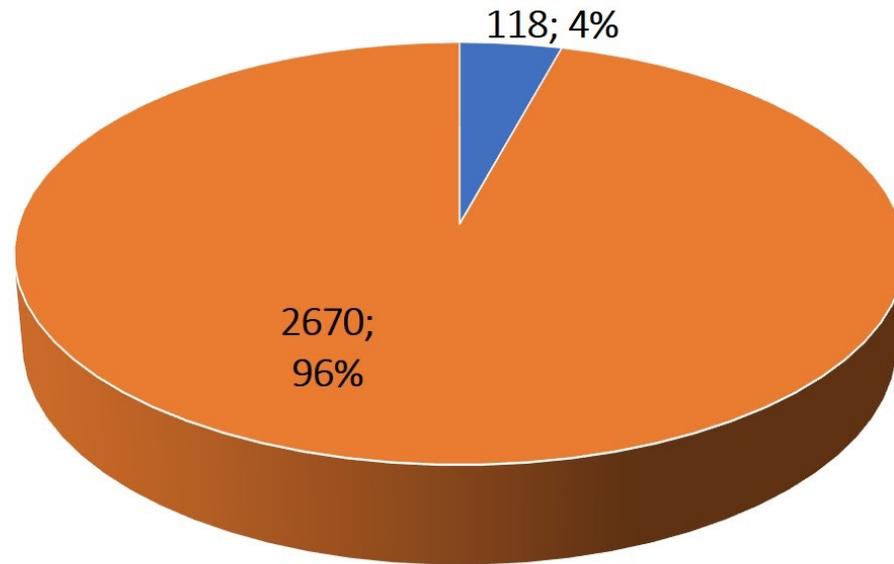


# HEMODINAMICA

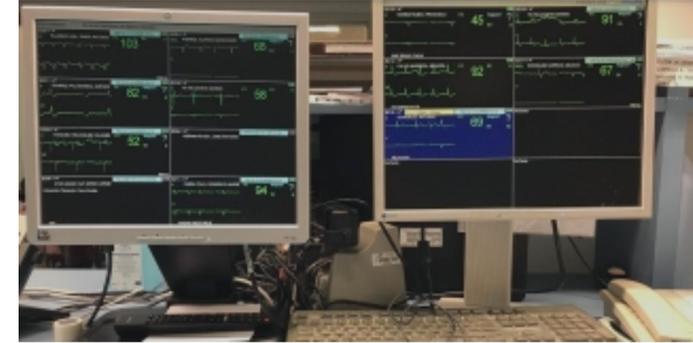
## *Tratamiento percutáneo Cardiopatía Estructural*

*Carlos Arellano Serrano*

# Procedimientos



■ Estructural ■ No estructural ■



## Nuevas Técnicas de Intervencionismo Cardíaco con Implicaciones para Atención Primaria

26/02/2020

SOLICITAR INSCRIPCIÓN

OBJETIVOS

CONTENIDOS

- Dar a conocer la Unidad de Hemodinámica y los procedimientos con implicación en Atención Primaria
- Fomentar la continuidad asistencial y establecer un circuito bidireccional Atención Primaria-Hemodinámica.
- Desarrollar los protocolos para la indicación de los procedimientos de Hemodinámica y el seguimiento conjunto de estos pacientes.

# Índice

## Índice

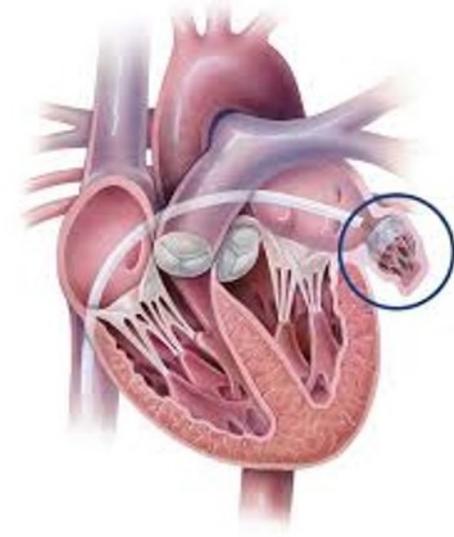
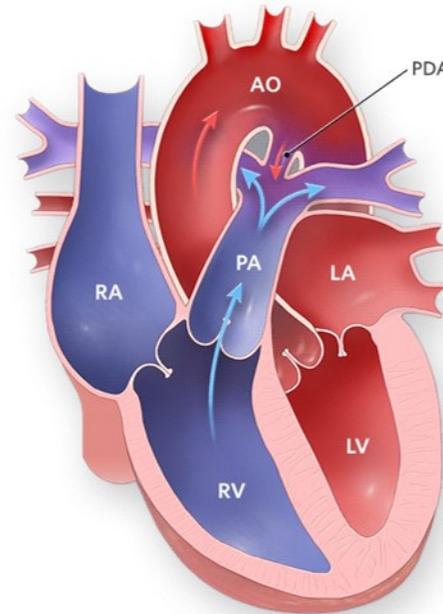
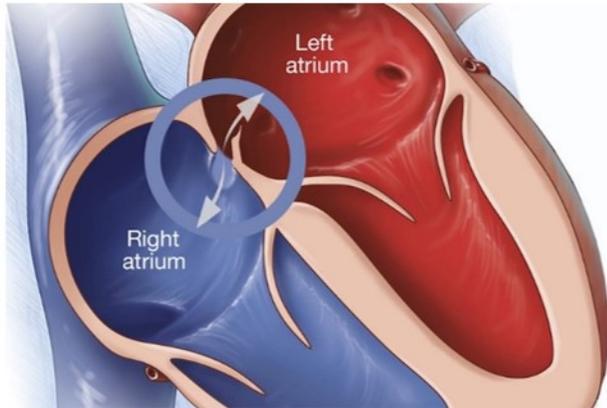
- Tratamiento C. Congénitas: Cierre FOP, CIA, Ductus y Orejuela Izquierda
- Tratamiento válvula aórtica: TAVI
- Tratamiento válvula mitral: TMVI, TMVR
- Tratamiento válvula tricúspide: TTVI, TTVR

## Objetivos

- Descripción principales dispositivos.
- Que pacientes podrían beneficiarse
- Literatura
- Nuestra experiencia.

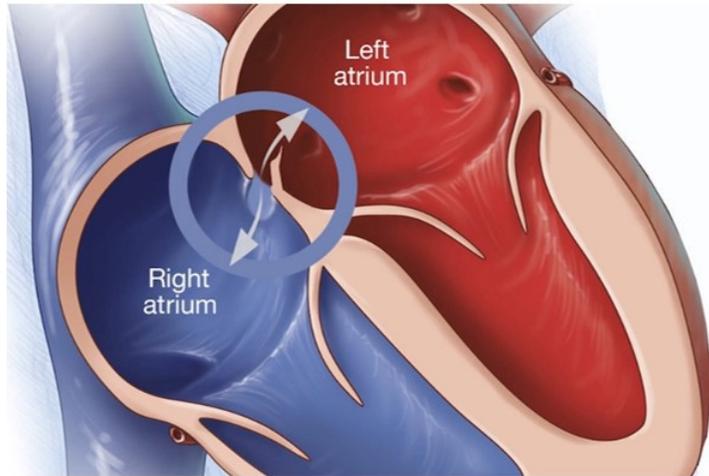
## Índice

- Tratamiento C. Congénitas: Cierre FOP, CIA, Ductus y Orejuela Izquierda
- Tratamiento válvula aórtica: TAVI
- Tratamiento válvula mitral: TMVI, TMVR
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# Foramen Ovale Permeable (FOP)

## Dispositivos de cierre



**FIGURE 1** **A** – Amplatzer PFO Occluder, Abbott Vascular; **B** – Amplatzer Multifenestrated (Cribiform) Septal Occluder, Abbott Vascular; **C** – Delivery sheath Amplatzer TorqVue 45°; **D** – GORE CARDIOFORM Septal Occluder, Gore Medical; **E** – Delivery knob of GORE CARDIOFORM Septal Occluder, Gore Medical; **F** – Figulla Flex II, Occlutech; **G** – CeraFlex PFO Occluder, Lifetech Scientific; **H** – Nit-Occlud PFO, PFM Medical

# Foramen Oval Permeable

**TABLE 1** Clinical Trials Randomizing Cryptogenic Stroke Patients to Percutaneous PFO Closure or Medical Therapy

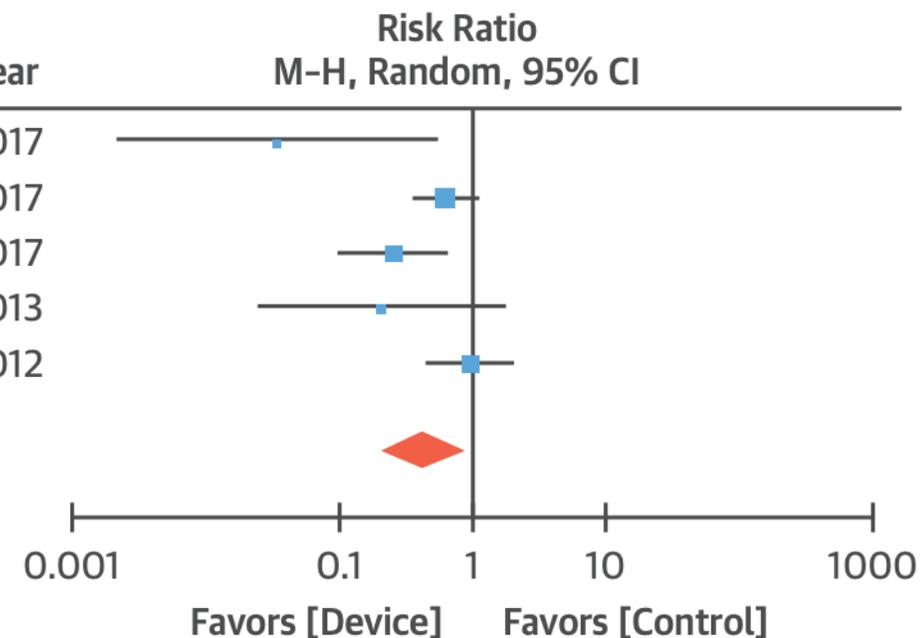
Randomized Clinical Trial (Ref. #)	Cohort (Number of Patients)	Device Arm	Medical Arm	Follow-Up	Primary Outcome	Results
CLOSURE I	Cryptogenic stroke or TIA +	PFO closure + aspirin and	Aspirin, warfarin or	2 yrs	Composite of stroke, TIA, PFO closure did not	

## A Recurrent Stroke

Study or Subgroup	Device		Control		Weight	Risk Ratio M-H, Random, 95% CI	Year
	Events	Total	Events	Total			
CLOSE (40)	0	238	14	235	6.1%	0.03 [0.00-0.57]	2017
RESPECT (27)	18	499	28	481	32.2%	0.62 [0.35-1.11]	2017
REDUCE (41)	6	441	12	223	24.1%	0.25 [0.10-0.66]	2017
PC (23)	1	204	5	210	9.5%	0.21 [0.02-1.75]	2013
CLOSURE I (20)	12	447	13	462	28.0%	0.95 [0.44-2.07]	2012
<b>Total (95% CI)</b>		<b>1829</b>		<b>1611</b>	<b>100.0%</b>	<b>0.42 [0.20-0.91]</b>	
Total events	37		72				

Heterogeneity:  $\tau^2 = 0.38$ ;  $\chi^2 = 9.72$ ,  $df = 4$  ( $P = 0.05$ );  $I^2 = 59\%$

Test for overall effect:  $Z = 2.22$  ( $P = 0.03$ )



medical therapy

MRI = magnetic resonance imaging; PFO = patent foramen ovale; TIA = transient ischemic attack.

