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ESC/EACTS GUIDELINES

2017 ESC/EACTS Guidelines for the management of valvular heart disease

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)

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28/11/17

Evaluación del paciente-Diagnóstico

- Ecocardiograma (ETT, ETE, eco-esfuerzo, eco-dobutamina)
- CMR
- TCMD
- Fluoroscopia
- Biomarcadores (BNP)
- CNG

** Estratificación de riesgo:* ***EuroSCORE II y STS score****……"Heart Team"*

Situaciones especiales/condiciones asociadas……**EAC, FA**

Recommendations	Class[a]	Level[b]
Diagnosis of CAD		
Coronary angiography[c] is recommended before valve surgery in patients with severe VHD and any of the following: • history of cardiovascular disease • suspected myocardial ischaemia[d] • LV systolic dysfunction • in men >40 years of age and postmenopausal women • one or more cardiovascular risk factors.	I	C
Coronary angiography is recommended in the evaluation of moderate to severe secondary mitral regurgitation.	I	C
CT angiography should be considered as an alternative to coronary angiography before valve surgery in patients with severe VHD and low probability of CAD or in whom conventional coronary angiography is technically not feasible or associated with a high risk.	IIa	C

Management of CAD in patients with VHD (adapted from Windecker *et al.*[16])

Indications for myocardial revascularization		
CABG is recommended in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis ≥70%.[e]	I	C
CABG should be considered in patients with a primary indication for aortic/mitral valve surgery and coronary artery diameter stenosis ≥50–70%.	IIa	C
PCI should be considered in patients with a primary indication to undergo TAVI and coronary artery diameter stenosis >70% in proximal segments.	IIa	C
PCI should be considered in patients with a primary indication to undergo transcatheter mitral valve interventions and coronary artery diameter stenosis >70% in proximal segments.	IIa	C

Management of atrial fibrillation in patients with VHD

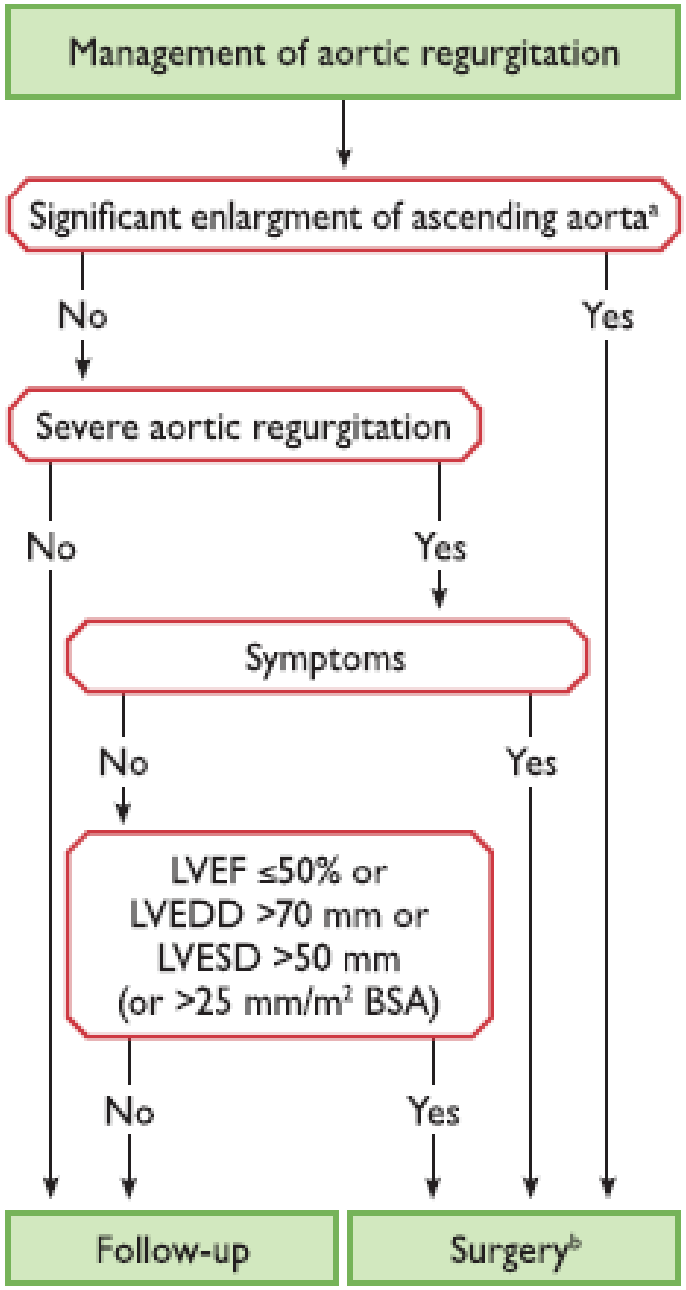
Recommendations	Class[a]	Level[b]
Anticoagulation		
NOACs should be considered as an alternative to VKAs in patients with aortic stenosis, aortic regurgitation and mitral regurgitation presenting with atrial fibrillation.[39–41]	IIa	B
NOACs should be considered as an alternative to VKAs after the third month of implantation in patients who have atrial fibrillation associated with a surgical or transcatheter aortic valve bioprosthesis.	IIa	C
The use of NOACs is not recommended in patients with atrial fibrillation and moderate to severe mitral stenosis.	III	C
NOACS are contraindicated in patients with a mechanical valve.[45]	III	B
Surgical interventions		
Surgical ablation of atrial fibrillation should be considered in patients with symptomatic atrial fibrillation who undergo valve surgery.[37]	IIa	A
Surgical ablation of atrial fibrillation may be considered in patients with asymptomatic atrial fibrillation who undergo valve surgery, if feasible, with minimal risk.	IIb	C
Surgical excision or external clipping of the LA appendage may be considered in patients undergoing valve surgery.[46]	IIb	B

Insuficiencia aórtica

Diagnóstico:

ETT/ETE (tipos 1, 2 y 3)

RM y TAC



Indications for surgery	Class[a]	Level[b]
A. Severe aortic regurgitation		
Surgery is indicated in symptomatic patients.[57,58,66,67]	I	B
Surgery is indicated in asymptomatic patients with resting LVEF ≤50%.[57,58]	I	B
Surgery is indicated in patients undergoing CABG or surgery of the ascending aorta or of another valve.	I	C
Heart Team discussion is recommended in selected patients[c] in whom aortic valve repair may be a feasible alternative to valve replacement.	I	C
Surgery should be considered in asymptomatic patients with resting ejection fraction >50% with severe LV dilatation: LVEDD >70 mm or LVESD >50 mm (or LVESD >25 mm/m^2 BSA in patients with small body size).[58,66]	IIa	B

B. Aortic root or tubular ascending aortic aneurysm[d] (irrespective of the severity of aortic regurgitation)		
Aortic valve repair, using the reimplantation or remodelling with aortic annuloplasty technique, is recommended in young patients with aortic root dilation and tricuspid aortic valves, when performed by experienced surgeons.	I	C
Surgery is indicated in patients with Marfan syndrome who have aortic root disease with a maximal ascending aortic diameter ≥50 mm.	I	C
Surgery should be considered in patients who have aortic root disease with maximal ascending aortic diameter:	IIa	C
• ≥45 mm in the presence of Marfan syndrome and additional risk factors[e] or patients with a *TGFBR1* or *TGFBR2* mutation (including Loeys–Dietz syndrome).[f]	IIa	C
• ≥50 mm in the presence of a bicuspid valve with additional risk factors[e] or coarctation.	IIa	C
• ≥55 mm for all other patients.	IIa	C
When surgery is primarily indicated for the aortic valve, replacement of the aortic root or tubular ascending aorta should be considered when ≥45 mm, particularly in the presence of a bicuspid valve.[g]	IIa	C

Tto médico:

-IC/HTA….IECAs, ARA-II, BB

-Sd Marfan/*VAo bicúspide*….BB y/o losartán

-Embarazo contraindicado en Sd Marfan + Ao>45 mm y en VAo bicúspides + Ao>50 mm.

-Screening en familiares de 1º grado de paciente con VAo bicúspide (ETT) y en conectivopatías (test genético +técnicas imagen)

Seguimiento:

- IAo severa asintomática + FE conservada…….clínica y eco anual

(IAo severa recién dx y/o cambios importantes en VI y/o FE…….seguimiento/3-6 meses)

- IAo ligera-moderada……clínica anual y eco/2 años

- Ao>40 mm……TAC-RM (seguimiento con eco y/o RM)

(cualquier aumento>3 mm….confirmar con TAC-RM)

Estenosis aórtica

Diagnóstico:

ETT
ETE
PE (eco-esfuerzo)
TCMD
RM
BNP
CNG

- EAo con gradientes elevados…….**EAo severa** (AVAo<1 cm2 y Grad medio >40 mmHg)

- EAo de bajo gradiente, bajo flujo, con FE reducida……**EAo de bajo flujo** (AVAo<1 cm2, Grad medio<40 mmHg, FE<50%, SVi=<35 ml/m2)……*test de dobutamina a dosis bajas (EAo verdadera vs pseudo-EAo)*

- EAo de bajo gradiente, bajo flujo, con FE normal……..**EAo de bajo flujo paradójico** (AVAo<1 cm2, Grad medio<40 mmHg, FE>=50%, SVi=<35 ml/m2)……*TCMD (score calcio)*

- EAo de bajo gradiente, con flujo y FE normales (AVAo<1 cm2, Grad medio<40 mmHg, FE>=50%, SVi>35 ml/m2)…….**EAo moderada**

