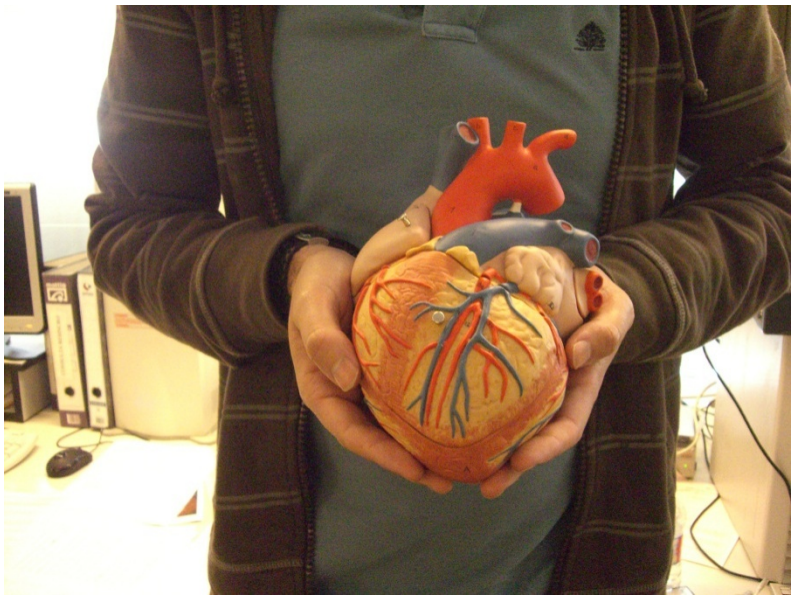
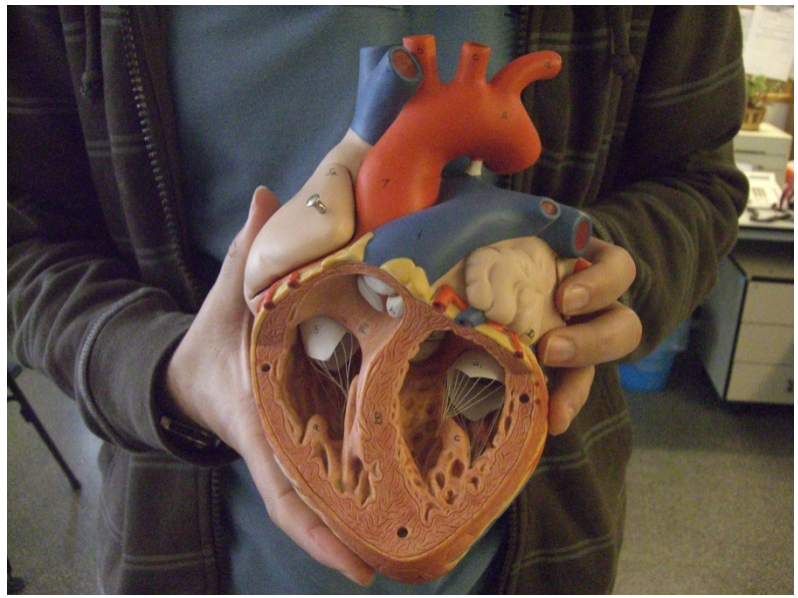
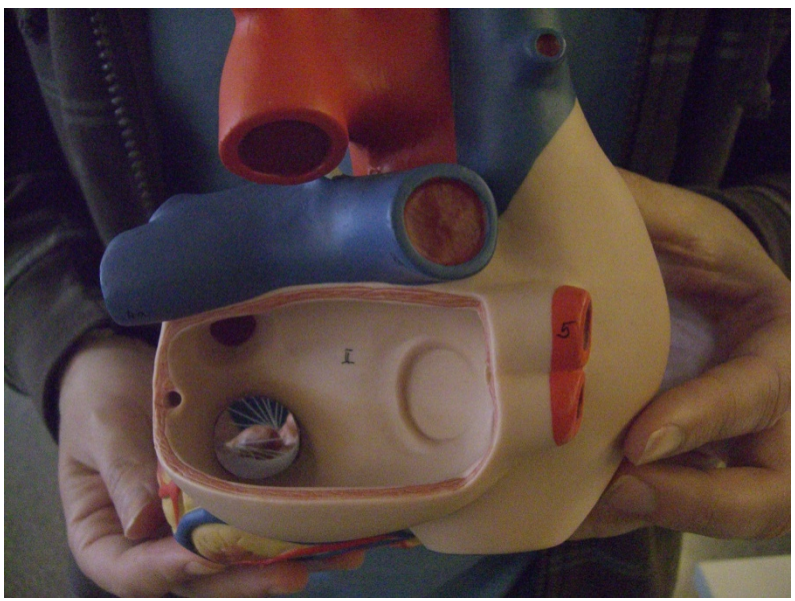
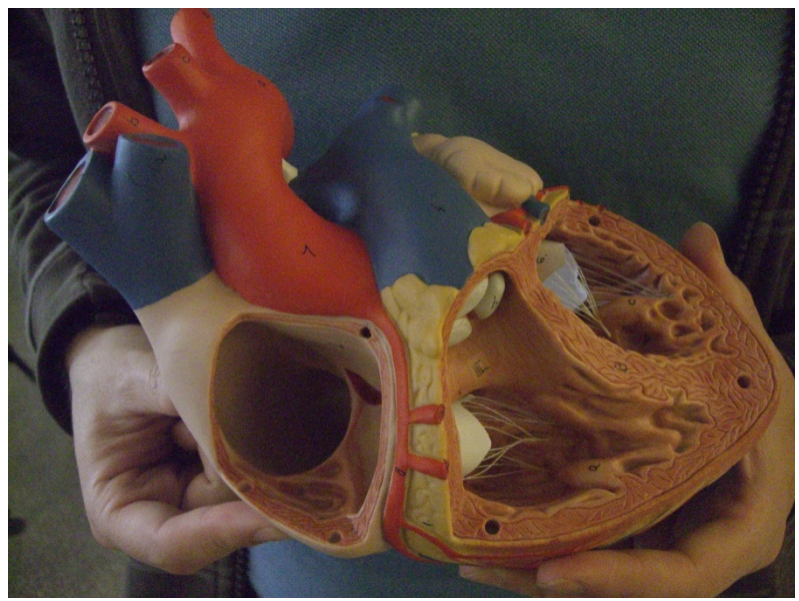
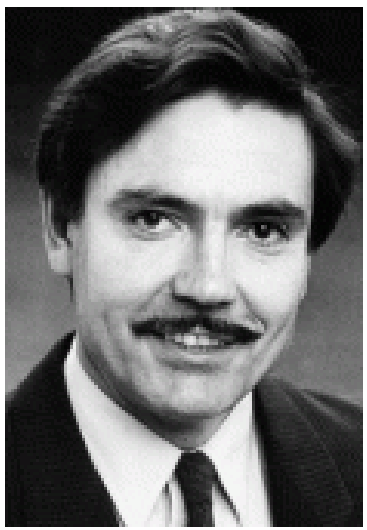
# APORTACIONES DEL LABORATORIO DE HEMODINÁMICA A LA CIRUGÍA CARDÍACA







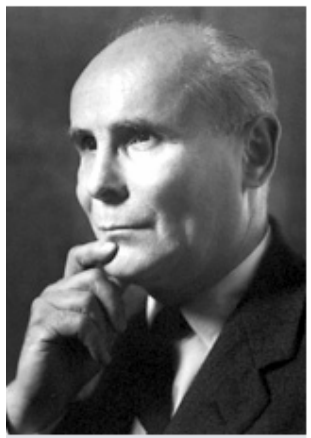




**Andreas Gruentzig**

## The Nobel Prize in Physiology or Medicine 1956

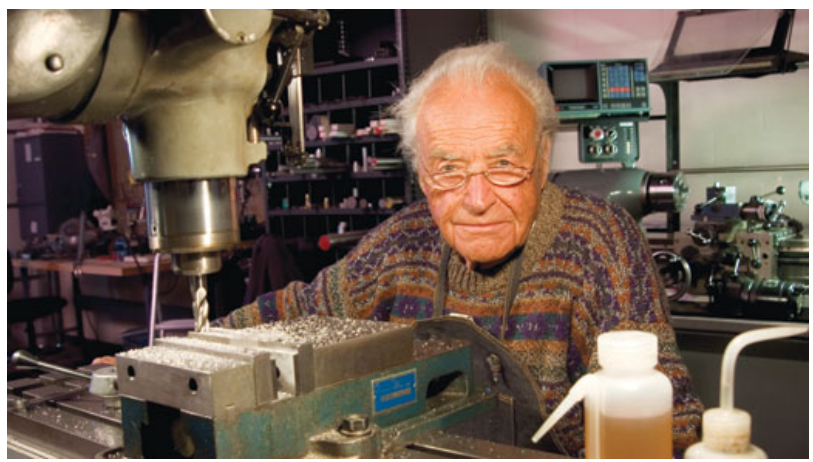
'for their discoveries concerning heart catheterization and pathological changes in the circulatory system"



**André Frédéric Cournand**

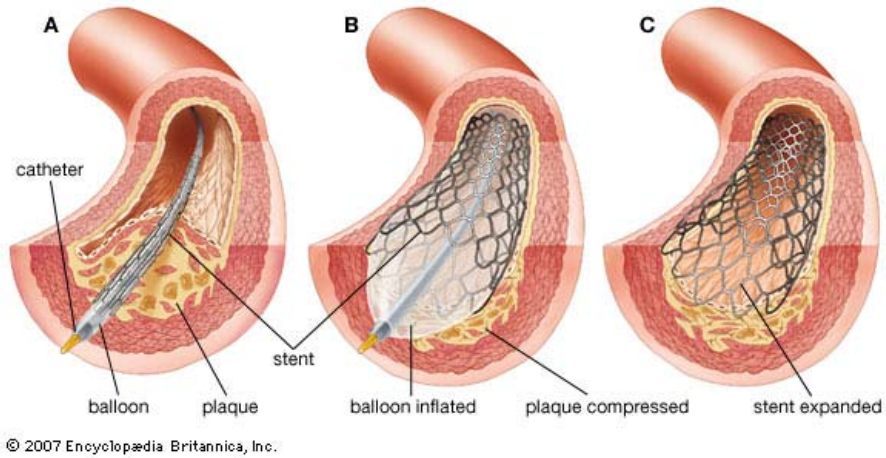
**Werner Forssmann**

**Dickinson W. Richards**

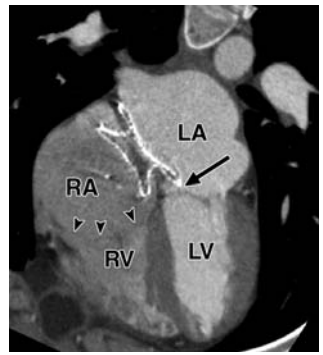


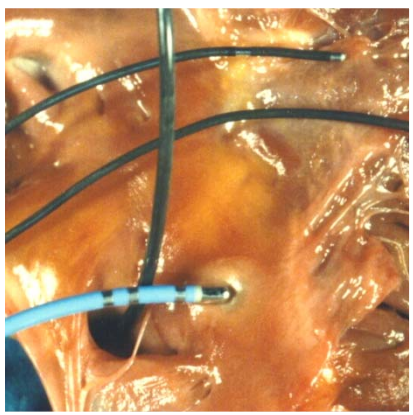
Kurt **Amplatz**

Desobstrucción mecánica

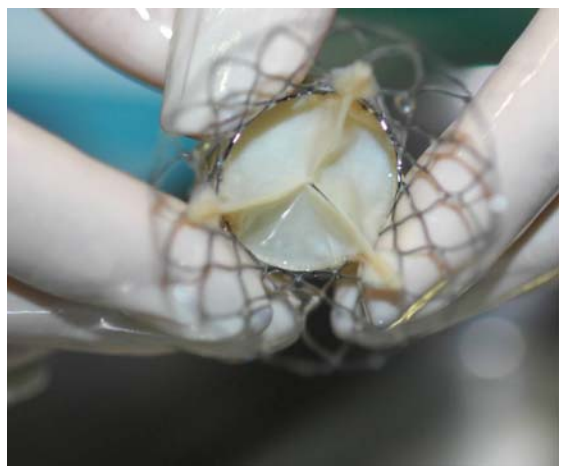



Cierre mecánico

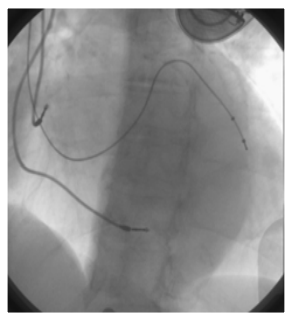


Burn



Válvulas



Pacing fisiológico

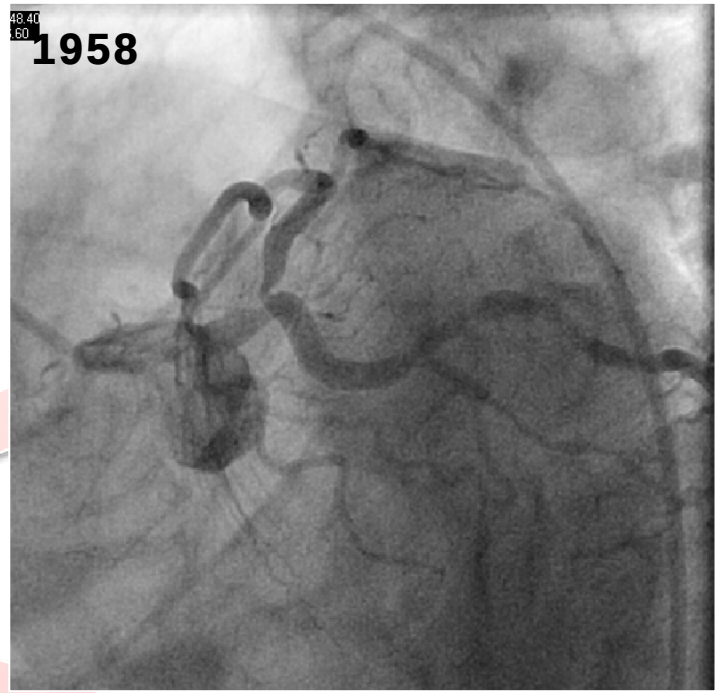
# ... CORPAL 1988-2011

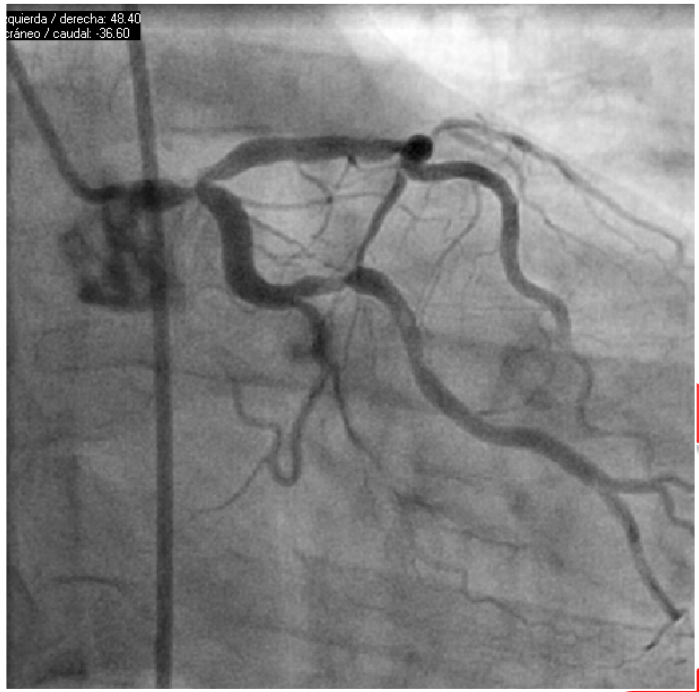
CORPAL

CÓRDOBA

LAS PALMAS

# Un círculo…



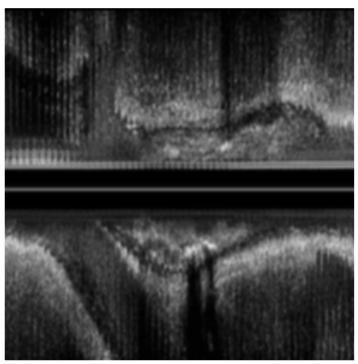



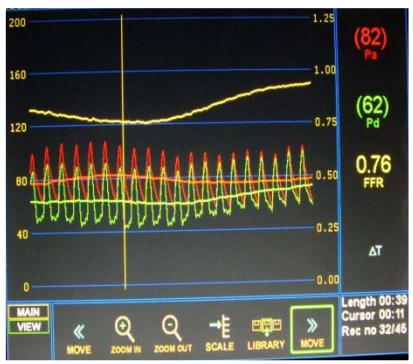
1990

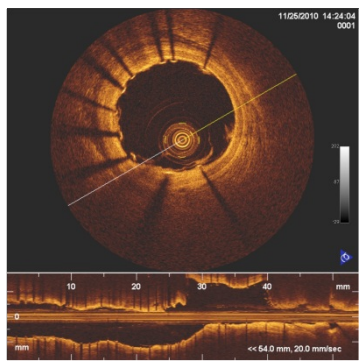
1995

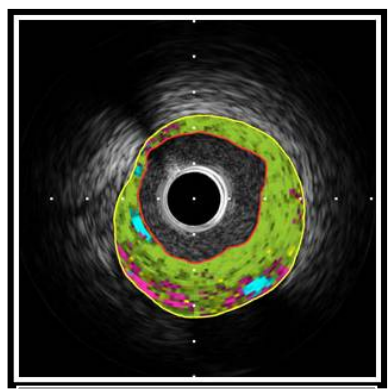
2001 (in-vivo)