# Foramen Oval Permeable

**TABLE 6** Recommendations for transcatheter patent foramen ovale closure in prevention of recurrent thromboembolic ischemic events

Transcatheter PFO closure should be performed in patients <60 years old

- After ESUS or TIA with confirmed ischemic lesions in neuroradiological imaging (CT or MRI) or after an episode of peripheral embolism (including myocardial infarction)
- With PFO with at least 1 anatomical or clinical high-risk factor confirmed by contrast TEE examination

Transcatheter PFO closure PFO should be considered in patients <60 years old

- After ESUS or with TIA with confirmed ischemic lesions in neuroradiological imaging (CT or MRI) or after an episode of peripheral embolism (including myocardial infarction)
- With PFO confirmed by contrast TEE

Transcatheter PFO closure should be considered in secondary prevention in patients

- After the episode of decompression divers disease and presence of PFO confirmed by contrast TEE
- After the episode of HAPE and presence of PFO confirmed by contrast TEE

Transcatheter PFO closure may be considered, especially if high-risk factors are present, in primary prevention in

- Deep or professional divers
- Mountain climbers, alpinists
- Professional, military and aerobatic pilots

Transcatheter PFO closure may be considered, especially if high-risk factors are present, in patients with

- Platypnoe-orthodeoxia syndrome
- Exercise desaturation (after excluding causes other than PFO)
- Sleep-apnea syndrome

Transcatheter PFO closure should not be performed in

- Primary prevention of ischemic episodes in patients with the presence of PFO without ESUS/TIA or ischemic lesions in neuroradiological imaging
- Patients with other causes of stroke (carotid atherosclerosis, atrial fibrillation) which, despite PFO coexistence, more likely explaining stroke
- Patients with indications for chronic anticoagulation (except of patients with simultaneous incidence of pulmonary embolism)
- Patients with migraine headaches without changes in neuroradiological studies

# Foramen Oval Permeable

**TABLE 5** Anatomical and clinical risk factors of recurrent stroke in patients with patent foramen ovale

## Anatomical risk factors

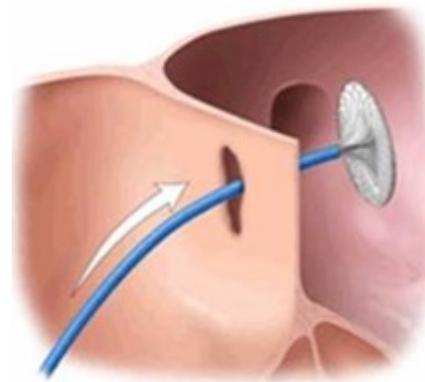
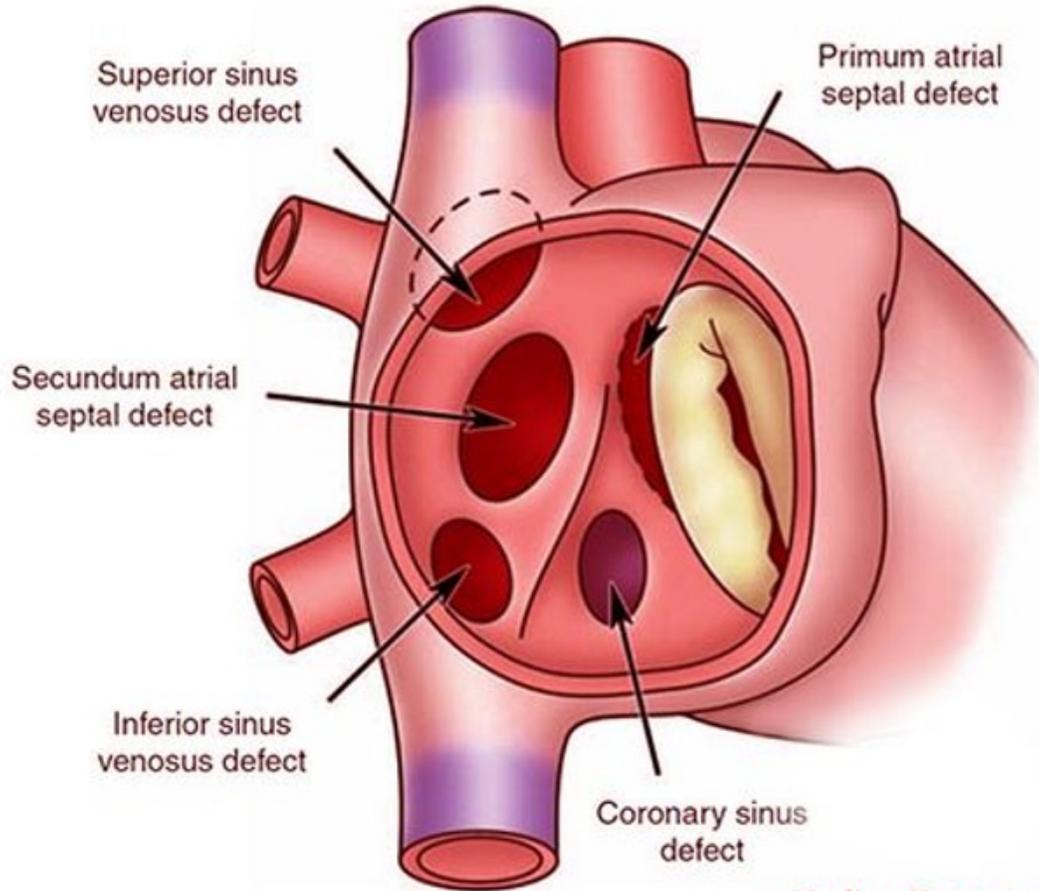
- ASA with septum shift >10 mm
- Large left-to-right shunt (passage of >25 contrast bubbles during the Valsalva maneuver or spontaneous right-to-left shunt at rest >4 mm on color Doppler TEE)
- Presence of Eustachian valve >10 mm or Chiari network
- Long PFO tunnel

## Clinical risk factors

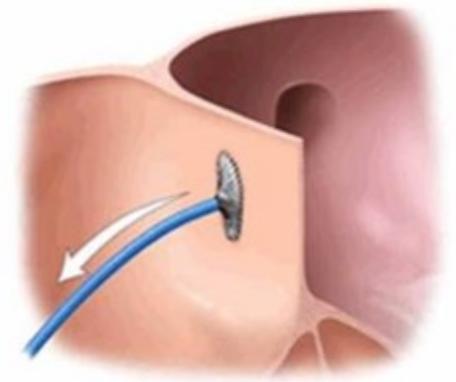
- Recurrent episodes of ESUS or TIA
- Multiple ischemic lesions in brain CT/MRI
- History of DVT/PE or thrombophilia
- Ischemic event associated with the Valsalva maneuver
- Ischemic event connected with long travel/immobilization
- Simultaneous pulmonary and systemic embolism
- Thromboembolic event during antiplatelet or anticoagulation therapy

Abbreviations: ASA, atrial septum aneurysm; DVT, deep vein thrombosis; ESUS, embolic stroke of undetermined source; MRI, magnetic resonance imaging; PE, pulmonary embolism; others, see TABLES 1–3

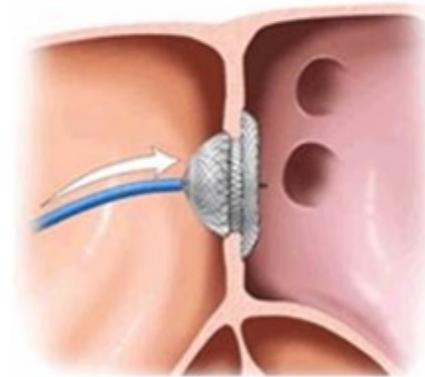
# Comunicación Interauricular



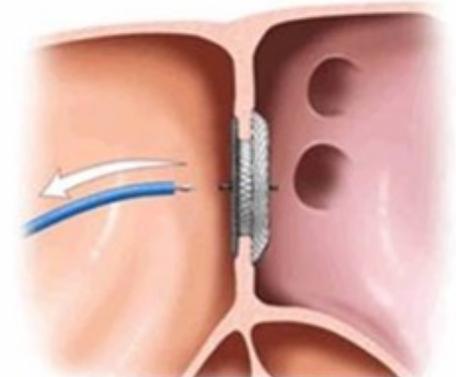
Step 1



Step 2



Step 3



Step 4

# Ductus Arterioso Persistente



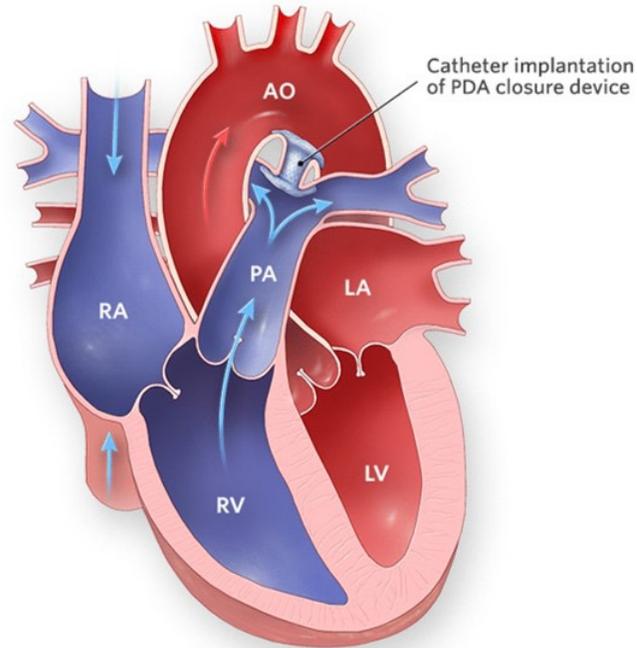
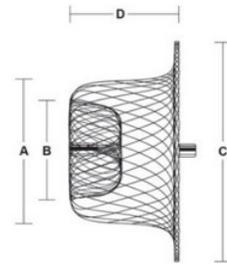
Amplazer Duct Occluder



Cocoon Duct Occluder



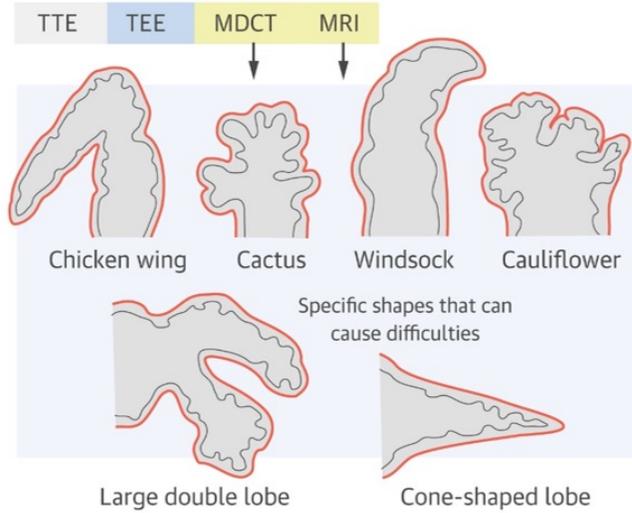
Cera Duct Occluder



Procedimiento	Foramen	CIA	Ductus
Inicio	Sept 04	Mayo 05	Sept 08
Número	167	72	18
Edad	49 (18/80)	48 (15/80)	44 (27-72)
Sexo (femenino, %)	69 (41%)	43 (60%)	15 (83%)
HTA	42 (25%)	33 (45%)	6 (33%)
Diabetes mellitus	12(7%)	13 (18%)	3 (17%)
Dislipemia	30 (18%)	37(51%)	3 (17%)
Tabaquismo	28(17%)	18 (25%)	1 (5%)
ACV previo	167 (100%)	48 (15/80) 16,88	
Éxito	165 (99%)	71 (99%)	18 (100%)
Estancia (días)	1.2 (1-4)	1.1 (1-3)	1 (1-2)
Mortalidad hospitalaria	0	0	0
Embolización	2 (1.2%)		

# Cierre Orejuela Izquierda

## Substantial Variations in LAA Shape



**ENDOLUMINAL LAA DEVICES**

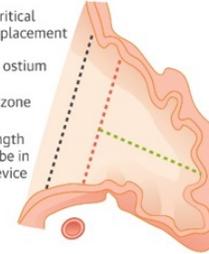
- LAA Occluder Device
- First and Second Generation LAA Plug
- Flexible LAA Occlusion Device

**2DTEE + 3DTEE**

- Evaluation of contraindications
- LAA dimensions
- Surrounding anatomical landmarks

Measurements critical to stable device placement

- 1 LAA ostium
- 2 Landing zone
- 3 Maximum length of anchoring lobe in the axis of the device