Table 6 Criteria that increase the likelihood of severe aortic stenosis in patients with AVA <1.0 cm^2 and mean gradient <40 mmHg in the presence of preserved ejection fraction (modified from Baumgartner *et al.*[4])

Criteria	
Clinical criteria	• Typical symptoms without other explanation • Elderly patient (>70 years)
Qualitative imaging data	• LV hypertrophy (additional history of hypertension to be considered) • Reduced LV longitudinal function without other explanation
Quantitative imaging data	• Mean gradient 30–40 mmHg[a]
	• AVA ≤0.8 cm^2
	• Low flow (SVi <35 mL/m^2) confirmed by techniques other than standard Doppler technique (LVOT measurement by 3D TOE or MSCT; CMR, invasive data)
	• Calcium score by MSCT[b] Severe aortic stenosis very likely: men ≥3000; women ≥1600 Severe aortic stenosis likely: men ≥2000; women ≥1200 Severe aortic stenosis unlikely: men <1600; women <800

Indications for intervention in aortic stenosis and recommendations for the choice of intervention mode

A) Symptomatic aortic stenosis	Class[a]	Level[b]
Intervention is indicated in symptomatic patients with severe, high-gradient aortic stenosis (mean gradient ≥40 mmHg or peak velocity ≥4.0 m/s).[91–93]	I	B
Intervention is indicated in symptomatic patients with severe low-flow, low-gradient (<40 mmHg) aortic stenosis with reduced ejection fraction and evidence of flow (contractile) reserve excluding pseudosevere aortic stenosis.	I	C
Intervention should be considered in symptomatic patients with low-flow, low-gradient (<40 mmHg) aortic stenosis with normal ejection fraction after careful confirmation of severe aortic stenosis[c] (see *Figure 2* and *Table 6*).	IIa	C
Intervention should be considered in symptomatic patients with low-flow, low-gradient aortic stenosis and reduced ejection fraction without flow (contractile) reserve, particularly when CT calcium scoring confirms severe aortic stenosis.	IIa	C
Intervention should not be performed in patients with severe comorbidities when the intervention is unlikely to improve quality of life or survival.	III	C

B) Choice of intervention in symptomatic aortic stenosis		
Aortic valve interventions should only be performed in centres with both departments of cardiology and cardiac surgery on site and with structured collaboration between the two, including a Heart Team (heart valve centres).	I	C
The choice for intervention must be based on careful individual evaluation of technical suitability and weighing of risks and benefits of each modality (aspects to be considered are listed in *Table 7*). In addition, the local expertise and outcomes data for the given intervention must be taken into account.	I	C
SAVR is recommended in patients at low surgical risk (STS or EuroSCORE II < 4% or logistic EuroSCORE I < 10%[d] and no other risk factors not included in these scores, such as frailty, porcelain aorta, sequelae of chest radiation).[93]	I	B
TAVI is recommended in patients who are not suitable for SAVR as assessed by the Heart Team.[91,94]	I	B
In patients who are at increased surgical risk (STS or EuroSCORE II ≥ 4% or logistic EuroSCORE I ≥ 10%[d] or other risk factors not included in these scores such as frailty, porcelain aorta, sequelae of chest radiation), the decision between SAVR and TAVI should be made by the Heart Team according to the individual patient characteristics (see *Table 7*), with TAVI being favoured in elderly patients suitable for transfemoral access.[91,94–102]	I	B
Balloon aortic valvotomy may be considered as a bridge to SAVR or TAVI in haemodynamically unstable patients or in patients with symptomatic severe aortic stenosis who require urgent major non-cardiac surgery.	IIb	C
Balloon aortic valvotomy may be considered as a diagnostic means in patients with severe aortic stenosis or other potential causes for symptoms (i.e. lung disease) and in patients with severe myocardial dysfunction, pre-renal insufficiency or other organ dysfunction that may be reversible with balloon aortic valvotomy when performed in centres that can escalate to TAVI.	IIb	C

C) Asymptomatic patients with severe aortic stenosis (refers only to patients eligible for surgical valve replacement)		
SAVR is indicated in asymptomatic patients with severe aortic stenosis and systolic LV dysfunction (LVEF <50%) not due to another cause.	I	C
SAVR is indicated in asymptomatic patients with severe aortic stenosis and an abnormal exercise test showing symptoms on exercise clearly related to aortic stenosis.	I	C
SAVR should be considered in asymptomatic patients with severe aortic stenosis and an abnormal exercise test showing a decrease in blood pressure below baseline.	IIa	C
SAVR should be considered in asymptomatic patients with normal ejection fraction and none of the above-mentioned exercise test abnormalities if the surgical risk is low and one of the following findings is present: • Very severe aortic stenosis defined by a V_{max} >5.5 m/s • Severe valve calcification and a rate of V_{max} progression ≥0.3 m/s/year • Markedly elevated BNP levels (>threefold age- and sex-corrected normal range) confirmed by repeated measurements without other explanations IIbC • Severe pulmonary hypertension (systolic pulmonary artery pressure at rest >60 mmHg confirmed by invasive measurement) without other explanation.	IIa	C

D) Concomitant aortic valve surgery at the time of other cardiac/ascending aorta surgery		
SAVR is indicated in patients with severe aortic stenosis undergoing CABG or surgery of the ascending aorta or of another valve.	I	C
SAVR should be considered in patients with moderate aortic stenosis[e] undergoing CABG or surgery of the ascending aorta or of another valve after Heart Team decision.	IIa	C

Table 7 Aspects to be considered by the Heart Team for the decision between SAVR and TAVI in patients at increased surgical risk (see Table of Recommendations in section 5.2.)

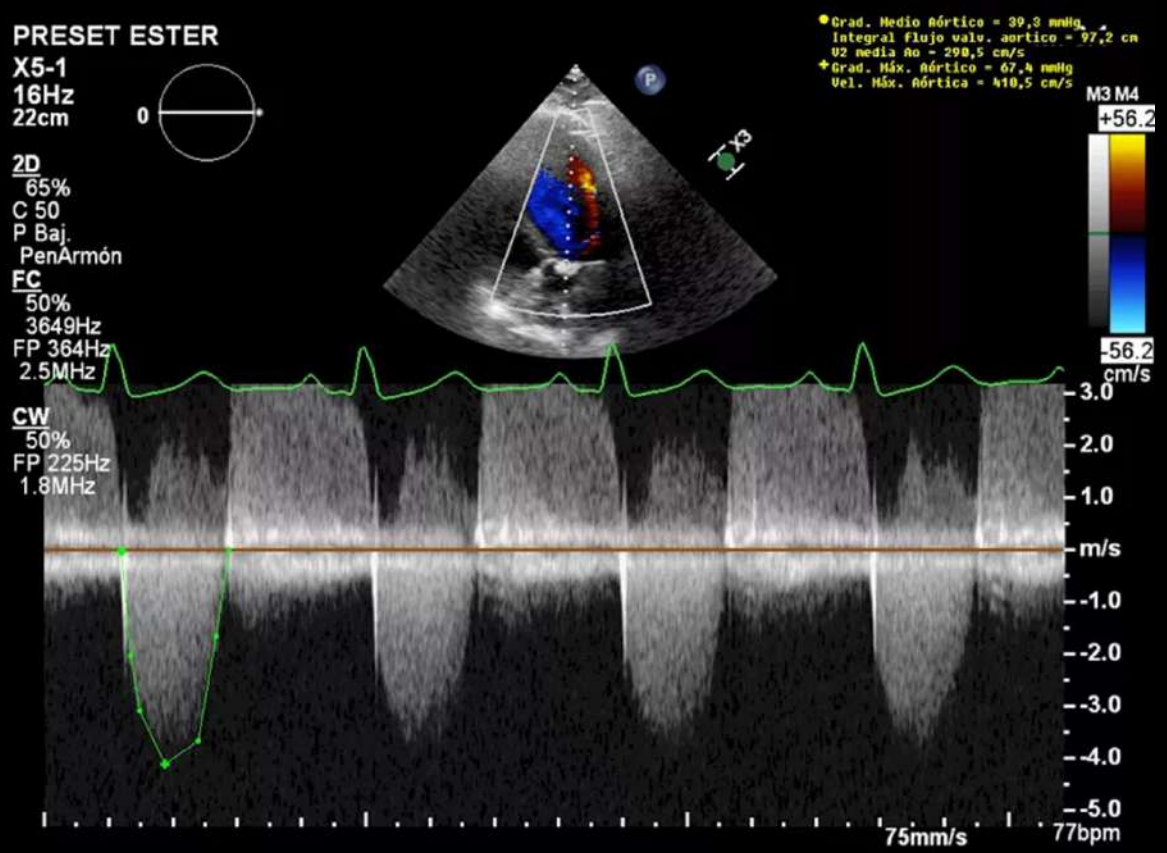
	Favours TAVI	Favours SAVR
Clinical characteristics		
STS/EuroSCORE II <4% (logistic EuroSCORE I <10%)[a]		+
STS/EuroSCORE II ≥4% (logistic EuroSCORE I ≥10%)[a]	+	
Presence of severe comorbidity (not adequately reflected by scores)	+	
Age <75 years		+
Age ≥75 years	+	
Previous cardiac surgery	+	
Frailty[b]	+	
Restricted mobility and conditions that may affect the rehabilitation process after the procedure	+	
Suspicion of endocarditis		+
Anatomical and technical aspects		
Favourable access for transfemoral TAVI	+	
Unfavourable access (any) for TAVI		+
Sequelae of chest radiation	+	
Porcelain aorta	+	
Presence of intact coronary bypass grafts at risk when sternotomy is performed	+	
Expected patient–prosthesis mismatch	+	
Severe chest deformation or scoliosis	+	
Short distance between coronary ostia and aortic valve annulus		+
Size of aortic valve annulus out of range for TAVI		+
Aortic root morphology unfavourable for TAVI		+
Valve morphology (bicuspid, degree of calcification, calcification pattern) unfavourable for TAVI		+
Presence of thrombi in aorta or LV		+
Cardiac conditions in addition to aortic stenosis that require consideration for concomitant intervention		
Severe CAD requiring revascularization by CABG		+
Severe primary mitral valve disease, which could be treated surgically		+
Severe tricuspid valve disease		+
Aneurysm of the ascending aorta		+
Septal hypertrophy requiring myectomy		+

