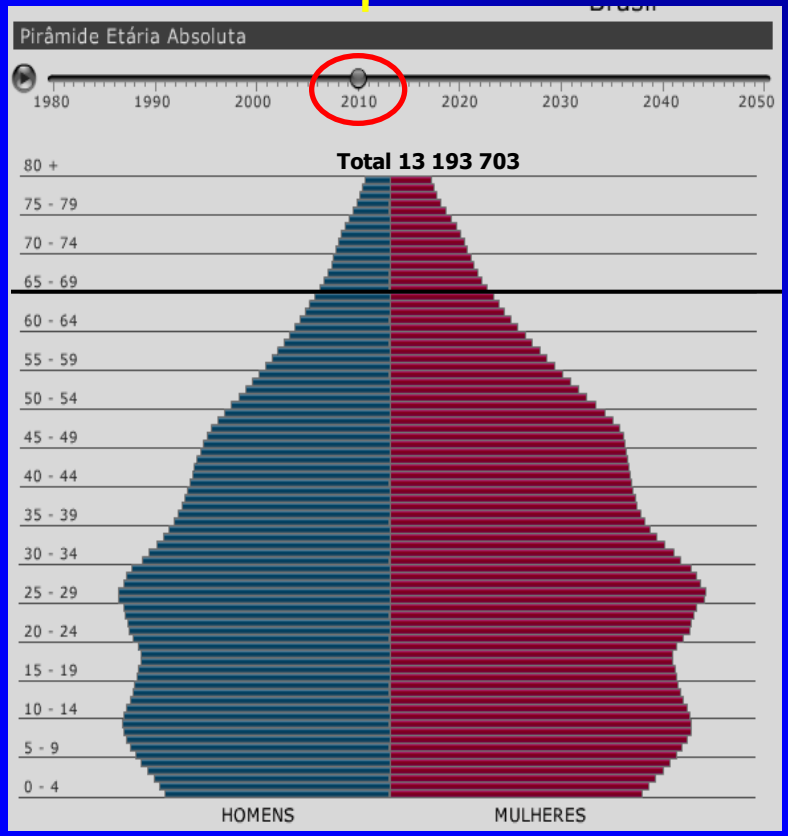
Selección de Pacientes para TAVI

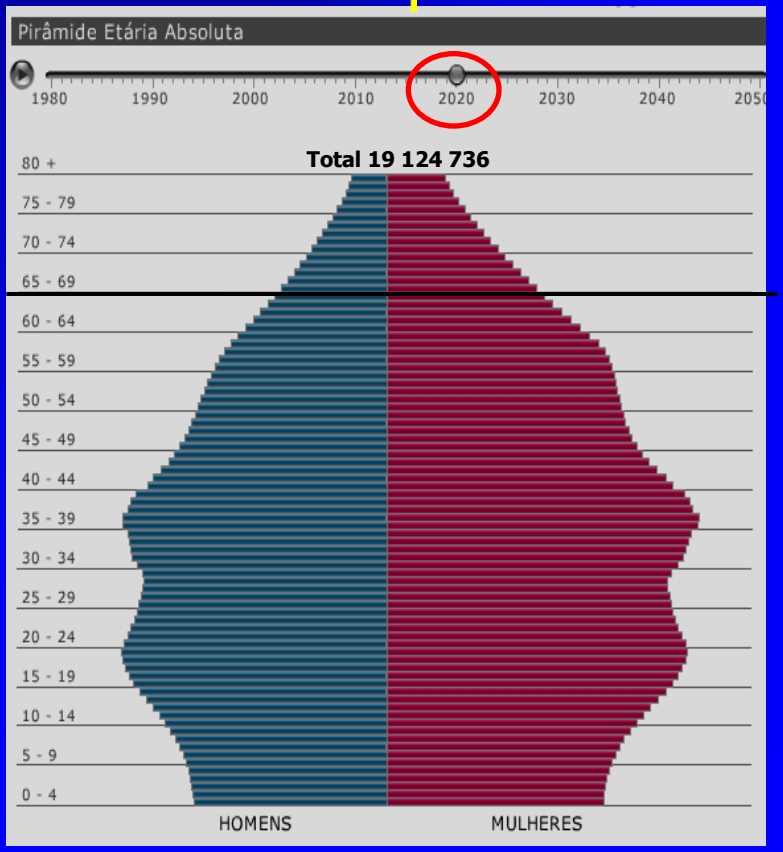
Lima – Perú

Población Anciana > 65 años

Demografía -Brasil

+ 44%





Dados IBGE/2008 – www.ibge.gov.br

Implante Transcateter Valvar Aórtico

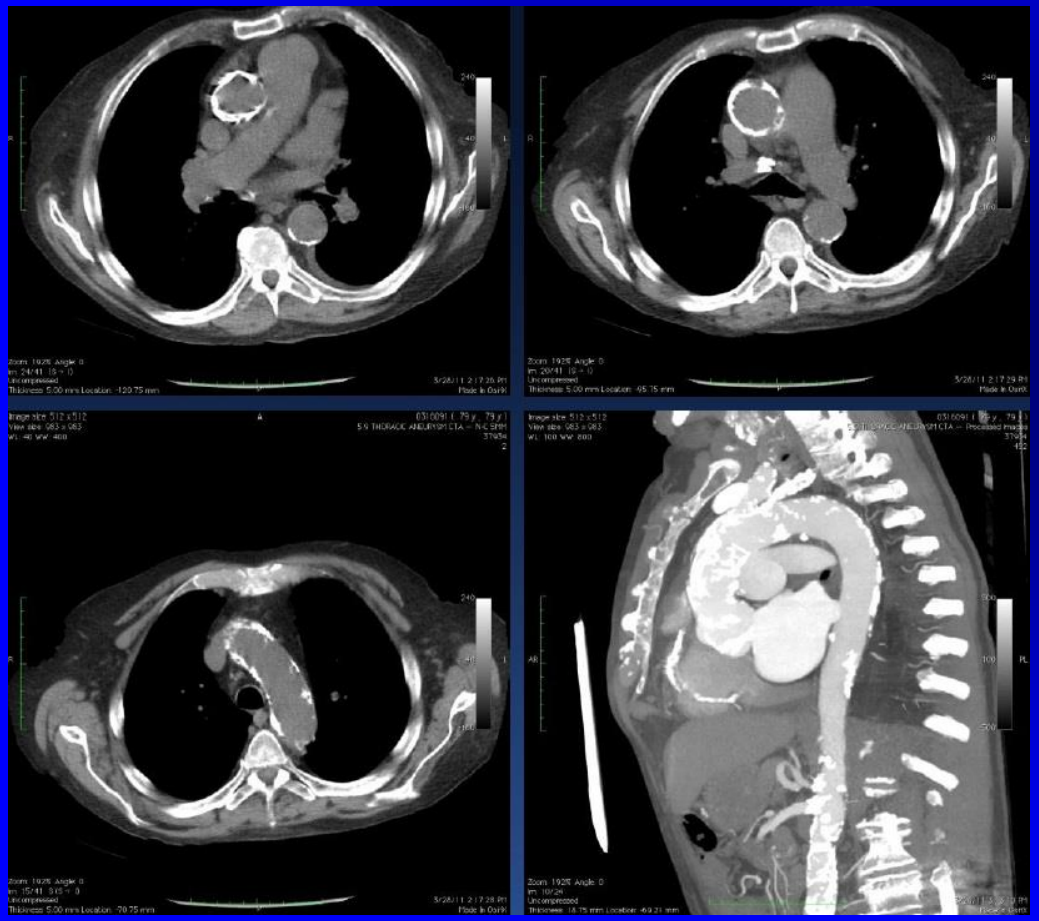
Indicaciones

- **EAo nativa calcificada grave - AVA < 1 cm^2 o ≤ 0,6 cm^2/m^2, Gradiente Medio > 40 mmHg, Velocidad del Jato > 4m/s**
- **Clase Funcional (NYHA) - ≥ II**
- **Euroscore Logístico - ≥ 15% o STS Score - ≥ 10%**
- **Otros datos clínicos que se deben considerar:**

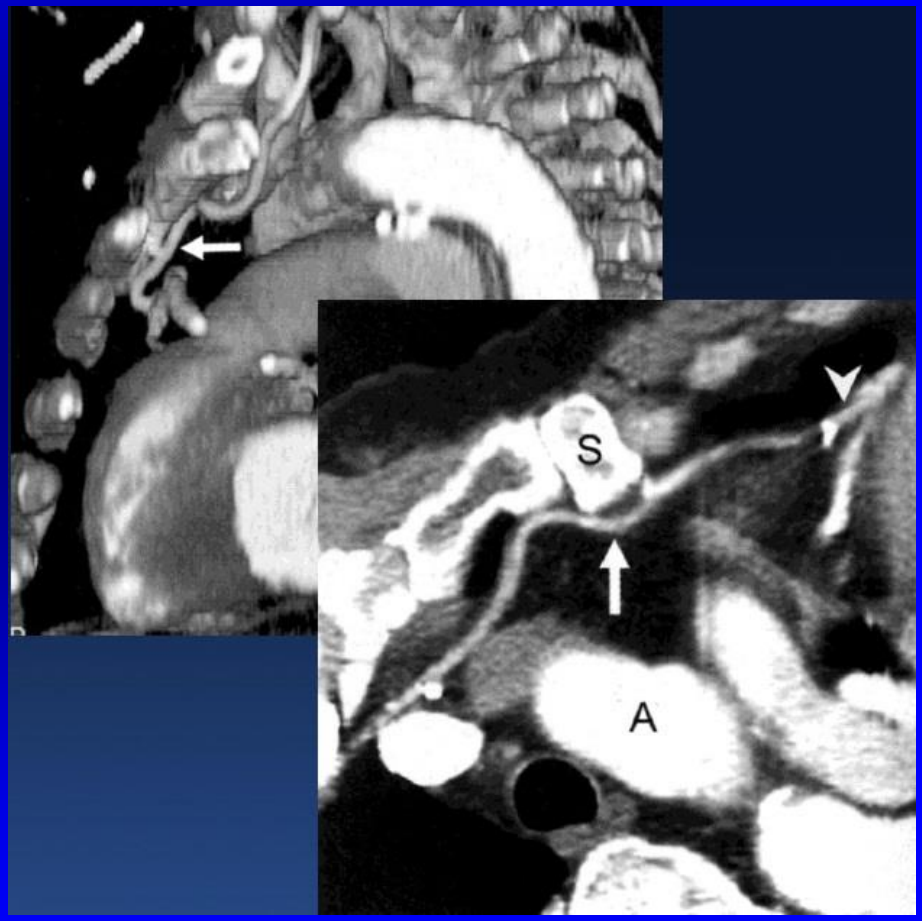
enfermedad hepática grave, aorta en porcelana, anastomosis LIMA-DA adyacente al esternón, HP > 60 mmHg, insuficiencia VD, enfermedad grave del tejido conectivo, caquexia, tórax hostil (radiación, quemaduras), embolia pulmonar de repetición

Cirugía de Reemplazo Valvar

Condiciones Desfavorables



Aorta en Porcelana



LIMA adyacente al esternón

Estenosis Aórtica

Aspectos Evolutivos

Sobrevida Después del Inicio de los Síntomas

50% - 2 años

20% - 5 años

Lester SJ. The Natural History and Rate of Progression of Aortic Stenosis. Chest 1998