2002

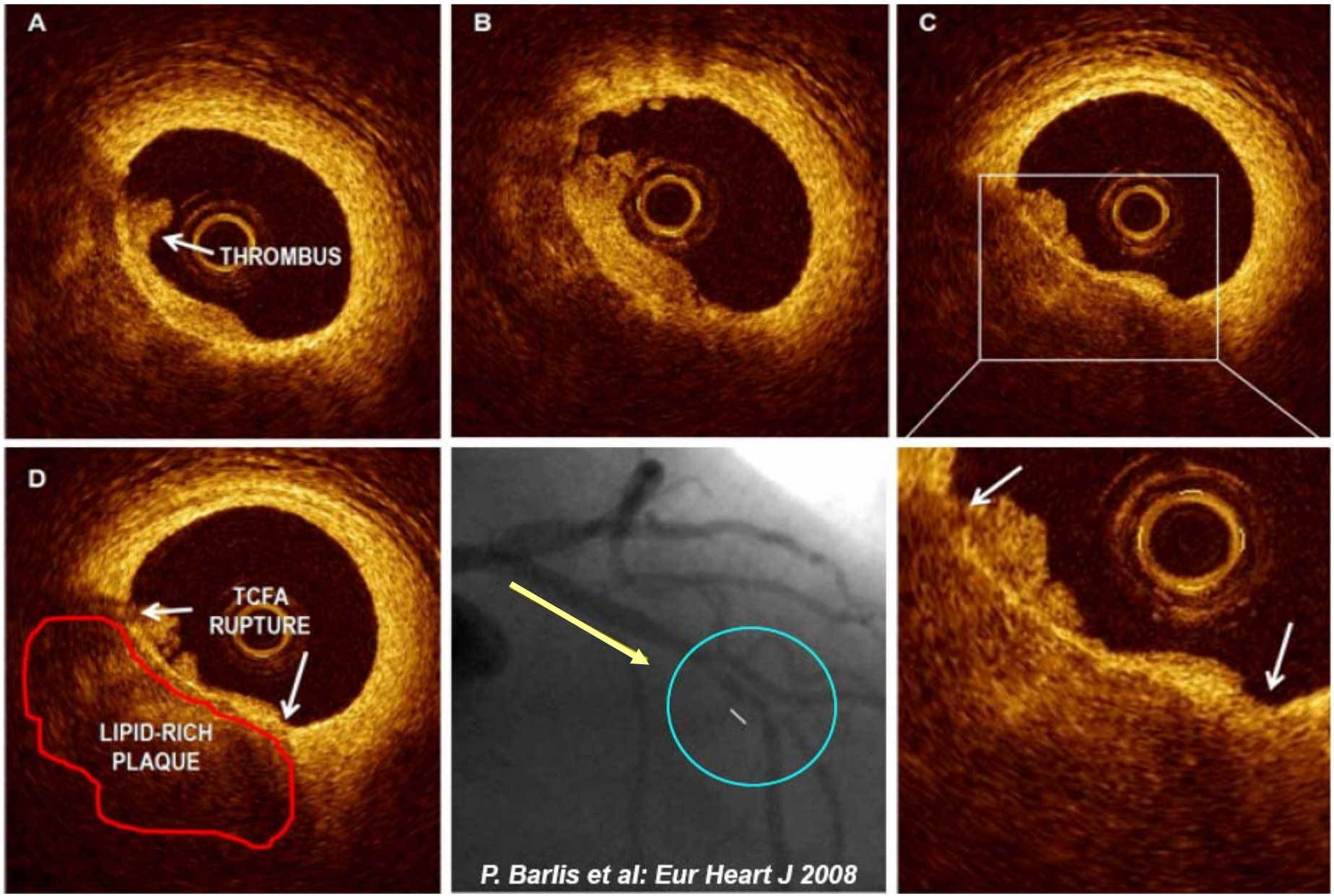




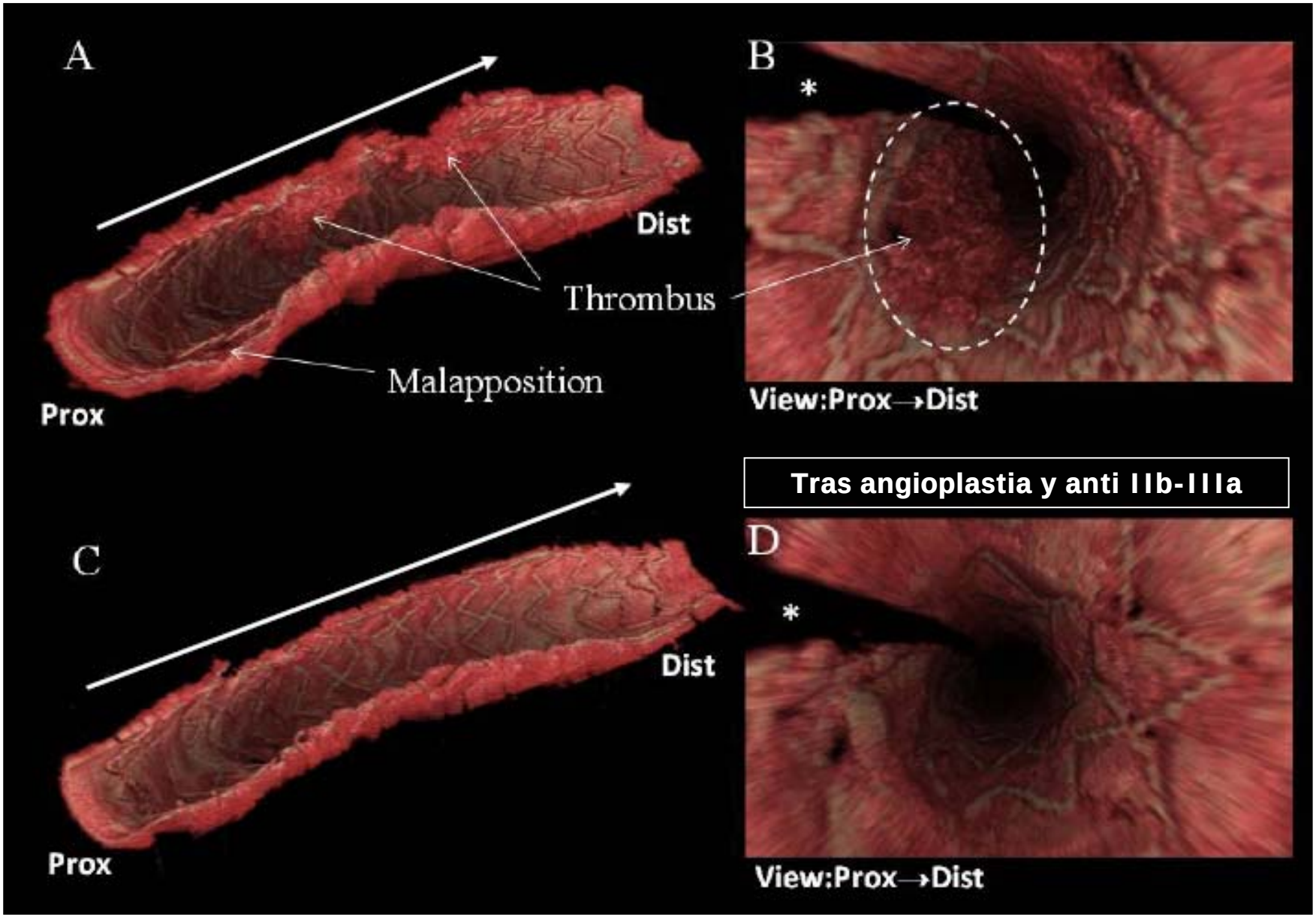



# RUPTURA DE UNA PLACA VULNERABLE

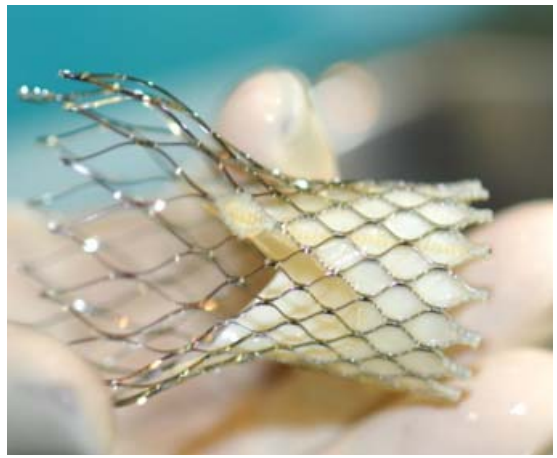


# TROMBOSIS SUBAGUDA DEL STENT



# 1 Válvula aórtica percutánea

# Prótesis valvular aórtica percutánea



# Aortic Valve Replacement

Homograft – 1962

Mechanical heart valve – 1962

Porcine valve – 1965

Pericardial tissue valve – 1969

First PVT animal implantation
A. Cribier

First Corevalve animal implantation
JC. Laborde

**Transvascular**

First Edwards/PVT Transapical Beating Heart AVR
Webb, Lichtenstein – Nov 29, 2005

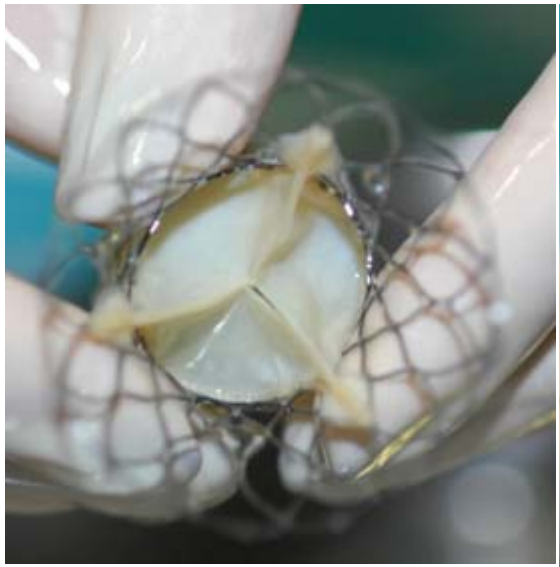
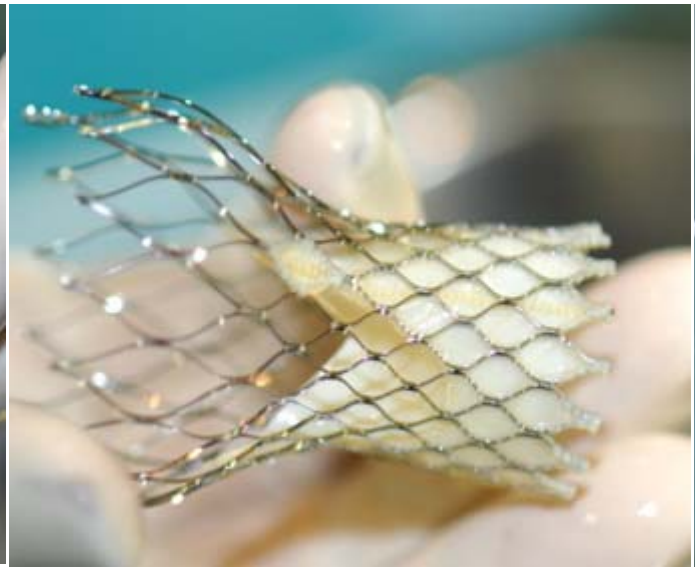
1960 1970 → 2000 2001 2002 2004 2006

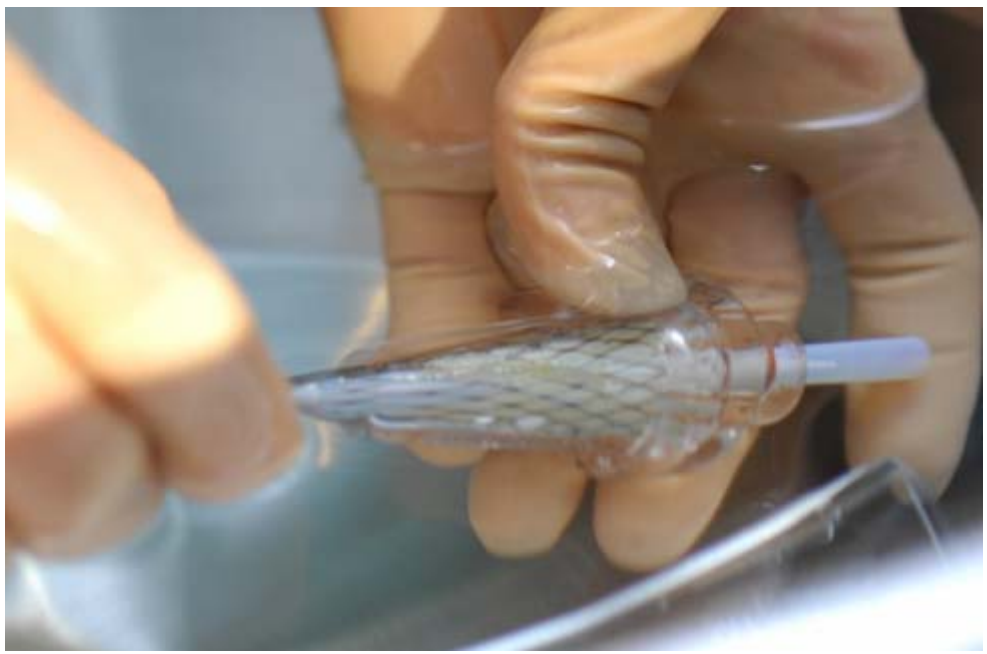
First PVT Transcatheter AVR by Antegrade Approach
Alain Cribier - 2002

First CoreValve PERCUTANEOUS AVR by Retrograde Approach – Oct 12, 2006
Serruys, DeJaegere, Laborde

First CoreValve Transcatheter AVR by Retrograde Approach
Laborde, Lal, Grube – July 12, 2004