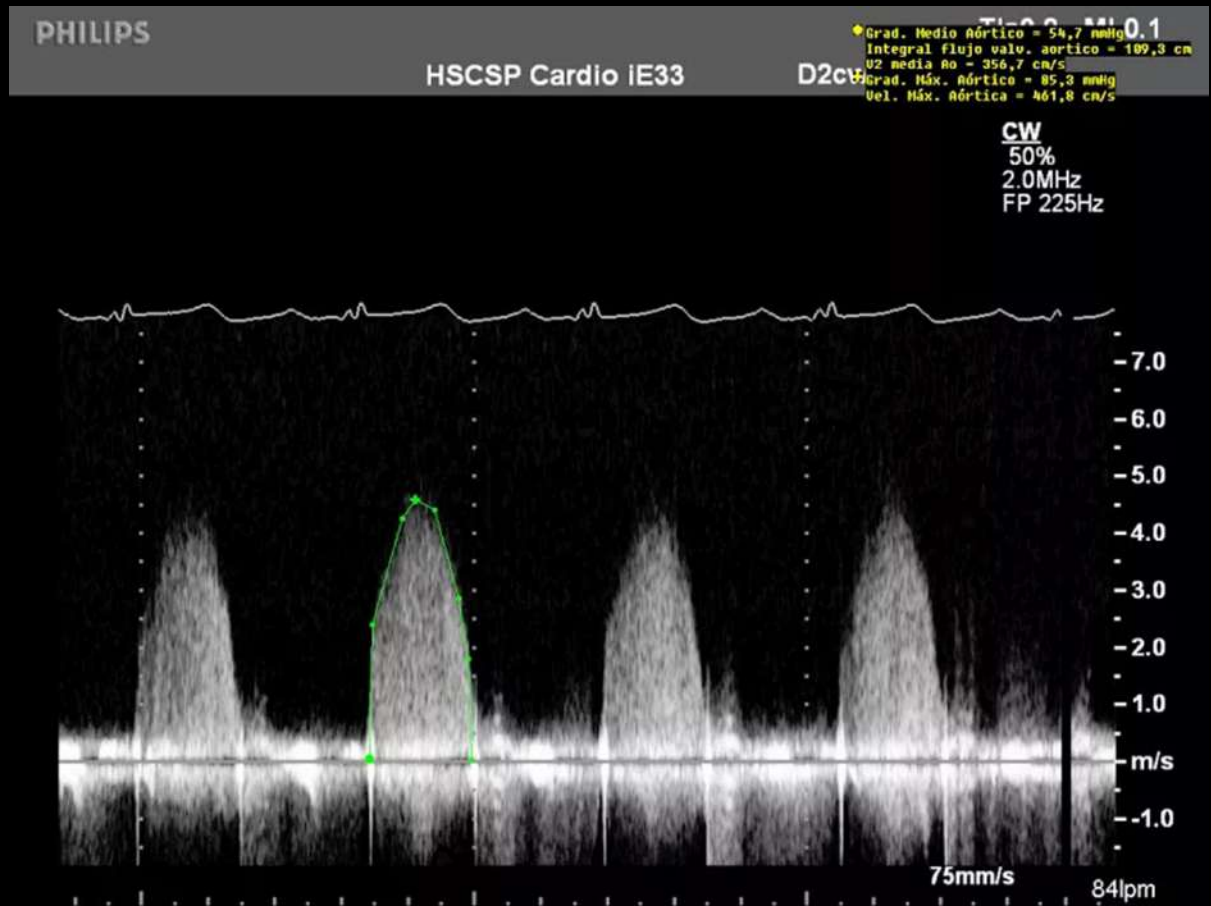
Tto médico:

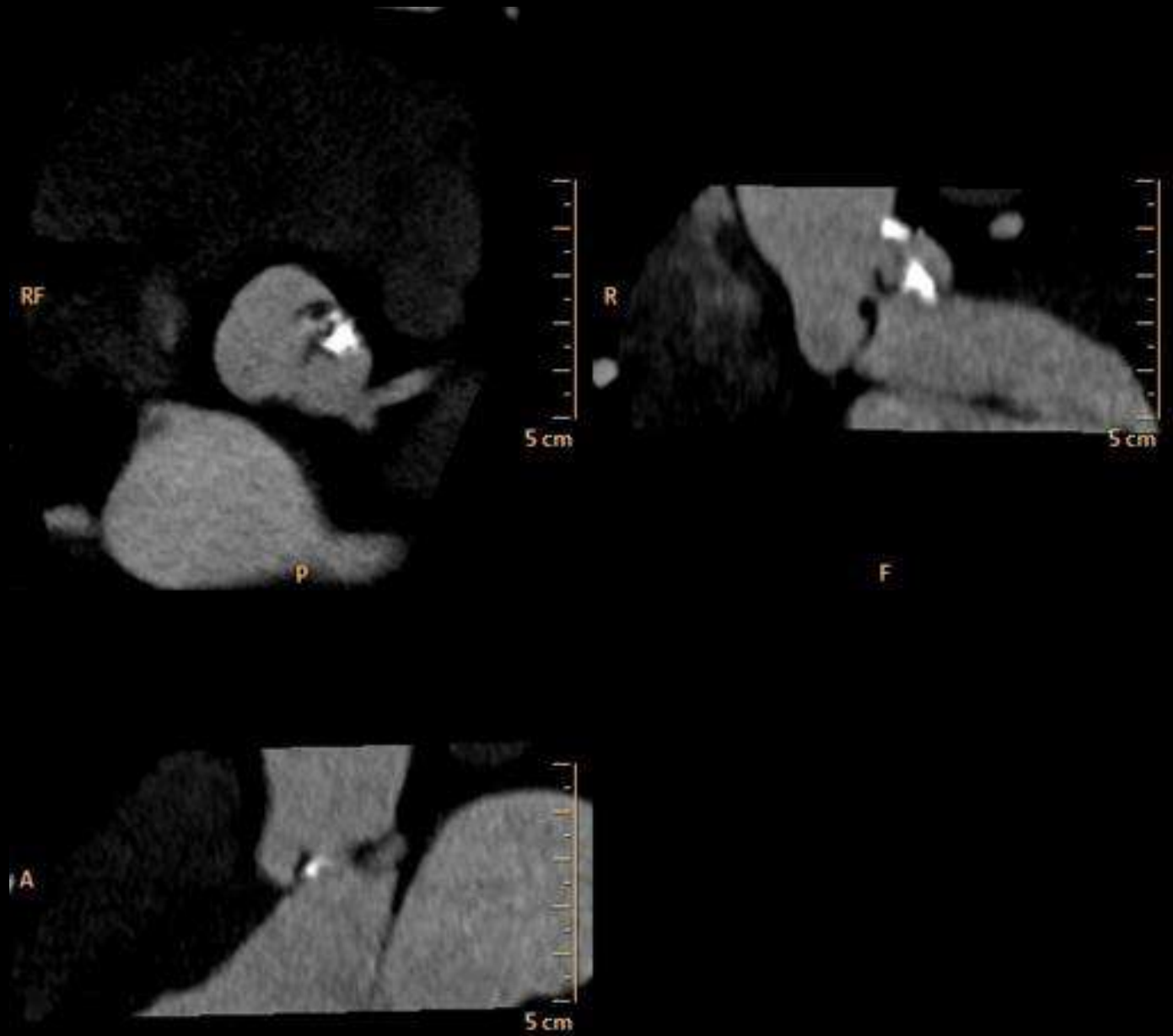
-IC/HTA……guías de IC *(evitar hipo TA)*

Seguimiento:

- EAo severa asintomática + FE conservada…….cada 6 meses *(PE, BNP)*
- EAo ligera-moderada (calcificación+++)…….revisión anual
- EAo ligera (+ jóvenes, calcificación leve)…….cada 2-3 años


PRESET ESTER
X5-1
16Hz
22cm
2D
65%
C 50
P Baj.
PenArmón
FC
50%
3649Hz
FP 364Hz
2.5MHz
CW
50%
FP 225Hz
1.8MHz
Grad. Medio Aórtico = 39,3 mmHg
Integral flujo valv. aortico = 97,2 cm
V2 media Ao = 290,5 cm/s
Grad. Máx. Aórtico = 67,4 mmHg
Vel. Máx. Aórtica = 410,5 cm/s
M3 M4
+56.2
-56.2
cm/s
3.0
2.0
1.0
m/s
-1.0
-2.0
-3.0
-4.0
-5.0
75mm/s
77bpm


PHILIPS
HSCSP Cardio iE33
Grad. Medio Aórtico = 54,7 mmHg
Integral flujo valv. aortico = 109,3 cm
V2 media Ao = 356,7 cm/s
Grad. Máx. Aórtico = 85,3 mmHg
Vel. Máx. Aórtica = 461,8 cm/s
CW
50%
2.0MHz
FP 225Hz
7.0
6.0
5.0
4.0
3.0
2.0
1.0
m/s
-1.0
75mm/s
84lpm