**EPICARDIAL LAA DEVICES**

- LAA Ligation Device

**Spiral CT**

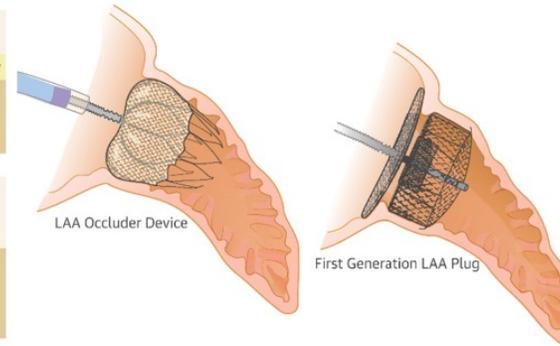
**TEE**

- Evaluation of contraindications
- LAA ostium and anatomical assessments
- Magnetic wire placement within LAA during procedure

**Peri-Procedural Echocardiographic Guidance**

**2DTEE + 3DTEE + Fluoroscopy**

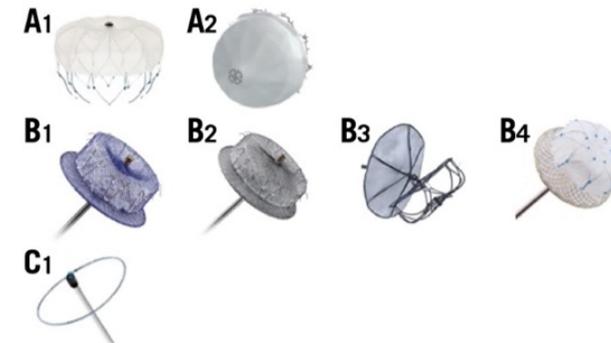
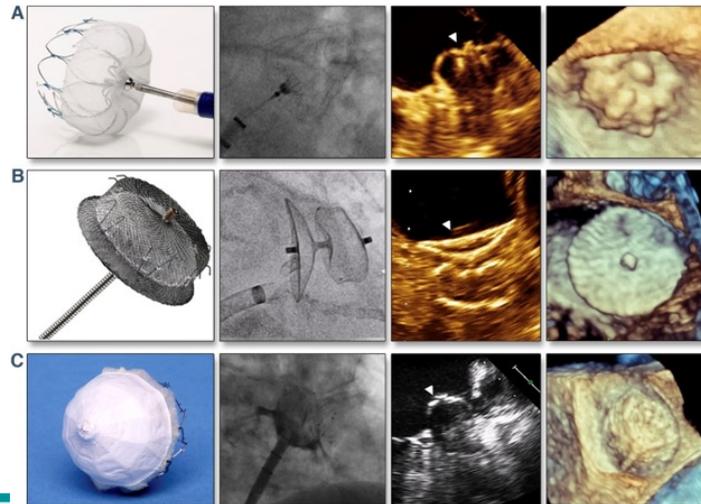
- Trans-septal puncture
- Placement of delivery sheath
- Correct device positioning



**Post-Procedural Echocardiographic Follow-Up**

**2DTEE + 3DTEE**

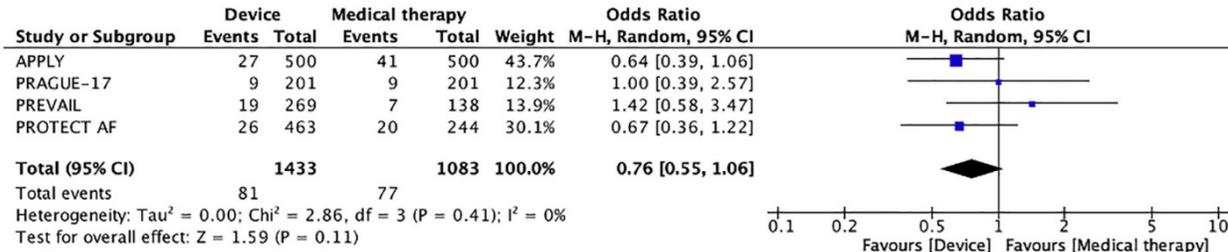
- Iatrogenic ASD
- Peri-device leakage
- Thrombi
- Device position



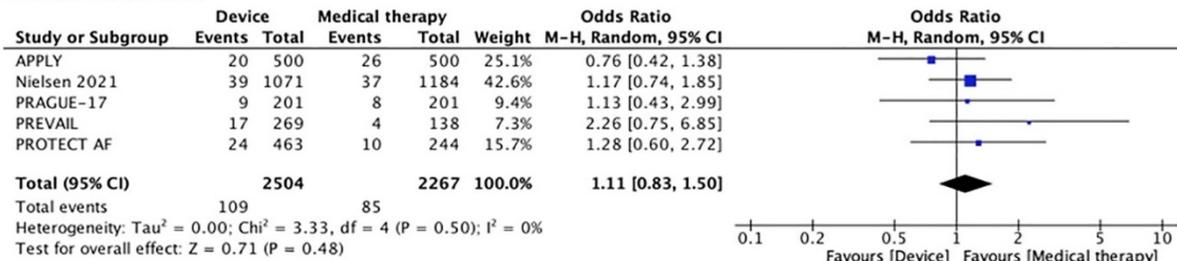
**Figure 2.** Commercially available, CE-mark approved devices. A1) WATCHMAN (Boston Scientific), A2) WaveCrest (Biosense Webster), B1) Amulet (Abbott Vascular), B2) AMPLATZER Cardiac Plug (Abbott Vascular), B3) Ultraseal LAA Occluder (Cardia), B4) LAmbré (Lifetech), C1) LARIAT (SentreHEART).

# Cierre Orejuela Izquierda

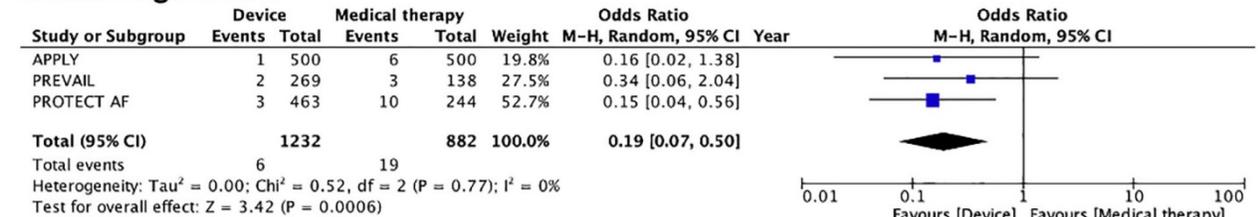
## All stroke



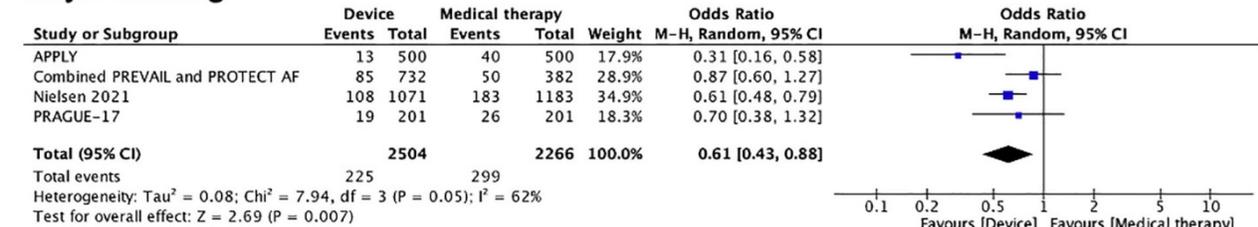
## Ischemic stroke



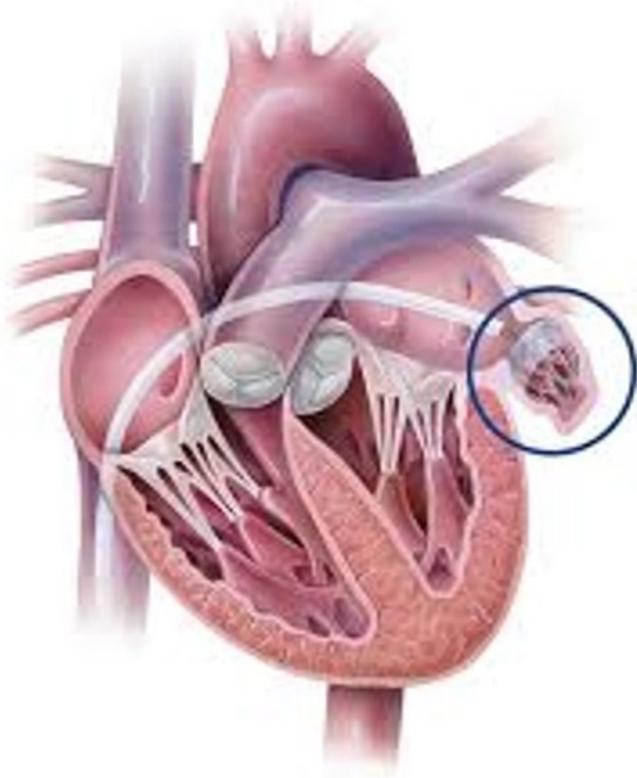
## Hemorrhagic stroke



## Major bleeding

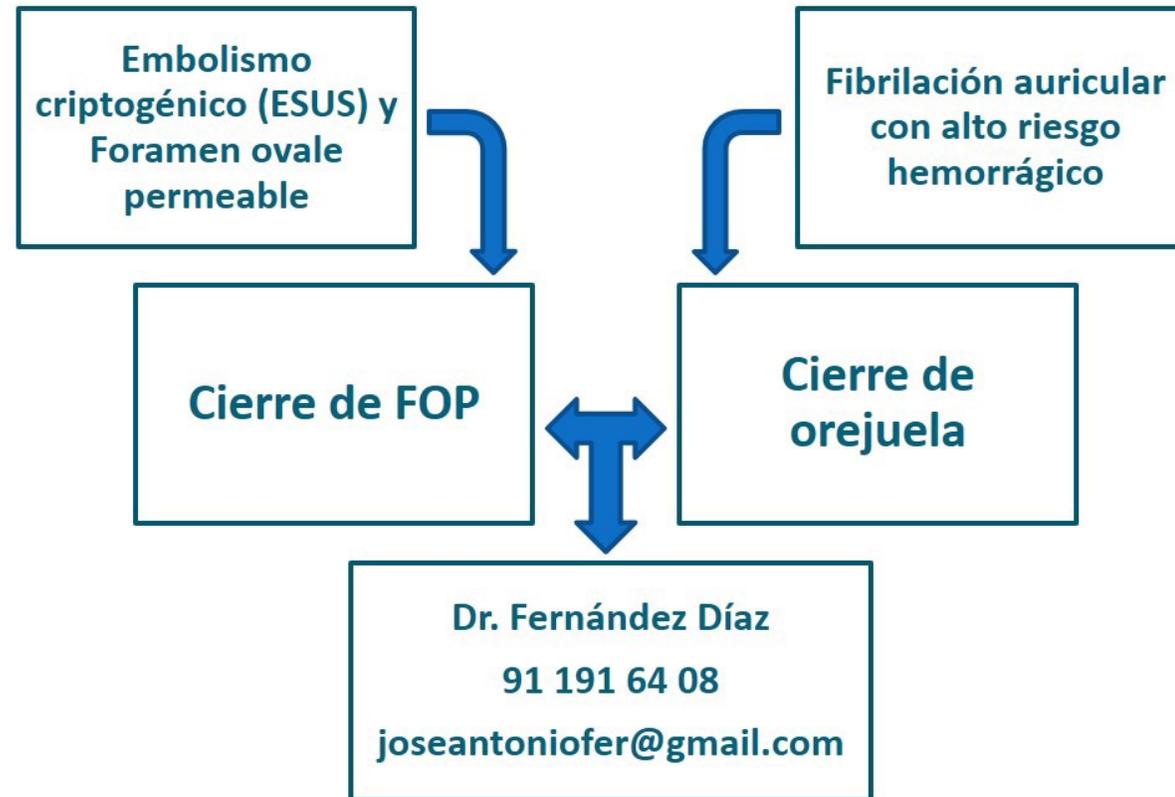


# Cierre Orejuela Izquierda



NUMERO	80
Edad	75 ± 6.8 (59-89)
Sexo (mujer)	24 (30%)
Hipertensión arterial	63 (79%)
Diabetes mellitus	35 (44%)
Dislipemia	47 (59%)
Tabaquismo	35 (44%)
Anestesia general	53 (66%)
Sedación (ETE pediátrico)	27 (34%)
Derrame/ taponamiento	8 (10%)
Éxito	77 (96%)
Mortalidad	1 (1.2%)
Estancia hospitalaria	1.5 (1-15)
Amulet/Watchman/LAmbre	45 (56%) / 10 (12%) / 25 (31%)