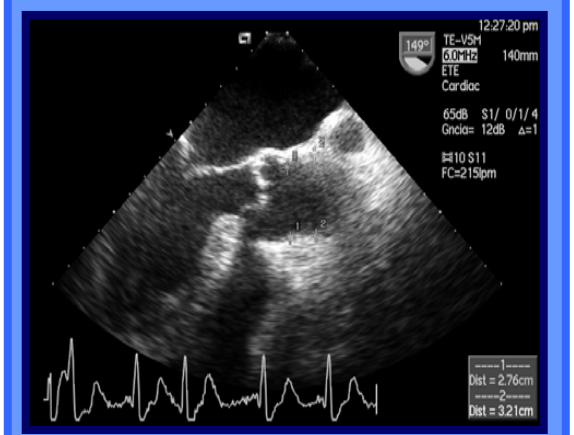
**Surgery**

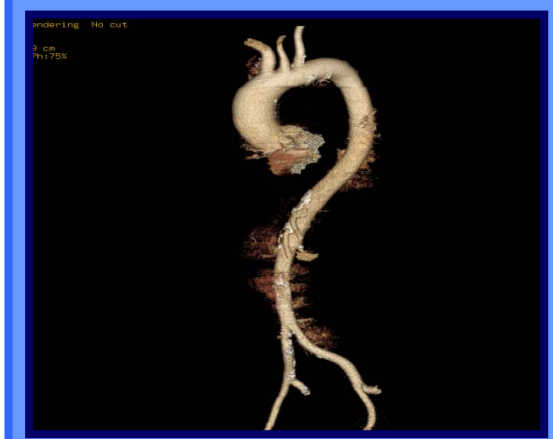



# Registro Actividad Intervencionista Año 2010 (SEC)

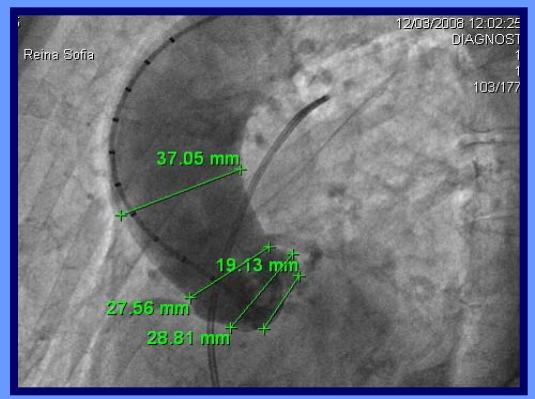
# MÉTODOS


Estudio ecocardiográfico TT y TE

Tomografía computarizada





Estudio angiográfico

# Válvula Aórtica Percutánea

## Experiencia CorPal (n=146)

## (Abril/08 – Octubre/11)

**Disnea**

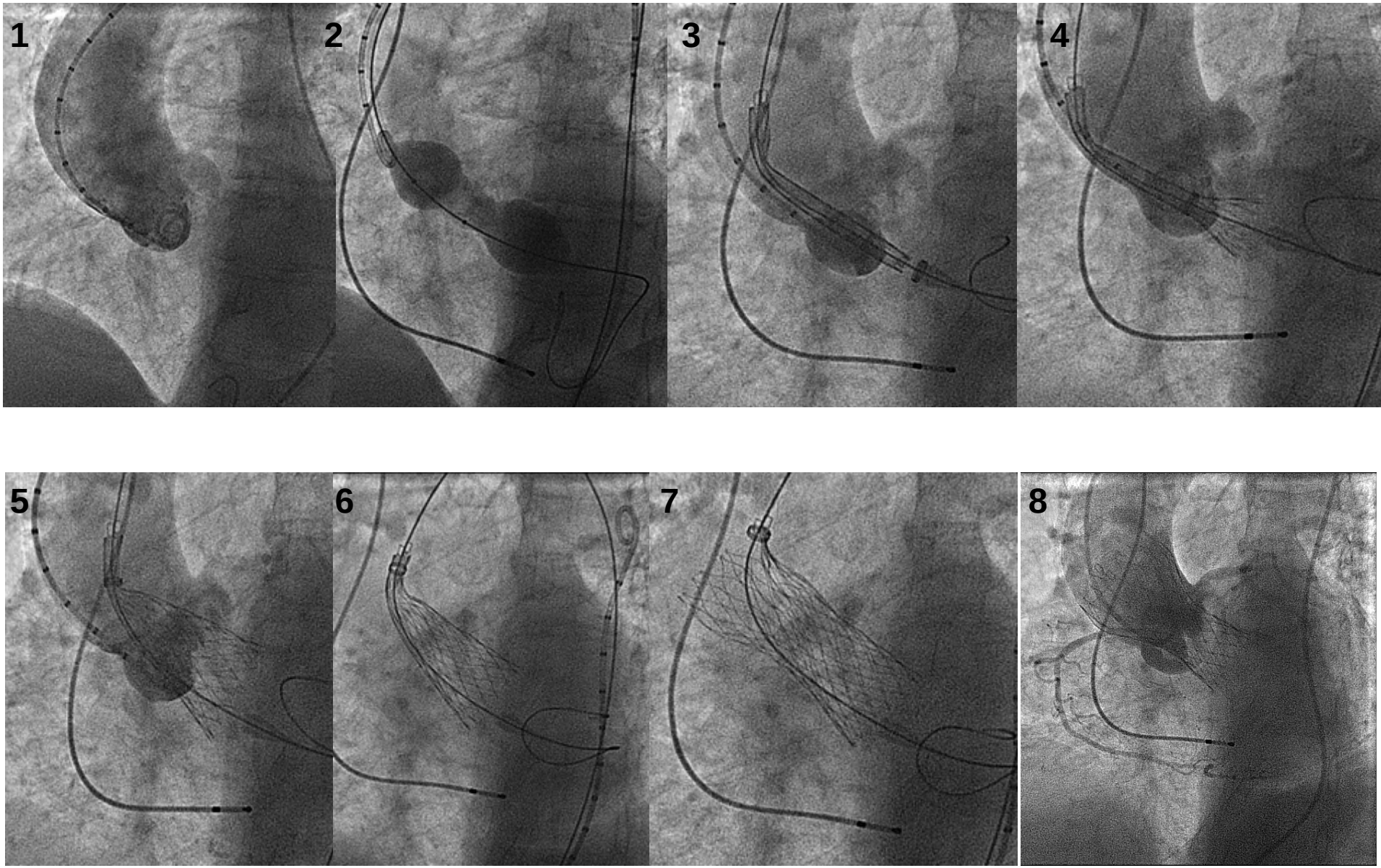
**Angor**

**Síncope**

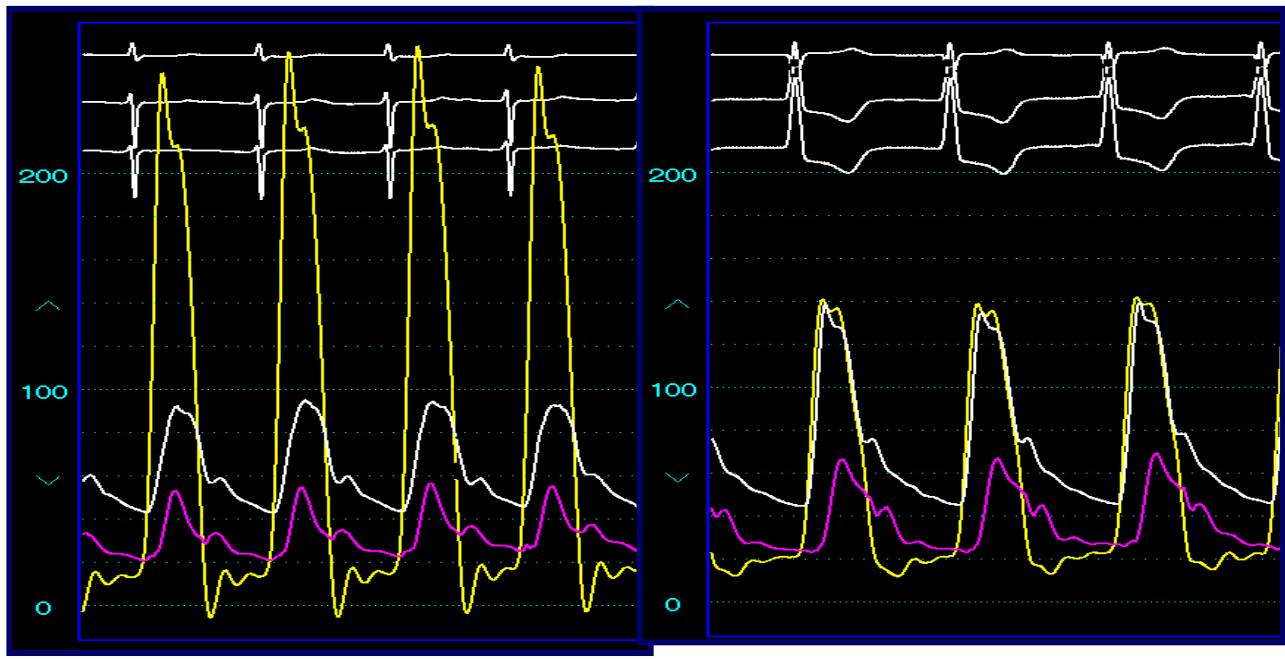
**Estado crítico pre-implante**

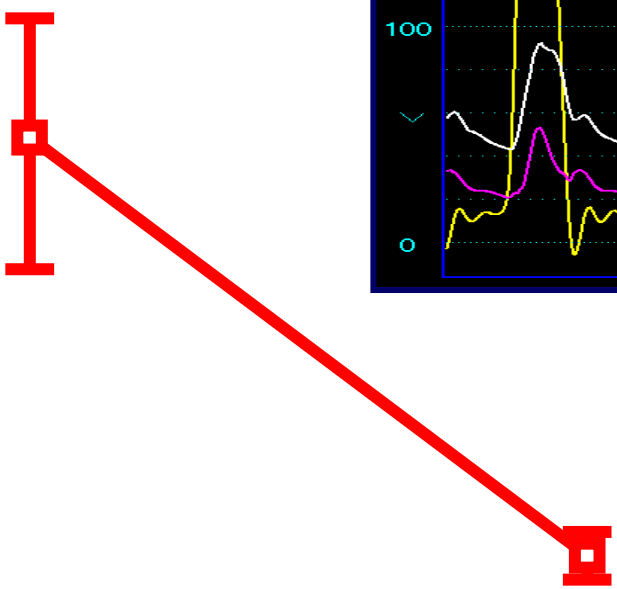
# *Comorbilidades*

**Enfermedad coronaria ..... 48 (33%)**


1
2
3
4
5
6
7
8

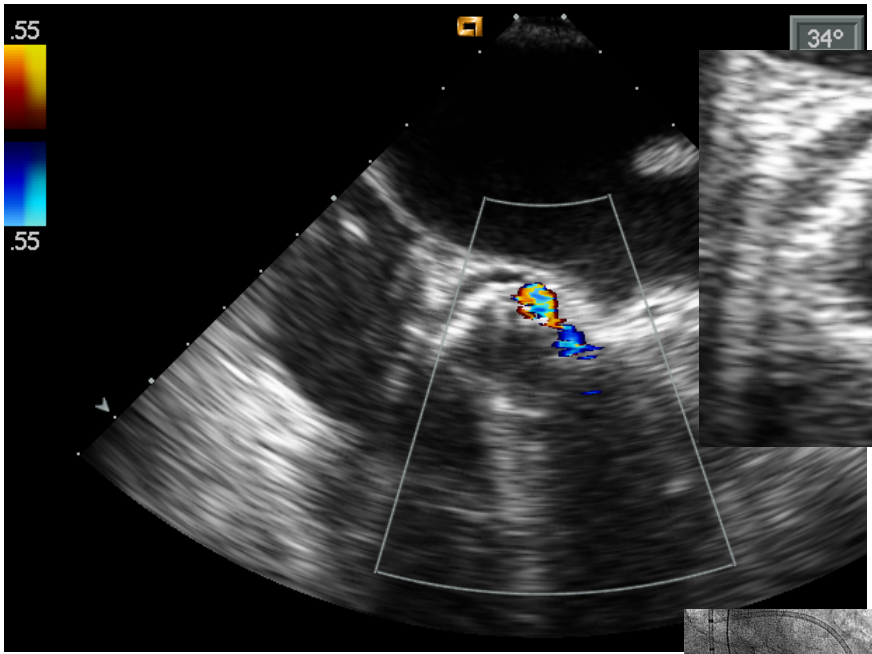
# RESULTADOS

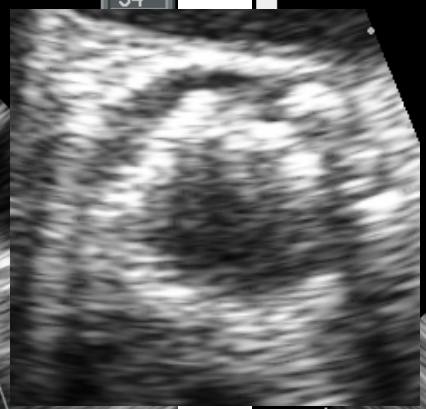


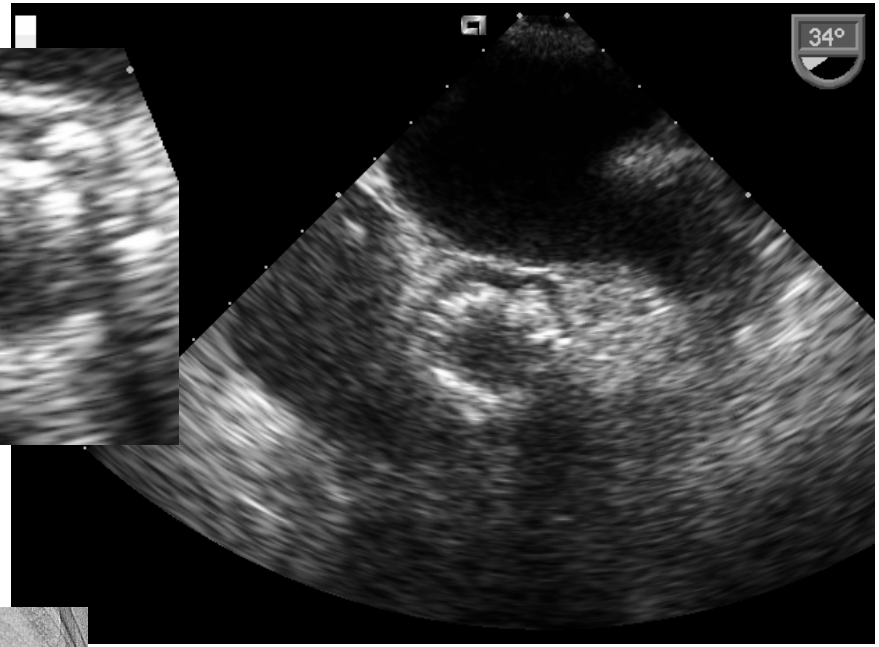



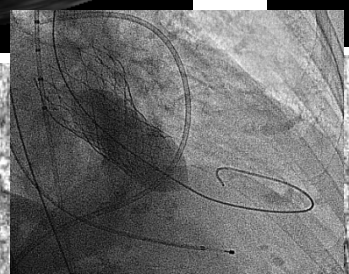
BASAL

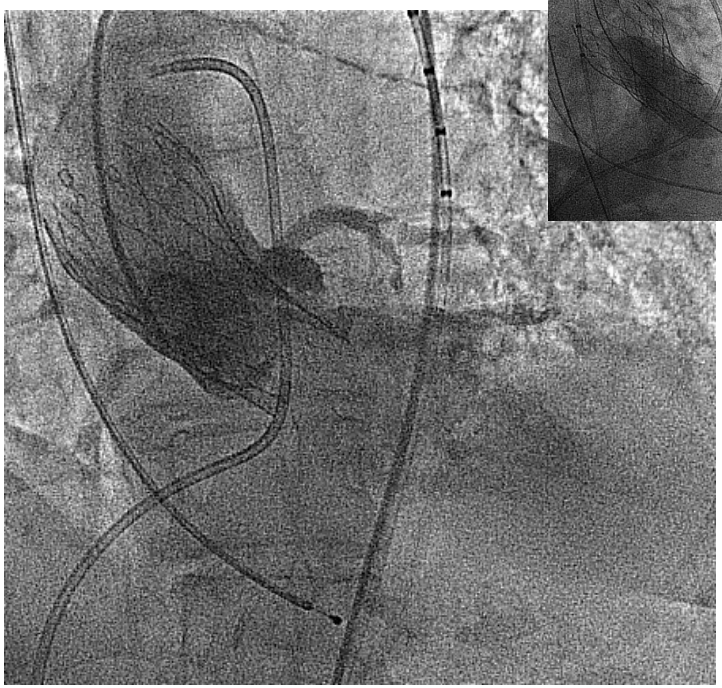
POST VALVULA

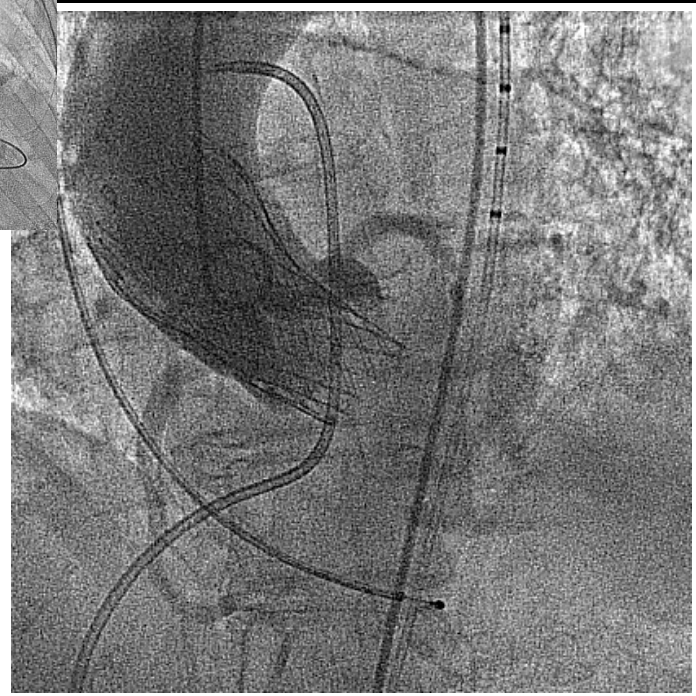

.55
34°
.55

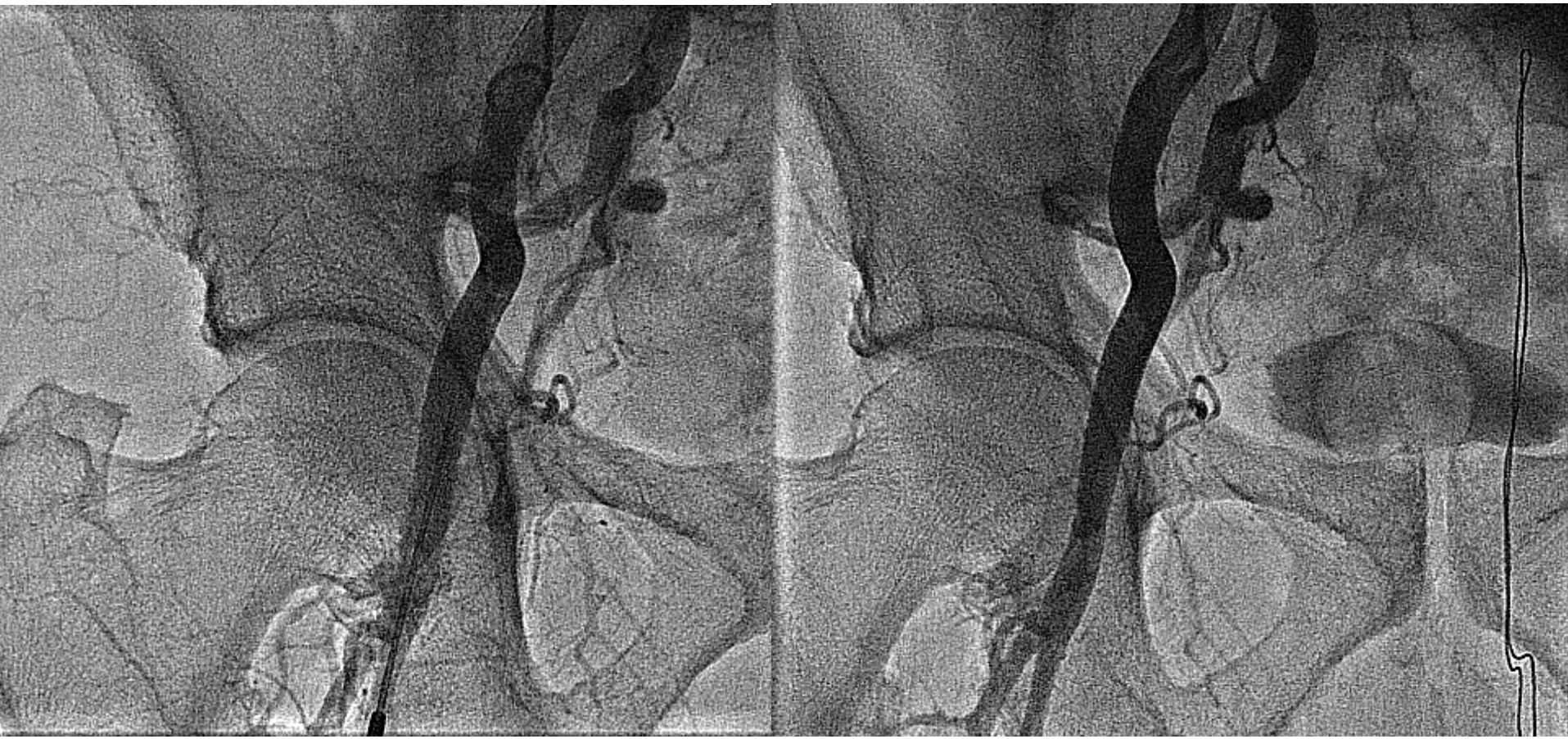



34°





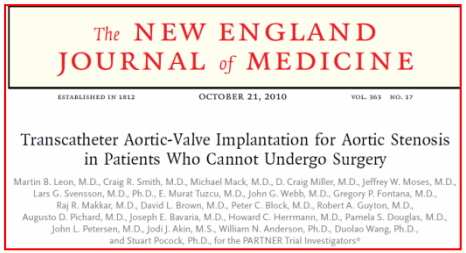




IN

OUT

# ESTUDIO PARTNER




**1057 Pacientes con Eao severa**

## Alto riesgo

n = 699

## Inoperable

n = 358

### Alto riesgo

**TAVI, n:348**

- Mortalidad precoz 30d n:12 (3.4%)
- Mortalidad tardía n:72 (21%)

**Cirugía, n:351**

- Mortalidad precoz 30 d n:22 (6.5)
- Mortalidad tardía n:67 (19%)

### Inoperable

**TAVI n: 179**

- Mortalidad precoz 30d n:9 (5%)
- Mortalidad tardía n:55(30%)

**T. Médico n: 179**

- Mortalidad precoz 30d n:5(2.8%)
- Mortalidad tardía n:89 (49%)

# RESULTADOS GLOBALES

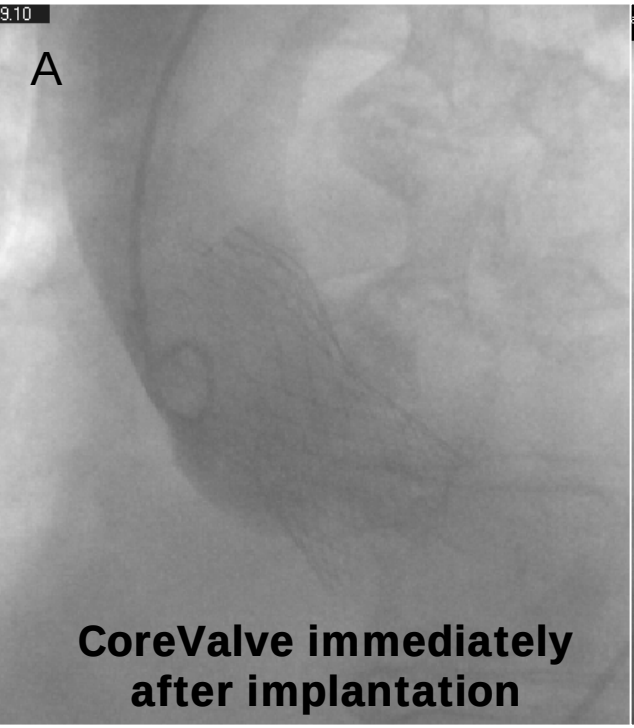
**Implante con éxito**

**Mortalidad global**

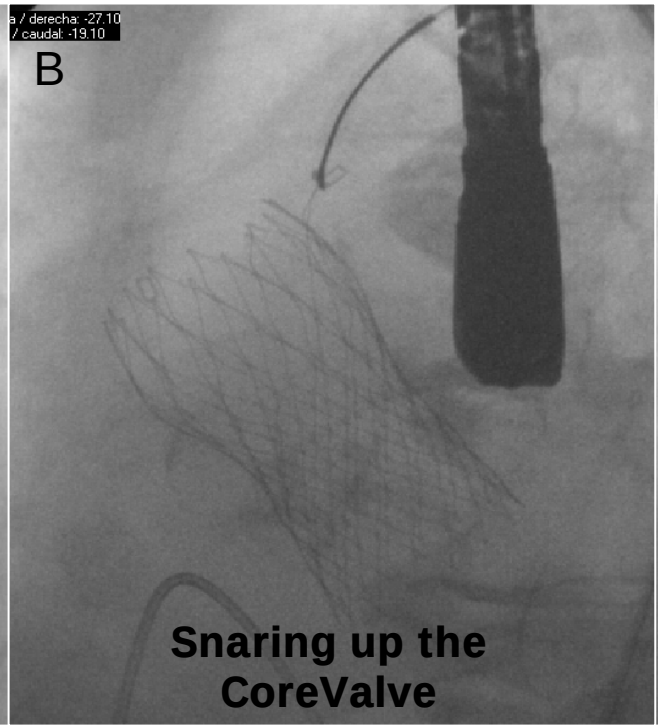
**Complicaciones agudas**

**Insuficiencia aórtica ≥ II ……..…… 33 (23%)**

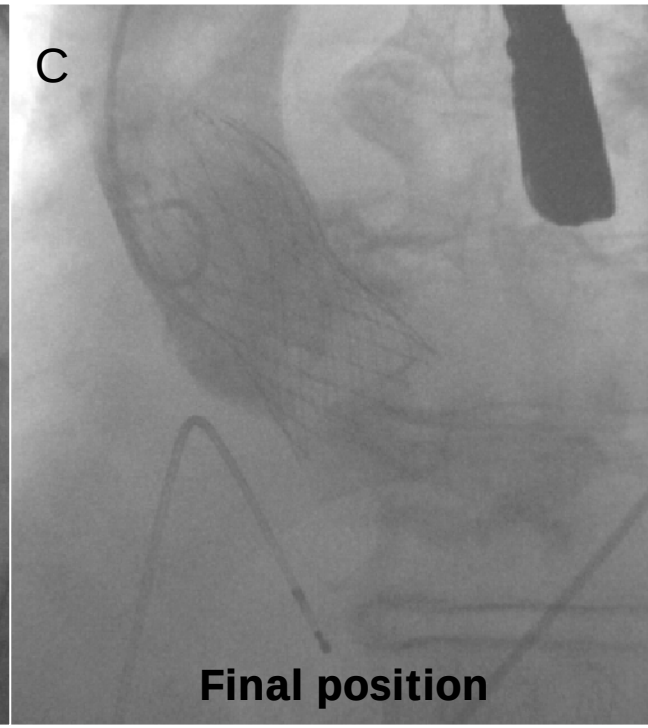
**Bloqueo AV primeras horas ……..….. 28 (19%)**
**Problemas con vía de abordaje …….. 36 (25%)**