AHA/ACC Guidelines

Momento de la Intervención – TAVI o Cirugía

Recommendations	COR	LOE
AVR is recommended for symptomatic patients with severe high-gradient AS who have symptoms by history or on exercise testing (stage D1)	I	B
AVR is recommended for asymptomatic patients with severe AS (stage C2) and LVEF <50%	I	B
AVR is indicated for patients with severe AS (stage C or D) when undergoing other cardiac surgery	I	B
AVR is reasonable for asymptomatic patients with very severe AS (stage C1, aortic velocity ≥5.0 m/s) and low surgical risk	IIa	B
AVR is reasonable in asymptomatic patients (stage C1) with severe AS and decreased exercise tolerance or an exercise fall in BP	IIa	B

Nishimura R.A. J Am Coll Cardiol 2014;63;2438-2488

Selección de Pacientes
Evaluación de la Fragilidad

Components of Frailty Score

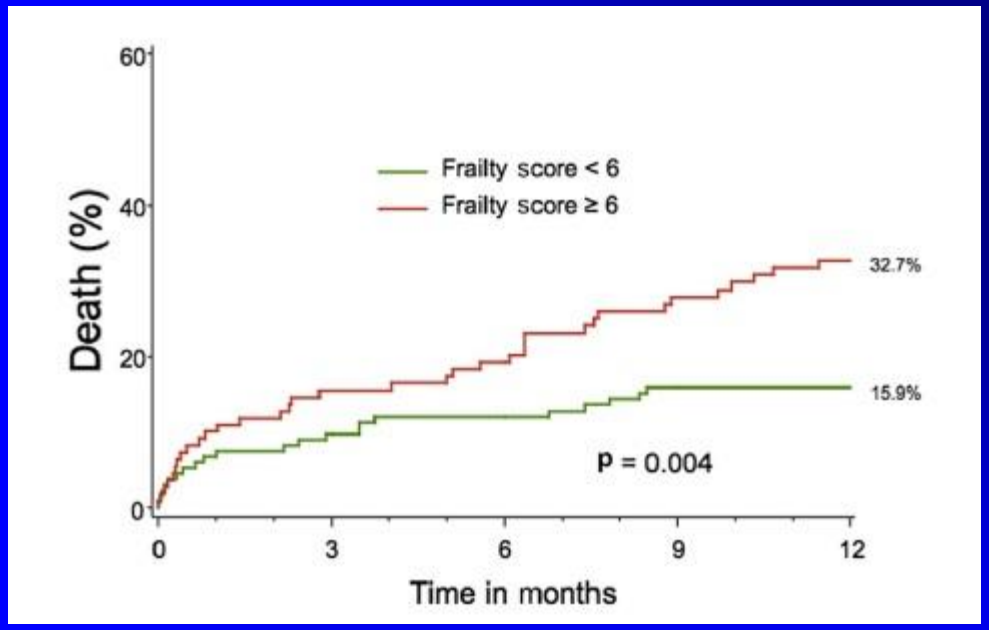
Frailty Domain	Measure	Frailty Score
Slowness	15-ft walk gait speed (m/s)	Quartiles (0–3)
Weakness	Grip strength (kg)	Sex-based quartiles (0–3)
Wasting and malnutrition	Serum albumin (g/dl)	Quartiles (0–3)
Inactivity	Katz activities of daily living	Any dependence = 3, Independent = 0

Green P. J Am Coll Cardiol Intv 2012;5:974-981

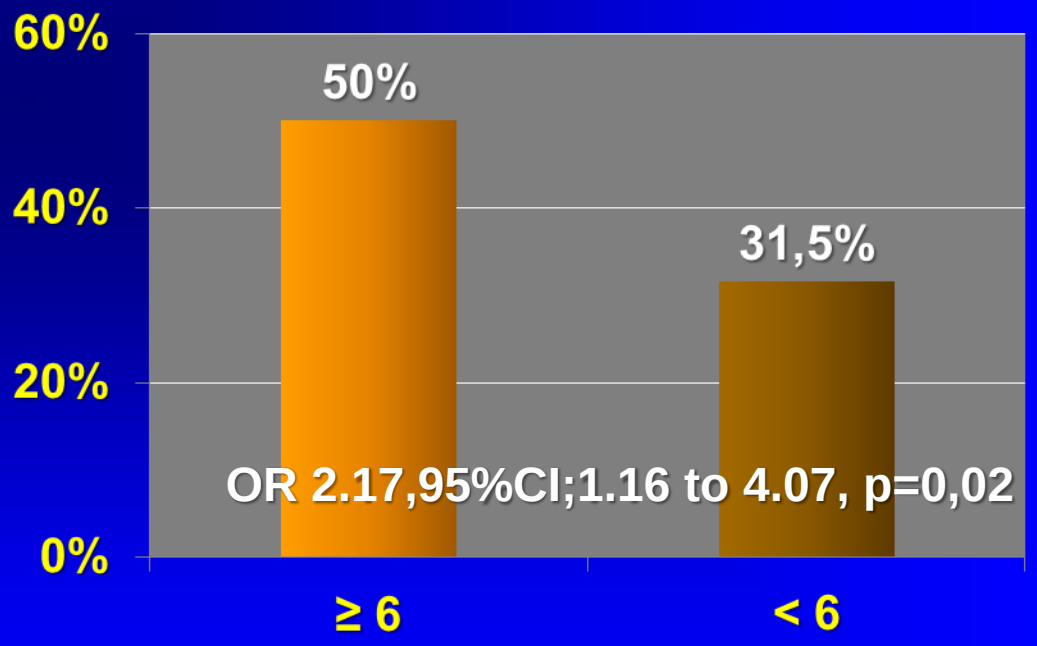
PARTNER SUBSTUDY

Evaluación de la Fragilidad

n = 244



Mortalidad y Calidad de Vida



Green P. J Am J Cardiol 2015;116;264-269

AHA/ACC Guidelines
Recomendaciones para TAVI

Table 8. Summary of Recommendations for AS: Choice of Surgical or Transcatheter Intervention

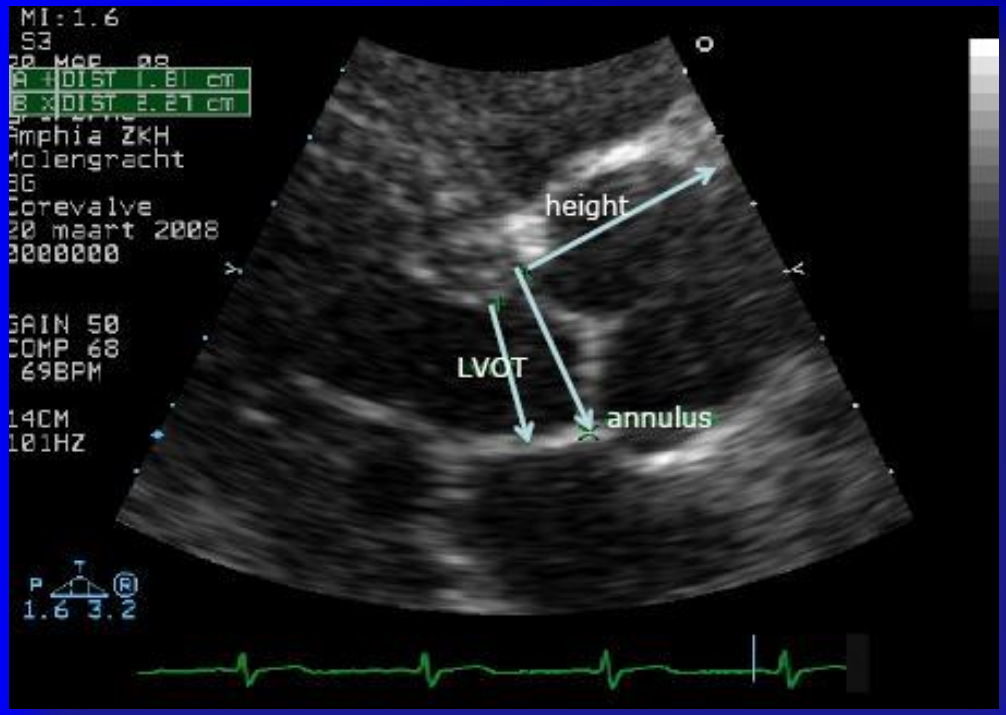
Recommendations	COR	LOE
Surgical AVR is recommended in patients who meet an indication for AVR (Section 3.4) with low or intermediate surgical risk (Section 2.5 in the full-text guideline)	I	A
For patients in whom TAVR or high-risk surgical AVR is being considered, members of a Heart Valve Team should collaborate to provide optimal patient care	I	C
TAVR is recommended in patients who meet an indication for AVR for AS who have a prohibitive surgical risk and a predicted post-TAVR survival >12 mo	I	B
TAVR is a reasonable alternative to surgical AVR in patients who meet an indication for AVR (Section 3.4) and who have high surgical risk (Section 2.5 in the full-text guideline)	IIa	B
Percutaneous aortic balloon dilation may be considered as a bridge to surgical or transcatheter AVR in severely symptomatic patients with severe AS	IIb	C
TAVR is not recommended in patients in whom existing comorbidities would preclude the expected benefit from correction of AS	III: No Benefit	B

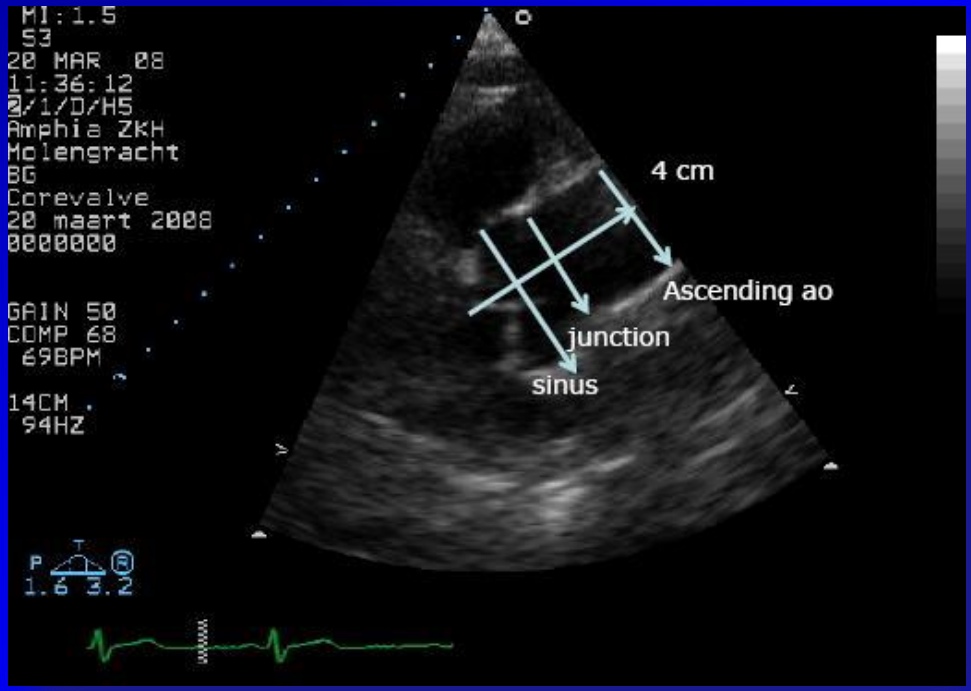
Nishimura R.A. J Am Coll Cardiol 2014;63;2438-2488

