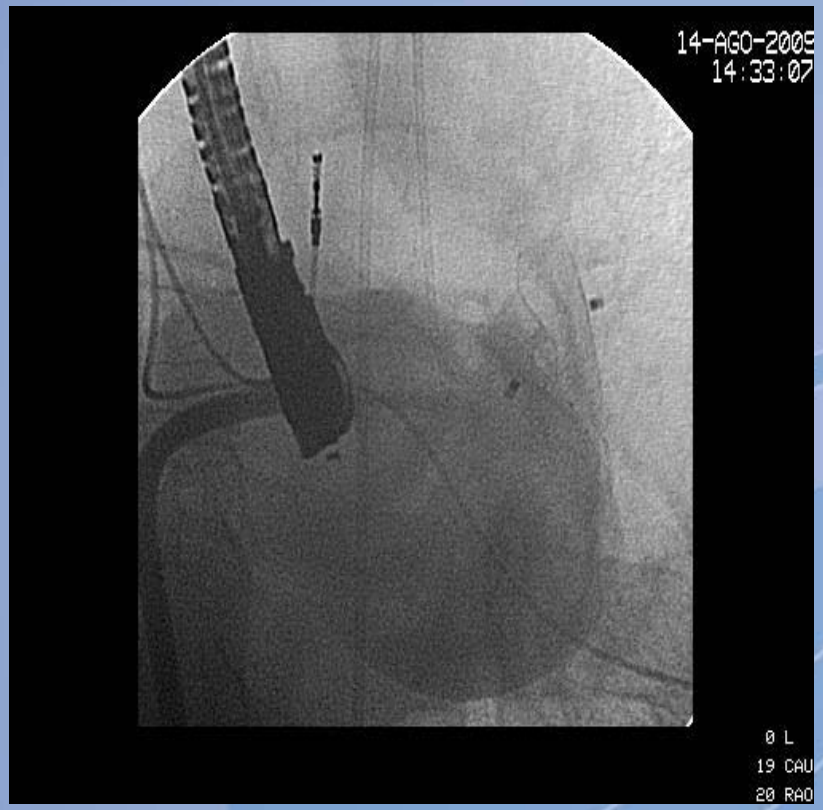

FAdq 61Hz
11cm
5:03:59
M3
2D
59%
C 50
P Des.
Gral.
60


FAdq 61Hz
11cm
5:17:09
M3
2D
59%
C 50
P Des.
Gral.
49

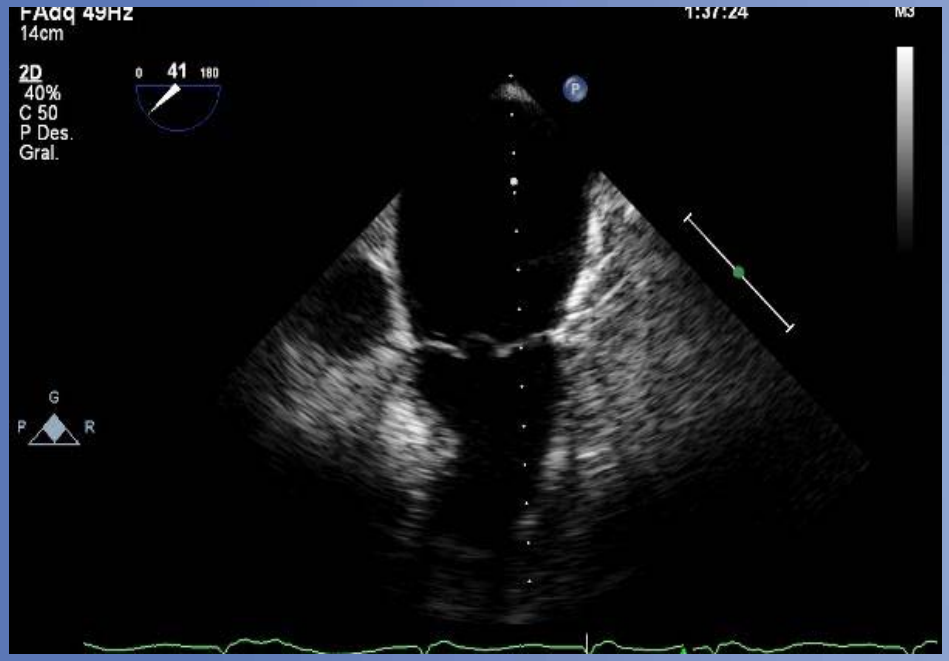
21 mm

22 mm

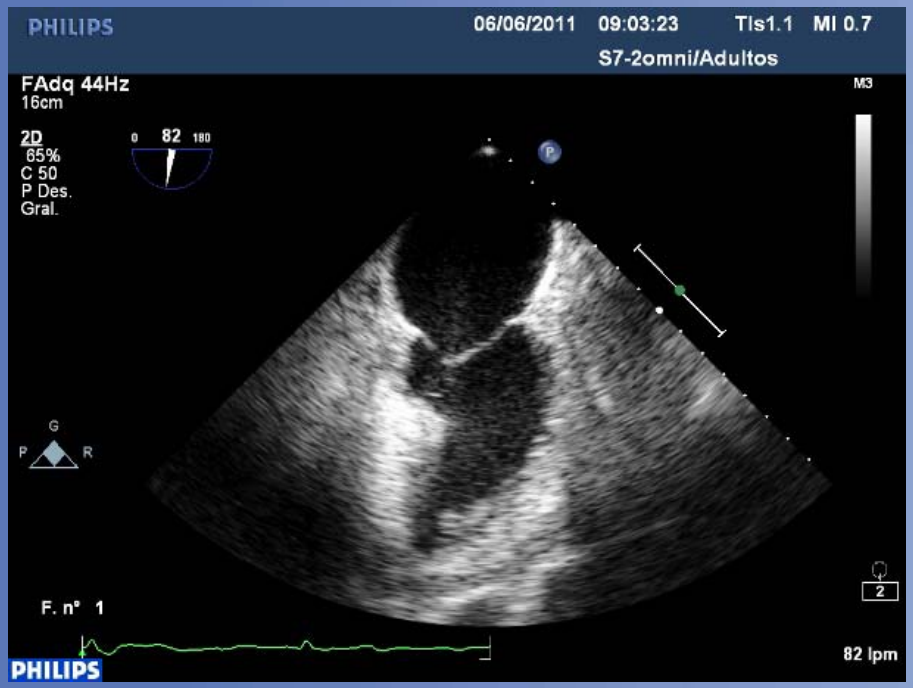

14-AGO-2009
14:33:07
0 L
19 CAU