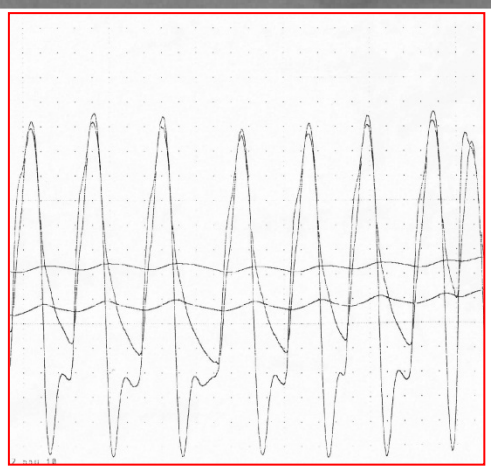

**CoreValve immediately after implantation**

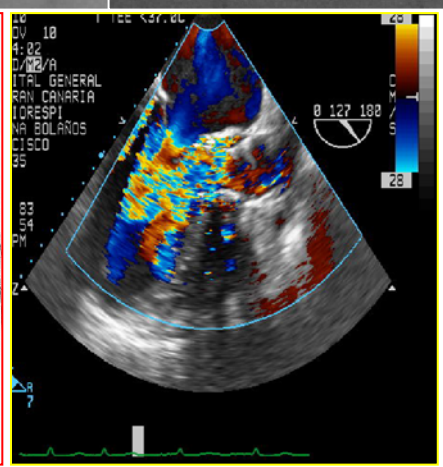


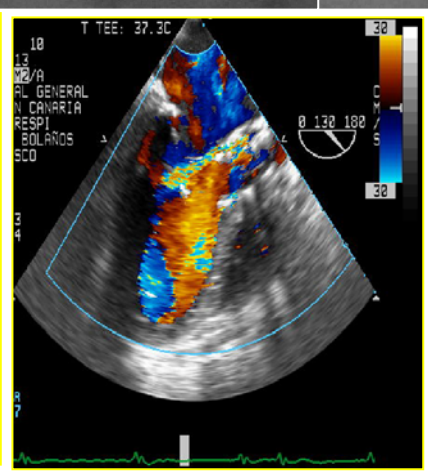

**Snaring up the CoreValve**

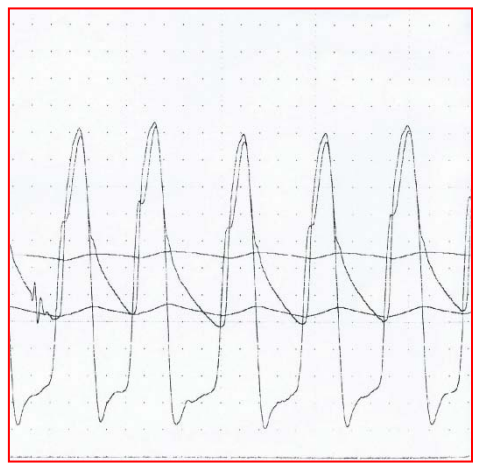



**Final position**







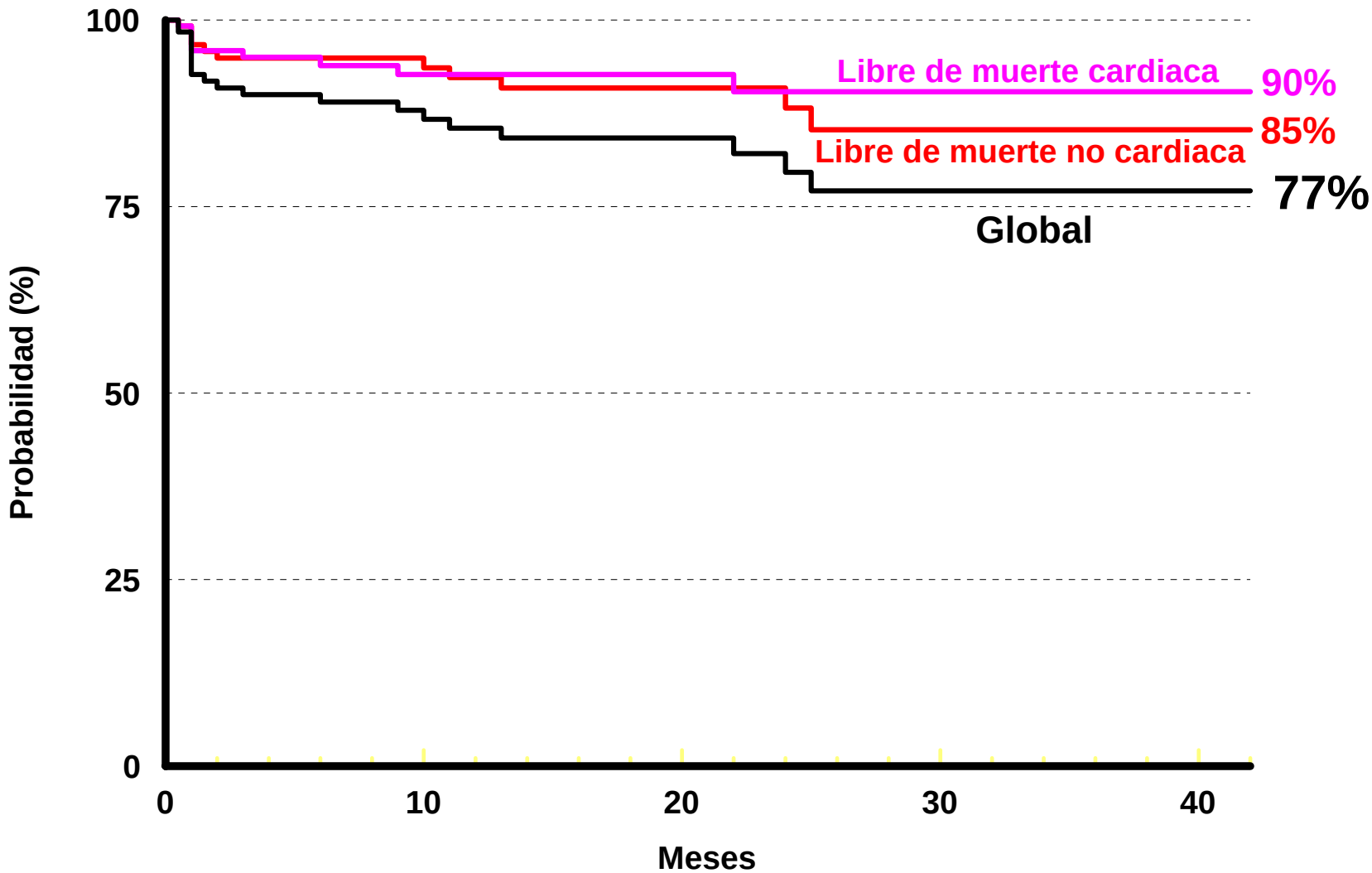


# RESULTADOS GLOBALES

## Complicaciones tardías

**Necesidad global de Marcapasos ……. 35 (24%)**

# SUPERVIVENCIA

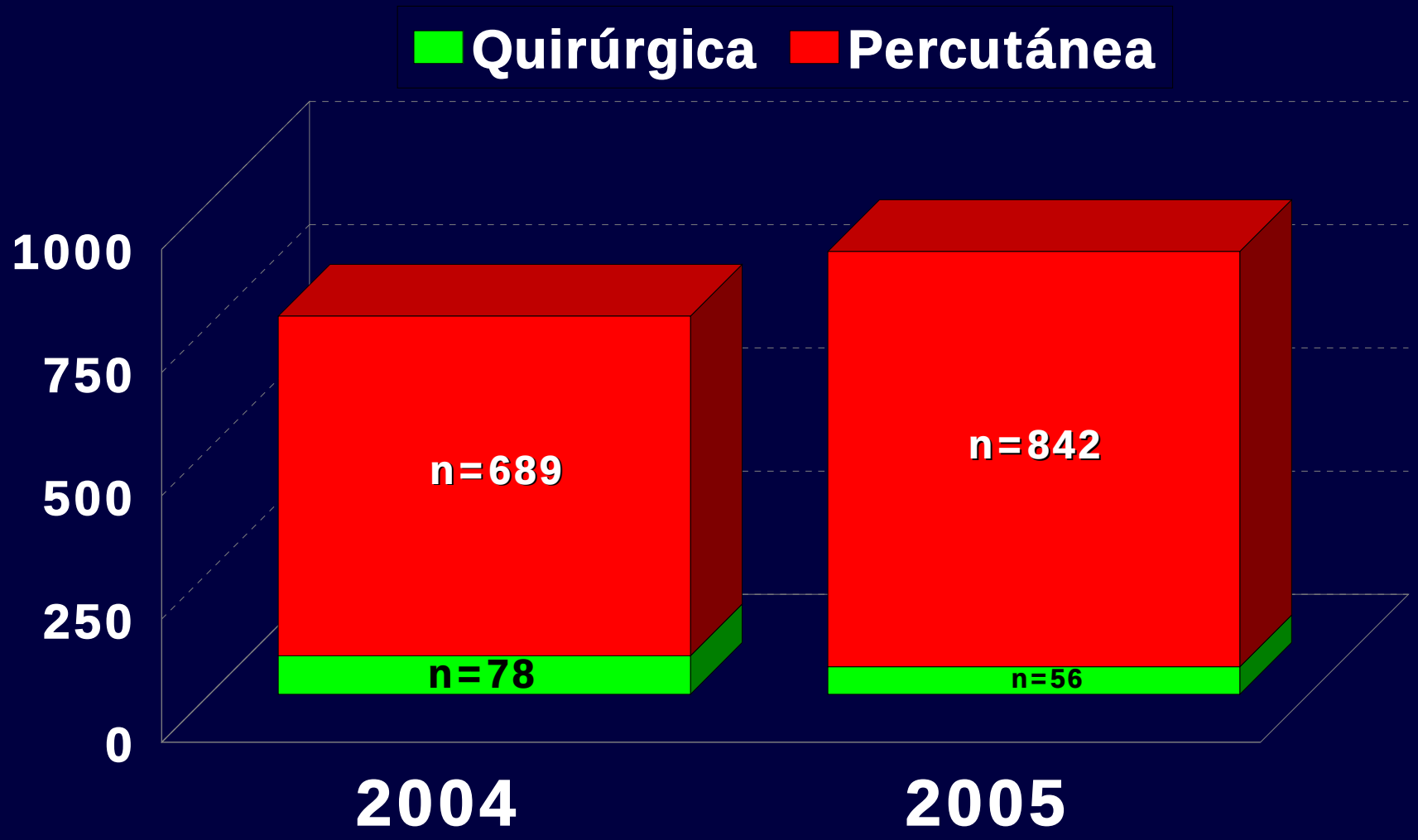


# Perspectivas futuras

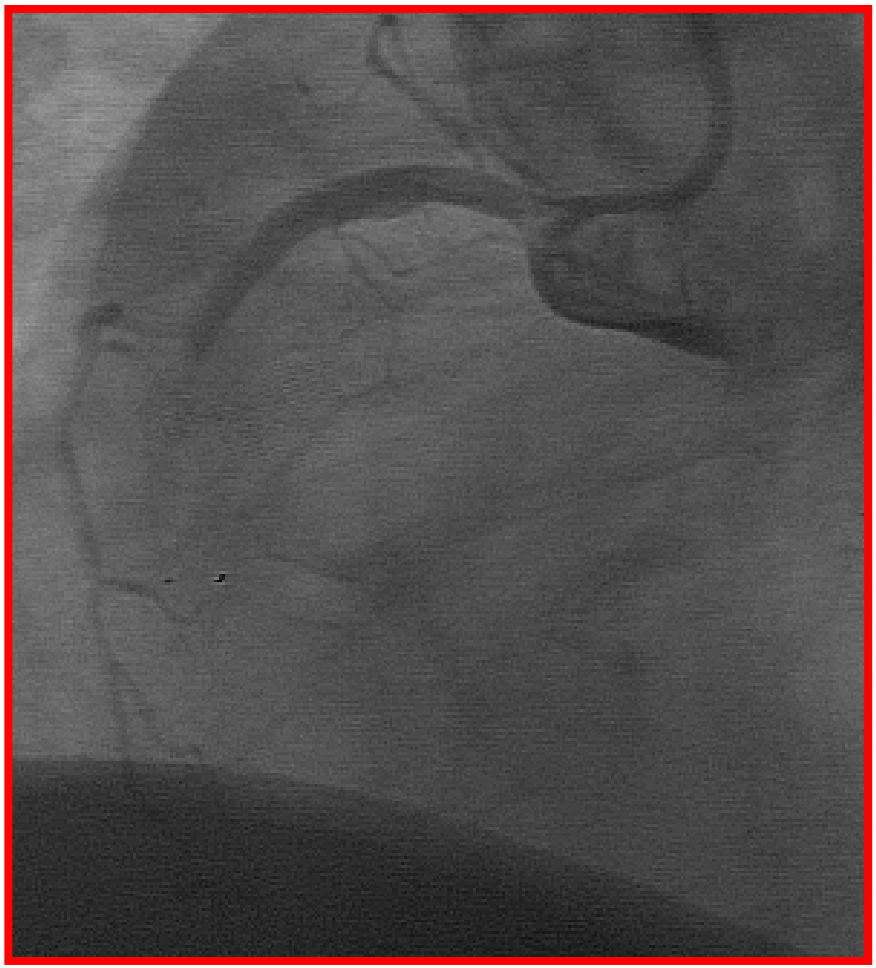
# 2 REVASCULARIZACIÓN CORONARIA QUIRÚRGICA VS PERCUTÁNEA

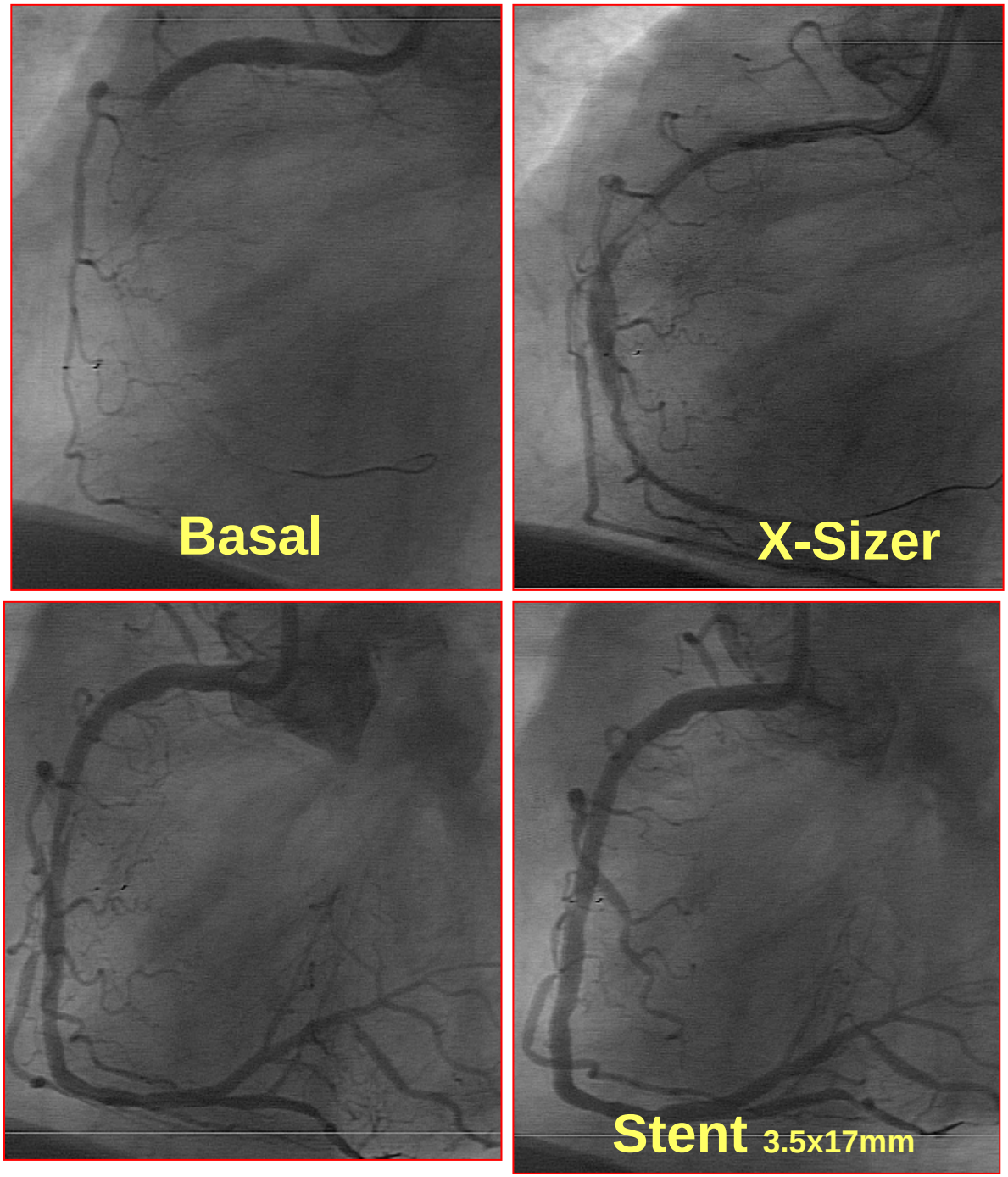
# REVASCULARIZACIÓN QUIRÚRGICA VS PERCUTÁNEA

# Revascularización coronaria

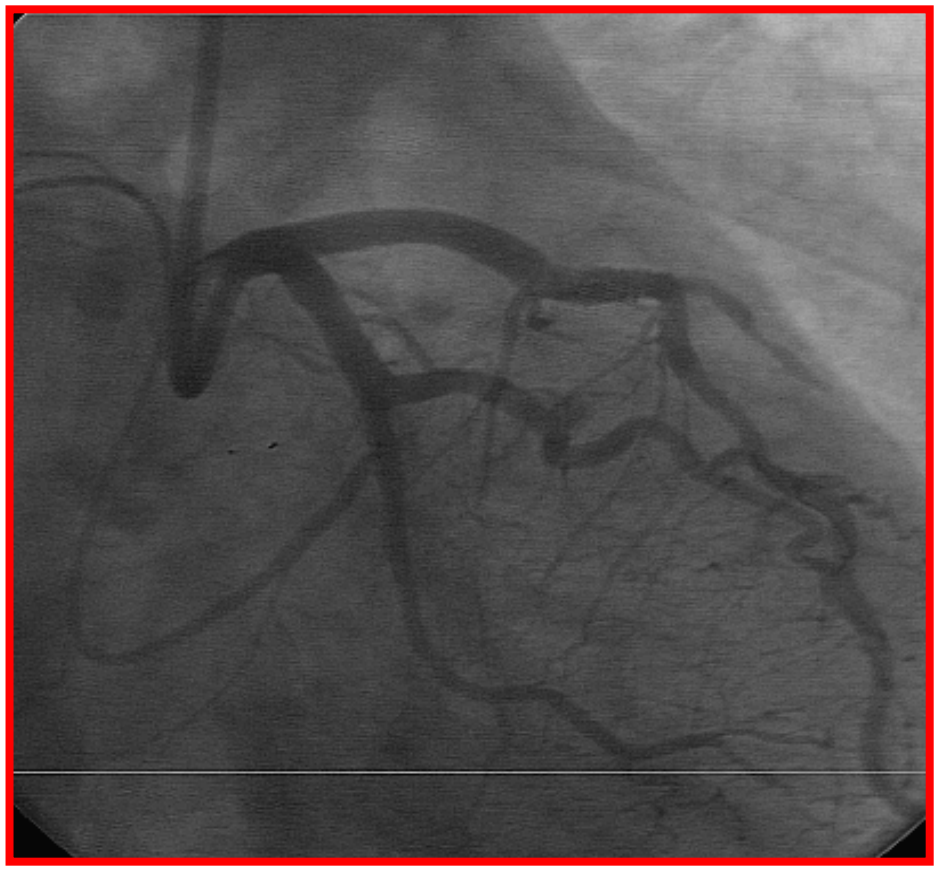


# ENFERMEDAD MULTIVASO




Basal
X-Sizer
Stent 3.5x17mm

# ENFERMEDAD MULTIVASO

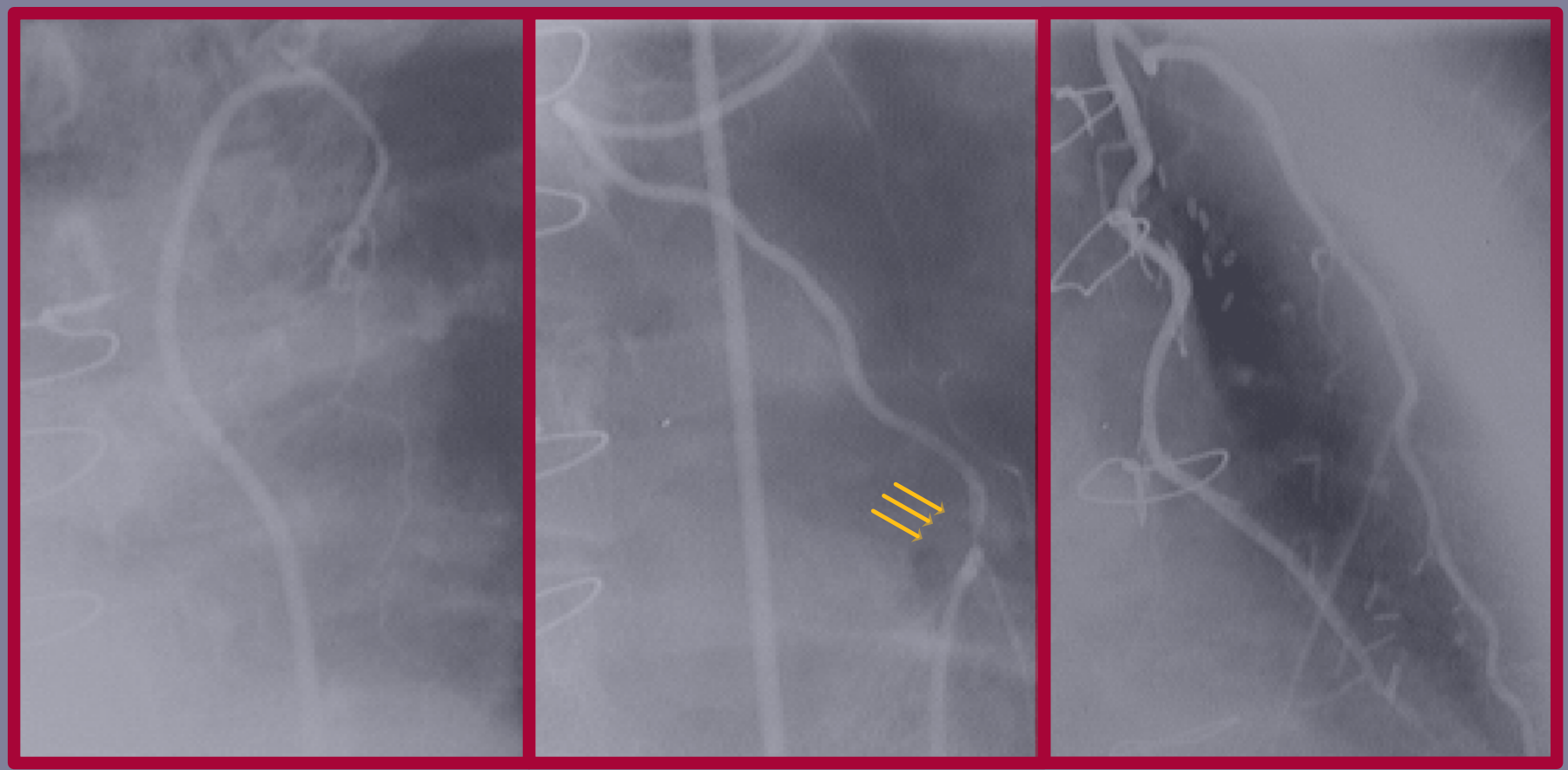


## Cirugia coronaria → Metodo eficaz de revascularizacion

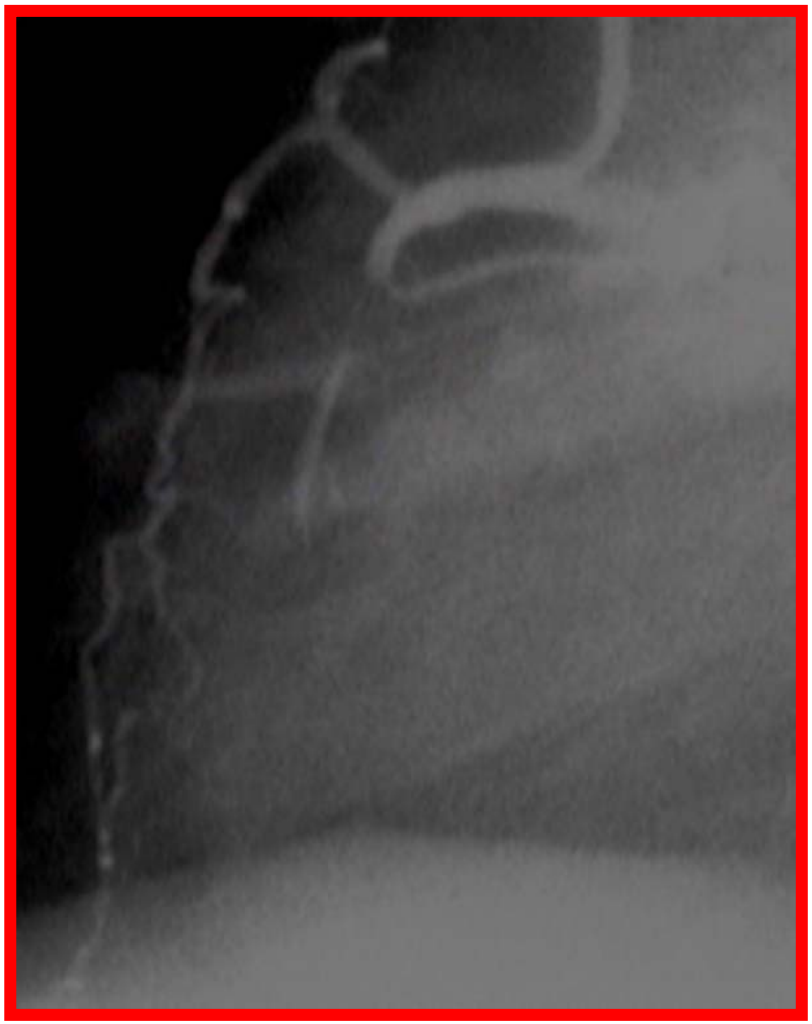
### Complicaciones tardias

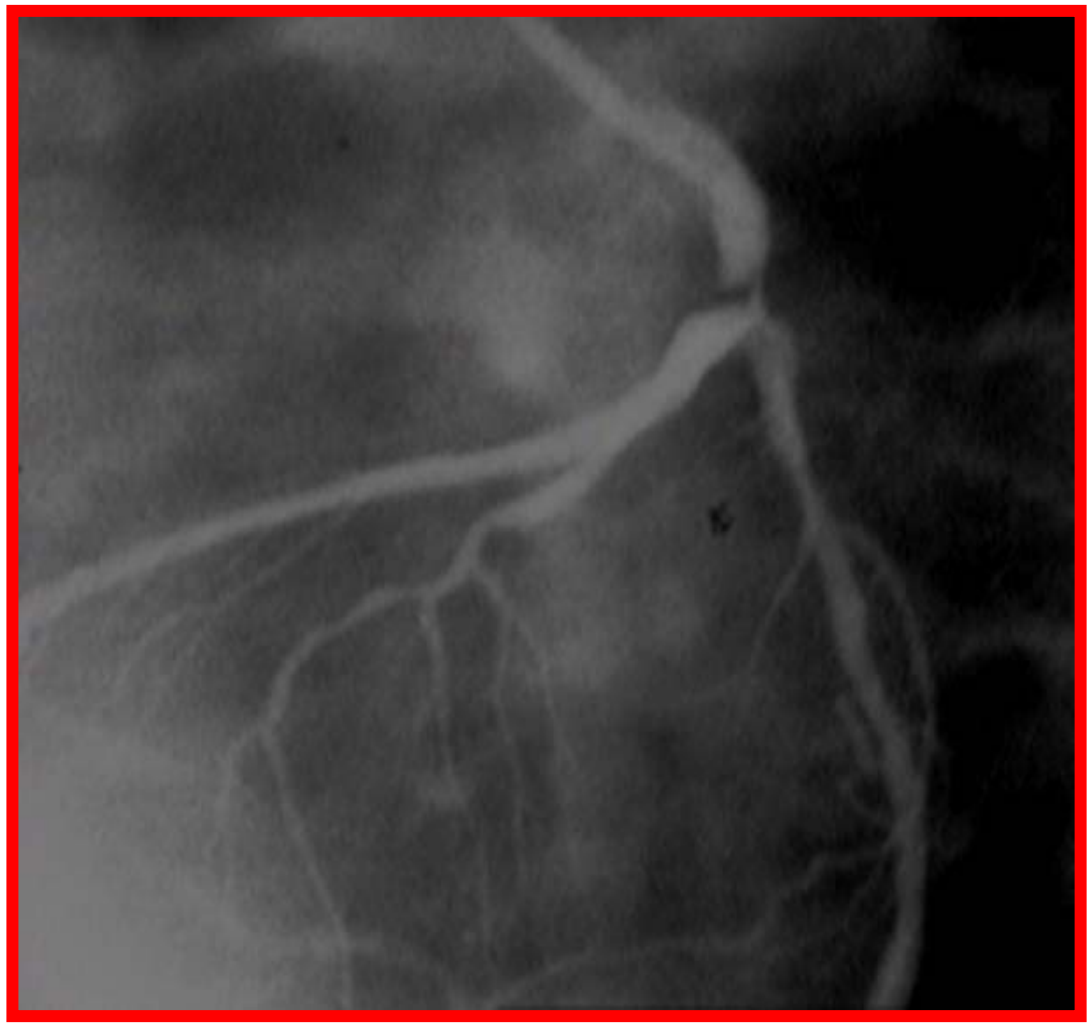
- Isquemia recurrente
  - 1 año : 17%
  - 10 años : 73%
  - Progresion otro vaso
  - Progresion mismo vaso distal a la anastomosis
  - Enfemedad del injerto:
    - 1 año.....8%
    - 5 años.....38%
    - 10 años.....75%
- Necesidad de nueva revascularizacion
  - 5 años.....4%
  - 10 años.....19%
  - 12 años.....31%

# RECURRENCIA DE SINTOMAS TRAS INJERTO DE MAMARIA



# ENFERMEDAD DE TRONCO CORONARIO





# Tratamiento percutáneo de la enfermedad de tronco

## *- Conceptos evolutivos CORPAL -*

## *(1991-2011)*

- **Abordaje del TCI como una necesidad**
- **Stent en TCI en candidatos no quirúrgicos**
- **Mejoras técnicas**
  - *Predictores de reestenosis a nivel del TCI*
- **Stents de liberación farmacos para el TCI**

# SERIES HISTÓRICAS

**Predictors of Restenosis Following Unprotected Left Main Coronary Stenting**

José Suárez de Lezo, MD, Alfonso Medina, MD, Miguel Romero, MD, Enrique Hernández, MD, Manuel Pan, MD, Antonio Delgado, MD, José Segura, MD, Djordje Pavlovic, MD, and Fernando Wanguemert, MD

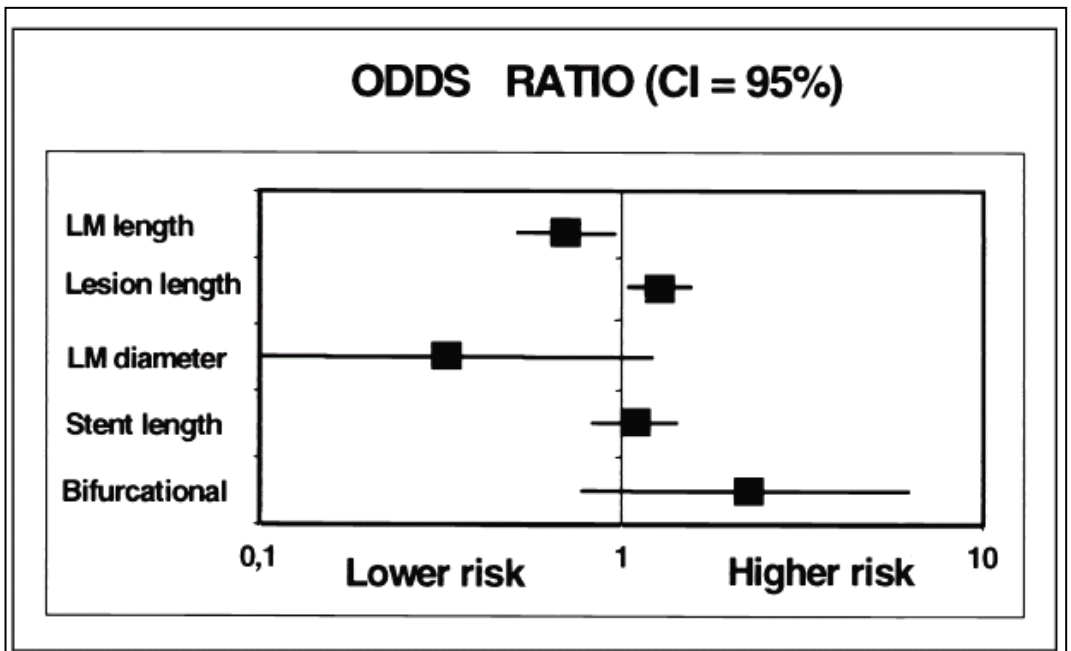



FIGURE 2. Factors influencing restenosis after unprotected LM coronary stenting (multivariate analysis). CI = confidence interval.