Selección de Pacientes

Evaluación Ecocardiografía

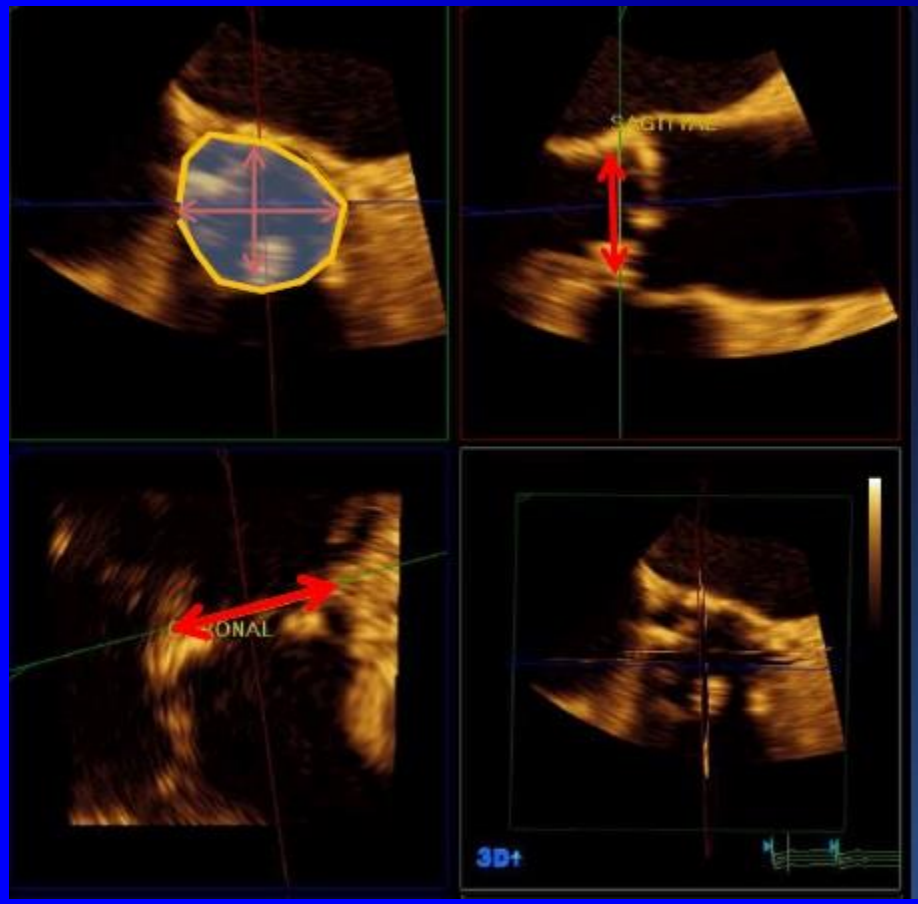
Proyección Paraesternal Eje Mayor





Ecocardiograma 3D

Ventajas



Annular Measurements

Advantages of 3D:

1.Ensures on-axis measurements of orthogonal views

2. Allows 3D assessment of annulus

Journal of the American College of Cardiology
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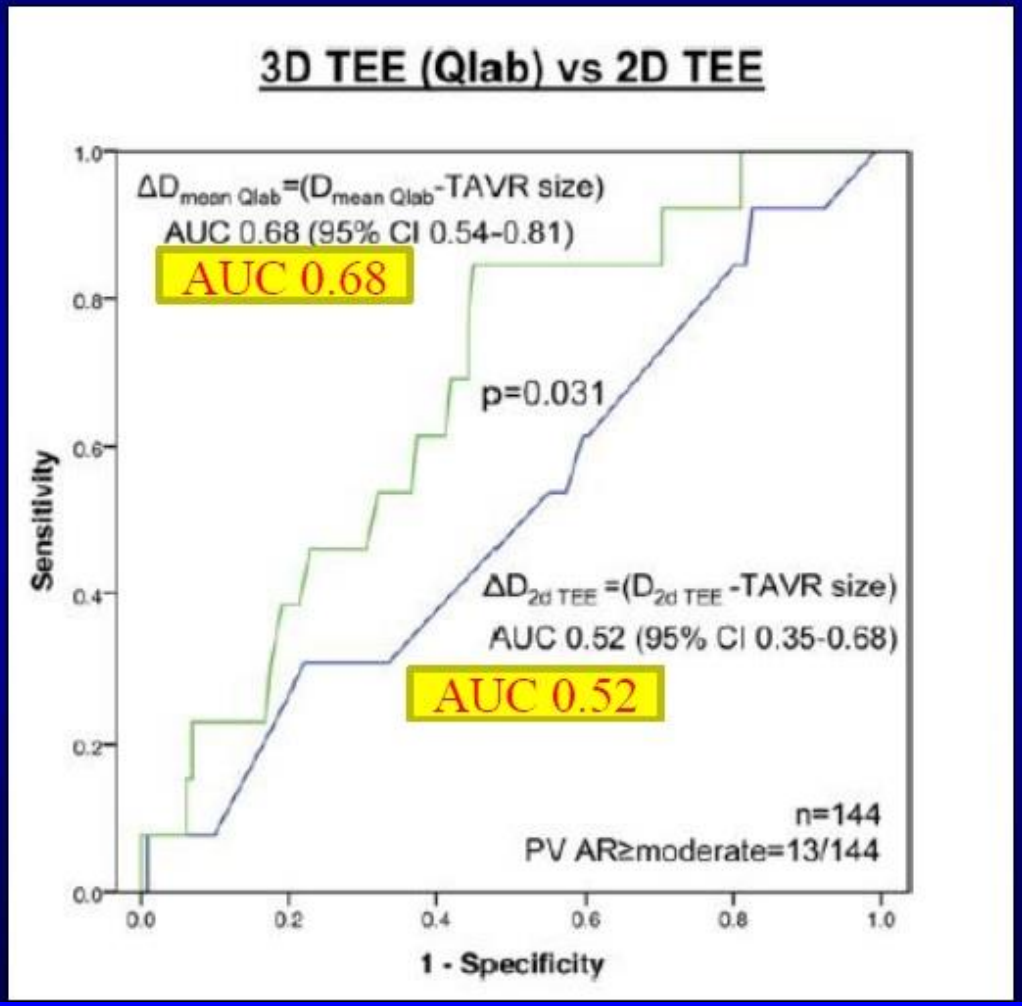
Published by Elsevier Inc.
Vol. 61, No. 9, 2013
ISSN 0735-1097/$36.00
http://dx.doi.org/10.1016/j.jacc.2012.11.055

CLINICAL RESEARCH — Interventional Cardiology

Aortic Annular Sizing for Transcatheter Aortic Valve Replacement Using Cross-Sectional 3-Dimensional Transesophageal Echocardiography

Cedars-Sinai Experience

256 patients undergoing TAVR with balloon-expandable valve

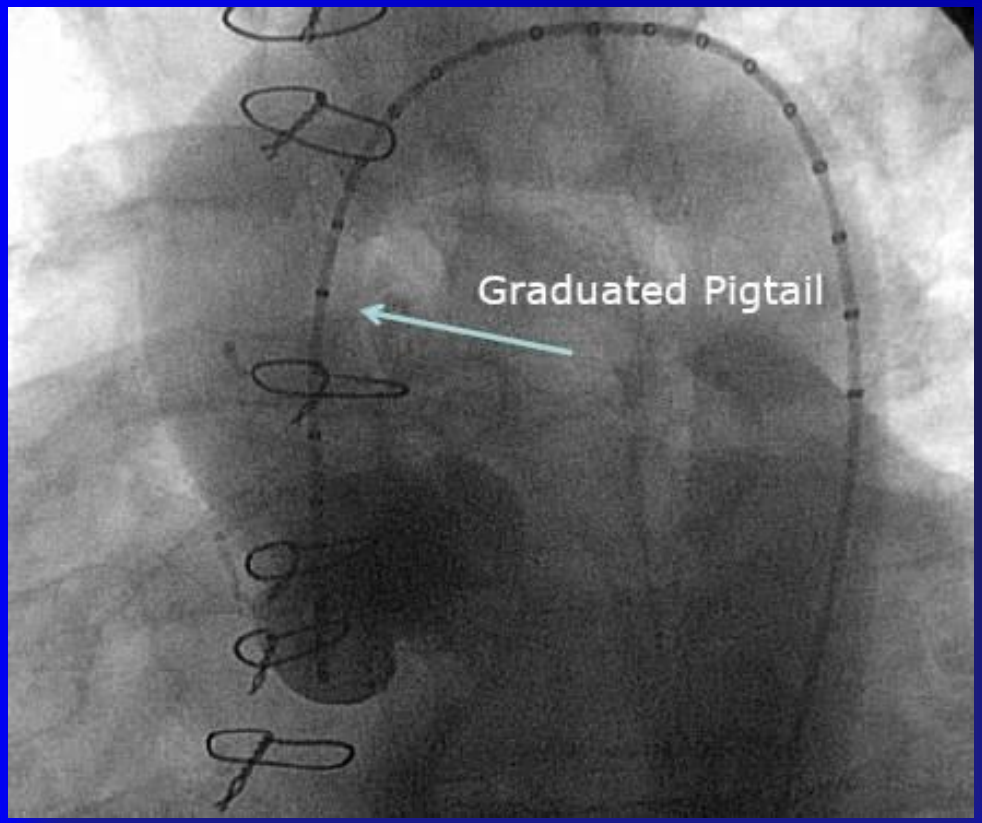


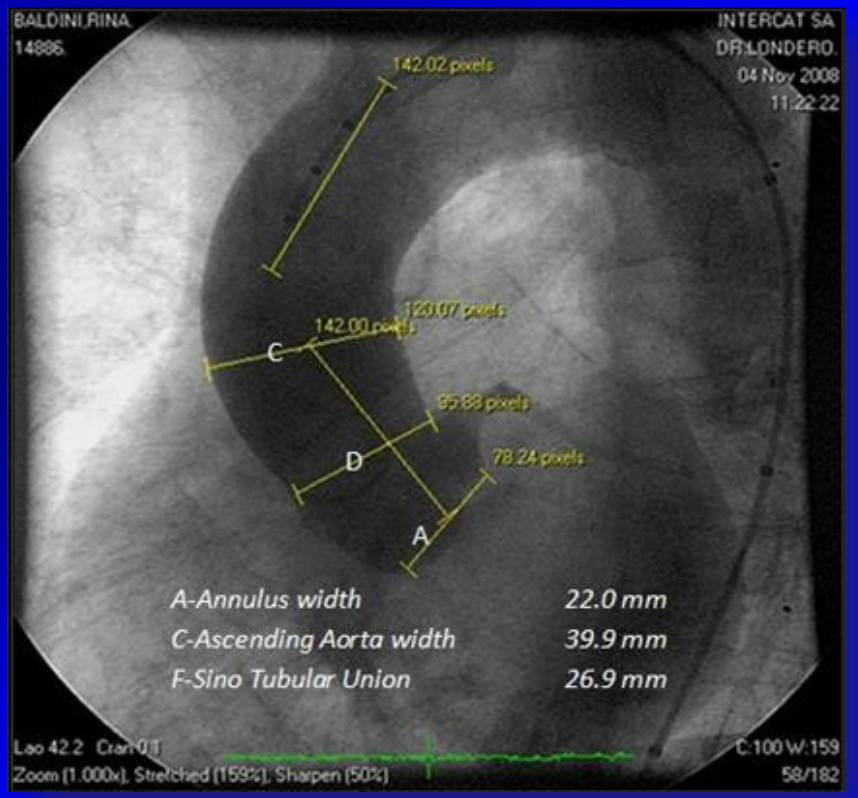
3D TEE has greater discriminatory value at predicting PAVR, compared to 2D TEE.