20 RAO
32/ 34
IMAGE

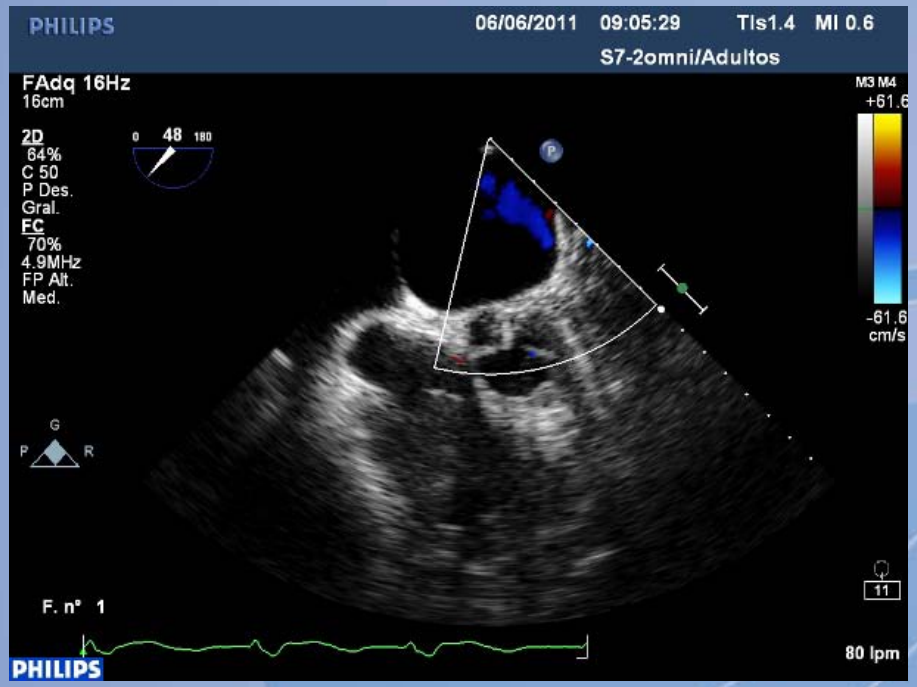

14-AGO-2009
14:33:07
0 L
19 CAU
20 RAO

ETE 45 días post procedimiento



ETE 06/2011


PHILIPS
06/06/2011 09:03:23 TIs1.1 MI 0.7
S7-2omni/Adultos
FAdq 44Hz
16cm
2D
65%
C 50
P Des.
Gral.
82
M3
F. nº 1
82 lpm
PHILIPS