**Éxito primario**

**Mortalidad hospitalaria**

**Revascularización del vaso "diana"**

**Reestenosis angiográfica**

**34 %**

# Rapamycin-eluting stents for the treatment of unprotected left main coronary disease

Jose Suarez de Lezo, MD, PhD,[a] Alfonso Medina, MD, PhD,[b] Manuel Pan, MD, PhD,[a] Antonio Delgado, MD, PhD,[b] José Segura, MD, PhD,[a] Djordje Pavlovic, MD, PhD,[a] Francisco Melián, MD, PhD,[b] Miguel Romero, MD, PhD,[a] Luis Burgos, MD,[b] Enrique Hernández, MD, PhD,[b] Isabel Ureña, MD,[a] and Juan Herrador, MD[a] *Córdoba and Las Palmas, Spain*

American Heart Journal
Volume 148, Number 3

**Table II.** Angiographic and procedural data

| | |
|---|---|
| **Angiographic** | |
| Ejection fraction | 57 ± 13 |
| LM diameter (mm) | 3.6 ± 0.4 |
| LM length (mm) | 13 ± 5 |
| Lesion length (within the LM) (mm) | 10 ± 6 |
| Overall lesion length (mm) | 15 ± 8 |
| MLD (mm) | 1.1 ± 0.6 |
| Stenosis percentage | 69 ± 14 |
| Lesion location (%) | |
| Ostial | 17 (13) |
| Body | 13 (25) |
| Bifurcation | 22 (42) |
| Procedural | |
| Mean deployment pressure | 15 ± 1 |
| Final diameter (mm) (at distal MLD) | 3.2 ± 0.4 |
| Final diameter at LM site (mm) | 3.6 ± 0.4 |
| Stented-length (mm) | 20 ± 9 |
| Involvement of bifurcation | 22 |
| One single stent | 18 |
| Complex reconstruction | 4 |
| Adjunctive IIb IIIa (%) | 17 (33) |

*LM*, Left main; *MLD*, minimal luminal diameter.

**Table III.** Serial angiographic and late ultrasound measurements

| | Basal | Post | Follow-up |
|---|---|---|---|
| QCA | | | |
| MLD (mm) | 1.1 ± 0.5 | 3.2 ± 0.4 | 2.9 ± 0.7 |
| Percent stenosis | 69 ± 14 | 8 ± 8 | 17 ± 17 |
| LM restenosis (in segment) (%) | – | – | 1/35 (3) |
| LM in-stent restenosis (%) | – | – | 0/35 (0) |
| Late loss (mm) | – | – | 0.3 ± 0.5 |
| IVUS (at proximal LAD) | | | |
| Stent diameter (mm) | – | – | 3.3 ± 0.6 |
| EEL area (stent) ($mm^2$) | – | – | 20 ± 6 |
| Lumen area ($mm^2$) | – | – | 7.0 ± 2.5 |
| Neointimal thickening (mm) | – | – | 0.2 ± 0.1 |
| Neointimal area ($mm^2$) | – | – | 1.3 ± 1.1 |
| IVUS (at LM-site) | | | |
| Stent diameter (mm) | – | – | 3.7 ± 0.5 |
| EEL area (stent) ($mm^2$) | – | – | 25 ± 5 |
| Lumen area ($mm^2$) | – | – | 9.6 ± 2.2 |
| Neointimal thickening (mm) | – | – | 0.1 ± 0.1 |
| Neointimal area ($mm^2$) | – | – | 1.1 ± 0.4 |

*EEL*, External elastic laminae; *IVUS*, intravascular ultrasound; *LM*, left main; *MLD*, minimal luminal diameter; *QCA*, quantitative coronary angiography.