RF
P
5 cm
R
F
5 cm
A
5 cm
RF
Ar: 143.4 mm2
Media: 477.2 HU
DE: 65.1
5 cm
F
L
P
PHILIPS
P
PHILIPS
FL

Insuficiencia mitral

Diagnóstico: ETT, ETE, PE/Eco-esfuerzo, BNP

Tto médico:

- IM aguda…..nitratos y diuréticos (inotropos y BCIAo si inestabilidad hemodinámica)
- IM crónica con disfunción VI…..IECAs, BB, espironolactona/eplerrenona

Seguimiento:

-IM severa asintomática, FE>60%.....clínica y eco/6 meses

-IM moderada asintomática, FE>60%.....clínica anual y eco/1-2 años

Recommendations	Class[a]	Level[b]
Mitral valve repair should be the preferred technique when the results are expected to be durable.	I	C
Surgery is indicated in symptomatic patients with LVEF >30%.[121,131,132]	I	B
Surgery is indicated in asymptomatic patients with LV dysfunction (LVESD ≥45 mm[c] and/or LVEF ≤60%).[122,131]	I	B
Surgery should be considered in asymptomatic patients with preserved LV function (LVESD <45 mm and LVEF >60%) and atrial fibrillation secondary to mitral regurgitation or pulmonary hypertension[d] (systolic pulmonary pressure at rest >50 mmHg).[123,124]	IIa	B
Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm[c] when a durable repair is likely, surgical risk is low, the repair is performed in a heart valve centre and at least one of the following findings is present: • flail leaflet or • presence of significant LA dilatation (volume index ≥60 mL/m^2 BSA) in sinus rhythm.	IIa	C

Indications for intervention in severe primary mitral regurgitation

Mitral valve repair should be considered in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when the likelihood of successful repair is high and comorbidity low.	IIa	C
Mitral valve replacement may be considered in symptomatic patients with severe LV dysfunction (LVEF <30% and/or LVESD >55 mm) refractory to medical therapy when the likelihood of successful repair is low and comorbidity low.	IIb	C
Percutaneous edge-to-edge procedure may be considered in patients with symptomatic severe primary mitral regurgitation who fulfil the echocardiographic criteria of eligibility and are judged inoperable or at high surgical risk by the Heart Team, avoiding futility.	IIb	C

Indications for mitral valve intervention in chronic secondary mitral regurgitation[a]

Recommendations	Class[b]	Level[c]
Surgery is indicated in patients with severe secondary mitral regurgitation undergoing CABG and LVEF >30%.	I	C
Surgery should be considered in symptomatic patients with severe secondary mitral regurgitation, LVEF <30% but with an option for revascularization and evidence of myocardial viability.	IIa	C
When revascularization is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30% who remain symptomatic despite optimal medical management (including CRT if indicated) and have a low surgical risk.	IIb	C
When revascularization is not indicated and surgical risk is not low, a percutaneous edge-to-edge procedure may be considered in patients with severe secondary mitral regurgitation and LVEF >30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography, avoiding futility.	IIb	C
In patients with severe secondary mitral regurgitation and LVEF <30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have no option for revascularization, the Heart Team may consider a percutaneous edge-to-edge procedure or valve surgery after careful evaluation for a ventricular assist device or heart transplant according to individual patient characteristics.	IIb	C

Estenosis mitral

Diagnóstico: ETT, ETE, PE/eco-esfuerzo

Tto médico:

- Diuréticos, BB, digoxina, Ca-Atg
- ACO…….. FA

  RS + Hª de embolismo sistémico o trombo en OI (Ic)
  Eco-contraste espontáneo en AI o tamaño AI>50 mm y/o vol>60 ml/m2 (IIaC)

Seguimiento:

- EM severa…….clínica y eco anual
- EM moderada……clínica y eco cada 2-3 años

Indications for PMC and mitral valve surgery in clinically significant (moderate or severe) mitral stenosis (valve area $\leq 1.5\ cm^2$)

Recommendations	Class[a]	Level[b]
PMC is indicated in symptomatic patients without unfavourable characteristics[c] for PMC.[144,146,148]	I	B
PMC is indicated in any symptomatic patients with a contraindication or a high risk for surgery.	I	C
Mitral valve surgery is indicated in symptomatic patients who are not suitable for PMC.	I	C
PMC should be considered as initial treatment in symptomatic patients with suboptimal anatomy but no unfavourable clinical characteristics for PMC.[c]	IIa	C
PMC should be considered in asymptomatic patients without unfavourable clinical and anatomical characteristics[c] for PMC and: • high thromboembolic risk (history of systemic embolism, dense spontaneous contrast in the LA, new-onset or paroxysmal atrial fibrillation), and/or • high risk of haemodynamic decompensation (systolic pulmonary pressure >50 mmHg at rest, need for major non-cardiac surgery, desire for pregnancy).	IIa	C

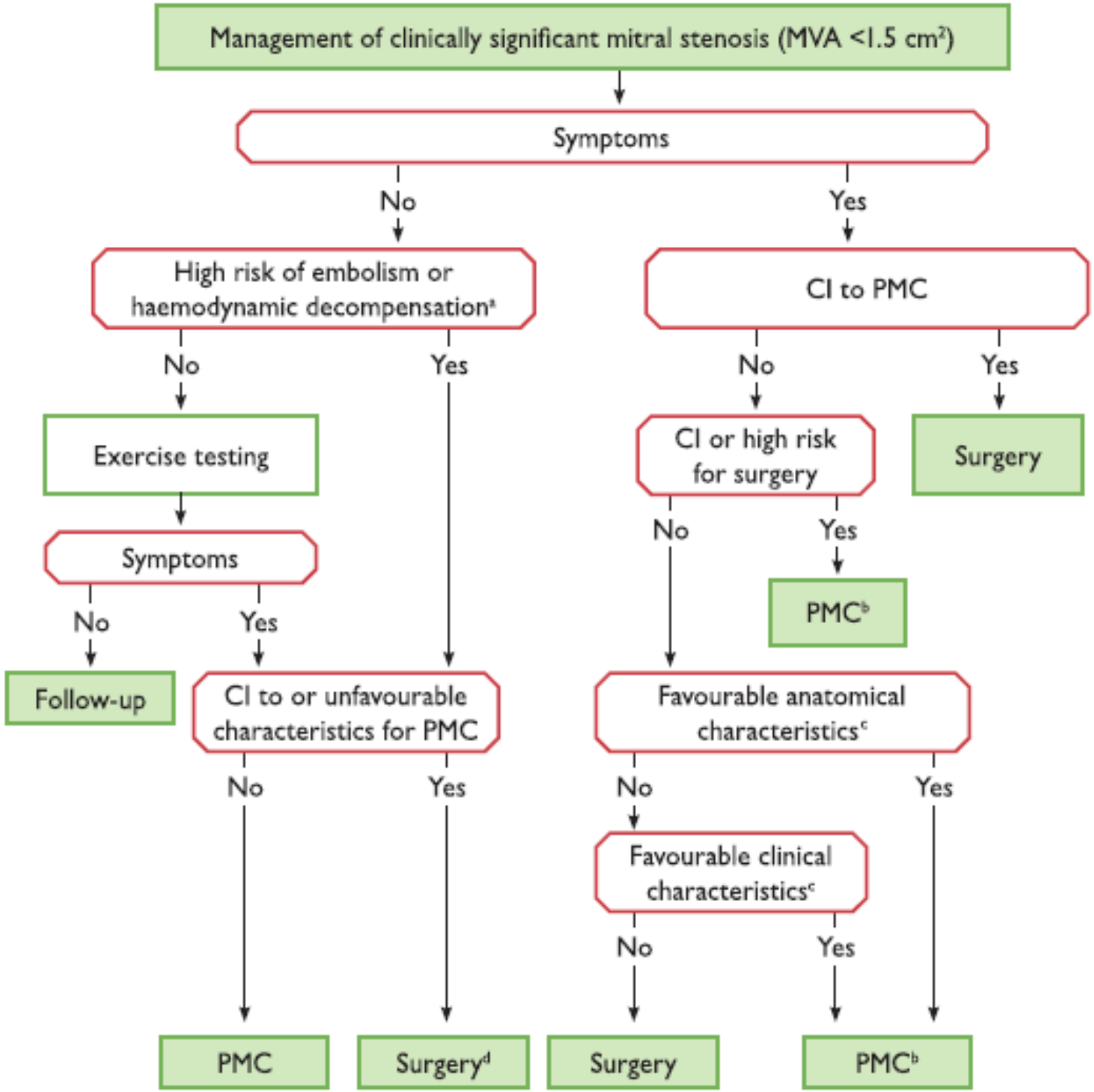

Management of clinically significant mitral stenosis (MVA <1.5 cm²)
Symptoms
No
Yes
High risk of embolism or haemodynamic decompensation[a]
CI to PMC
No
Yes
No
Yes
Exercise testing
CI or high risk for surgery
Surgery
Symptoms
No
Yes
PMC[b]
No
Yes
Follow-up
CI to or unfavourable characteristics for PMC
Favourable anatomical characteristics[c]
No
Yes
No
Yes
Favourable clinical characteristics[c]
No
Yes
PMC
Surgery[d]
Surgery
PMC[b]

Table 8 Contra-indications for percutaneous mitral commissurotomy (PMC)[a]