Jilaihawi H. J Am Coll Cardiol 2013;61:908-916

Implante Transcateter Valvar Aórtico

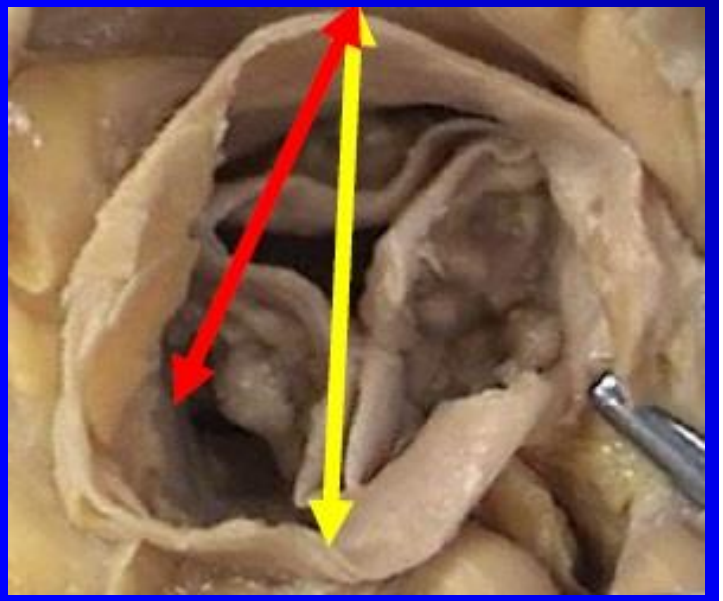
Evaluación Angiográfica



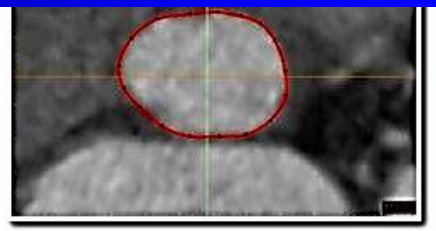


Evaluación del Anillo Valvar

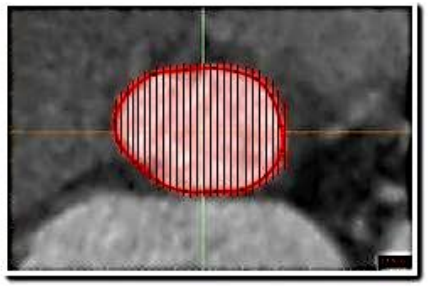
MSCT



Perimeter: linear distance of tracing around the aortic annulus

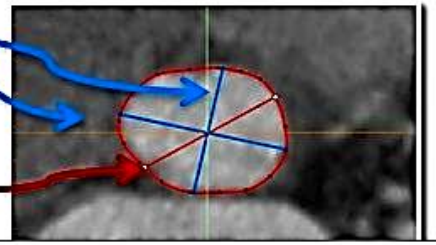


Area: area contained within tracing around the aortic annulus



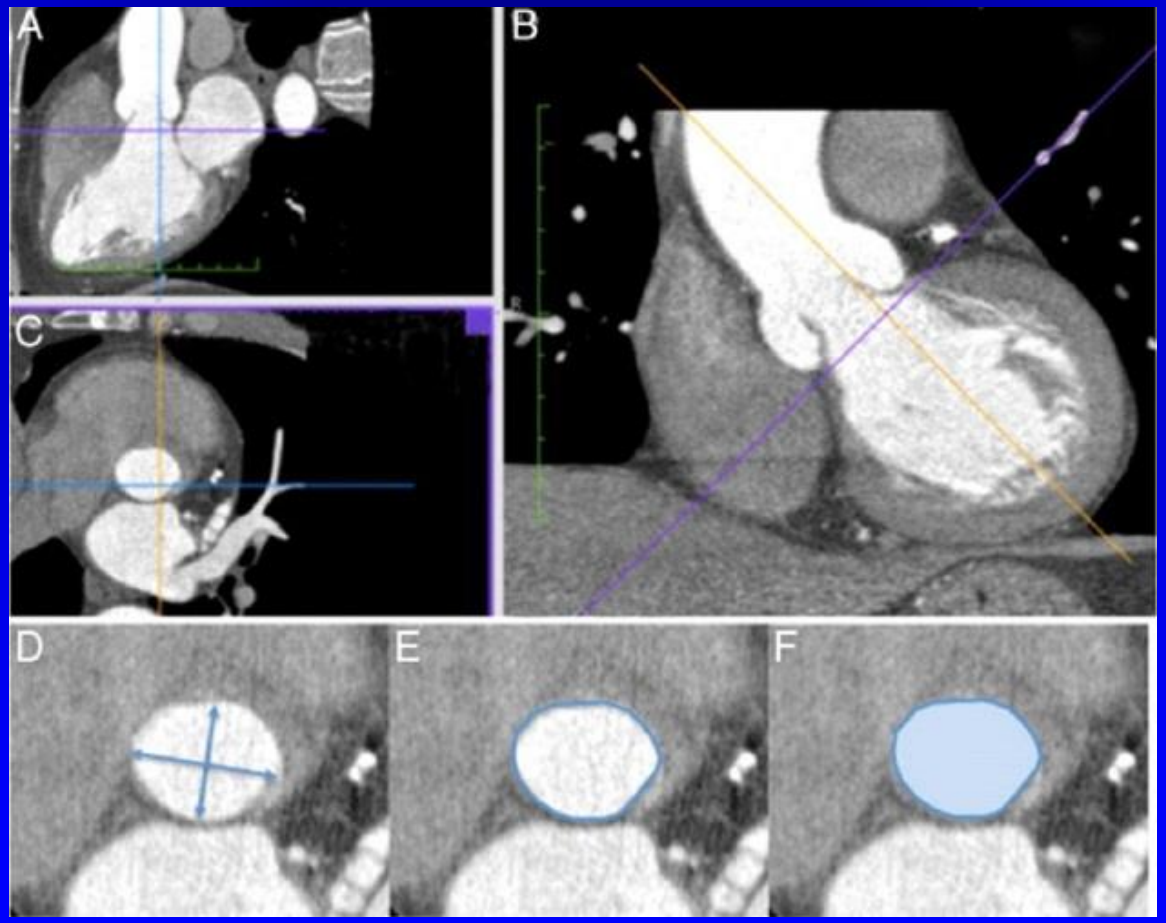
Major & Orthogonal Minor Diameters: linear distances through the center of the aortic annulus

Mean Diameter: Calculated mean of major and minor diameters



Evaluación del Anillo Valvar

MSCT



Hamdan A. J Am Coll Cardiol 2012;59:119-127

Journal of the American College of Cardiology
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Published by Elsevier Inc.

Vol. 61, No. 9, 2013
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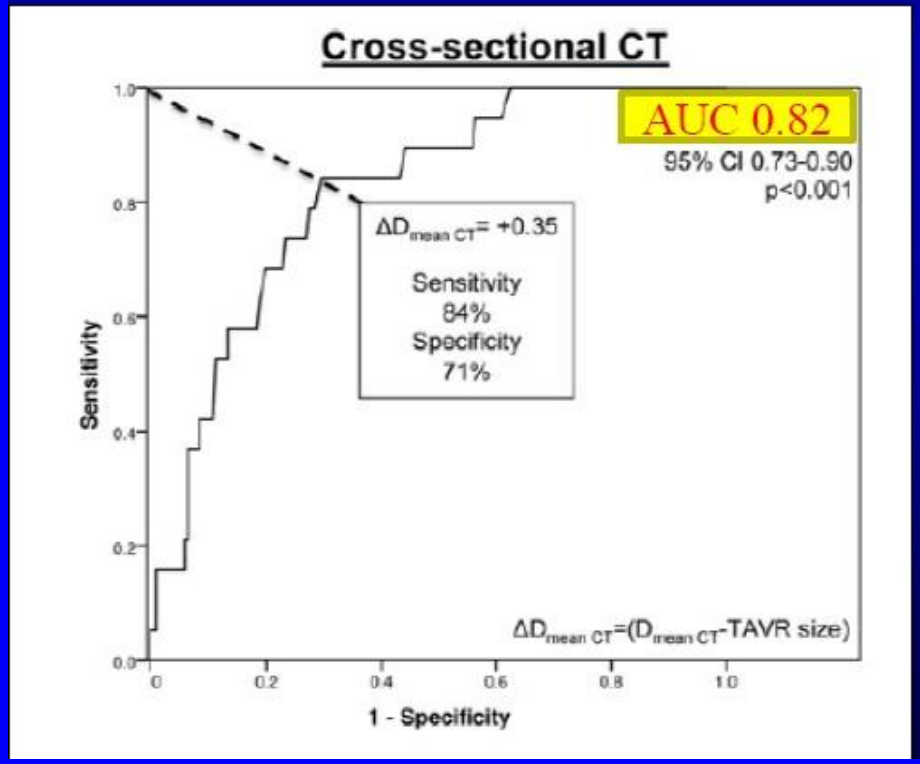
CLINICAL RESEARCH — Interventional Cardiology

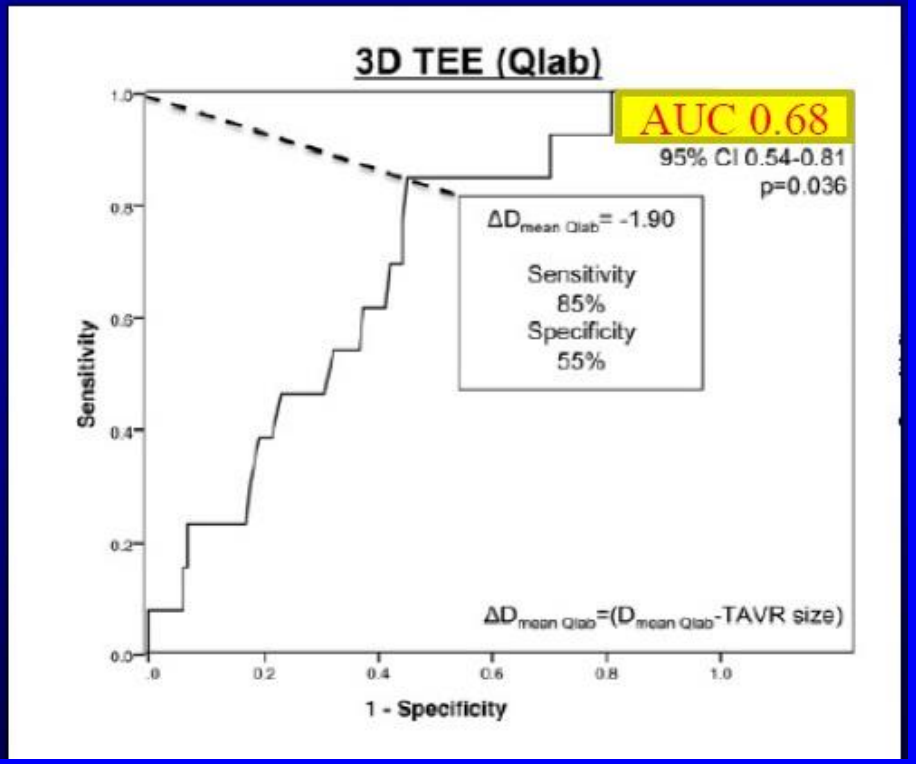
Aortic Annular Sizing for Transcatheter Aortic Valve Replacement Using Cross-Sectional 3-Dimensional Transesophageal Echocardiography

Cedars-Sinai Experience

256 patients undergoing TAVR with balloon-expandable valve

CT-based parameters have numerically greater discriminatory value for PVAR, compared with 3D TEE-derived parameters.