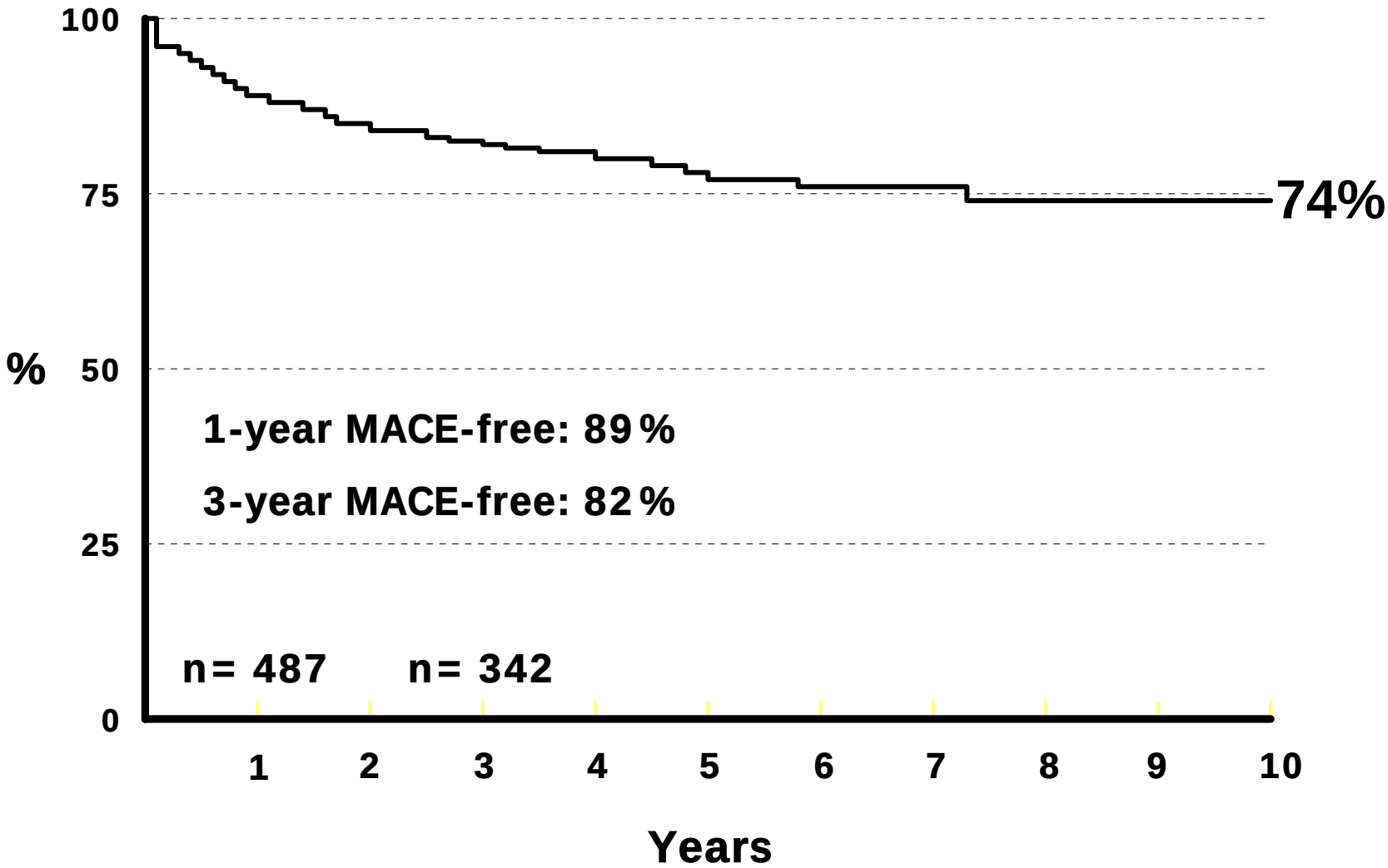
**Éxito primario**

**Mortalidad hospitalaria**

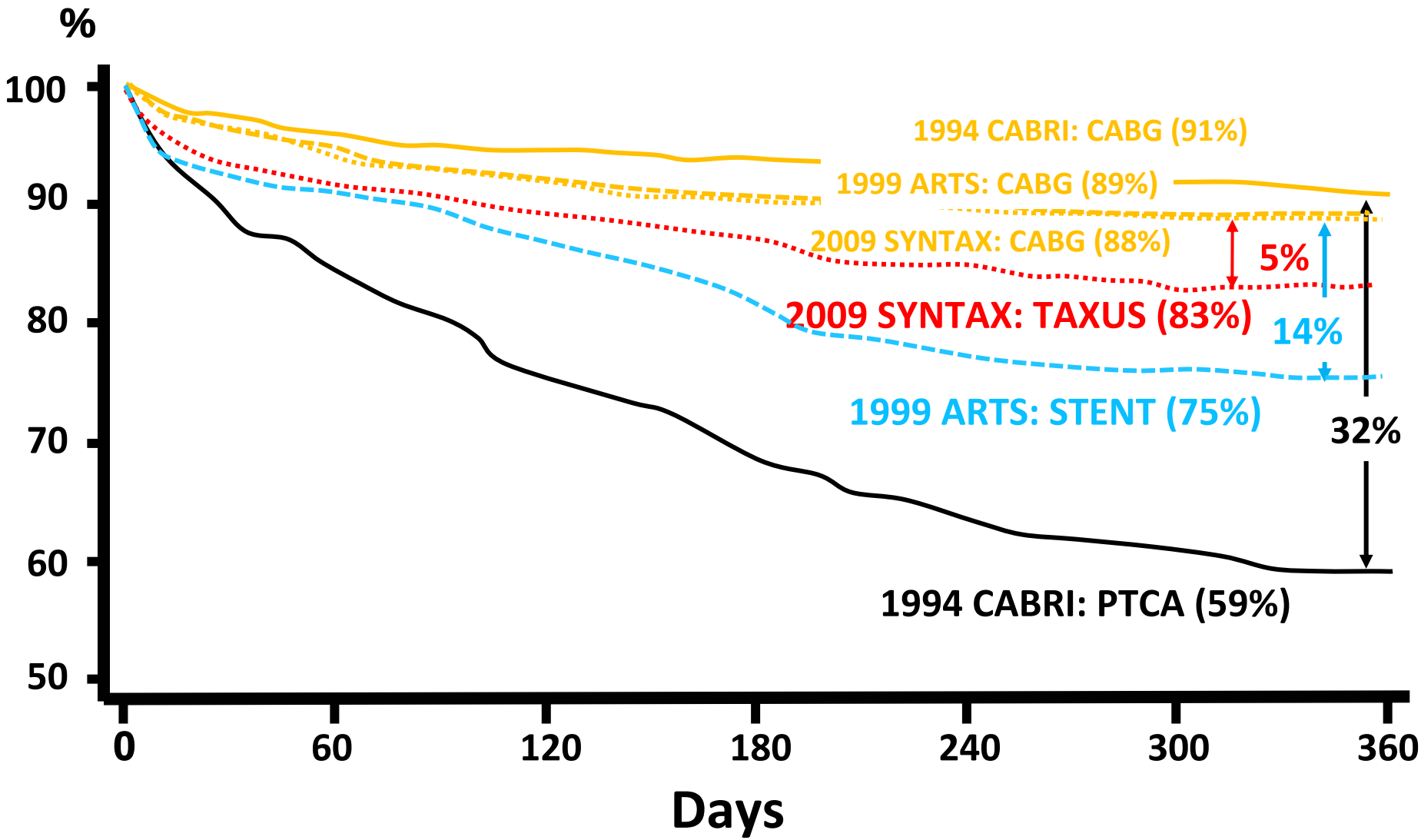
**Revascularización del vaso “diana”**

**Reestenosis angiográfica**

**3 %**


Left-main disease
Event-free probability (MACE)
(n=595)
100
75
50
25
0
%
74%
1-year MACE-free: 89%
3-year MACE-free: 82%
n= 487
n= 342
1
2
3
4
5
6
7
8
9
10
Years

# Freedom from Death / MI / CABG / Re-PTCA



The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 MARCH 5, 2009 VOL. 360 NO. 10

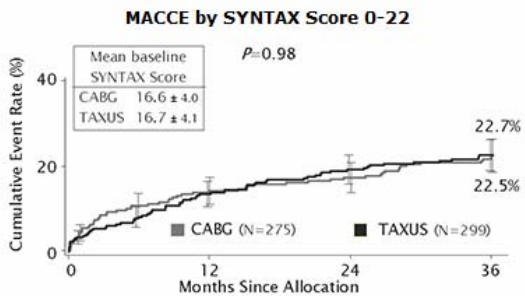
# Percutaneous Coronary Intervention versus Coronary-Artery Bypass Grafting for Severe Coronary Artery Disease

Patrick W. Serruys, M.D., Ph.D., Marie-Claude Morice, M.D., A. Pieter Kappetein, M.D., Ph.D., Antonio Colombo, M.D., David R. Holmes, M.D., Michael J. Mack, M.D., Elisabeth Ståhle, M.D., Ted E. Feldman, M.D., Marcel van den Brand, M.D., Eric J. Bass, B.A., Nic Van Dyck, R.N., Katrin Leadley, M.D., Keith D. Dawkins, M.D., and Friedrich W. Mohr, M.D., Ph.D., for the SYNTAX Investigators*

CONCLUSIONS

CABG remains the standard of care for patients with three-vessel or left main coronary artery disease, since the use of CABG, as compared with PCI, resulted in lower rates of the combined end point of major adverse cardiac or cerebrovascular events at 1 year. (ClinicalTrials.gov number, NCT00114972.)





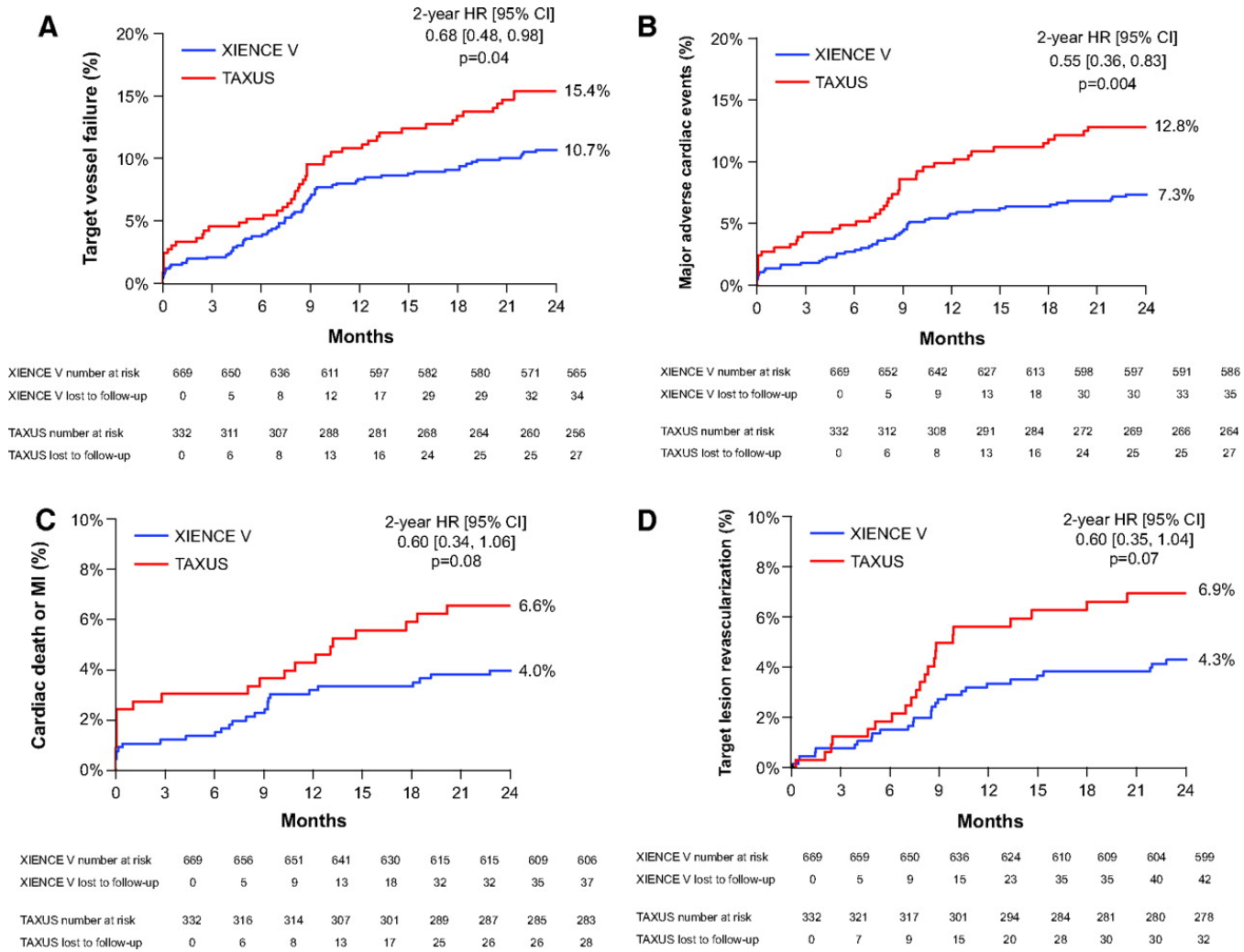

*The cumulative MACCE rate is displayed for the SYNTAX Trial group this score corresponds to.*

## Summary

| | |
|---|---|
| **Lesion 1** | |
| (segment 5): 6x2= | 12 |
| Bifurcation Type: Medina 1,1,0: | 1 |
| *Sub total lesion 1* | *13* |
| **Lesion 2** | |
| (segment 7): 2.5x2= | 5 |
| *Sub total lesion 2* | *5* |
| *TOTAL:* | *18* |

# LIMITACIONES DEL ESTUDIO SYNTAX

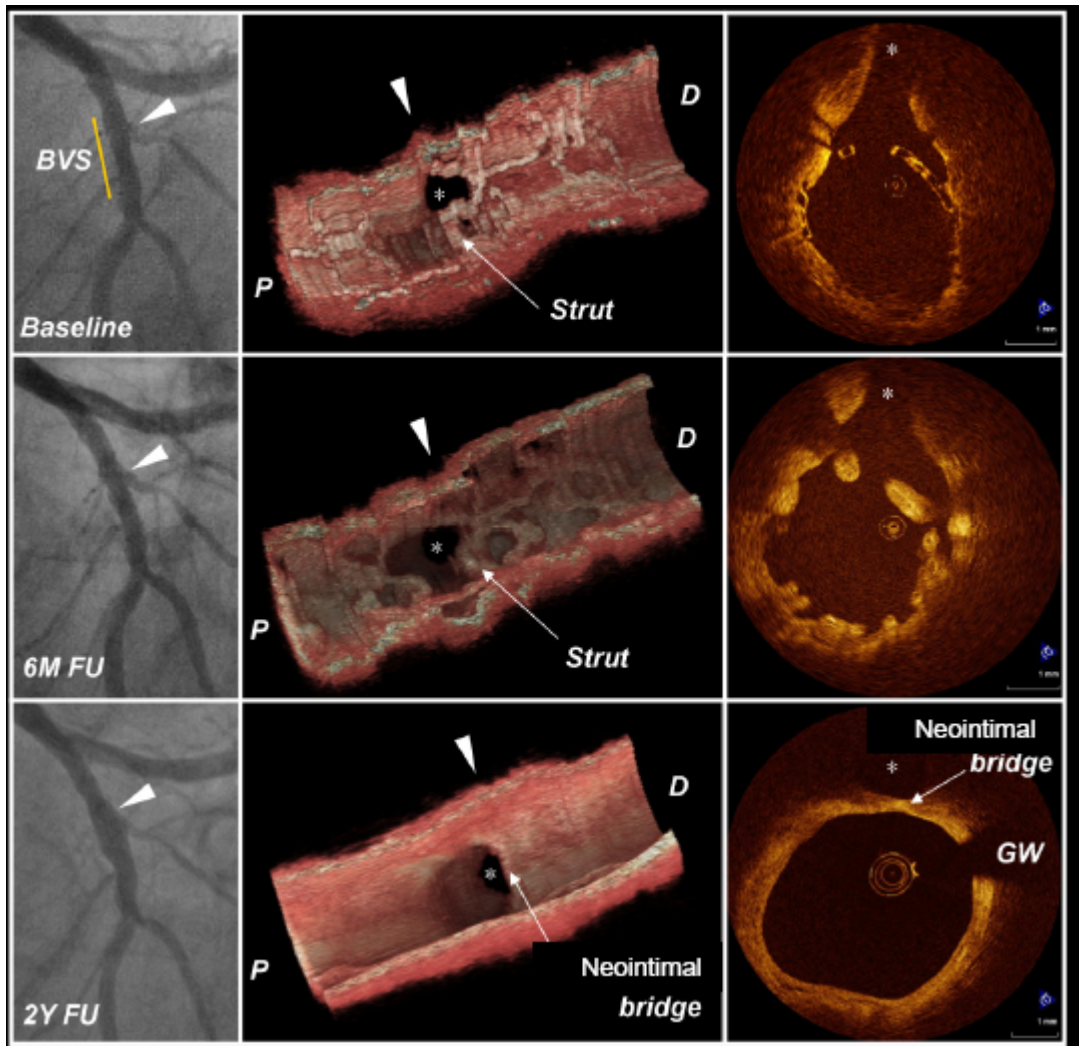
- *“Assessed”: 4337 pts*
- *“Enrolled”: 3075 pts*
- *“Randomized”: 1800 pts*



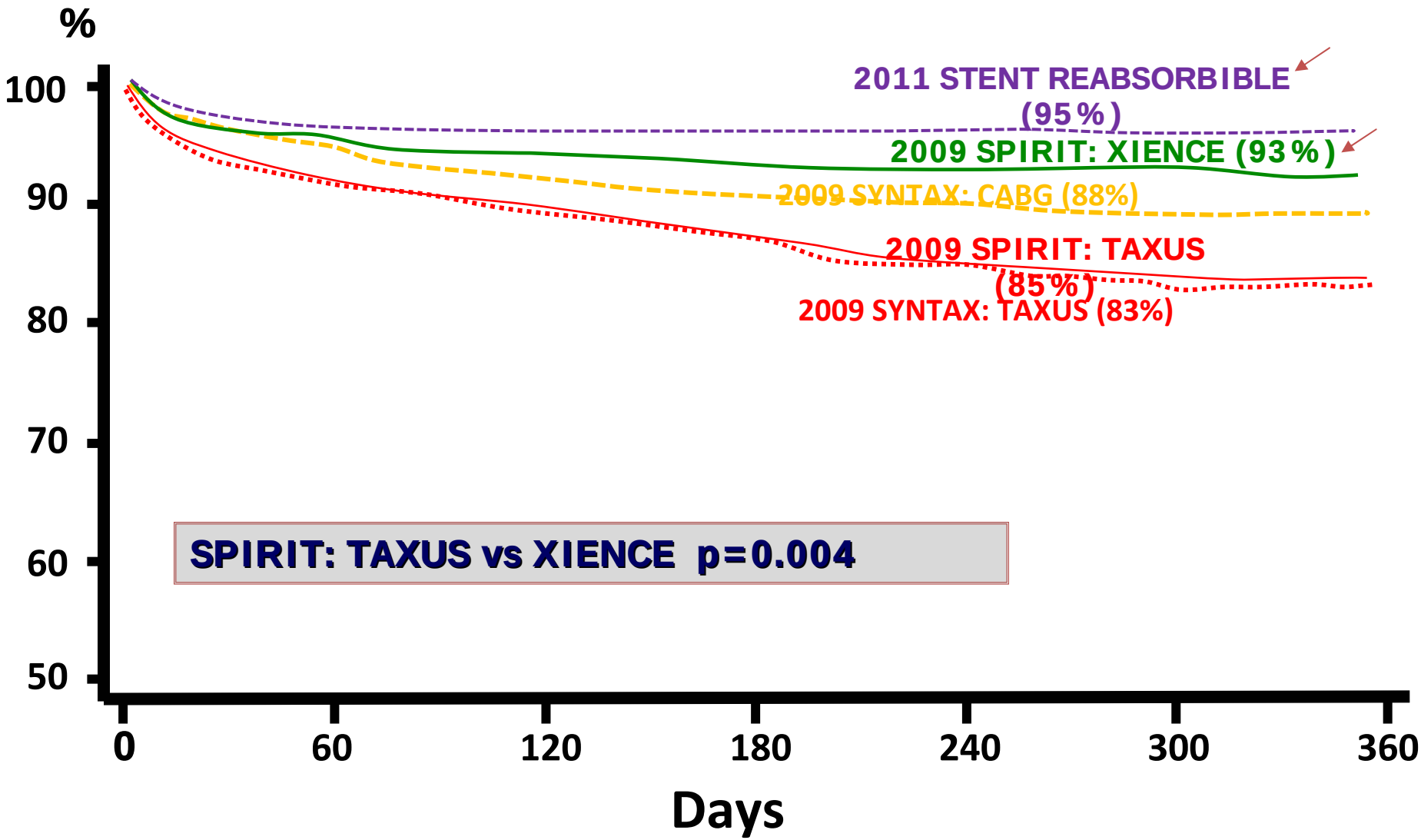

American Heart Association
*Learn and Live*

## *Stent farmacoactivo bioreabsorbible*

**STENT BIOABSORBIBLE (ABSORB)**




# Freedom from Death / MI / CABG / Re-PTCA



# 3 Miscelánea intervencionismo

# Síndrome de Platipnea-Ortodesoxia

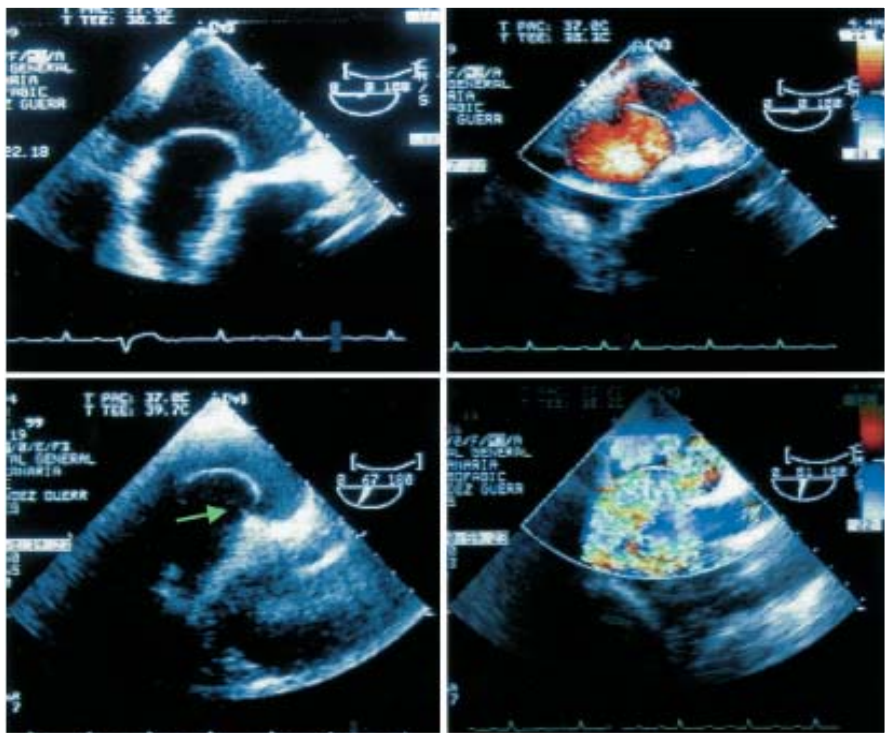
Circulation
JOURNAL OF THE AMERICAN HEART ASSOCIATION