Contra-indications
Mitral valve area >1.5 cm^{2}[a]
Left atrial thrombus
More than mild mitral regurgitation
Severe or bi-commissural calcification
Absence of commissural fusion
Severe concomitant aortic valve disease, or severe combined tricuspid stenosis and regurgitation requiring surgery
Concomitant CAD requiring bypass surgery

Casos-poblaciones especiales

- ✓EM severa + EAo moderada……PMC
- ✓EM severa + EAo severa……Q VM y VAo

- ✓EM sintomática tras PMC…..Q VM>>>>PMC

- ✓IT severa……PMC si RS, dilatación moderada AI y/o IT funcional (HTP)

  (en otros casos……Q VM y VT)

- ✓*EM severa degenerativa sintomática en ancianos noQ…..TAVI en posición mitral*

Insuficiencia-Estenosis tricúspide

ETT (eco-3D…vol VD)

CMR (función y vol VD)

CNG dcho (IT)

Reparación>>>>>>sustitución valvular (IT)

PT biológicas>>>>mecánicas (ET)

Tto diurético (si IC)

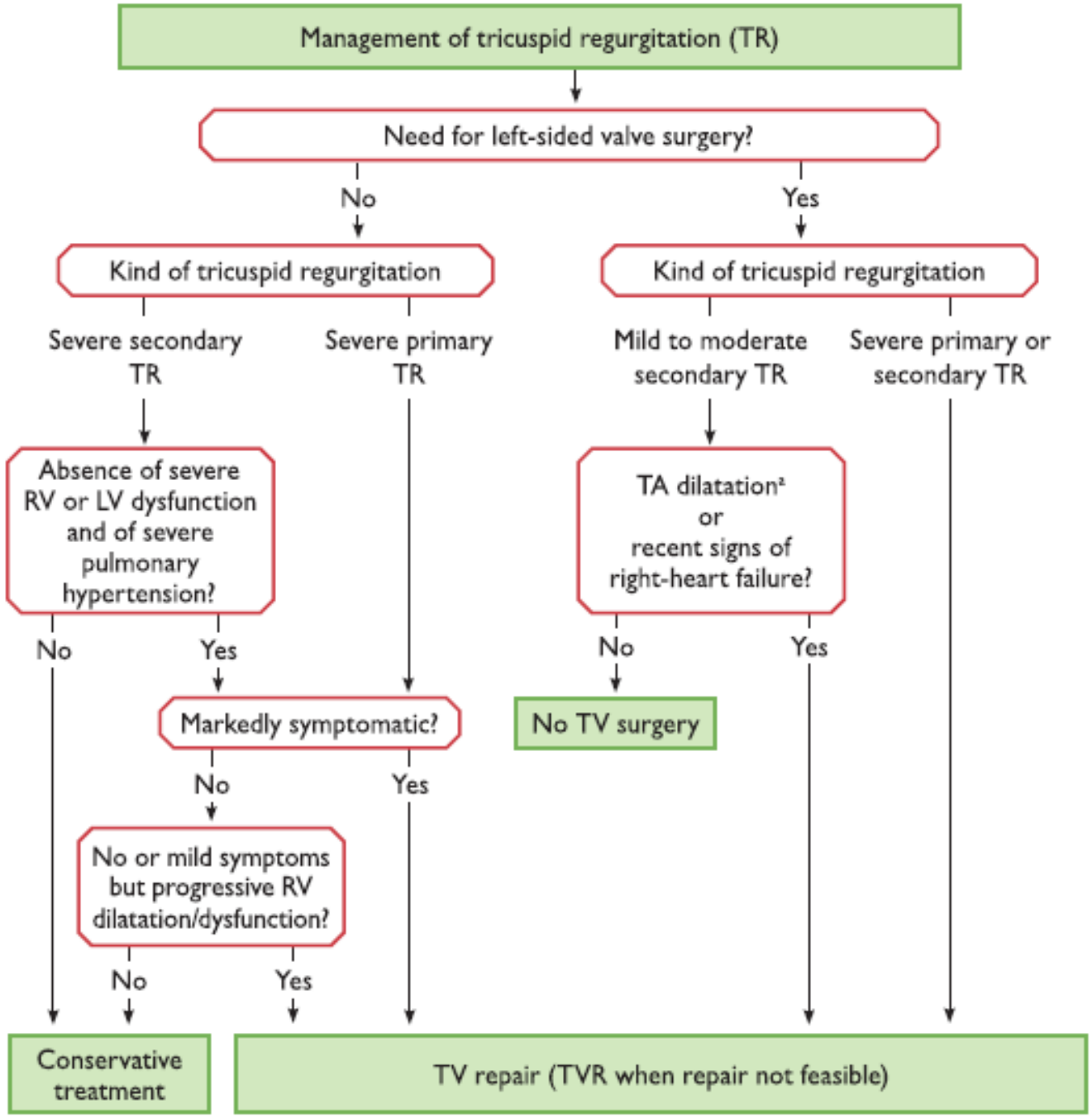
Tto percutáneo…faltan estudios

Indications for tricuspid valve surgery

Recommendations on tricuspid stenosis		
Surgery is indicated in symptomatic patients with severe tricuspid stenosis.[c]	I	C
Surgery is indicated in patients with severe tricuspid stenosis undergoing left-sided valve intervention.[d]	I	C

Recommendations on primary tricuspid regurgitation		
Surgery is indicated in patients with severe primary tricuspid regurgitation undergoing left-sided valve surgery.	I	C
Surgery is indicated in symptomatic patients with severe isolated primary tricuspid regurgitation without severe RV dysfunction.	I	C
Surgery should be considered in patients with moderate primary tricuspid regurgitation undergoing left-sided valve surgery.	IIa	C
Surgery should be considered in asymptomatic or mildly symptomatic patients with severe isolated primary tricuspid regurgitation and progressive RV dilatation or deterioration of RV function.	IIa	C

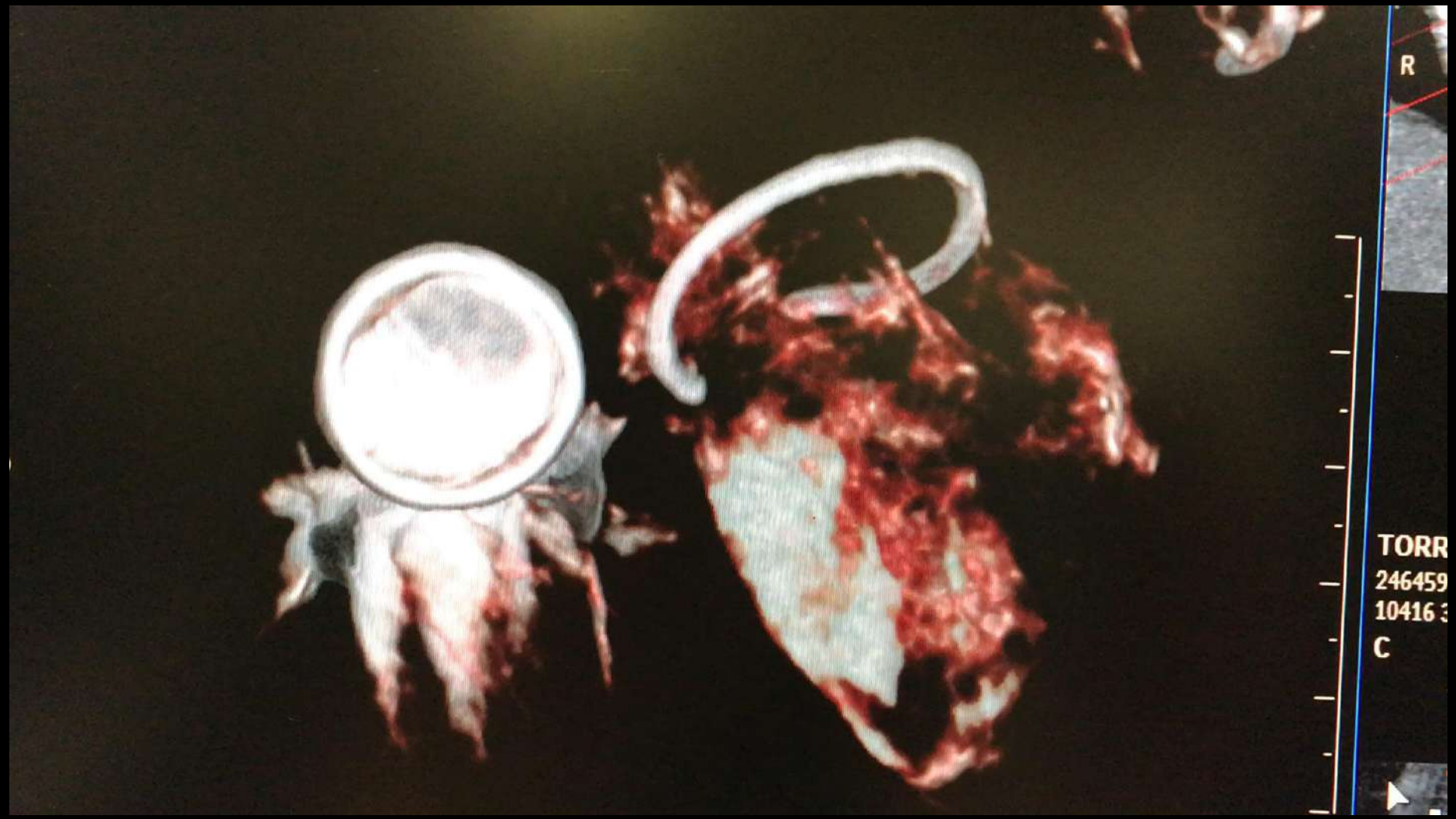
Recommendations on secondary tricuspid regurgitation		
Surgery is indicated in patients with severe secondary tricuspid regurgitation undergoing left-sided valve surgery.	I	C
Surgery should be considered in patients with mild or moderate secondary tricuspid regurgitation with a dilated annulus (≥40 mm or > 21 mm/m^2 by 2D echocardiography) undergoing left-sided valve surgery.	IIa	C
Surgery may be considered in patients undergoing left-sided valve surgery with mild or moderate secondary tricuspid regurgitation even in the absence of annular dilatation when previous recent right-heart failure has been documented.	IIb	C
After previous left-sided surgery and in absence of recurrent left-sided valve dysfunction, surgery should be considered in patients with severe tricuspid regurgitation who are symptomatic or have progressive RV dilatation/dysfunction, in the absence of severe RV or LV dysfunction and severe pulmonary vascular disease/hypertension.	IIa	C