Jilaihawi H. J Am Coll Cardiol 2013;61:908-916

Elección de la Prótesis

CoreValve

Produto	CoreValve® Evolut™	CoreValve®		
				
Tamanho	23 mm	26 mm	29 mm	31 mm
Diâmetro do anel	18-20 mm	20-23 mm	23-26 mm	26-29 mm
Perímetro do anel	56.5-62.8 mm	62.8-72.3 mm	72.3-81.7 mm	81.7-91.1 mm
Diâmetro da aorta ascendente	≤34 mm @ 30 mm do anel	≤40 mm @ 40 mm do anel	≤43 mm @ 40 mm do anel	≤43 mm @ 40 mm do anel
Diâmetros do seio de valsalva	≥25 mm	≥27 mm	≥29 mm	≥29 mm
Altura do seio de Valsalva	≥15 mm	≥15 mm	≥15 mm	≥15 mm

Elección de la Prótesis

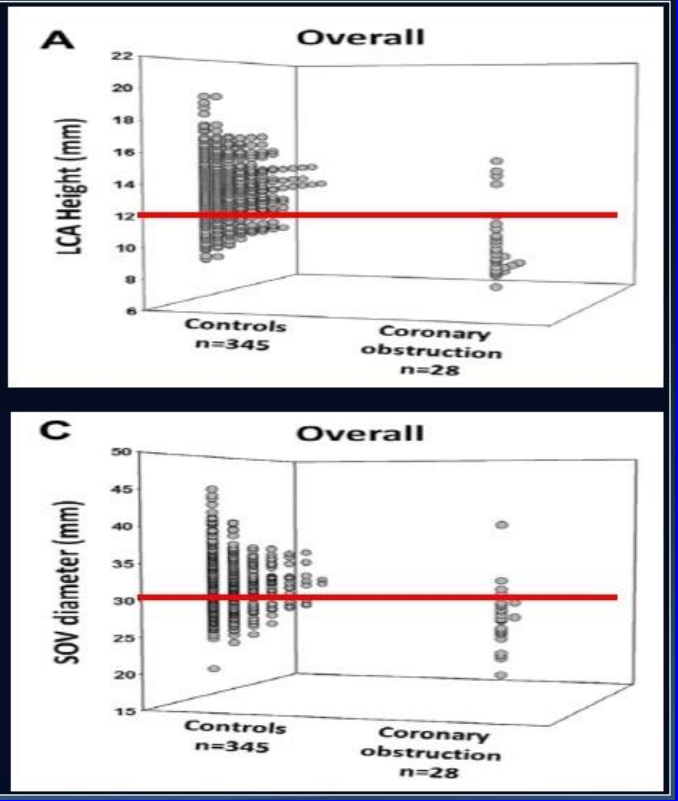
Edwards Sapien

Annulus area mm^2	Perimeter (mm)	Diameter (mm)	THV size (mm)	% oversize by area
255	57	18	23	63%
285	60	19	23	46%
315	63	20	23	30%
345	66	21	23	20%
380	69	22	23-26	9%-39%
415	72	23	23-26	0%-28%
450	75	24	26	17%
490	79	25	26-29	8%-35%
530	82	26	26-29	0%-25%
575	85	27	29	15%
615	88	28	29	7%
660	91	29	29	0

Coronary Obstruction
CT Data

n = 6.688 81 centros n = 44 (0,66%)

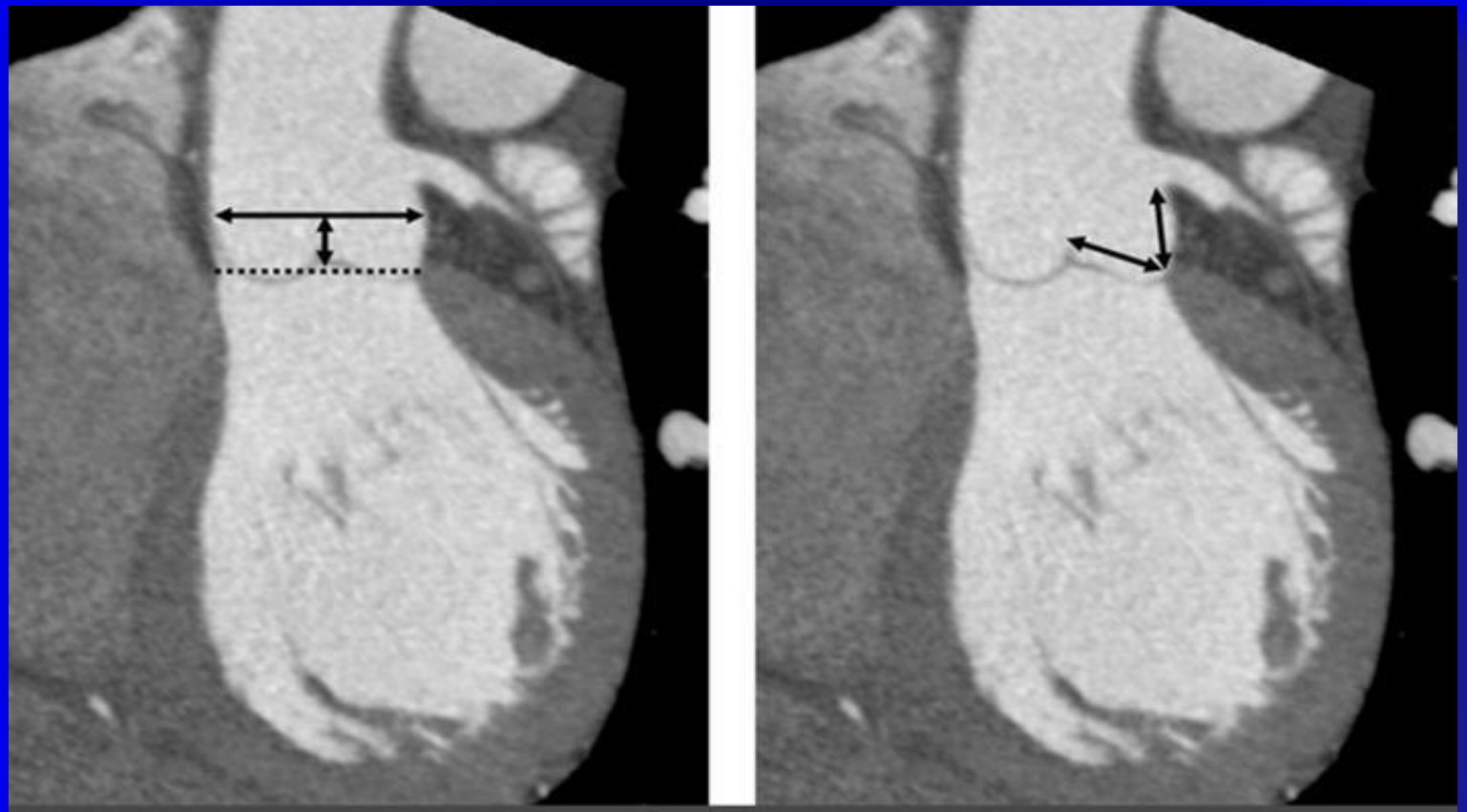
- Up to 86% of the pts who had a coronary obstruction had a LCA height of < 12 mm
- The SOV diameter was <30 mm in 71.4% of the pts who had a coronary obstruction