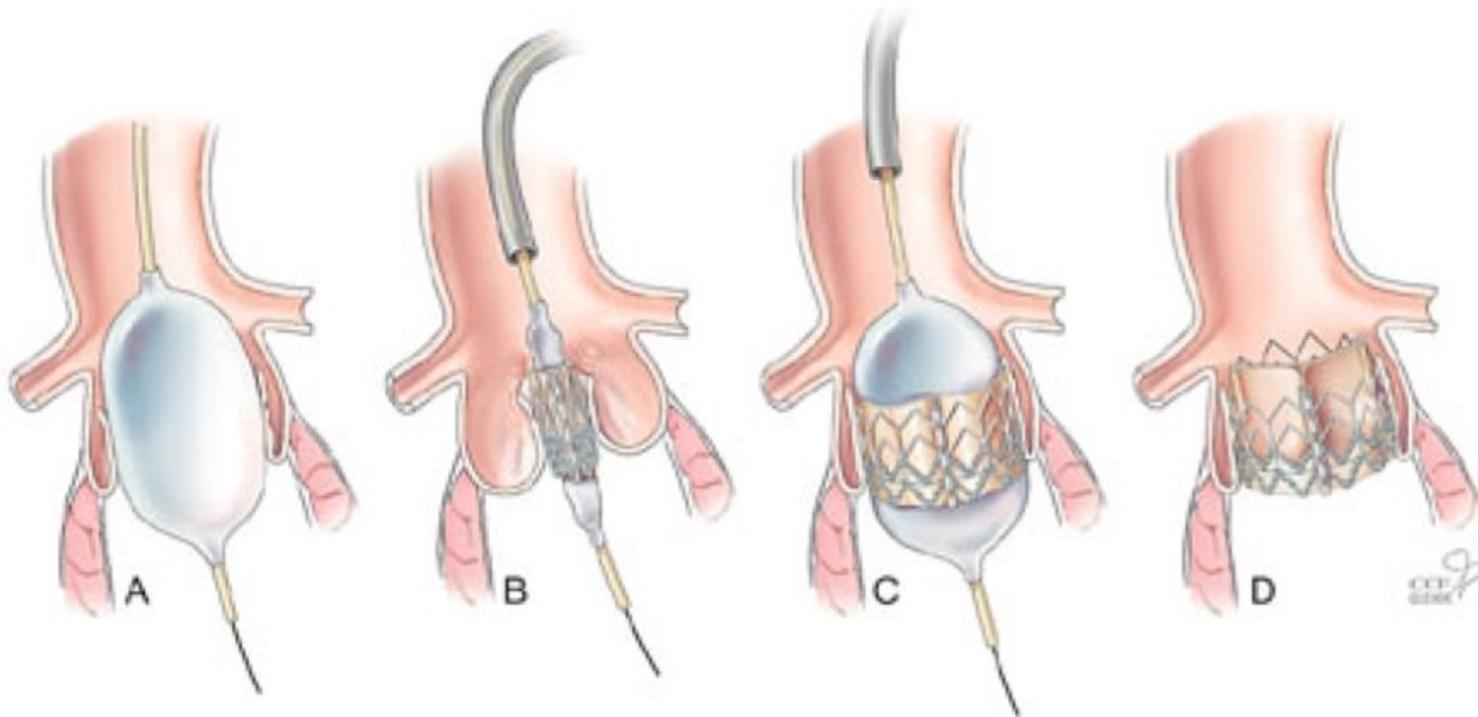
# Take home messages



- ✓ Doble antiagregación 3 a 6 meses
- ✓ Profilaxis de endocarditis 6 meses.
- ✓ RMN permitidas a partir de las 6 semanas.
- ✓ Ecografía de control. Buscar Trombosis y/o leak. Trombosis dar anticoagulación

## Índice

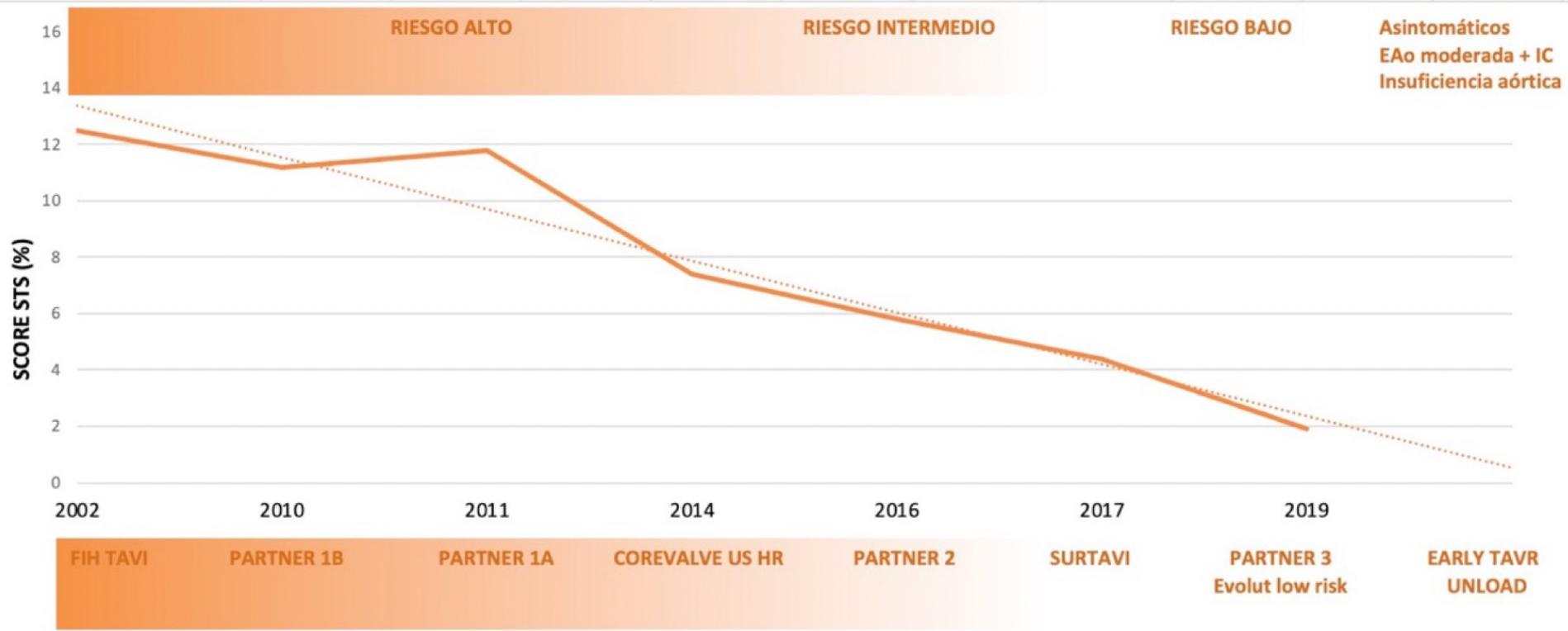
- Tratamiento C. Congénitas: Cierre FOP, CIA, Ductus y Orejuela Izquierda
- Tratamiento válvula aórtica: TAVI
- Tratamiento válvula mitral: TMVI, TMVR
- Tratamiento válvula tricúspide: TTVI, TTVR



# TAVI

Estudio	N	Edad, años	STS, %	Resultados a 1 año		
				Mortalidad global, %	Ictus, %	Reingreso, %
PARTNER 1B	358	83.1±8.6	11.2±5.8	30.7	10.6	22.3
CoreValve US ER	489	83.2±8.7	10.3±5.5	24.3	7.0	-
PARTNER 1A	699	83.6±6.8	11.8±3.3	24.2	8.3	18.2
CoreValve High Risk	747	83.1±7.1	7.3±3.0	14.2	8.8	-
PARTNER 2A	2,032	81.5±6.7	5.8±2.1	12.3	8.0	14.8
SURTAVI	1,660	79.9±6.2	4.4±1.5	6.7	5.4	8.5
NOTION	280	79.2±4.9	2.9±1.6	4.9	2.9	-
Evolut Low Risk	1,403	74.1±5.8	1.9±0.7	2.4	4.1	3.2
PARTNER 3	950	73.3±5.8	1.9±0.7	1.0	1.2	7.3

# TAVI



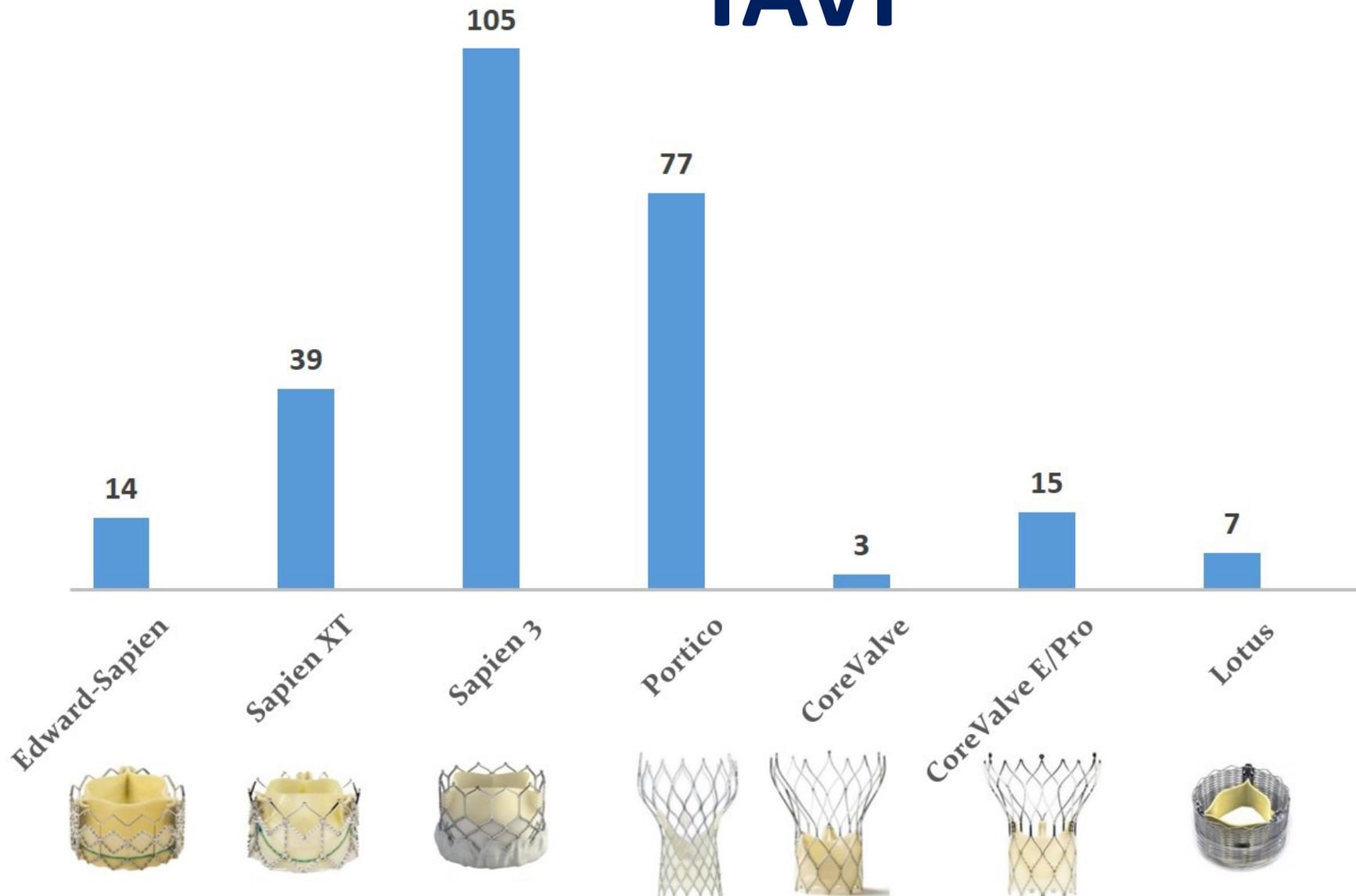
	Riesgo alto	Riesgo intermedio	Riesgo bajo
Guías ESC 2021	I-A	I-A (≥75 años)	I-A (≥75 años)
Guías ACC/AHA 2020	I-A	I-A	I-A (>80 años) I-A (65-80 años; TAVI o SVA)