Management of tricuspid regurgitation (TR)
Need for left-sided valve surgery?
No
Yes
Kind of tricuspid regurgitation
Kind of tricuspid regurgitation
Severe secondary TR
Severe primary TR
Mild to moderate secondary TR
Severe primary or secondary TR
Absence of severe RV or LV dysfunction and of severe pulmonary hypertension?
TA dilatation[a] or recent signs of right-heart failure?
No
Yes
No
Yes
Markedly symptomatic?
No TV surgery
No
Yes
No or mild symptoms but progressive RV dilatation/dysfunction?
No
Yes
Conservative treatment
TV repair (TVR when repair not feasible)

Prótesis valvulares

Seguimiento:

- Eco basal <30 días tras IQ
- Revisión **clínica + eco anual** (antes si sospecha de disfunción)
- ETE: ETT subóptimo, en todos los casos de sospecha disfunción PT y/o EI
- Cinefluoroscopia: PT mecánica
- TCMD: sospecha de trombo/pannus


R
TORR
246459
10416 3
C

Choice of the aortic/mitral prosthesis in favour of a mechanical prosthesis: the decision is based on the integration of several of the following factors

Recommendations	Class[a]	Level[b]
A mechanical prosthesis is recommended according to the desire of the informed patient and if there are no contraindications to long-term anticoagulation.[c]	I	C
A mechanical prosthesis is recommended in patients at risk of accelerated structural valve deterioration.[d]	I	C
A mechanical prosthesis should be considered in patients already on anticoagulation because of a mechanical prosthesis in another valve position.	IIa	C
A mechanical prosthesis should be considered in patients <60 years of age for prostheses in the aortic position and <65 years of age for prostheses in the mitral position.[e]	IIa	C
A mechanical prosthesis should be considered in patients with a reasonable life expectancy[f] for whom future redo valve surgery would be at high risk.	IIa	C
A mechanical prosthesis may be considered in patients already on long-term anticoagulation due to the high risk for thromboembolism.[g]	IIb	C

Choice of the aortic/mitral prosthesis in favour of a bioprosthesis: the decision is based on the integration of several of the following factors

Recommendations	Class[a]	Level[b]
A bioprosthesis is recommended according to the desire of the informed patient.	I	C
A bioprosthesis is recommended when good-quality anticoagulation is unlikely (compliance problems, not readily available) or contraindicated because of high bleeding risk (previous major bleed, comorbidities, unwillingness, compliance problems, lifestyle, occupation).	I	C
A bioprosthesis is recommended for reoperation for mechanical valve thrombosis despite good long-term anticoagulant control.	I	C
A bioprosthesis should be considered in patients for whom there is a low likelihood and/or a low operative risk of future redo valve surgery.	IIa	C
A bioprosthesis should be considered in young women contemplating pregnancy.	IIa	C
A bioprosthesis should be considered in patients >65 years of age for a prosthesis in the aortic position or > 70 years of age in a mitral position or those with a life expectancy[c] lower than the presumed durability of the bioprosthesis.[d]	IIa	C

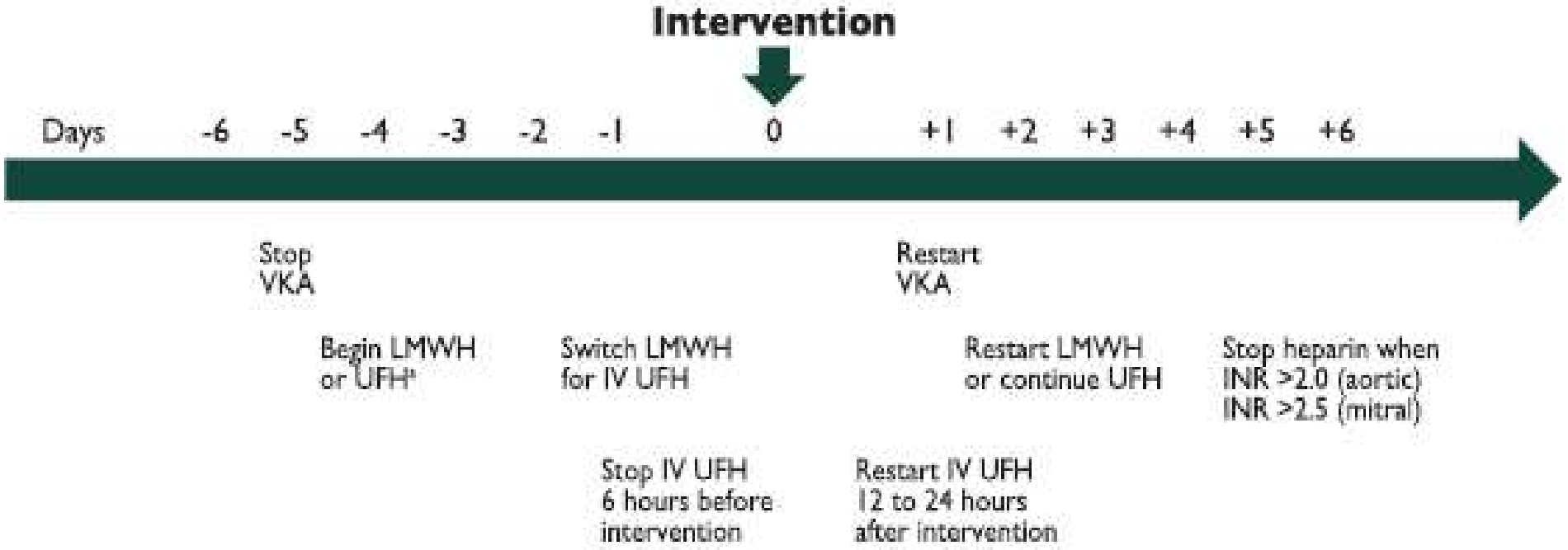
Indications for antithrombotic therapy in patients with a prosthetic heart valve or valve repair

Bioprostheses		
Oral anticoagulation is recommended lifelong for patients with surgical or transcatheter implanted bioprostheses who have other indications for anticoagulation.[c]	I	C
Oral anticoagulation using a VKA should be considered for the first 3 months after surgical implantation of a mitral or tricuspid bioprosthesis.	IIa	C
Oral anticoagulation using a VKA should be considered for the first 3 months after surgical mitral or tricuspid valve repair.	IIa	C
Low-dose aspirin (75 - 100 mg/day) should be considered for the first 3 months after surgical implantation of an aortic bioprosthesis or valve-sparing aortic surgery.	IIa	C
Dual antiplatelet therapy should be considered for the first 3–6 months after TAVI, followed by lifelong single antiplatelet therapy in patients who do not need oral anticoagulation for other reasons.	IIa	C
Single antiplatelet therapy may be considered after TAVI in the case of high bleeding risk.	IIb	C
Oral anticoagulation may be considered for the first 3 months after surgical implantation of an aortic bioprosthesis.	IIb	C

Mechanical prostheses		
Oral anticoagulation using a VKA is recommended lifelong for all patients.[179,180]	I	B
Bridging using therapeutic doses of UFH or LMWH is recommended when VKA treatment should be interrupted.	I	C
The addition of low-dose aspirin (75 - 100 mg/day) to VKA should be considered after thromboembolism despite an adequate INR.	IIa	C
The addition of low-dose aspirin (75 - 100 mg/day) to VKA may be considered in the case of concomitant atherosclerotic disease.	IIb	C
INR self-management is recommended provided appropriate training and quality control are performed.[181]	I	B
In patients treated with coronary stent implantation, triple therapy with aspirin (75 - 100 mg/day), clopidogrel (75 mg/day) and VKA should be considered for 1 month, irrespective of the type of stent used and the clinical presentation (i.e. ACS or stable CAD).[182]	IIa	B
Triple therapy comprising aspirin (75–100 mg/day), clopidogrel (75 mg/day) and VKA for >1 month and up to 6 months should be considered in patients with high ischaemic risk due to ACS or other anatomical/procedural characteristics that outweighs the bleeding risk.[182]	IIa	B
Dual therapy comprising VKA and clopidogrel (75 mg/day) should be considered as an alternative to 1-month triple antithrombotic therapy in patients in whom the bleeding risk outweighs the ischaemic risk.[183,184]	IIa	A
In patients who have undergone PCI, discontinuation of antiplatelet treatment should be considered at 12 months.[185]	IIa	B
In patients requiring aspirin and/or clopidogrel in addition to VKA, the dose intensity of VKA should be carefully regulated with a target INR in the lower part of the recommended target range and a time in the therapeutic range >65 - 70%.[182,184]	IIa	B
The use of NOACs is contraindicated.[45]	III	B

- No interrumpir ACO para Q menores ni para CNG (vía radial).