Ribeiro H. J Am Coll Cardiol 2013;62:1752-62

Implante Valvar Aórtico

Altura Coronaria

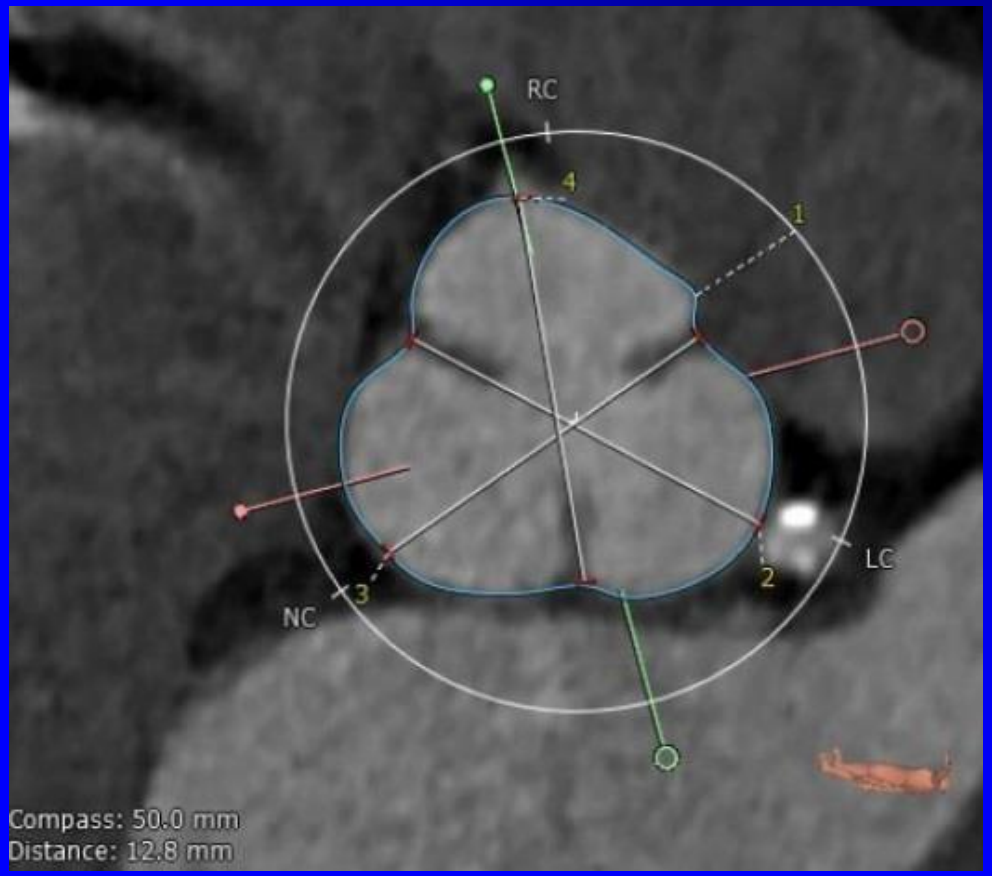


Annulus 26.3+2.8 mm
Sinus of Valsalva 32.4+4.8 mm

Annulus–L Cor. Ostium 14.4+2.9 mm
L Cor. Leaflet Length 14.2+1.8 mm

Coronary Obstruction

CT Data

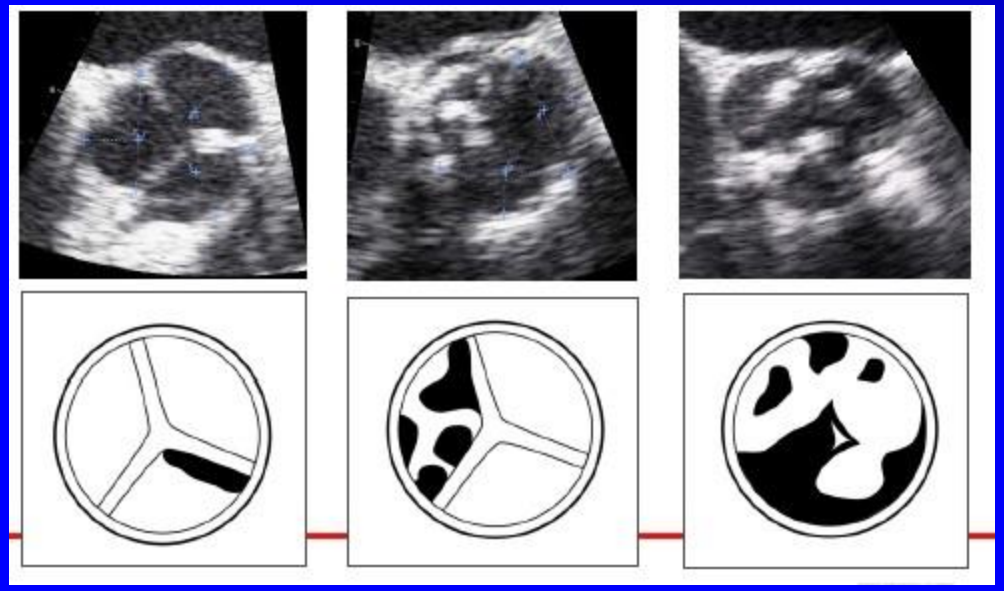


ID	Type	Label	Value
1	MasterSplineAtCurve	Area derived Ø	34.7 mm
		Perimeter derived Ø	36.6 mm
		Area	945.2 mm^2
		Perimeter	114.9 mm
2	Diameter	Sinus Of Valsava Width - LC	33.9 mm
3	Diameter	Sinus Of Valsava Width - NC	32.6 mm
4	Diameter	Sinus Of Valsava Width - RC	33.5 mm

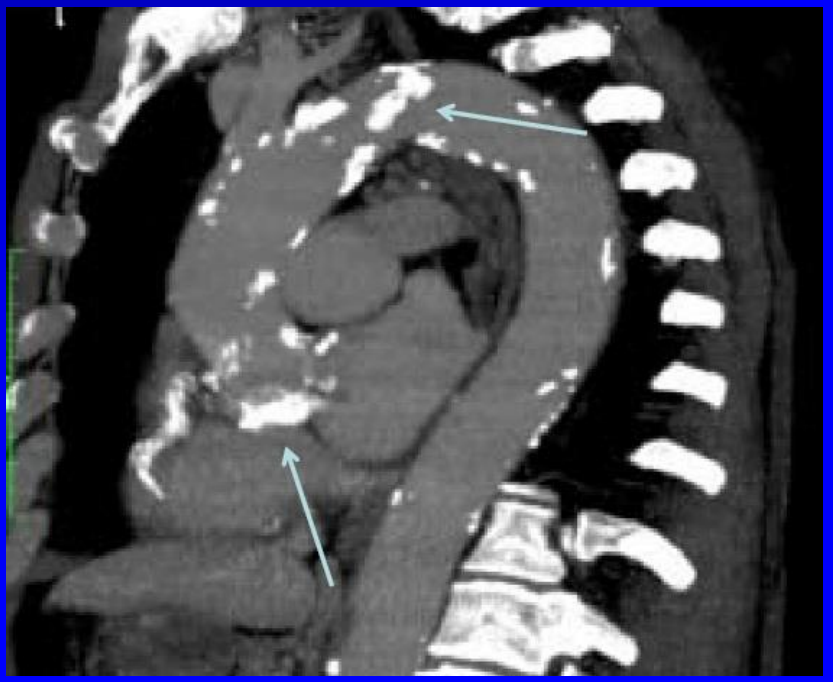
Implante Transcateter Valvar Aórtico

Grado de Calcificación

- Calcificación Homogénea es Ideal
- Distribución heterogénea aumenta la posibilidad de “leak paravalvar”
- Calcificación voluminosa → Riesgo de obstrucción coronaria

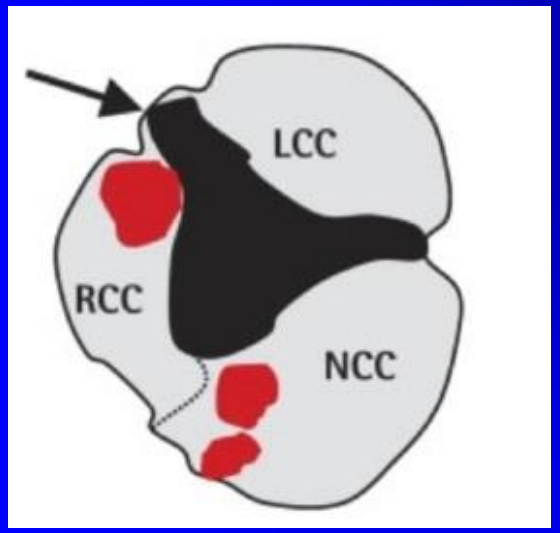


Proyección Eje Menor

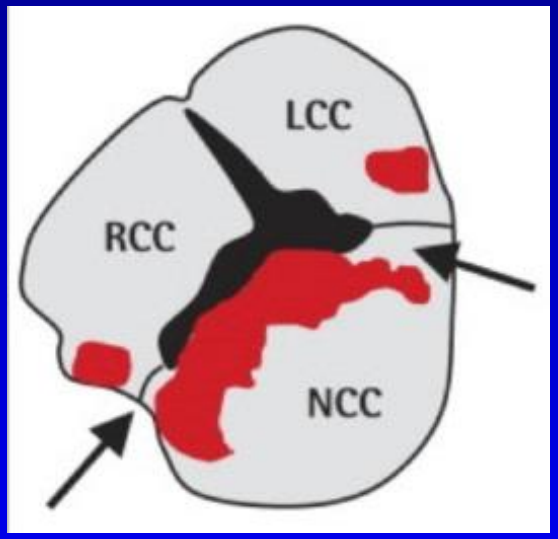


Regurgitación Aórtica Pós-Procedimiento

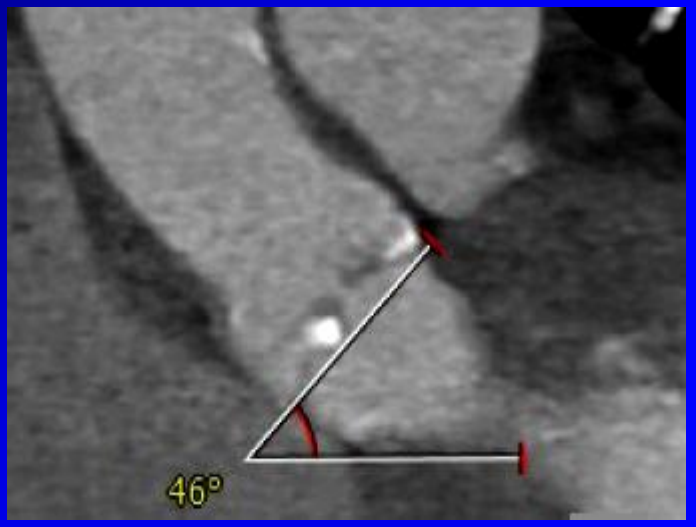
Factores Morfológicos de Riesgo



Comisuras sin fusión vecino a masas voluminosas de calcio



Distribución asimétrica de las masas de calcio en las cúspides (rojo)



Angulación extrema entre la vía de salida VI e la aorta ascendente*

*** CoreValve - > 45^0**

Unbehaun A. J Am Coll Cardiol 2012;59:211-221

Rotura del Anillo Aórtico

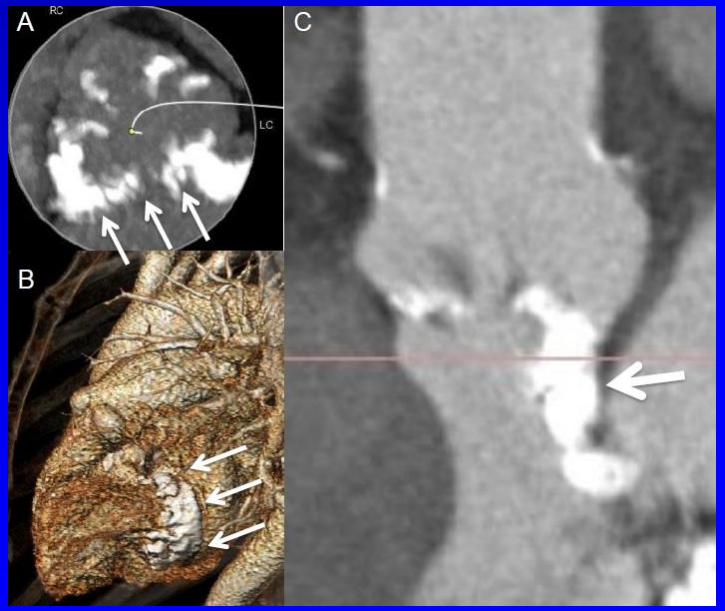
Predictores

n = 16 centers n = 31 (annular or LVOT rupture)

n = 31 (matched sample no rupture)

Conditional Logistic Regression Analysis

Factors		p value
Moderate/Severe LVOT/ Subannular Calcification	OR, 10.92;95% CI, 3.23–36.91	< 0.001
Prosthesis Oversizing ≥ 20%	OR, 8.38; 95% CI, 2.67-26.33	= 0.001



Barbanti M. Circulation 2013;28:244-253

Procedimiento de Valve-in-Valve

Diámetro Interno de la Prótesis

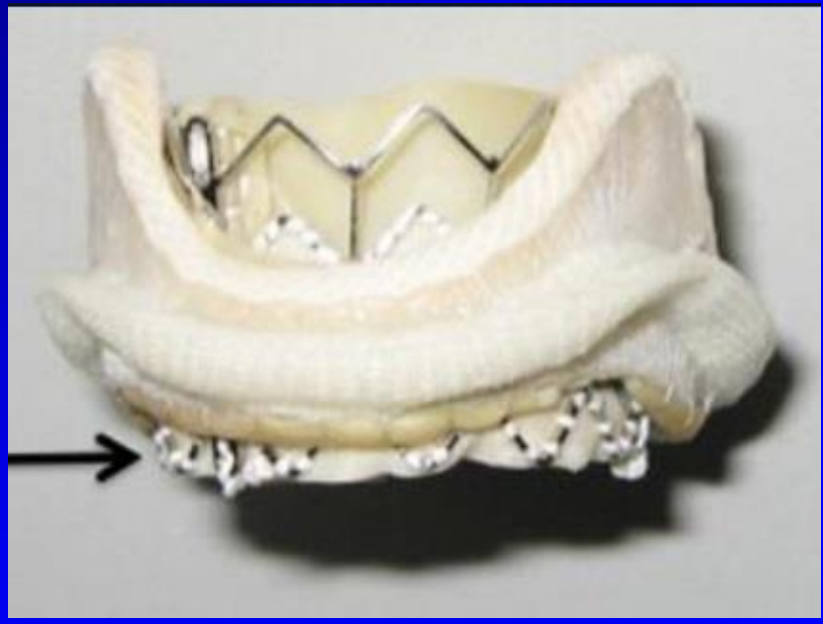
Inner diameter of aortic bioprostheses with corresponding suggested Sapien™ XT valve size