Prótesis	Material Stent	Válvula	Tamaños, mm	Tamaño del introductor	Posición de los velos	Reposicionable	Comentario	Imagen
<b>Auto expandibles</b>								
CoreValve, Medtronic	Nitinol	Pericardio porcino	26, 29, 31	18 Fr	Supra-anular	SI	No disponible	
Evolut R, Medtronic	Nitinol	Pericardio porcino	23,26,29,34	Equivalente a 14 Fr (23, 26, 29 mm) Equivalente a 16 Fr (34 mm)	Supra-anular	SI		
Evolut Pro, Medtronic	Nitinol	Pericardio porcino	23, 26, 29	Equivalente a 16 Fr	Supra-anular	SI	Comparado con la Evolut R, se añade una falda de pericardio para reducir los leaks paravalvulares	
Evolut Pro +, Medtronic	Nitinol	Pericardio porcino	23, 26, 29, 34	Equivalente a 14 Fr (23, 26, 29 mm) Equivalente a 16 Fr (34 mm)	Supra-anular	SI	Es compatible con introductores más pequeños e incluye el tamaño de 34mm con falda de pericardio.	
Acurate-Neo, Boston Scientific	Nitinol	Pericardio porcino	23, 25, 27 (S,M, L)	18 Fr	Supra-anular	No		

Prótesis	Material Stent	Válvula	Tamaños, mm	Tamaño del introductor	Posición de los velos	Reposicionable	Comentario	Imagen
Acurate-Neo2, Boston Scientific	Nitinol	Pericardio porcino	23, 25, 27 (S,M, L)	iSleeve: Equivalente a 14 Fr expandible	Supra-anular	No	Comparado con la Acurate-Neo, añade una falda más alta para reducir el riesgo de leaks.	
Portico, Abbott	Nitinol	Pericardio bovino	23, 25, 27, 29	FlexNav: equivalente 14 Fr (23-25 mm) Equivalente 15 Fr (27 y 29 mm)	Intra-anular	SI		
Navitor, Abbott	Nitinol	Pericardio bovino	23, 25, 27, 29	FlexNav: equivalente 14 Fr (23-25 mm) Equivalente 15 Fr (27 y 29 mm)	Intra-anular	SI	En relación con Portico, añade una falda de tela para reducir el riesgo de leaks.	
Allegra, New Valve Technology	Nitinol	Pericardio bovino	23, 27, 31	18 Fr	Supra-anular	SI		
JenaValve, JenaValve technology	Nitinol	Pericardio porcino	23, 25, 27	19 Fr	Intra-anular	SI	Tiene un sistema que captura los velos nativos permitiendo tratar las IAo puras	
J-Valve, JC medical.	Nitinol	Pericardio bovino	22, 25, 28	18 Fr	Intra-anular	No	Forma de U con anclajes para los velos para tratar IAo puras.	
<b>Expandibles con balón</b>								
SAPIEN, Edwards	Acero inoxidable	Pericardio bovino	23, 26	22 FR (23 mm), 24Fr (26 mm)	Intra-anular	No	No disponible	

Prótesis	Material Stent	Válvula	Tamaños, mm	Tamaño del introductor	Posición de los velos	Reposicionable	Comentario	Imagen
SAPIEN XT, Edwards	Cromo-cobalto	Pericardio bovino	23, 26, 29	16 Fr (23 mm), 18 Fr (26 mm), 20 Fr (29 mm)	Intra-anular	No	No disponible	
SAPIEN 3, Edwards	Cromo-cobalto	Pericardio bovino	20, 23, 26, 29	14 Fr (20, 23, 26 mm), 16 Fr (29 mm) expandible	Intra-anular	No	Se añade una falda externa de polietileno (PET) en las celdas a nivel valvular para reducir el riesgo de leak.	
SAPIEN 3 Ultra, Edwards	Cromo-cobalto	Pericardio bovino	20, 23, 26, 29	14 Fr expandible	Intra-anular	No	Falda de polietileno (PET) texturizado más alta comparada con la S3.	
Myval, Meril	Niquel-cobalto	Pericardio bovino	20, 21.5, 23, 24.5, 26, 27.5, 29, 30.5, 32	Python: 14 Fr expandible	Intra-anular	No	Falda de polietileno para reducir el riesgo de leak	

# TAVI



# TAVI

	Global
Edad	80 (50-93)
Sexo (m)	110 (42,3%)
EuroSCORE	24±15
NYHA III-IV	191 (73%)
NTproBNP	5683
Diabetes	108 (41.6%)
Sin insulina	87 (33,5%)
Con insulina	21 (8,1%)
Hipertensión	200 (76.9%)
IMC	27,5 ±5.5
ACV	37 (14.2%)
Arteriopatía periférica	70 (26.9%)
EPOC	32 (12.3%)
Enf renal > grave	47 (18,1%)

	Global
Isquémicos	128 (49,2%)
IAM	40 (15.4%)
ICP	58 (22.3%)
CABG	13 (5%)
Híbrido	12 (4,6%)
Prótesis valvulares	
Mitrales	8 (3.1%)
Aórticas (ViV)	5 (1,9%)

# TAVI

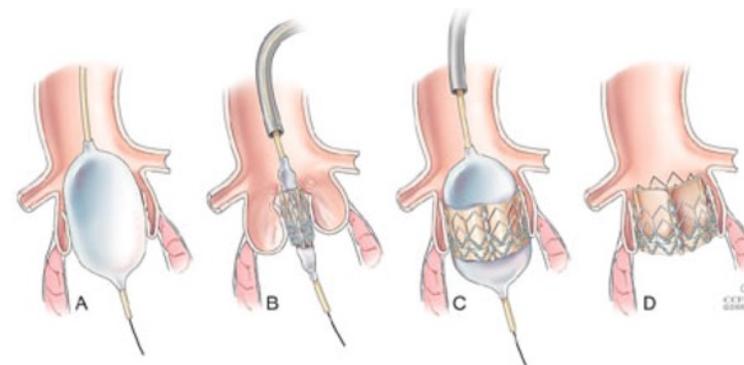
	Global
Gradiente medio	45 ± 13.7
Bajo gradiente	30 (11,5%)
Insuficiencia Ao IV	16 (6.2%)
FEVI	55 ± 15
FEVI < 30%	29 (11,2%)
PSAP > 50	67 (25,7%)
Insuficiencia mitral (≥ moderada)	73 (28,1%)
Etiología no senil	
Bicúspide	19 (7,3%)
Prótesis aórtica (ViV)	5 (2.3%)
Reumática	8 (3%)

	Global
Trastornos del ritmo	
FA / flutter	55 (29.7%)
Bloqueo AV	4 (2.3%)
TCIV	69 (40.1%)
BRD	10 (5.8%)
BRI	13 (7.6%)
Ritmo de marcapasos	16 (9.3%)

# TAVI

Global	
Lugar de realización	
Hemodinámica	259 (99.6%)
Quirófano	1 (0.4%)
Duración media (min)	78.42 ± 27
Tipo de anestesia	
Anestesia general	89 (34,2%)
Sedación	171 (65,8%)
NYHA IV (ingresados)	37 (14,2%)
Acceso vascular	
Femoral	252 (97%)
Axilar	2 (0,8%)
Subclavio	4 (1.5%)
Otras (IC/Carótida)	2 (0.8%)
Tiempo de escopia	27,4 ± 11,7
Contraste	107.6 ± 55.5
Soporte ETE	84 (32,3%)

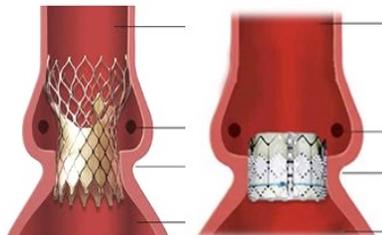
Global	
Éxito	257 (98.8%)
Predilatación	120 (46,1%)
Posdilatación	48 (18.4%)
Cierre vascular	
Quirúrgico	20 (7.7%)
Prostar	85 (32,7%)
Perclose	154 (59,2%)
Conversión a Cx	1 (0.4%)
Días de ingreso	6,4 ± 6



Medicación previa	Global
Profilaxis antibiótica	257 (98.8%)
Antiagregación	115 (44,2%)
AAS	57 (21.9%)
Clopidogrel	17 (6,5%)
Doble	41(15.7%)

COMPLICACIONES HOSPITALARIAS	Total
	260
Mortalidad	7 (2,7%)
Fracaso implante	3 (1.2%)
Conversión a cirugía	1 (0.4%)
ACV no invalidante	5 (1.9%)
ACV invalidante	1 (0.4%)
Leak	94 (36,1%)
Leak grado >2	2 (0.8%)
Rotura anular grave	2 (0.8%)
Rotura anular leve	3 (1.2%)
Marcapasos MP previo (26)	54 (21%)
Obstrucción coronaria	2 (0,8%)
ICP coronaria	1 (0.4%)
Taponamiento (quirúrgico)	5 (1.9%) 3 (1.2%)

COMPLICACIONES HOSPITALARIAS	Total
	260
Trasfusiones	49 (18.8%)
Procedimiento	8 (3,07%)
Ingreso	41 (15,7%)
Infecciones Relacionadas	12 (4,6%) 7 (2,7%)
Perforación vascular o fallo del cierre (6 + 2)	11 (4,2%)



Supervivencia hospitalaria: 97.3%  
2 años: 80.2%

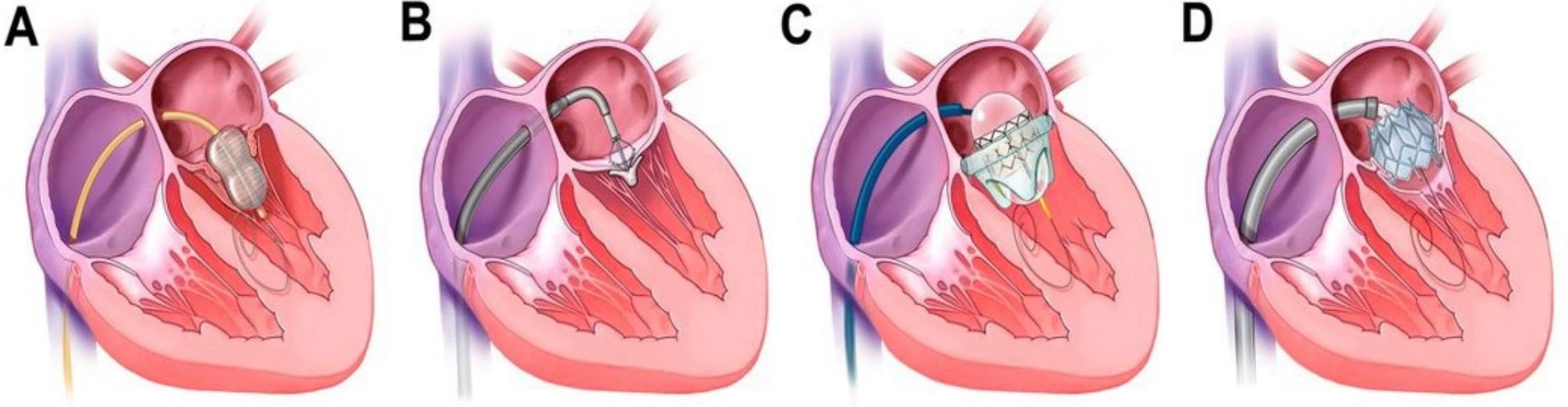
1 mes: 95.7%

1 año: 88.2%

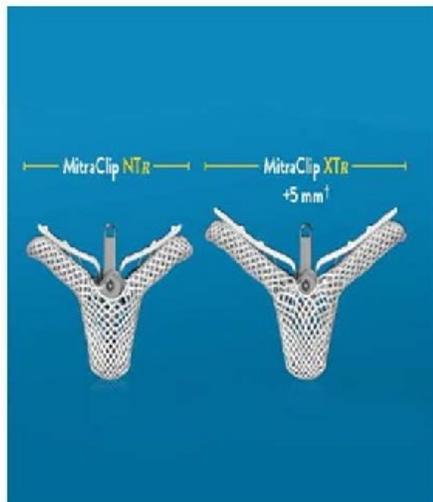
5 años: 72.5%

## Índice

- Tratamiento C. Congénitas: Cierre FOP, CIA, Ductus y Orejuela Izquierda
- Tratamiento válvula aórtica: TAVI
- Tratamiento válvula mitral: TMVI, TMVR
- Tratamiento válvula tricúspide: TTVI, TTVR