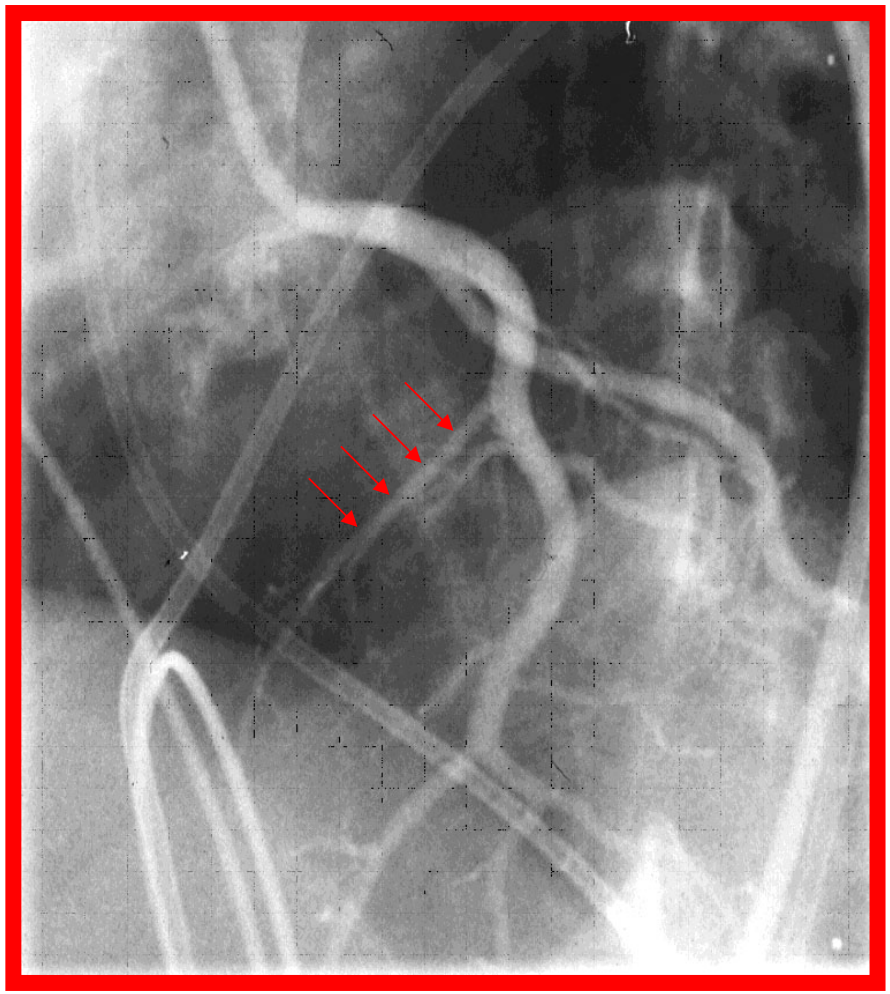
American Heart Association.
Learn and Live.

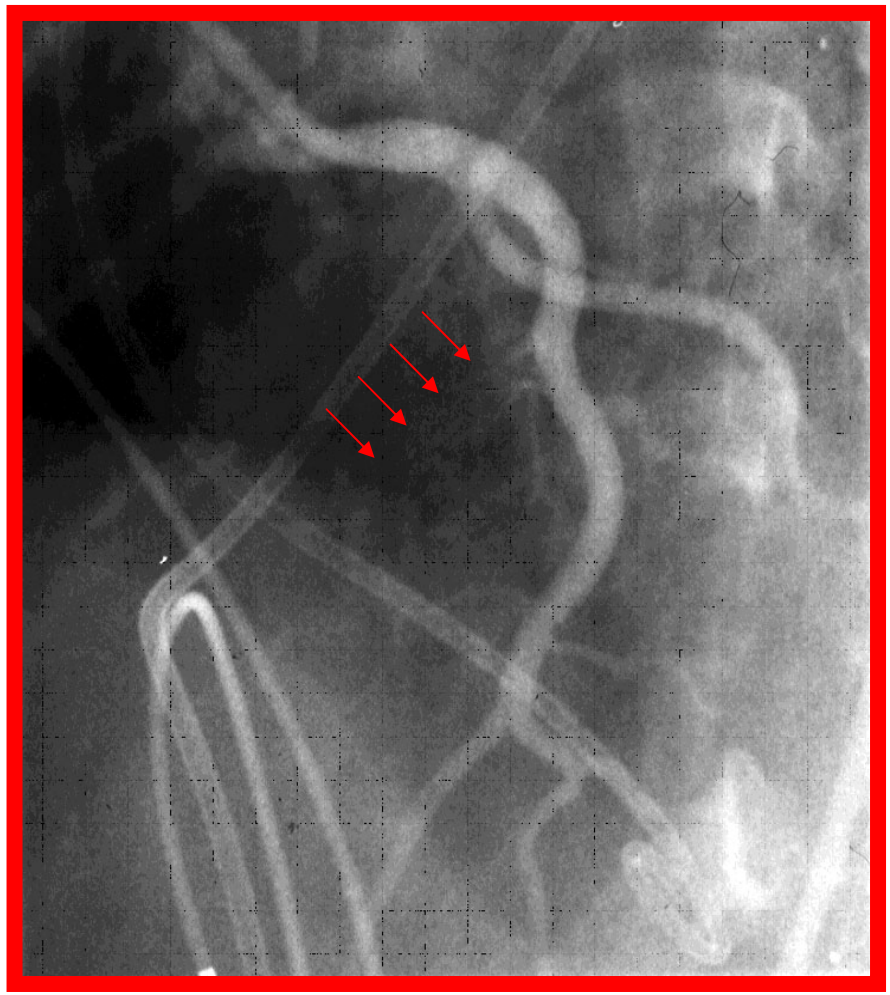
**Platypnea-Orthodeoxia due to Aortic Elongation**
Alfonso Medina, Jose Suarez de Lezo, Eduardo Caballero and Jose Ramon Ortega
*Circulation* 2001;104;741
DOI: 10.1161/hc3101.093603
Circulation is published by the American Heart Association. 7272 Greenville Avenue, Dallas, TX 72514
 Print ISSN: 0009-7322. Online ISSN: 1524-4539