	Labelled size (mm)	Measured inner diameter (mm)	Suggested Sapien™ size (mm)
Sorin Biomedica MITROFLOW™	21	17	23*
	23	19	23
	25	20	23
	27	22	23
Edwards PERIMOUNT™ Magna Ease	21	18	23*
	23	21	23
	25	22	23
	27	24	26
St. Jude medical TRIFECTA™	21	18	23*
	23	20	23
	25	22	23
	27	24	26
Medtronic HANCOCK II™	21	18	23*
	23	20	23
	25	22	23
	27	24	26

*The suggested Sapien™ size will create high trans-valvular gradients. This option should be used only in inoperable patients

Procedimiento de Valve-in-Valve

CoreValve vs Edwards Sapien

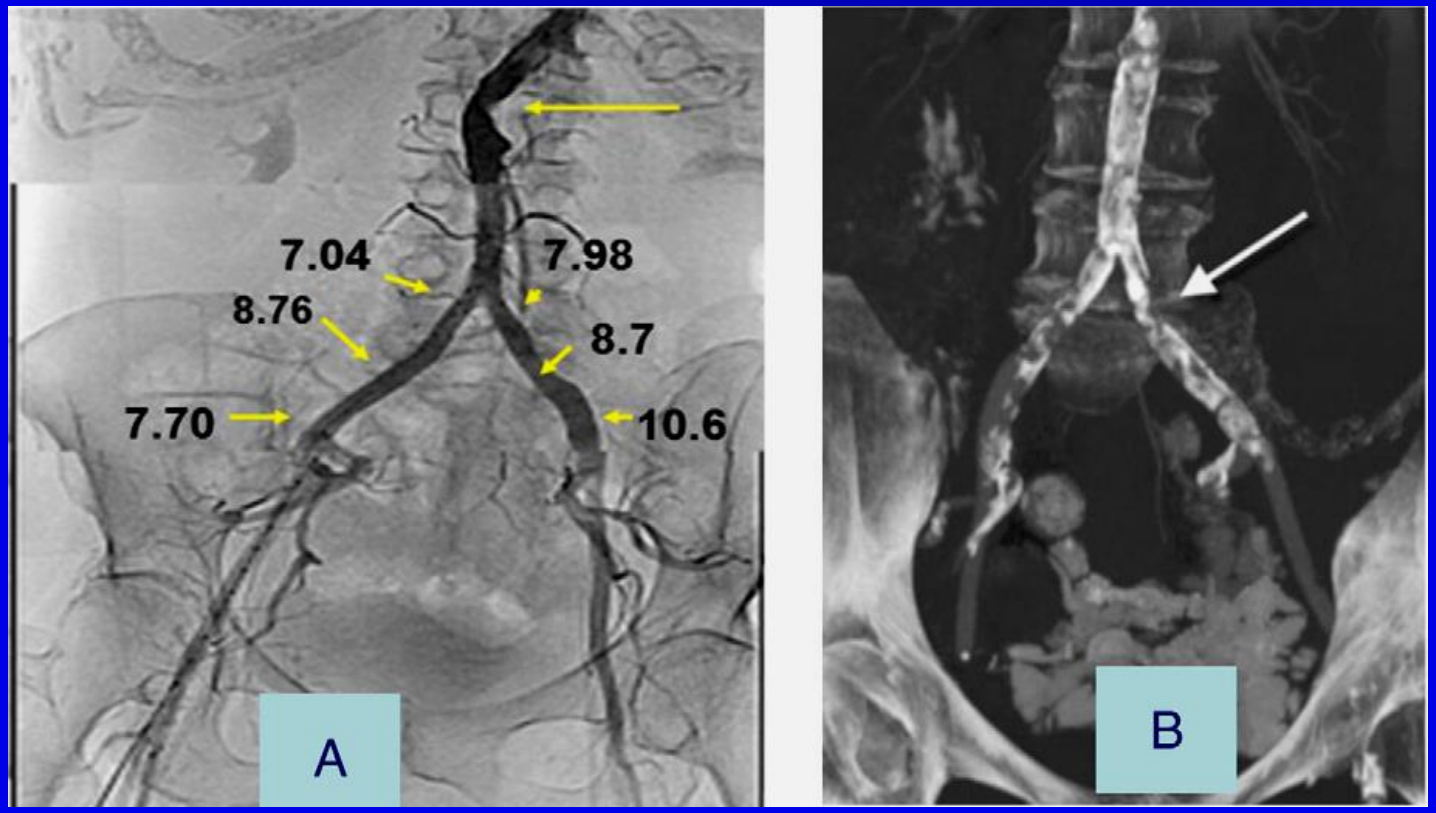


CoreValve - Las valvas se posicionan por encima de la prótesis quirúrgica; disminuyendo la dependencia de la dimensión interna de la bioprótesis

Evaluación Vascular Periférica

Grado de Calcificación e Calibre

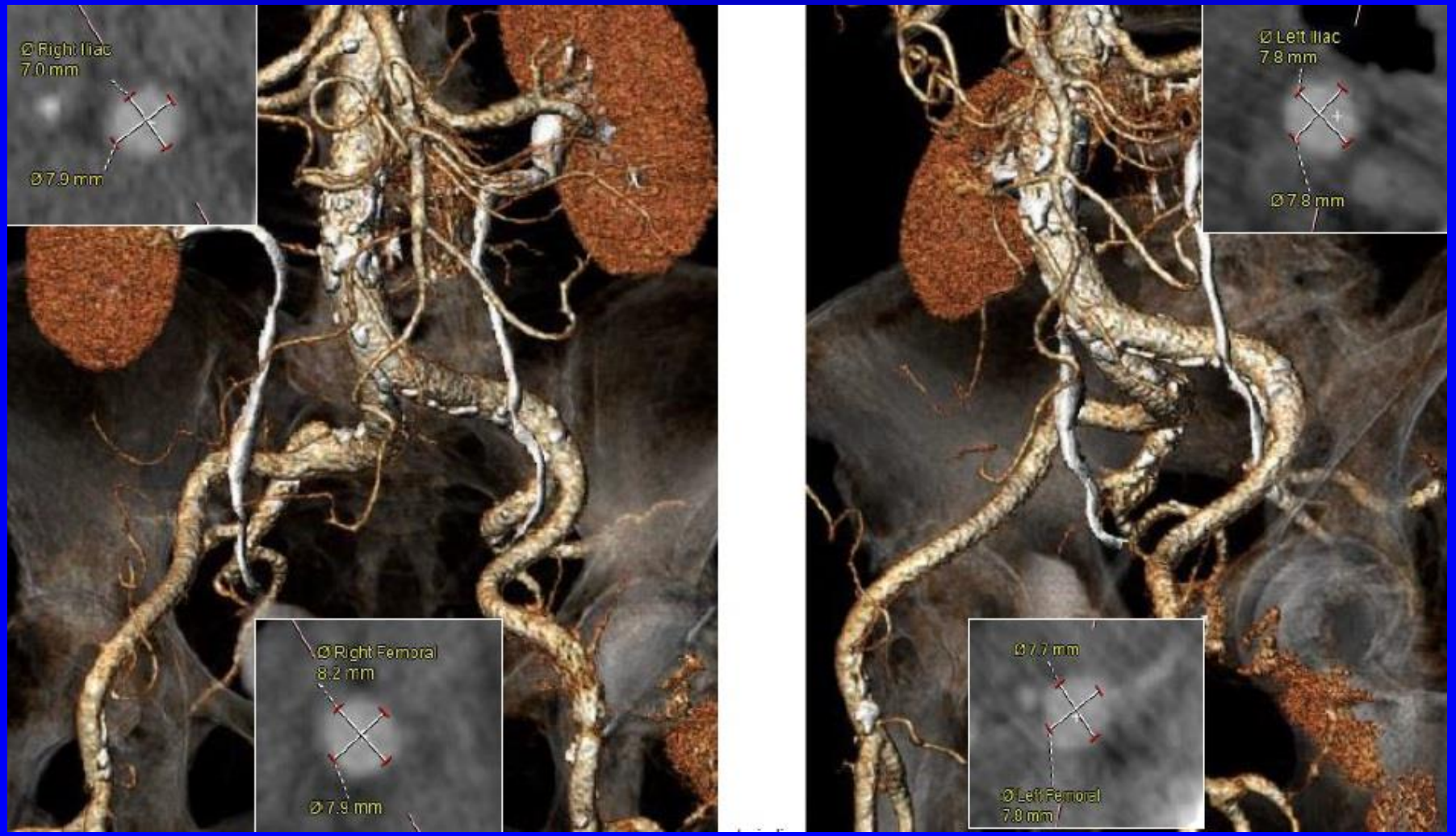
Calcificación puede no ser correctamente evaluada por angiografía



Diâmetro Mínimo da Artéria Femoral
CoreValve - 6 mm
Edwards Sapien – 6 mm (23) e 6,5 mm (26-29)