**Edge-to-edge repair**

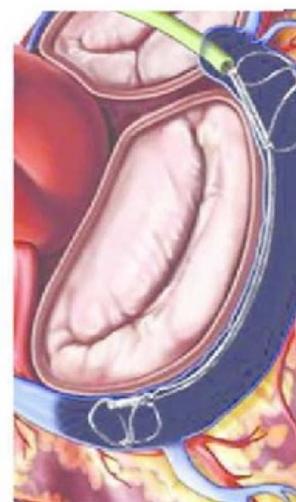


Newer generation MitraClip

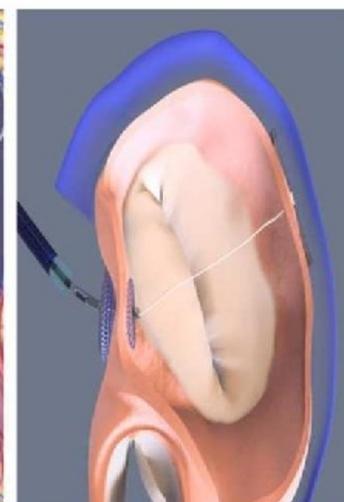


Pascal

**Indirect annuloplasty**



Carillon

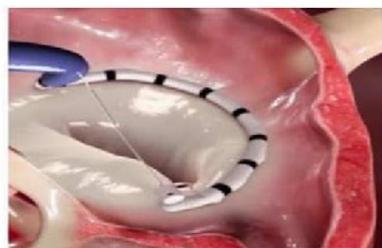


MVRx ARTO



Mitral Loop Cerclage

**Direct annuloplasty**



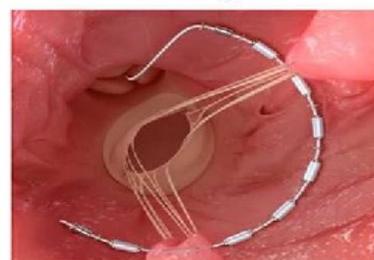
Cardioband



Mitralign



Millipede



Accucinch

**Chordal replacement**

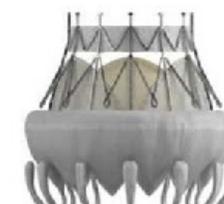


NeoChord

**Transcatheter replacement**



Sapien 3



Intrepid



CardiaQ



Tiara

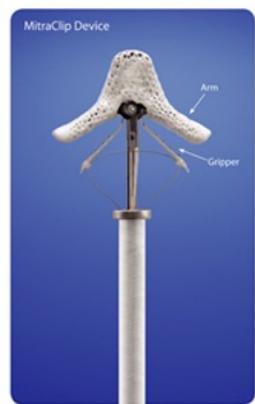
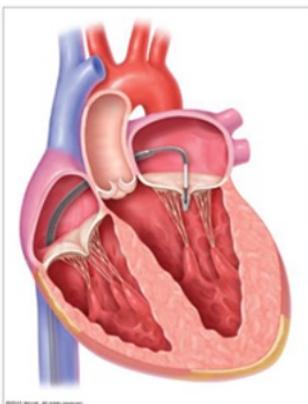


Caisson

# REPARACIÓN “EDGE-TO-EDGE”

## MitraCLIP

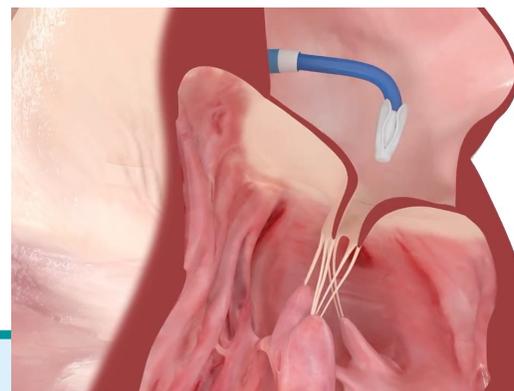
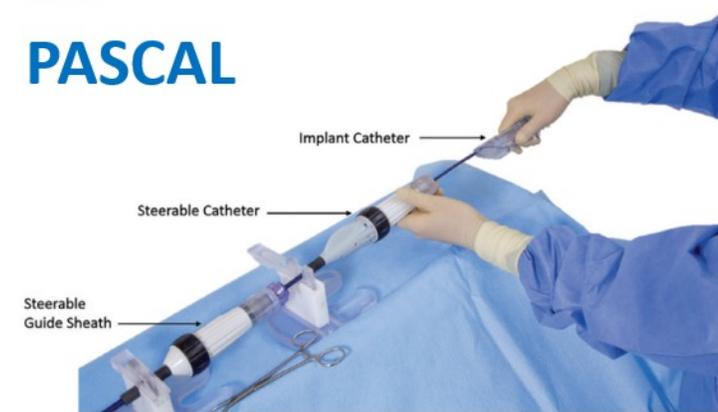
- ✓ Dispositivo con mayor experiencia clínica.
- ✓ Más de 80000 pacientes tratados
- ✓ Importancia en la selección de Pacientes
- ✓ Estudios MITRAFR y COAPT



Compassionate use of the PASCAL transcatheter mitral valve repair system for patients with severe mitral regurgitation: a multicentre, prospective, observational, first-in-man study

Fabien Praz\*, Konstantinos Spargias\*, Michael Chrissaheris, Lutz Büllfeld, Georg Nickenig, Florian Deuschl, Robert Schaefer, Neil P Fam, Robert Moss, Moody Makar, Robert Boone, Jeremy Edwards, Aris Moschovitis, Saibal Kar, John Webb, Ulrich Schäfer, Ted Feldman, Stephan Windecker

## PASCAL





## 2021 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the Task Force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Surgery is recommended in symptomatic patients who are operable and not high risk. <sup>293–296</sup>	<b>I</b>	<b>B</b>
TEER may be considered in symptomatic patients who fulfil the echocardiographic criteria of eligibility, are judged inoperable or at high surgical risk by the Heart Team and for whom the procedure is not considered futile. <sup>299–302</sup>	<b>IIb</b>	<b>B</b>

### Patients with concomitant coronary artery or other cardiac disease requiring treatment

Valve surgery is recommended in patients undergoing CABG or other cardiac surgery. <sup>329,330,333</sup>	<b>I</b>	<b>B</b>
In symptomatic patients, who are judged not appropriate for surgery by the Heart Team on the basis of their individual characteristics, <sup>d</sup> PCI (and/or TAVI) possibly followed by TEER (in case of persisting severe SMR) should be considered.	<b>IIa</b>	<b>C</b>

### Patients without concomitant coronary artery or other cardiac disease requiring treatment

TEER should be considered in selected symptomatic patients, not eligible for surgery and fulfilling criteria suggesting an increased chance of responding to the treatment. <sup>337,338,356,357 e</sup>	<b>IIa</b>	<b>B</b>
Valve surgery may be considered in symptomatic patients judged appropriate for surgery by the Heart Team.	<b>IIb</b>	<b>C</b>
In high-risk symptomatic patients not eligible for surgery and not fulfilling the criteria suggesting an increased chance of responding to TEER, the Heart Team may consider in selected cases a TEER procedure or other transcatheter valve therapy if applicable, after careful evaluation for ventricular assist device or heart transplant. <sup>e</sup>	<b>IIb</b>	<b>C</b>

# Reparación “Edge to edge”

FEVI < 20%  
DTdVI > 70 mm  
ORE > 0.3 cm<sup>2</sup> o VR > 45 ml

FEVI > 20%  
DTdVI < 70 mm  
PSAP < 70 mmHg  
ORE > 0.3 cm<sup>2</sup> o VR > 45 ml

TEER incierto

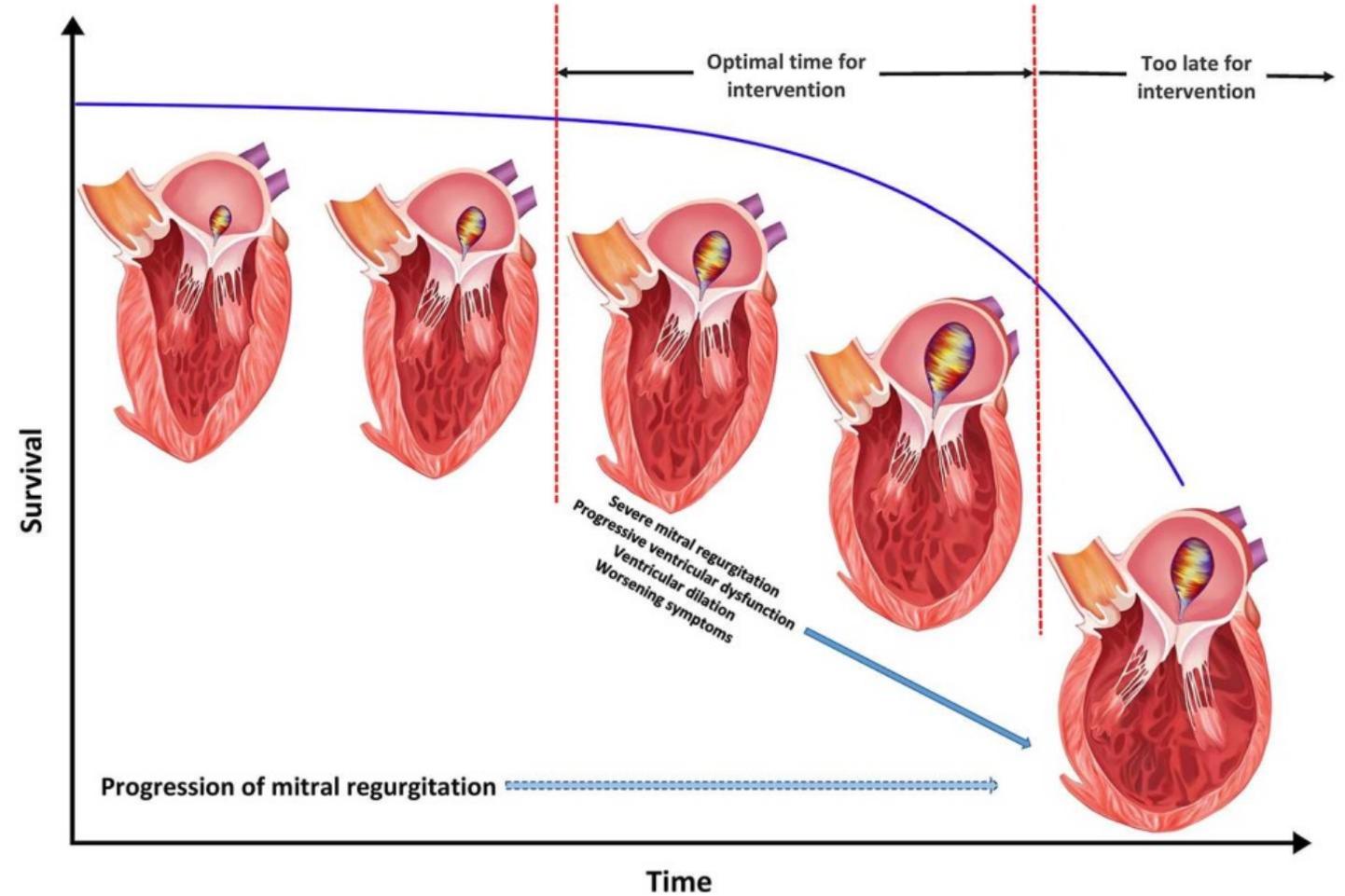
TEER ideal

TEER Futil

TEER caso a caso

FEVI < 20%  
DTdVI > 70 mm  
ORE < 0.3 cm<sup>2</sup> o VR < 45 ml

FEVI > 20%  
DTdVI < 70 mm  
ORE 0.2-0.3 cm<sup>2</sup> o VR 30-45 ml



\* adaptado de Pibarot P et al. Eur Heart J Cardiovasc Imaging. 2019;20:620-624.