PHILIPS
06/06/2011 09:05:29 TIs1.4 MI 0.6
S7-2omni/Adultos
FAdq 16Hz
16cm
2D
64%
C 50
P Des.
Gral.
FC
70%
4.9MHz
FP Alt.
Med.
48
M3 M4
+61.6
-61.6
cm/s
F. nº 1
80 lpm
PHILIPS

Guidelines - NICE


Issue date: June 2010

NHS
National Institute for
Health and Clinical Excellence

Percutaneous occlusion of the left atrial appendage in non-valvular atrial fibrillation for the prevention of thromboembolism

Guidance

- Current evidence suggests that percutaneous occlusion of the left atrial appendage (LAA) is efficacious in reducing the risk of thromboembolic complications associated with non-valvular atrial fibrillation.
  - With regard to safety, there is a risk of life-threatening complications from the procedure, but the incidence of these is low.
  - Therefore, this procedure may be used provided that normal arrangements are in place for clinical governance, consent and audit.
- Patient selection should be carried out by a multidisciplinary team including a cardiologist and other appropriate clinicians experienced in the management of patients with AF at risk of stroke.
  - Patients should be considered for alternative treatments to reduce the risk of thromboembolism associated with AF, and should be informed about these alternatives.
- Percutaneous occlusion of the LAA is a technically challenging procedure which should only be carried out by clinicians with specific training and appropriate experience in the procedure.
- Procedure should be carried out only in units with on-site cardiac surgery.

National Institute for Health and Clinical Excellence, UK, Percutaneous occlusion of the left atrial appendage in non-valvular atrial fibrillation for the prevention of thromboembolism. Issue date: June 2010, Interventional procedure guidance 349

Conclusiones

- La racionalidad del cierre percutáneo de la orejuela auricular izquierda en pacientes con FA permanente se basa en la evidencia que el 90% de los trombos se originan en ella.
- Diferentes estudios demostraron la factibilidad del procedimiento con alta tasa de implante exitoso en pacientes con contraindicación para ACO.
- El % stroke observado a 1 año y 5 años de seguimiento en los pacientes implantados fue 60% y 40% menor que el esperado de acuerdo a CHADS2 score.
- Datos recientes del estudio PROTECT AF demuestran que en pacientes sin contraindicación para ACO, la oclusión de la orejuela no es inferior a warfarina en la prevención del stroke.
- Existen complicaciones tempranas inherentes al procedimiento y a la curva de aprendizaje, fundamentalmente derrame pericárdico, que se ven contrarrestadas en el seguimiento tardío por los eventos de stroke y sangrado en los pacientes bajo ACO
- Constituye una alternativa aceptable en pacientes con FA permanente, con scores de alto riesgo para cardioembolia, y contraindicación de ACO, o aquellos pacientes que aún estando ACO presentan un evento cardioembólico.
- Debemos esperar resultado de mayor número de ensayos clínicos, adecuadamente dimensionados, para conocer hasta donde se pueden extender sus indicaciones

“MUCHAS GRACIAS”

ICR online
INSTITUTO CARDIOVASCULAR DE ROSARIO
Boulevard Oroño 450, 2000 Rosario Argentina, Teléfono (0341) 4203040 - Fax (0341) 4203337

Market Adoption Levels

- By the end of 2011: about 5000 cases are done world wide
  - Majority is in Europe: approx. 80%
    - Germany is 50% -> ± 2000 cases in Germany
  - 30% are in clinical research (RCT) and 15% in post market studies (registries).
- 60% of cases are done by interventional cardiologists and 40% implants are done by electrophysiologists.
  - Lowest complication rates in mixed teams: EP for transseptal puncture and IC for device deployment

Region	AF pts w/ bleeding complications	LAA implants (until end of 2011)	Market Adoption
US	26000	1000	4%
Europe	43000	3850	9%
Other*	15500	150	1%
Total	84500	5000	6%

* Australia/New Zealand, Canada, Japan

Dispositivo - ACP

ACP Results Across Series*

	ACP Initial European Registry[1]	ACP Italian registry[2]	Dual Center experience[3]	ACP Post Market Registry[4]
	N = 143	N = 100	N = 131	N = 145
Enrollment period	December 2008 - November 2009	December 2008 – November 2010	2010 - 2011	August 2009- May 2011 (interim)
Serious Pericardial Effusion	N = 5 (3.5%)	N = 2 (2.0 %)	N = 0	N = 3 (2 %)
Device Embolization	N = 2 (1.4%)	N = 0 (0%)	N = 0	N= 2 (1.4 %)
Ischemic Stroke	N = 3 (2.1%)	N = 0 (0%)	N = 0	N = 0
Total reported safety events	**N = 10 (7%)**	**N = 2 (2%)**	**N = 0 (0%)**	**N = 5 (3.4%)**