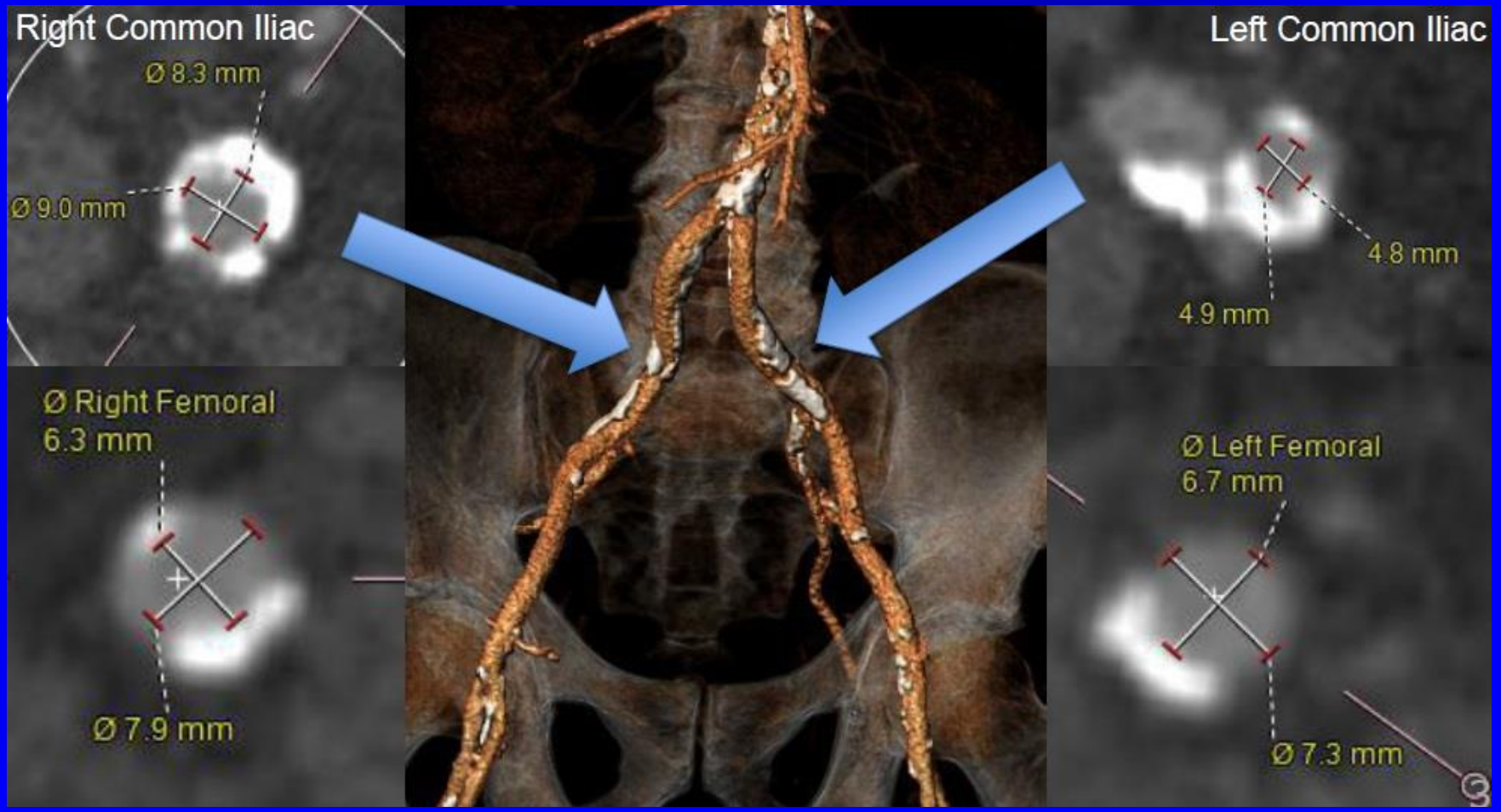
Evaluación Vascular Periférica

Grado de Tortuosidad y Calibre



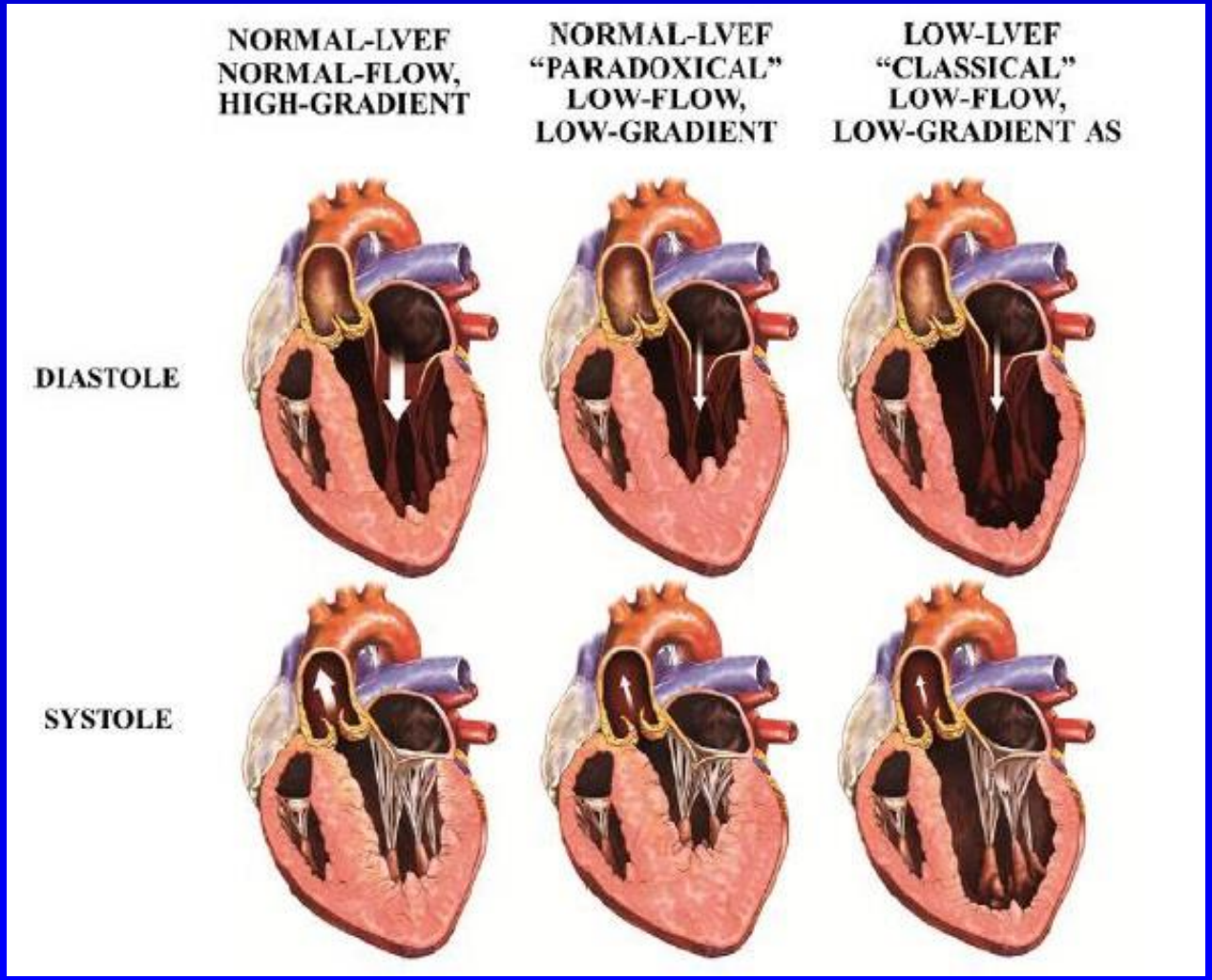
Evaluación Vascular periférica

Grado de Calcificación y Calibre



Estenosis Aórtica Grave

Bajo Flujo – Bajo Gradiente



Estenosis Aórtica Grave
Clasificación

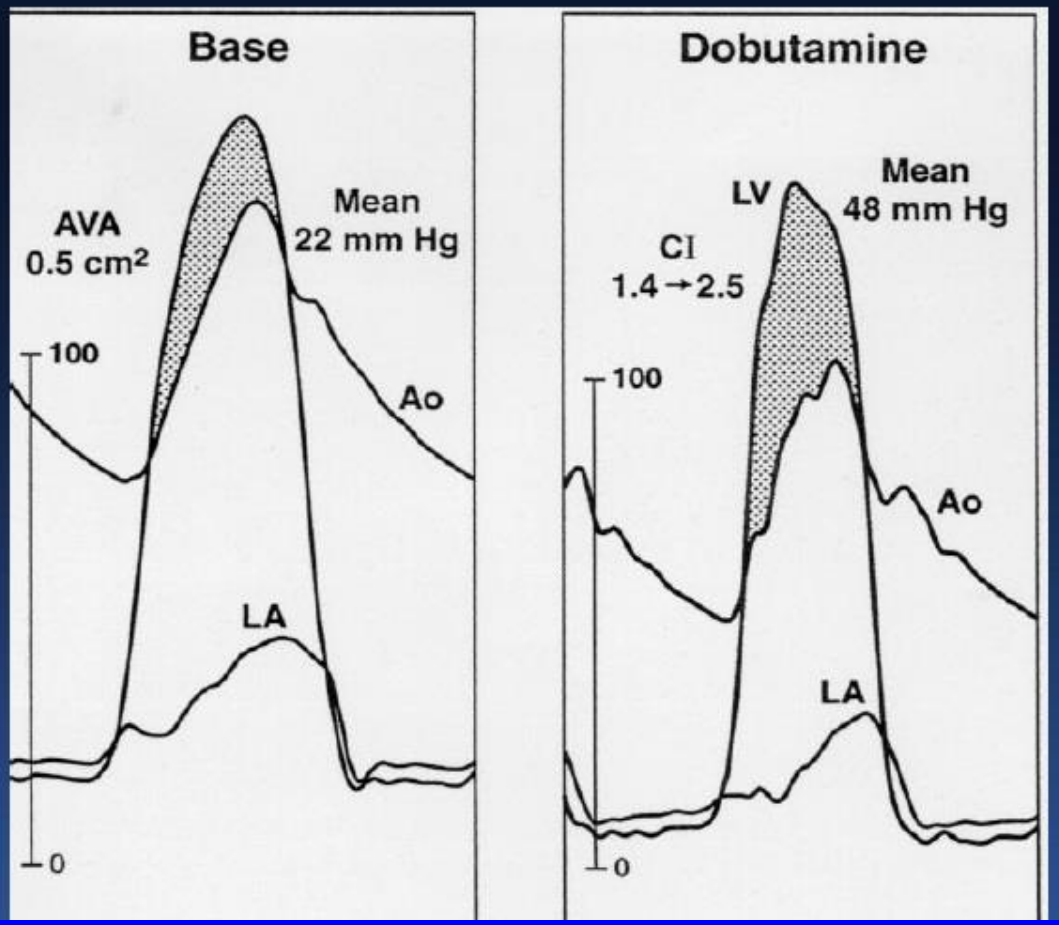
D: Symptomatic severe AS					
D1	**Symptomatic severe high-gradient AS**	• Severe leaflet calcification or congenital stenosis with severely reduced leaflet opening	• Aortic V_{max} $\geq$4 m/s or mean ΔP $\geq$40 mm Hg • AVA typically $\leq$1.0 cm^2 (or AVAi $\leq$0.6 cm^2/m^2) but may be larger with mixed AS/AR	• LV diastolic dysfunction • LV hypertrophy • Pulmonary hypertension may be present	• Exertional dyspnea or decreased exercise tolerance • Exertional angina • Exertional syncope or presyncope
D2	**Symptomatic severe low-flow/low-gradient AS with reduced LVEF**	• Severe leaflet calcification with severely reduced leaflet motion	• AVA $\leq$1.0 cm^2 with resting aortic V_{max} <4 m/s or mean ΔP <40 mm Hg • Dobutamine stress echocardiography shows AVA $\leq$1.0 cm^2 with V_{max} $\geq$4 m/s at any flow rate	• LV diastolic dysfunction • LV hypertrophy • LVEF <50%	• HF • Angina • Syncope or presyncope
D3	**Symptomatic severe low-gradient AS with normal LVEF or paradoxical low-flow severe AS**	• Severe leaflet calcification with severely reduced leaflet motion	• AVA $\leq$1.0 cm^2 with aortic V_{max} <4 m/s or mean ΔP <40 mm Hg • Indexed AVA $\leq$0.6 cm^2/m^2 and • Stroke volume index <35 mL/m^2 • Measured when patient is normotensive (systolic BP <140 mm Hg)	• Increased LV relative wall thickness • Small LV chamber with low stroke volume • Restrictive diastolic filling • LVEF $\geq$50%	• HF • Angina • Syncope or presyncope

Nishimura R.A. J Am Coll Cardiol 2014;63;2438-2488

Low Flow - Low Gradient

FE ≤ 50%

Gradient 22 mmHg



Gradient 48 mmHg

Nishimura R.A. Circulation 2002;106;803-813

Implante Transcateter Valvar Aórtico

Conclusiones

1) Lo ITVA es una alternativa atractiva de tratamiento para los pacientes portadores de EAo calcificada grave con alto riesgo quirúrgico o inoperables
2) La selección criteriosa previa es de fundamental importancia para el éxito del procedimiento y reducción de las complicaciones
3) La MSCT demuestra ser un examen extrema importancia permitiendo una evaluación global y con alta precision de estos pacientes