- Suspender ACO en CNG que precisen px transeptal para procedimientos valvulares y/o pericardiocentesis
- Suspender ACO en Q mayores (INR<1,5)



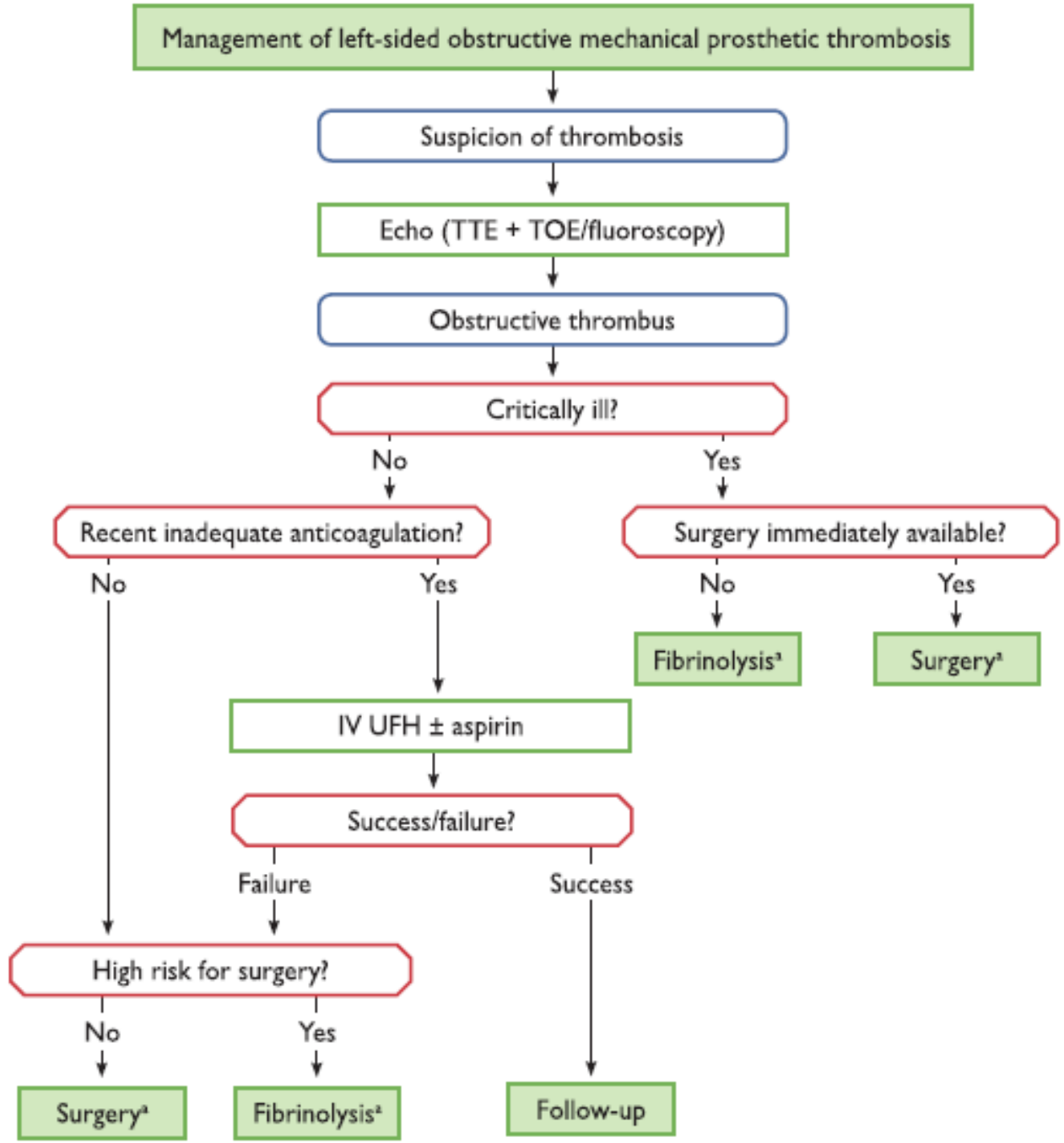
Complicaciones……tto

- ✓Trombosis (obstructiva y no obstructiva)
- ✓Hemólisis
- ✓Leaks
- ✓Disfunción PT

Management of prosthetic valve dysfunction

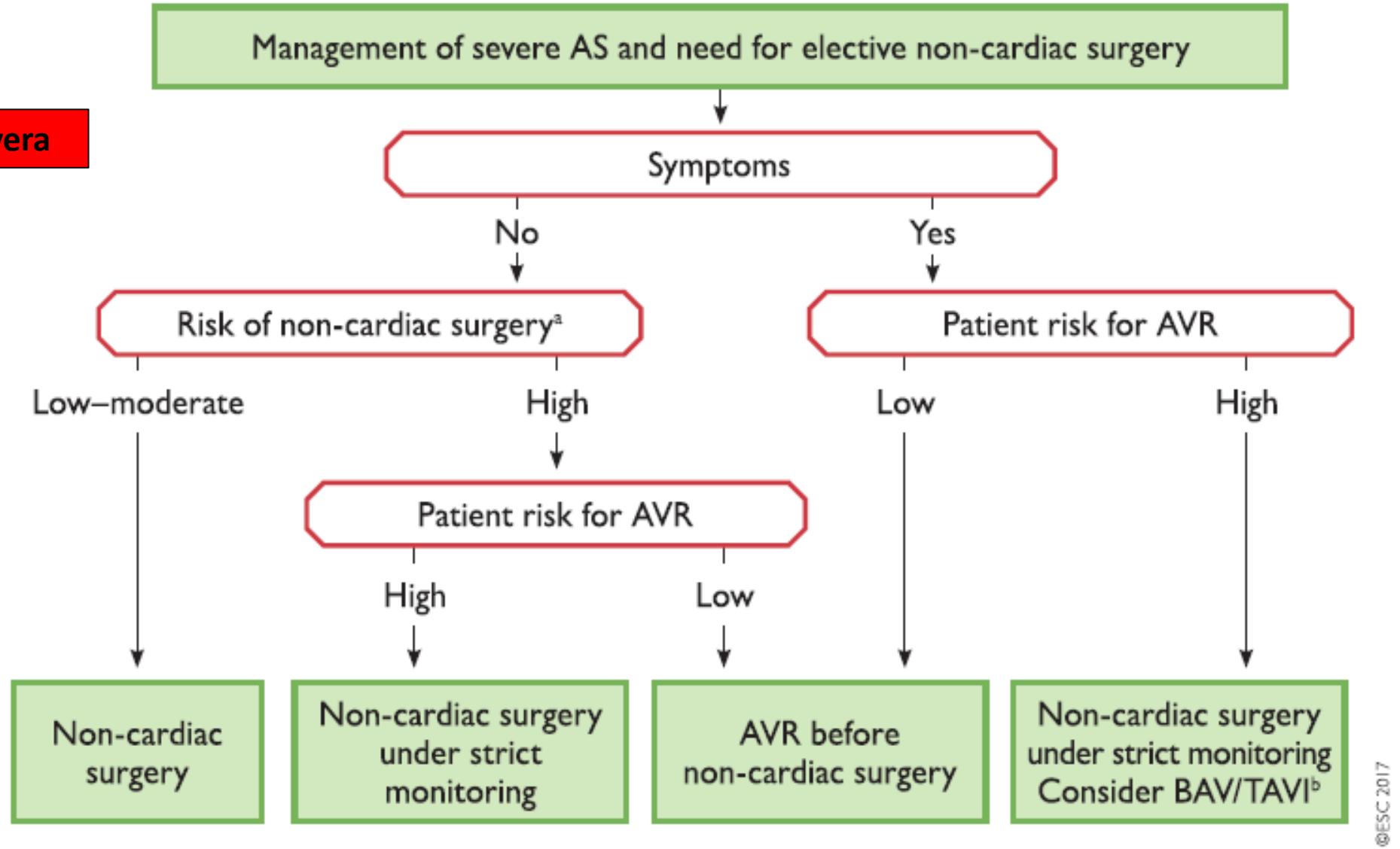
Mechanical prosthetic thrombosis		
Urgent or emergency valve replacement is recommended for obstructive thrombosis in critically ill patients without serious comorbidity.	I	C
Fibrinolysis (using recombinant tissue plasminogen activator 10 mg bolus + 90 mg in 90 min with UFH or streptokinase 1 500 000 U in 60 min without UFH) should be considered when surgery is not available or is very high risk or for thrombosis of right-sided prostheses.	IIa	C
Surgery should be considered for large (>10 mm) non-obstructive prosthetic thrombus complicated by embolism.	IIa	C
Bioprosthetic thrombosis		
Anticoagulation using a VKA and/or UFH is recommended in bioprosthetic valve thrombosis before considering reintervention.	I	C

Haemolysis and paravalvular leak		
Reoperation is recommended if paravalvular leak is related to endocarditis or causes haemolysis requiring repeated blood transfusions or leading to severe symptoms.	I	C
Transcatheter closure may be considered for paravalvular leaks with clinically significant regurgitation in surgical high-risk patients (Heart Team decision).	IIb	C
Bioprosthetic failure		
Reoperation is recommended in symptomatic patients with a significant increase in transprosthetic gradient (after exclusion of valve thrombosis) or severe regurgitation.	I	C
Reoperation should be considered in asymptomatic patients with significant prosthetic dysfunction if reoperation is at low risk.	IIa	C
Transcatheter valve-in-valve implantation in the aortic position should be considered by the Heart Team depending on the risk of reoperation and the type and size of prosthesis.	IIa	C