# Reparación “Edge to edge”

Clasificación e la anatomía apta para el tratamiento con las terapias borde-a-borde

	Anatomía favorable	Anatomía menos favorable o desfavorable
Localización de la patología	Patología no comisural (medial, central o lateral)	Patología comisural, perforaciones o clefts.
Calcificación	Ausente o mínima	Calcificación importante del anillo o de la zona de grasping
Gradiente medio transmitral	Gradiente transmitral <4mmHg	Estenosis mitral (reumática o calcificada; gradiente medio >5mm Hg)
Área valvular mitral	AVM $\geq 4$ cm <sup>2</sup>	AVM <4 cm <sup>2</sup>
Longitud de velo mitral	>10 mm	<7 mm
Insuficiencia mitral primaria	<ul style="list-style-type: none"> <li>Amplitud del flail &lt;15mm, altura del flail &lt;10mm, patología en 1 sólo segmento</li> <li>Velos de grosor normal</li> </ul>	<ul style="list-style-type: none"> <li>Amplitud del flail &gt;15mm, altura del flail &gt;10mm</li> <li>Patología en multisegmento; flail de elevada movilidad con rotura de cuerdas</li> <li>Engrosamiento importante y difuso (5mm en diástole) y velos redundantes (E. Barlow); DTSVI &gt;55mm</li> </ul>
Insuficiencia mitral secundaria	Profundidad de coaptación <11mm; longitud de coaptación $\geq 2$ mm	DTSVI > 70mm

# Reparación “Edge to edge”

53 p	Global
Edad	65,9 ± 9,1
Sexo (v)	44 (83%)
ASC	1,8 ± 0,2
NYHA III-IV	46 (87%)
NTproBNP	7857
Ingreso ICC	34 (64,25)
Diabetes	17 (32,1%)
Hipertensión	34 (64,2%)
Enf renal ≥ grave	31 (58,5,1%)
FA	29 (54,7%)
<hr/>	
Isquémicos	31 (58,5%)
ICP	17 (32,1%)
CABG	16 (30,2%)
Dispositivos	
DAI	32 (60,4%)
TRC	19 (35,8%)

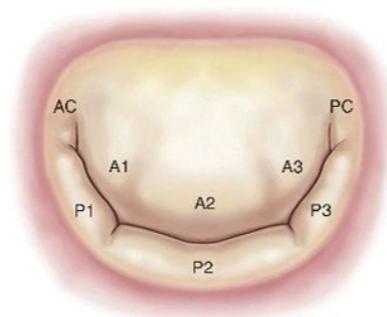
53 p	Global
FEVI	34 ±13
VTDVI	201± 99
PSAP	49,4 ± 15
Grado IM pre	
Moderada	2 (3,7%)
Mod-severa	8 (15%)
Severa	43 (81,1%)

Mecanismo de IM	
Funcional (dilatación anillo)	25 (47,1%)
Isquémica	13 (24,5%)
Dilatación + isquémica	9 (17%)
Degenerativa (Prolapso)	5 (9,4%)
Dehiscencia de una anuloplastia	1 (1,8%)

# Reparación “Edge to edge”

## Procedimiento y resultados

Procedimiento	Global (N 53)
<b>Clip nº</b>	
1 clip	27 (51%)
2 clips	23 (43,4%)
3 clips	3 (5,6%)
<b>Lugar clips</b>	
A2-P2	37 (70%)
A2-P2 y A3-P3	8 (15%)
A2-P2 y A1-P1	8 (15%)



Resultados	Global (N 53)
<b>Grado IM post (ETE)</b>	
Nada	3 (5%)
Leve	32 (60%)
Moderada	14 (26%)
Mod-severa	3 (5,6%)
Severa	1 (1,8%)
Éxito (bajar 2 grados)	49 (92%)

## Complicaciones y seguimiento

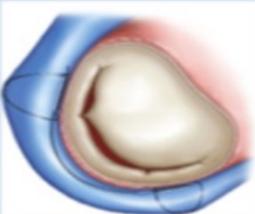
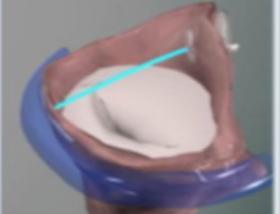
53 P	Global (N 53)
<b>Complicaciones</b>	
Rotura de velo	1 (1,8%)
Desenganche	1 (1,8%)
Fallo de grasping	1 (1,8%)
Mortalidad Hospitalaria	0 (0%)
Conversión Q (urgente)	1 (1,8%)

Seguimiento	Global (N 53)
<b>Grado NYHA</b>	
I	2 (3,8%)
II	40 (75%)
III	11 (21%)
Ingreso por ICC	10 (18,4%)
Cirugía valv. mitral	1 (1,8%)
Tx cardíaco	3 (5,7%)
Muerte	7 (13,2%)

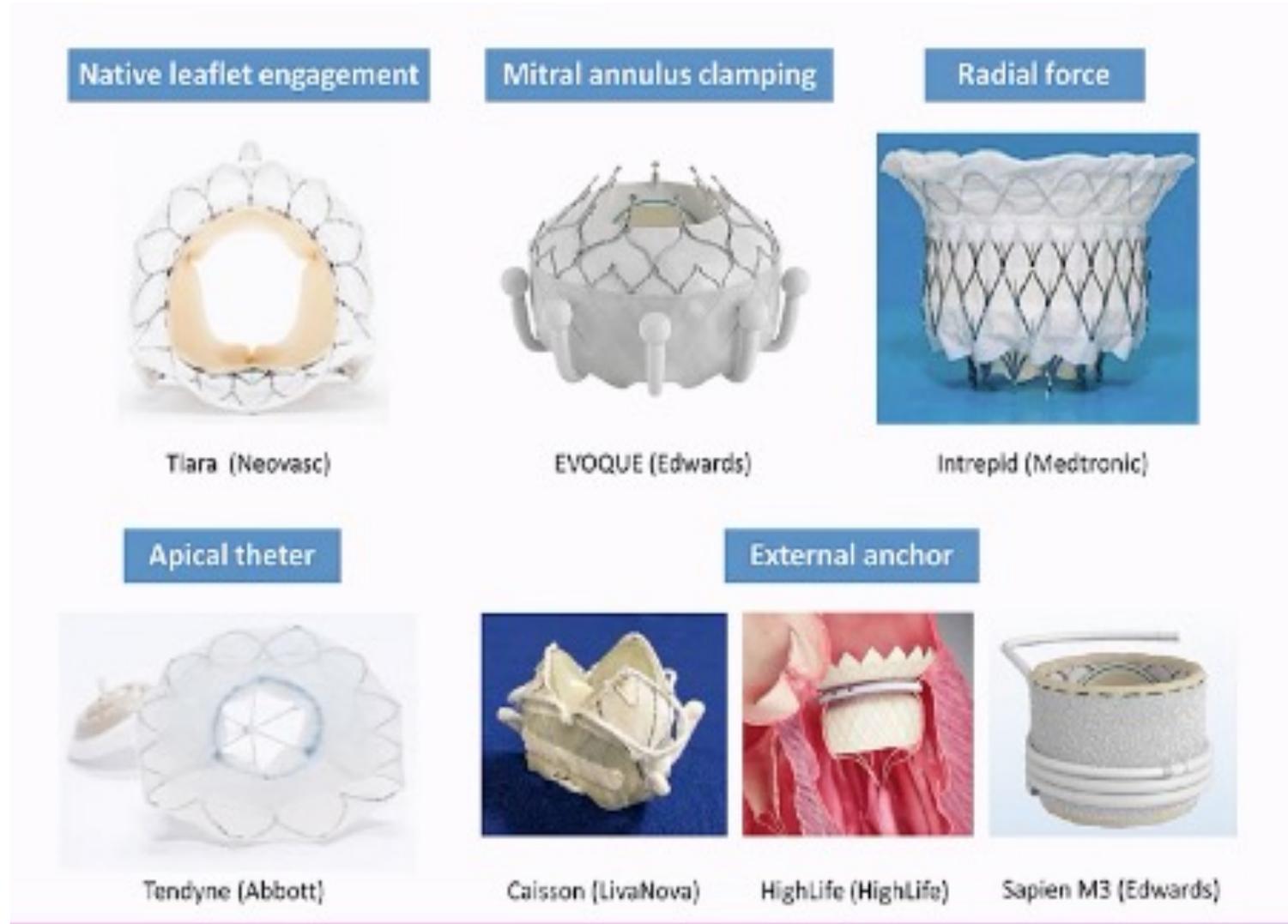
# Reparación “Edge to edge”



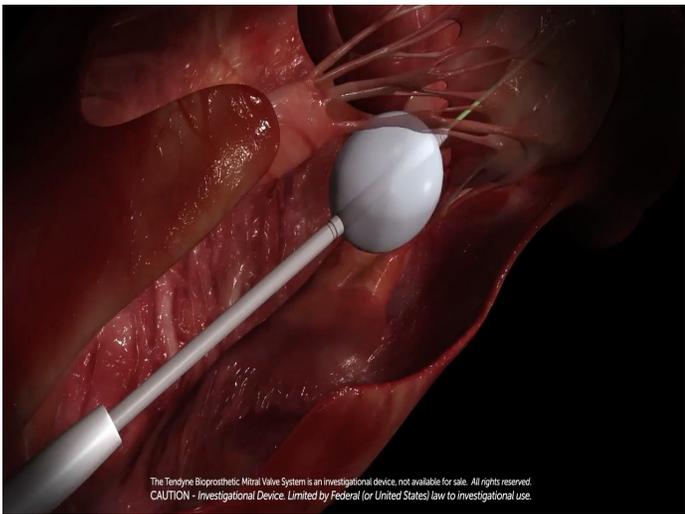
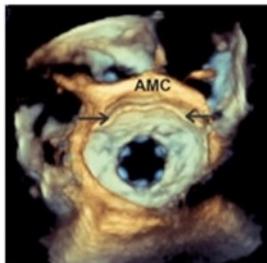
# Anuloplastia Mitral

	Indirect anuloplasty	Direct anuloplasty					
Company	Cardiac dimensions, Kirkland, WA	Edwards Lifesciences, Irvine, CA	Mitralign Inc., Tewksbury, MA	Millipede Inc, Santa Rosa, CA	Guided Delivery Systems, Santa Clara, CA	Valcare Medical, Israel	MVRx, Inc., Belmont, CA
Valve Name	<b>Carillon Mitral Countour System</b>	<b>Cardioband</b>	<b>Mitralign</b>	<b>Millipede</b>	<b>Accucinch</b>	<b>AMEND</b>	<b>ARTO</b>
Device Image							
Description	Indirect coronary sinus anuloplasty	Adjustable cinching device	Leaflet plication using pledgets	Complete semi rigid ring	endovascular technique to reduce the sub-mitral LV dimensions	Complete D-shaped semi rigid ring	Direct A-P Diameter Shortening
Access	Transjugular	TF/transseptal	TF/transaortic	TF/transseptal	TF/transaortic	TA	Endovascular venous delivery

# Prótesis percutáneas mitrales



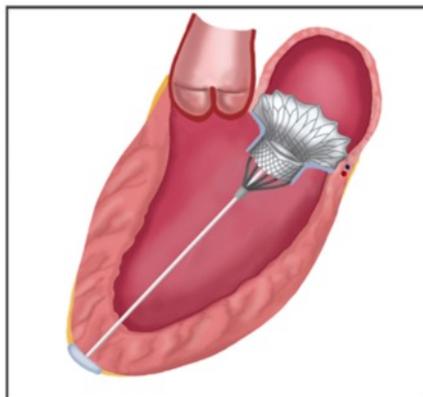
# Tendyne Mitral Valve



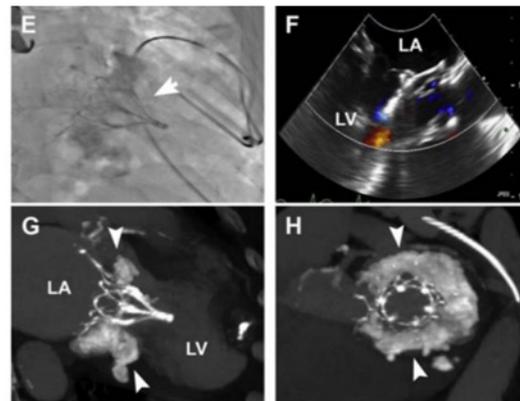
## Tendyne

Valve shape	D-shaped (outer stent) Circular (inner frame)
Frame	Nitinol, double frame; Self-expandable
Anchoring mechanism	Apical tether
Leaflets	Trileaflet Porcine pericardium
Valve position	Intra-annular
Access	Transapical
Delivery system size	36-F
Recapture	Fully recapturable system after complete deployment
Valve size(s)	Outer frame ranges from 30–43 mm in the SL dimension and 34–50 mm in the IC dimension
Additional features	Single inner valve size; Multiple outer frame sizes