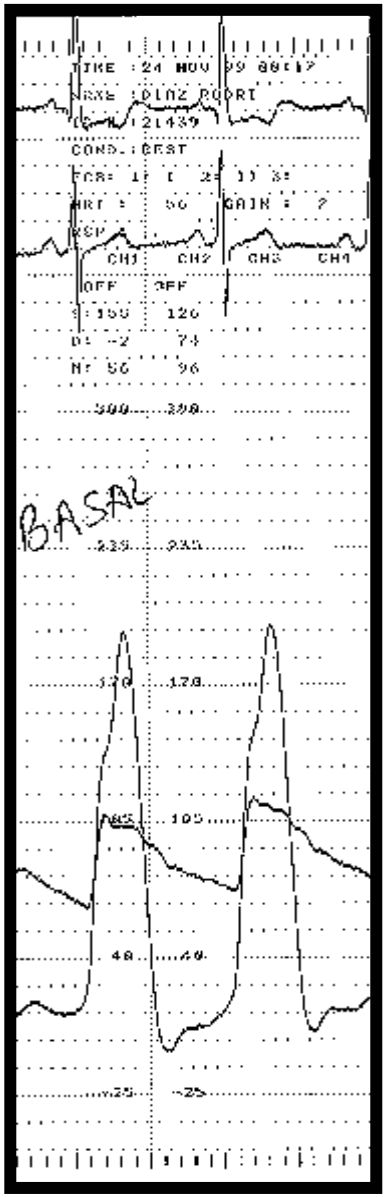
Decúbito

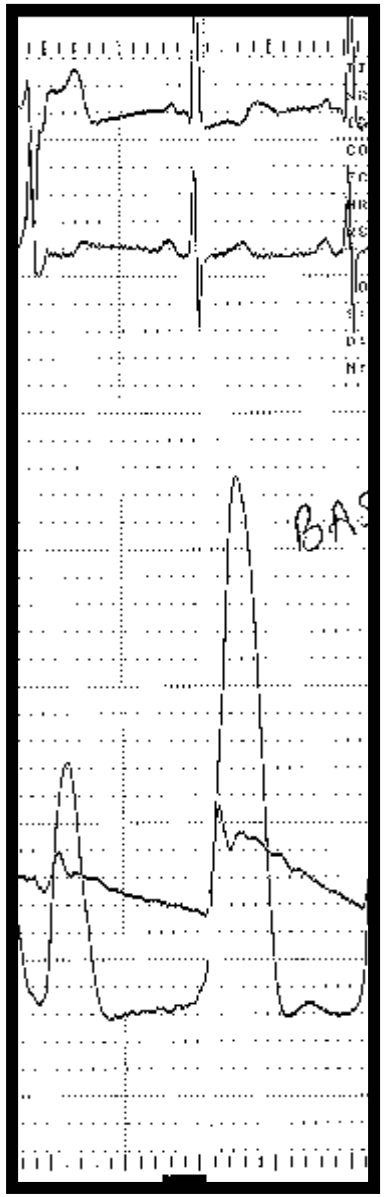
Incorporada

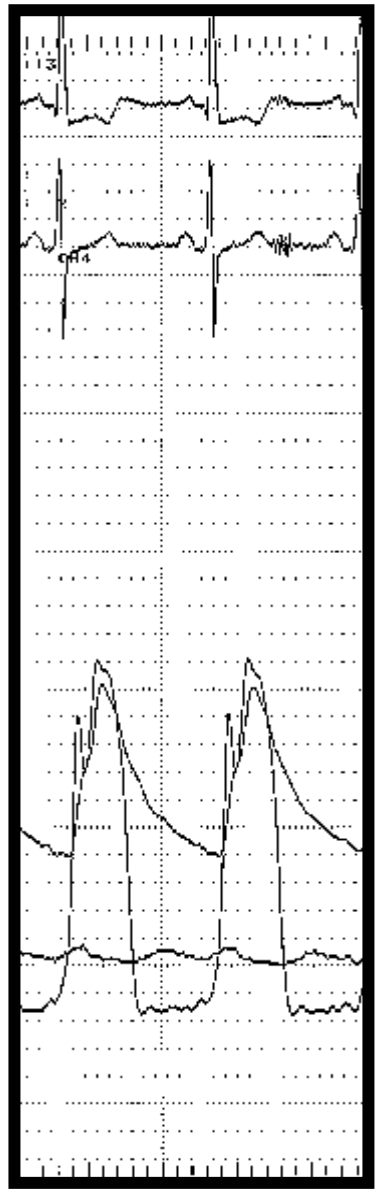


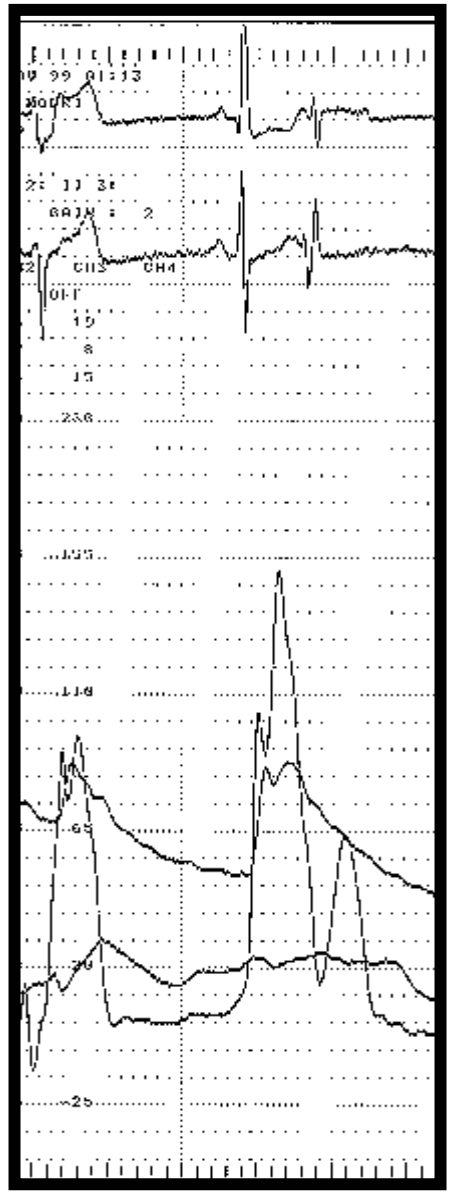


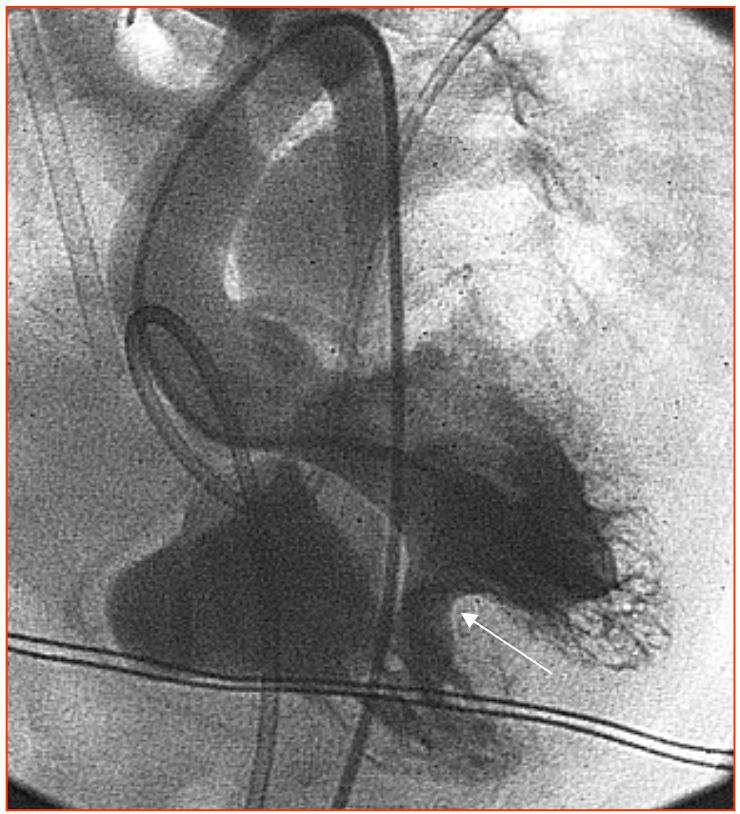


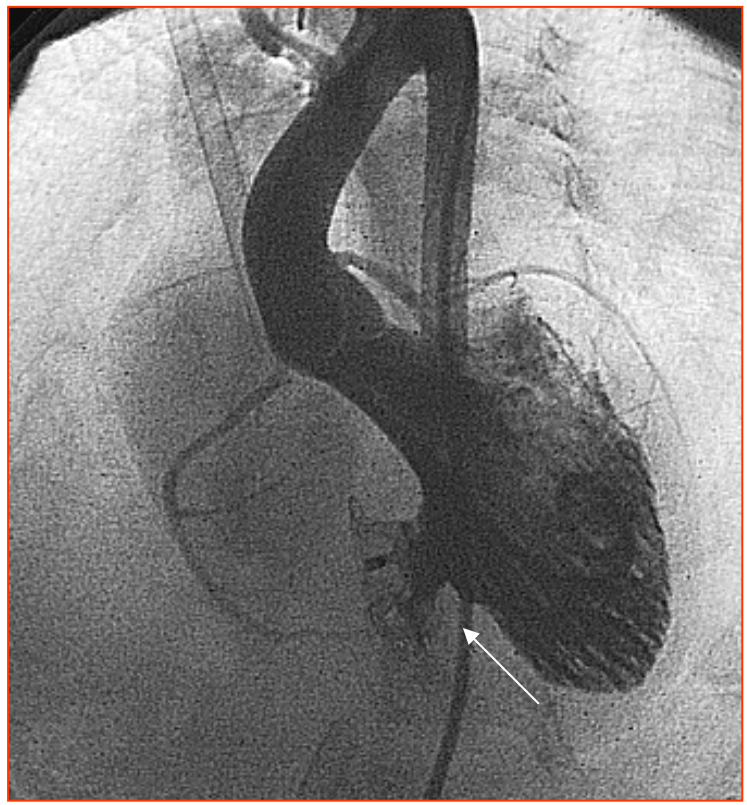

CH1
CH2
CH3
CH4
BASAL


BAS

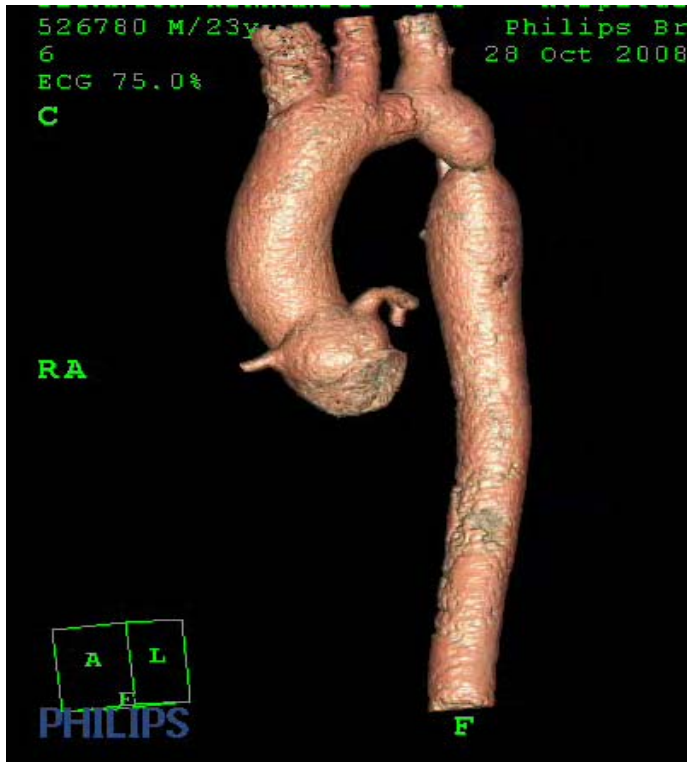

CH4

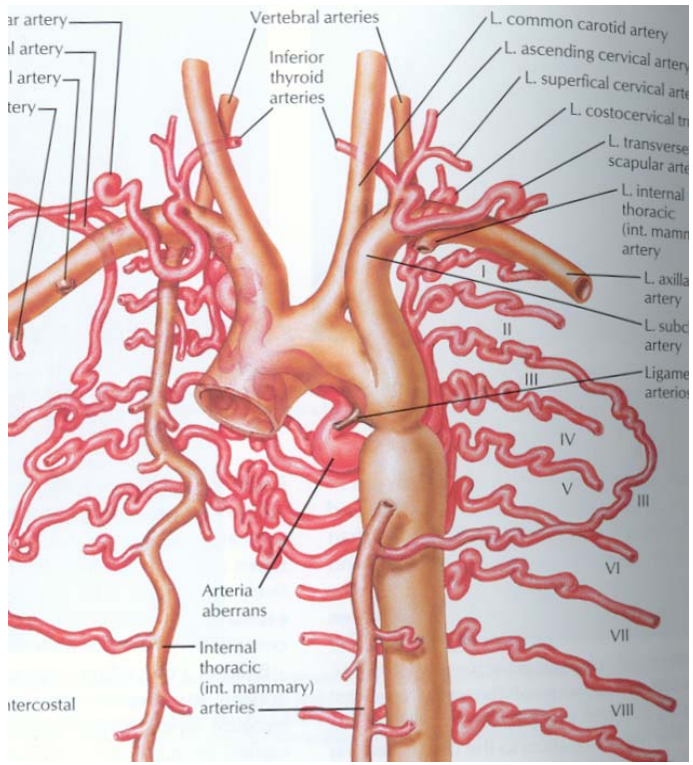

CH3
CH4

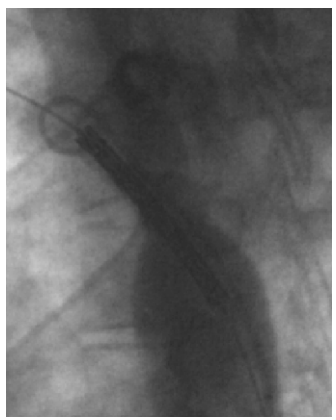


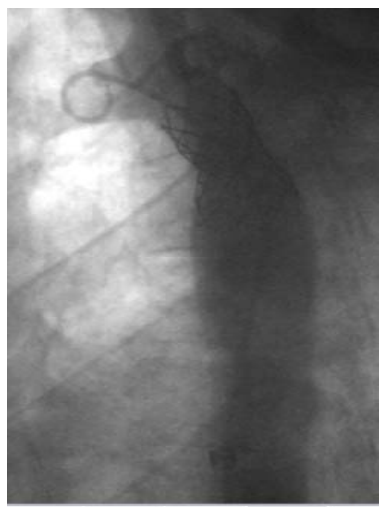


# COARTACIÓN DE AORTA

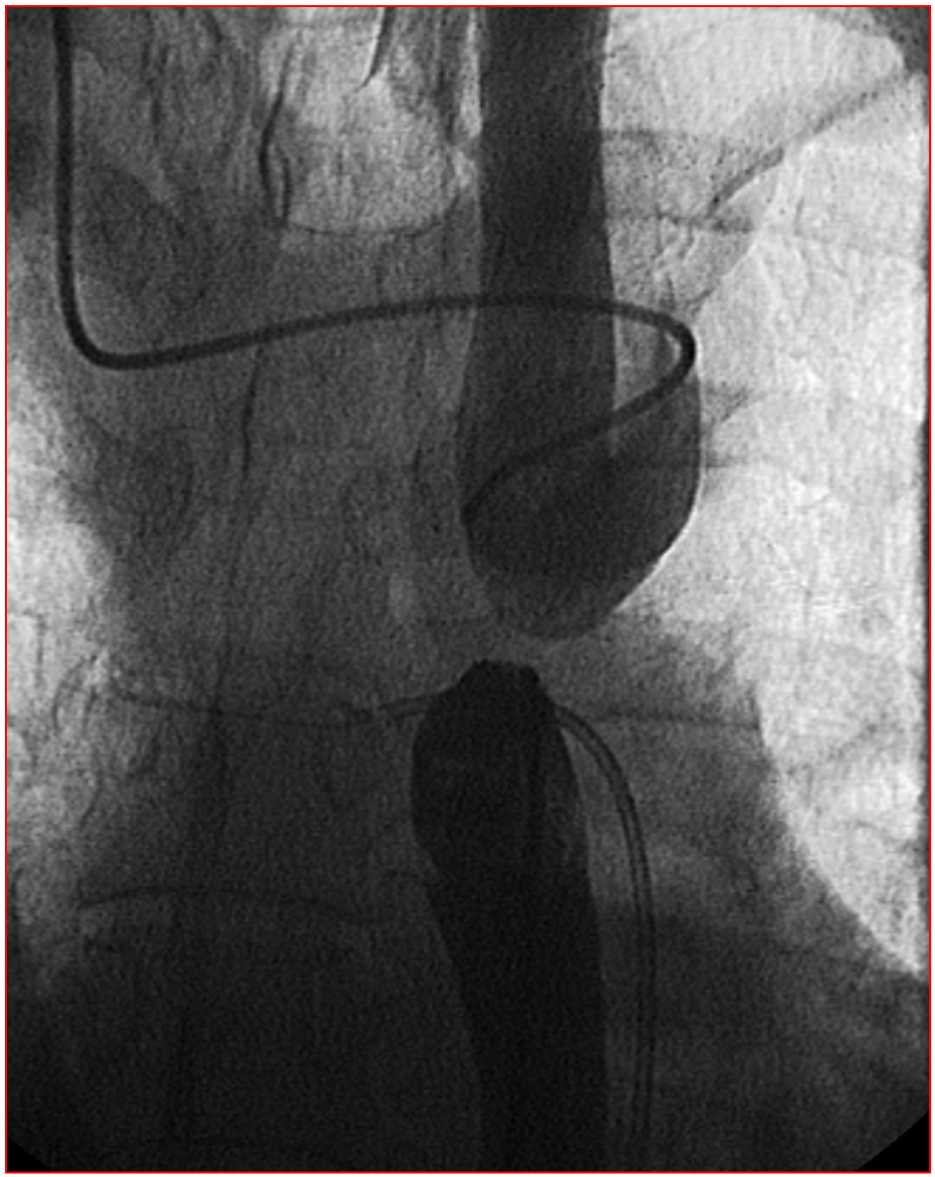


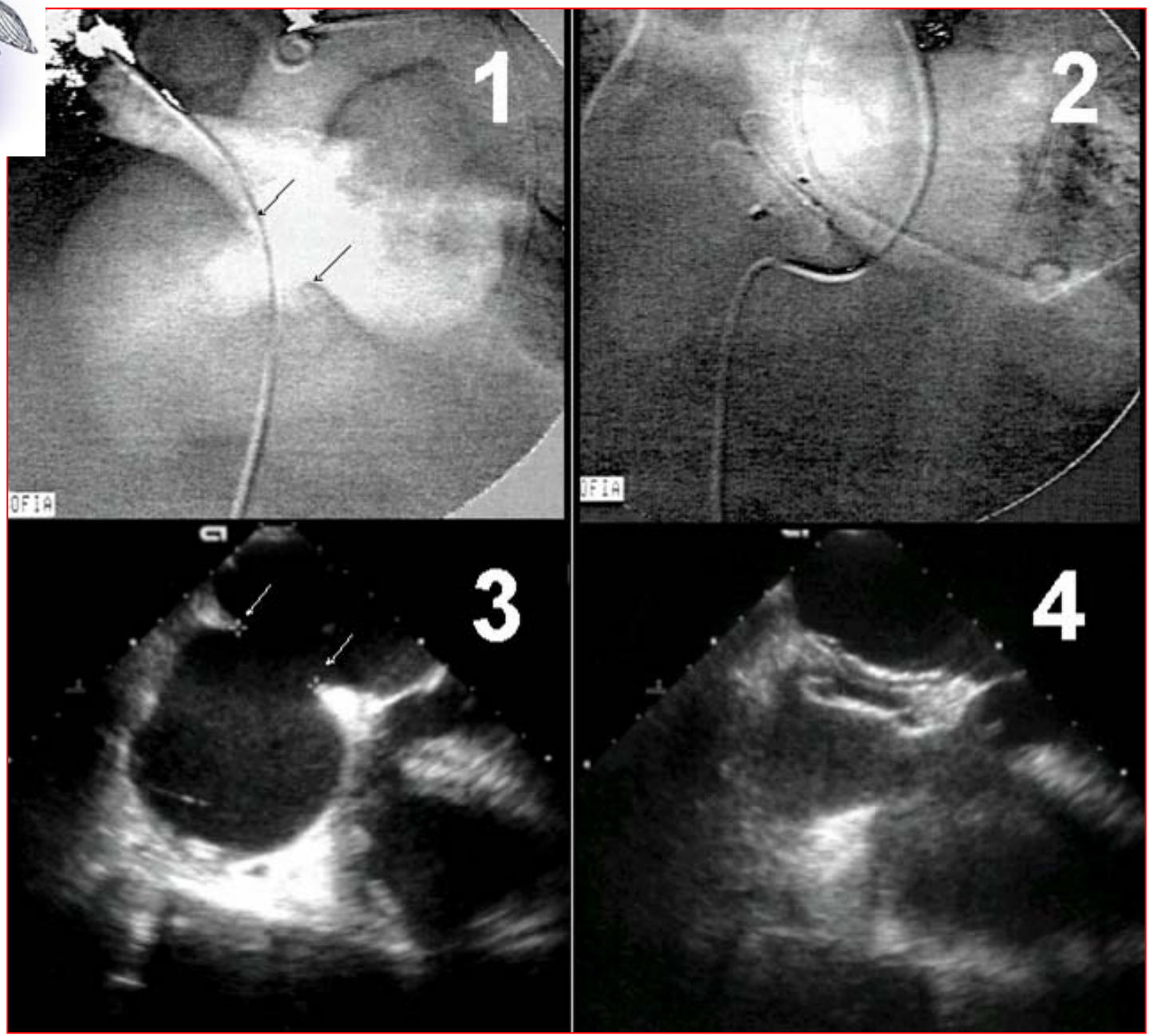





# STENT EN INTERRUPCIÓN DEL ARCO AÓRTICO COARTACIÓN



# COMUNICACIÓN INTERAURICULAR



# CORPAL 1988-2011

Miscelánea

Enfermedad coronaria

Válvulas Percutáneas

Defectos septales

Enfermedades eléctricas

Miocardiopatías

Futuro

(*) contribuciones CORPAL

# Coronarios

Effectiveness of coronary stenting for the treatment of chronic total occlusion in angina pectoris.

Simple and complex stent strategies for bifurcated coronary arterial stenosis involving the side branch origin.

Predictors of restenosis following unprotected left main coronary stenting.

Percutaneous cardiopulmonary support in critical patients needing coronary interventions with stents.

A stepwise strategy for the stent treatment of bifurcated coronary lesions.

Successful stent ablation with rotational atherectomy.

Rapamycin-eluting stents for the treatment of unprotected left main coronary disease.

Sirolimus-eluting stents for treatment of in-stent restenosis: immediate and late results.

Left main total occlusion treated with drug eluting sten

A new classification of coronary bifurcation lesions

Ultrasound findings during percutaneous treatment of bifurcated coronary lesions.

# *Cierres septales*

**Effectiveness of percutaneous device occlusion for atrial septal defect in adult patients with pulmonary hypertension**
de Lezo JS, Medina A, Romero M, Pan M, Segura J, Caballero E, Pavlovic D, Ortega JR, Franco M, Delgado A, Ojeda S, Mesa D, Lafuente M.
Am Heart J. 2002 Nov;144(5):877-80

**Platypnea-orthodeoxia due to aortic elongation**
Medina A, de Lezo JS, Caballero E, Ortega JR.
Circulation. 2001 Aug 7;104(6):741

**Percutaneous transcatheter closure of ventricular septal defects using an Amplatz device**
Herrador JA, Suárez de Lezo J, Pan M, Romero M, Segura J, Mesa D.
Rev Esp Cardiol. 2006 May;59(5):510-4. Spanish.

**Transcatheter closure of patent foramen ovale in patients with platypnea-orthodeoxia**
Ortega Trujillo JR, Suárez de Lezo Herreros de Tejada J, García Quintana A, Melián Nuez F, Rodríguez Delgado R, Medina Fernández-Aceytuno A.
Rev Esp Cardiol. 2006 Jan;59(1):78-81. Spanish.

## *Electrofisiología*

**The architecture of the atrial musculature between the orifice of the inferior caval vein and the tricuspid valve: the anatomy of the isthmus**

**Angiographic anatomy of the inferior right atrial isthmus in patients with and without history of common atrial flutter**

**Successful slow pathway ablation for atrioventricular nodal re-entrant tachycardia via a hypoplastic inferior vena cava in a patient with an azygos continuation**

## *Resincronización*

**Double-wire technique for implanting a left ventricular venous lead in patients with complicated coronary venous anatomy**

**Late failure of left ventricular leads stabilized using the retained guidewire technique in patients undergoing cardiac resynchronization therapy**

**Usefulness of hyperemic venous return angiography for studying coronary venous anatomy prior to cardiac resynchronization device implantation**

# *Valvulares*

**Quantitative and qualitative angiographic evaluation of mitral stenosis. Preoperative prediction of the type of stenosis**

**Combined percutaneous mitral and aortic balloon valvuloplasty**

**Balloon valvuloplasty for mitral restenosis after previous surgery: a comparative study**

**Factors determining late success after mitral balloon valvulotomy**

# *Miscelánea*

**Percutaneous transluminal balloon dilatation for discrete subaortic stenosis**
Suárez de Lezo J, Pan M, Sancho M, Herrera N, Arizon J, Franco M, Concha M, Valles F, Romanos A.
Am J Cardiol. 1986 Sep 15;58(7):619-21.

**Immediate and follow-up results of transluminal balloon dilation for discrete subaortic stenosis**
Suárez de Lezo J, Pan M, Medina A, Romero M, Melián F, Segura J, Hernández E, Pavlovic D, Morales J, Vivancos R, et al.
J Am Coll Cardiol. 1991 Nov 1;18(5):1309-15.

**Balloon-expandable stent repair of severe coarctation of aorta.**
Suárez de Lezo J, Pan M, Romero M, Medina A, Segura J, Pavlovic D, Martinez C, Tejero I, Perez Navero J, Torres F, et al.
Am Heart J. 1995 May;129(5):1002-8

**Immediate and follow-up findings after stent treatment for severe coarctation of aorta.**
Suárez de Lezo J, Pan M, Romero M, Medina A, Segura J, Lafuente M, Pavlovic D, Hernández E, Melián F, Espada J.
Am J Cardiol. 1999 Feb 1;83(3):400-6.

**Effects of stem-cell mobilization with recombinant human granulocyte colony stimulating factor in patients with percutaneously revascularized acute anterior myocardial infarction**
Suárez de Lezo J, Torres A, Herrera I, Pan M, Romero M, Pavlovic D, Segura J, Ojeda S, Sánchez J, López Rubio F, Medina A.
Rev Esp Cardiol. 2005 Mar;58(3):253-61. Spanish.

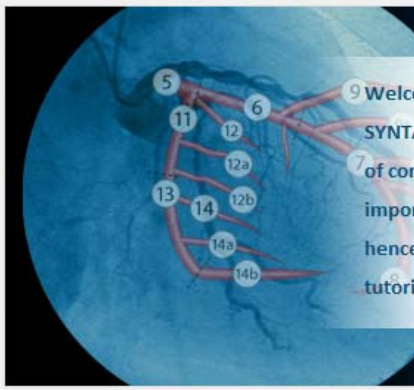
# Conclusión

El intervencionismo da respuesta a un espectro muy amplio de patologías cardiacas que inicialmente fueron tributarias de la cirugía cardiaca.

¿Se complementan o compiten?

# SYNTAX SCORE

Search...




Welcome to the SYNTAX Score website. The SYNTAX Score is a unique tool to score complexity of coronary artery disease. However, it is very important to use this new scoring tool correctly, hence, it is strongly recommended to complete the tutorial first.

**TUTORIAL**

Knowledge of definitions is vital. Please use the tutorial prior to first calculator use.

Start tutorial...

**CALCULATOR**

Start using the calculator when you have successfully completed the tutorial.

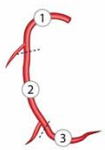
Start calculator...

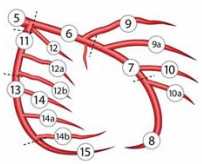
## Calculator updated to version 2.1

SYNTAX SCORE — CARDIALYSIS — Boston Scientific

Score: 13 Dominance: left Current lesion: 1/1 Calculator version 2.

| | | | Lesions: | 1 |
|---|---|---|---|---|
| | Segments: | | | |
| RCA | RCA proximal | 1 | | |
| | RCA mid | 2 | | |
| | RCA distal | 3 | | |
| LM | Left main | 5 | v | |
| LAD | LAD proximal | 6 | | |
| | LAD mid | 7 | | |
| | LAD apical | 8 | | |
| | First diagonal | 9 | | |
| | Add. first diagonal | 9a | | |
| | Second diagonal | 10 | | |
| | Add. second diagonal | 10a | | |
| LCX | Proximal circumflex | 11 | | |
| | Intermediate/anterolateral | 12 | | |
| | Obtuse marginal | 12a | | |
| | Obtuse marginal | 12b | | |
| | Distal circumflex | 13 | | |
| | Left posterolateral | 14 | | |
| | Left posterolateral | 14a | | |
| | Left posterolateral | 14b | | |
| | Posterior descending | 15 | | |




**Please fill in the following variables :**

**4. Total occlusion (T.O.)**

a. (•) No
b. ( ) Yes:

**5. Trifurcation**

a. (•) No
b. ( ) Yes

**6. Bifurcation**

a. ( ) No
b. (•) Yes

( ) Medina 1,0,0
( ) Medina 0,1,0
(•) Medina 1,1,0
( ) Medina 1,1,1
( ) Medina 0,0,1
( ) Medina 1,0,1
( ) Medina 0,1,1

**Bifurcation angulation (between distal main vessel and side branch) < 70°**

a. (•) No
b. ( ) Yes

**7. Aorto Ostial lesion**

a. ( ) No
b. ( ) Yes