## First 100 Patients Treated



- No intra-procedural deaths
- Technical success in 96%
- 30-day death, 6%; 1-year mortality, 26%
- Among survivors at 1 year, 88.5% with mild or no symptoms



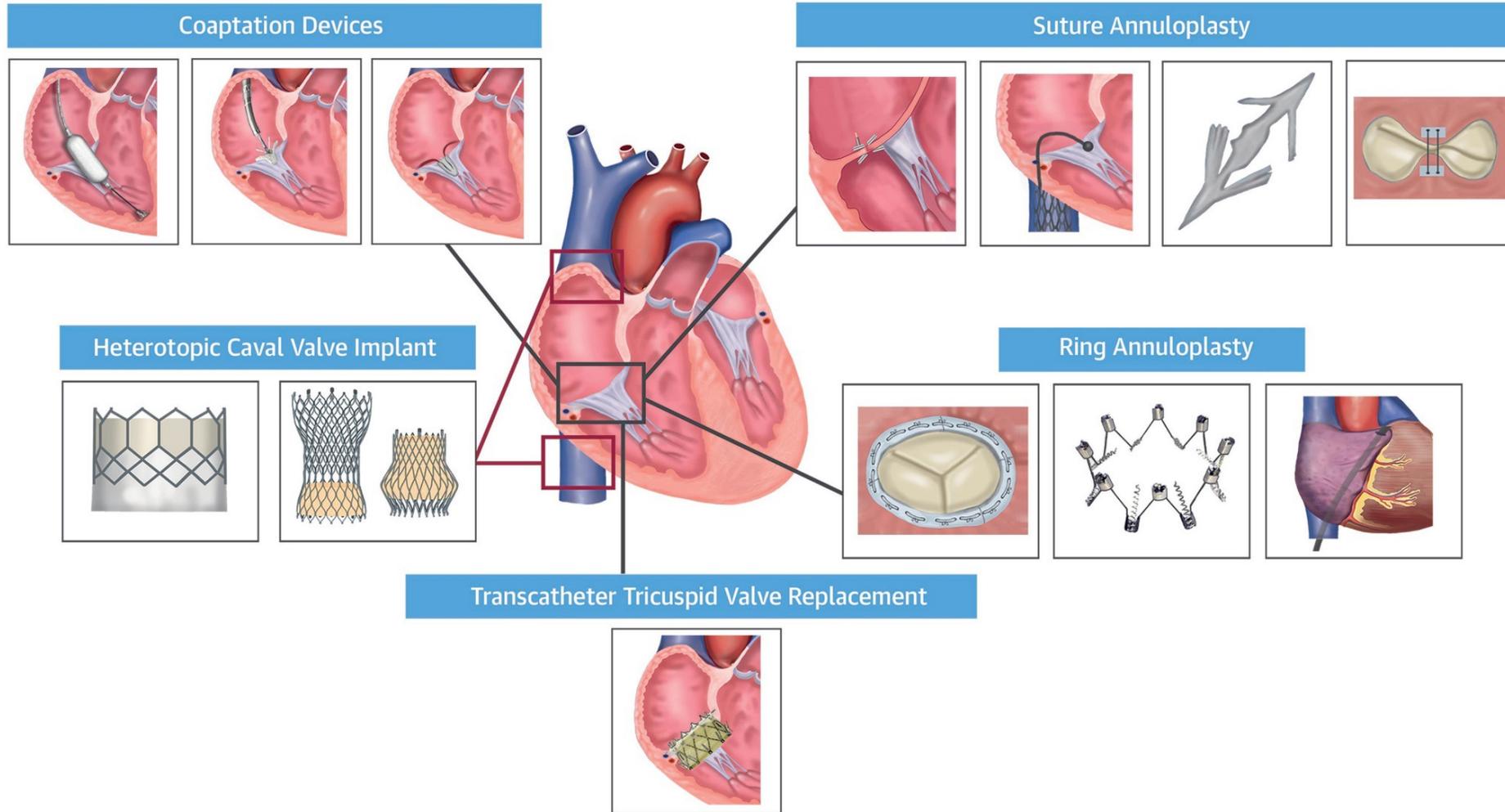
## Valve-in-MAC: n=9

- High technical success (89%), 0% procedural death
- Mean MV gradient 3.4±1.8mmHg
- No adverse events at 30 days

## Índice

- Tratamiento C. Congénitas: Cierre FOP, CIA, Ductus y Orejuela Izquierda
- Tratamiento válvula aórtica: TAVI
- Tratamiento válvula mitral: TMVI, TMVR
- Tratamiento válvula tricúspide: TTVI, TTVR

# Tratamiento válvula tricúspide

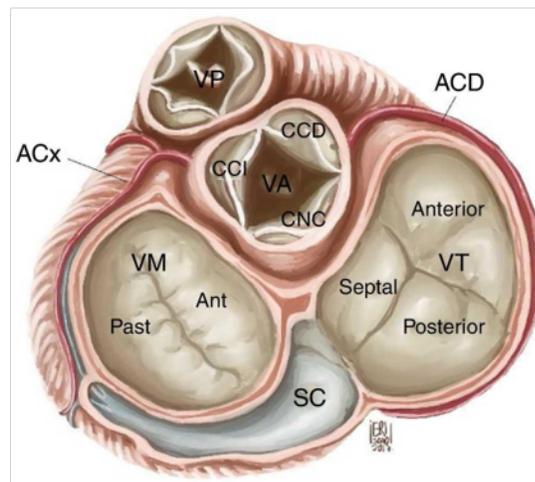


# Tratamiento percutáneo de la tricúspide

10 p	2018-
Edad	70,6 (57-77)
Sexo (v)	2 (20%)
Peso	69 ± 20
NYHA III-IV	10 (100%)
<b>Etiología</b>	
Funcional	7 (70%)
Aislada (FA)	1
Anuloplastia previa	3 (30%)

10 p	2018-
<b>Tipo Trat</b>	
Clip	7 (70%)
Bioprótesis	3 (30%)
PSP	50 ± 19
<b>Grado IT</b>	
Severa	2 (20%)
Masiva	5 (50%)
Torrencial	3 (30%)

7 p	2018-
<b>Clip nº</b>	
1 clip	4 (57%)
2 clips	3 (43%)
<b>Lugar clips</b>	
Septal-Anterior	5 (71%)
Septal-Anterior y Septal-Posterior	2 (29%)



10 p	Global
Conversión a Q	0 (0%)
Embolización	0 (0%)
Mortalidad hosp	0 (0%)
Estancia hosp	11,9 ± 6,8
<b>Complicaciones</b>	
Stroke	0 (0%)
IAM	0 (0%)
Sangrado (BARC ≥ 3)	3 (30%)

# El Puerta de Hierro, pionero en España en sustituir la válvula tricúspide

En todo el mundo se han realizado poco más de 20 intervenciones de este tipo



redacción méd

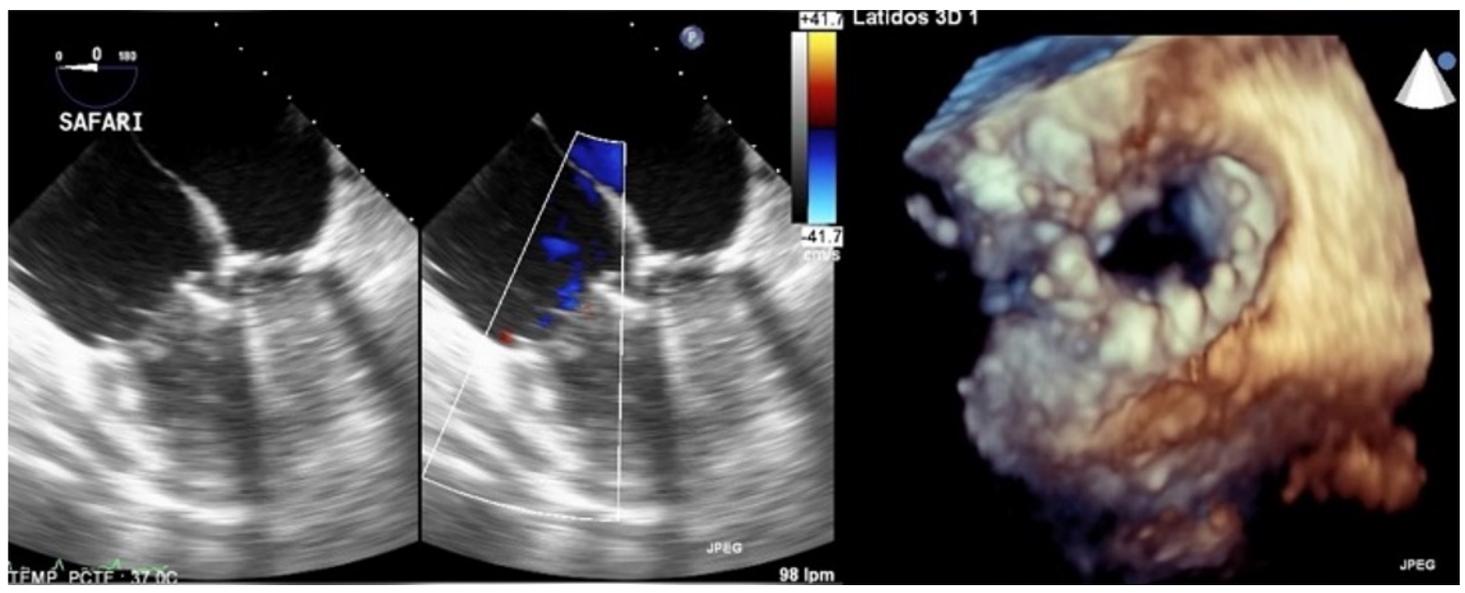
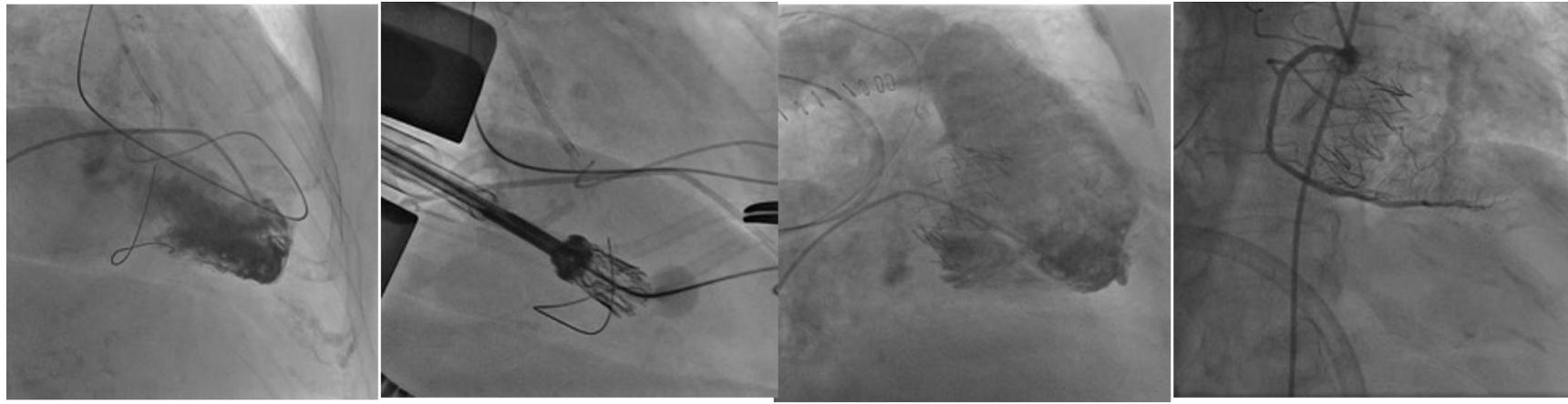
Portada > Autonomías > Madrid

**El Puerta de Hierro repara la válvula tricúspide con un método no invasivo**

Esta técnica pionera, desarrollada por cardiólogos del centro, se basa en la implantación de un MitraClip

Exteriores del Hospital Universitario Puerta de Hierro.





*Gracias*