Management of left-sided obstructive mechanical prosthetic thrombosis
Suspicion of thrombosis
Echo (TTE + TOE/fluoroscopy)
Obstructive thrombus
Critically ill?
No
Yes
Recent inadequate anticoagulation?
Surgery immediately available?
No
Yes
No
Yes
Fibrinolysis[a]
Surgery[a]
IV UFH ± aspirin
Success/failure?
Failure
Success
High risk for surgery?
No
Yes
Surgery[a]
Fibrinolysis[a]
Follow-up

Manejo de las valvulopatías en pacientes que precisan Q no cardiaca……ETT

EAo severa



EM

EM ligera (AVM>1,5 cm2)
EM significativa asintomática + PSAP <50 mmHg

] 1º Q no cardiaca

EM sintomática
PSAP>50 mmHg

] 1º Tto mitral (percutáneo>>>>Q) y luego Q no cardiaca

IAo/IM severas

FE normal + asintomáticos……..Q no cardiaca
FE reducida y/o síntomas……..1º Q Valvular y luego Q no cardiaca

FEVI <30%

Q no cardica que sea estrictamente necesaria (tras optimizar tto médico)

What is new in the 2017 Valvular Heart Disease Guidelines?

Changes in recommendations

2012	2017
Indications for intervention in symptomatic aortic stenosis	
IIb C Intervention may be considered in symptomatic patients with low-flow, low-gradient aortic stenosis and reduced ejection fraction without flow (contractile) reserve.	**IIa C** Intervention should be considered in symptomatic patients with low-flow, low-gradient aortic stenosis and reduced ejection fraction without flow (contractile) reserve, particularly when CT calcium scoring confirms severe aortic stenosis.
Choice of intervention in symptomatic aortic stenosis	
Recommendations for the use of TAVI (Tables on *"Contra-indications for TAVI"* and Table on *"Recommendations for the use of TAVI"*)	**Replaced by recommendations for the choice of intervention** See Section b in Table *"Indications for intervention in aortic stenosis and recommendations for the choice of intervention"* (Section 5.2), and Table 7 *"Aspects to be considered by the heart team for the decision between SAVR and TAVI in patients at increased surgical risk"*
Indications for surgery in asymptomatic aortic stenosis	
IIb C Markedly elevated BNP levels.	**IIa C** Markedly elevated BNP levels (>threefold age- and sex-corrected normal range) confirmed by repeated measurements without other explanations.
IIb C Increase of mean pressure gradient with exercise by >20 mmHg	Taken out

Indications for surgery in asymptomatic aortic stenosis

- **New IIa C recommendation:**
  Severe pulmonary hypertension (systolic pulmonary artery pressure at rest >60 mmHg confirmed by invasive measurement) without other explanation.

Changes in recommendations

2012	2017
Indications for intervention in asymptomatic severe primary mitral regurgitation	
IIb C Surgery may be considered in asymptomatic patients with preserved LV function, high likelihood of durable repair, low surgical risk, and: • Left atrial dilatation (volume index ≥60 mL/m² BSA) and sinus rhythm	**IIa C (modified!)** Surgery should be considered in asymptomatic patients with preserved LVEF (>60%) and LVESD 40–44 mm when a durable repair is likely, surgical risk is low, the repair is performed in heart valve centres, and the following finding is present: presence of significant LA dilatation (volume index ≥60 mL/m² BSA) in sinus rhythm.
Pulmonary hypertension on exercise (SPAP ≥ 60 mmHg at exercise)	Taken out

Indications for intervention in asymptomatic severe primary mitral regurgitation

New additional statement:

• If pulmonary hypertension (SPAP >50 mmHg at rest) is the only indication for surgery, the value should be confirmed by invasive measurement.

Changes in recommendations

2012	2017
Indications for mitral valve intervention in secondary mitral regurgitation	
IIa C Surgery should be considered in patients with moderate secondary mitral regurgitation undergoing CABG	Taken out
IIb C When revascularization is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated).	**IIb C (modified)** When revascularization is not indicated, surgery may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and have a low surgical risk. When revascularization is not indicated and surgical risk is not low, a percutaneous edge-to-edge procedure may be considered in patients with severe secondary mitral regurgitation and LVEF >30%, who remain symptomatic despite optimal medical management (including CRT if indicated) and who have a suitable valve morphology by echocardiography, avoiding futility. In patients with severe secondary mitral regurgitation and LVEF <30% who remain symptomatic despite optimal medical management (including CRT if indicated) and who have no option for revascularization, the Heart Team may consider percutaneous edge-to-edge procedure or valve surgery after careful evaluation for ventricular assist device or heart transplant according to individual patient characteristics.

Changes in recommendations

2012	2017
Indications for antithrombotic therapy in patients with a prosthetic heart valve or valve repair	
IIa C The addition of low-dose aspirin (75–100 mg/day) to VKA should be considered in the case of concomitant atherosclerotic disease.	**IIb C** The addition of low-dose aspirin (75–100 mg/day) to VKA may be considered in the case of concomitant atherosclerotic disease.

Management of CAD in patients with VHD

New IIa C recommendations:

- CT angiography should be considered as an alternative to coronary angiography before valve surgery in patients with severe VHD and low probability of CAD, or in whom conventional coronary angiography is technically not feasible or who are at high risk.
- PCI should be considered in patients with a primary indication to undergo TAVI and coronary artery diameter stenosis >70% in proximal segments.
- PCI should be considered in patients with a primary indication to undergo transcatheter mitral valve interventions and coronary artery diameter stenosis >70% in proximal segments.

Indications for surgery in severe aortic regurgitation and aortic root disease

- **New I C recommendations:**
  Heart Team discussion is recommended in selected patientsc in whom aortic valve repair may be a feasible alternative to valve replacement.
- Aortic valve repair, using the reimplantation or remodelling with aortic annuloplasty technique, is recommended in young patients with aortic root dilation and tricuspid aortic valves, when performed by experienced surgeons.

- **New IIa C recommendation:**
  Surgery should be considered in patients who have aortic root disease with maximal ascending aortic diameter: ≥45 mm in patients with a *TGFBR1* or *TGFBR2* mutation (including Loeys-Dietz syndrome).[f]

[f] A lower threshold of 40 mm may be considered in women with low BSA, in patients with a TGFBR2 mutation, or in patients with severe extra-aortic features.[60]

Diagnosis of severe aortic stenosis

See new recommendations for the diagnosis of severe aortic stenosis in Figure 2 and Table 6.

Table 6 Criteria that increase the likelihood of severe aortic stenosis in patients with AVA <1.0 cm^2 and mean gradient <40 mmHg in the presence of preserved ejection fraction (modified from Baumgartner *et al.*[4])

Criteria	
Clinical criteria	• Typical symptoms without other explanation • Elderly patient (>70 years)
Qualitative imaging data	• LV hypertrophy (additional history of hypertension to be considered) • Reduced LV longitudinal function without other explanation
Quantitative imaging data	• Mean gradient 30–40 mmHg[a]
	• AVA ≤0.8 cm^2
	• Low flow (SVi <35 mL/m^2) confirmed by techniques other than standard Doppler technique (LVOT measurement by 3D TOE or MSCT; CMR, invasive data)
	• Calcium score by MSCT[b] Severe aortic stenosis very likely: men ≥3000; women ≥1600 Severe aortic stenosis likely: men ≥2000; women ≥1200 Severe aortic stenosis unlikely: men <1600; women <800

Management after valve intervention

New recommendation:

- After transcatheter as well as surgical implantation of a bioprosthetic valve, echocardiography – including the measurement of transprosthetic gradients – should be performed within 30 days (preferably around 30 days for surgery) after valve implantation (i.e. baseline imaging), at 1 year after implantation, and annually thereafter.

Indications for antithrombotic therapy in patients with a prosthetic heart valve or valve repair

New recommendations:

I B

- INR self-management is recommended provided appropriate training and quality control are performed.

IIa B

- In patients treated with coronary stent implantation, triple therapy with aspirin (75–100 mg/day), clopidogrel (75 mg/day), and VKA should be considered for 1 month, irrespective of the type of stent used and the clinical presentation (i.e. ACS or stable CAD).
- Triple therapy comprising aspirin (75–100 mg/day), clopidogrel (75 mg/day), and VKA for longer than 1 month and up to 6 months should be considered in patients with high ischaemic risk due to ACS or other anatomical/procedural characteristics that outweigh the bleeding risk.

IIa A

- Dual therapy comprising VKA and clopidogrel (75 mg/day) should be considered as an alternative to 1-month triple antithrombotic therapy in patients in whom the bleeding risk outweighs the ischaemic risk.

IIa B

- In patients who have undergone PCI, discontinuation of antiplatelet treatment should be considered at 12 months.
- In patients requiring aspirin and/or clopidogrel in addition to VKA, the dose intensity of VKA should be carefully regulated with a target INR in the lower part of the recommended target range and a time in therapeutic range >65–70%.

IIa C

- Dual antiplatelet therapy should be considered for the first 3–6 months after TAVI, followed by lifelong single antiplatelet therapy in patients who do not need oral anticoagulation for other reasons.

IIb C

- Single antiplatelet therapy may be considered after TAVI in the case of high bleeding risk.

III B

- The use of NOACs is contraindicated in mechanical valves

Management of prosthetic valve dysfunction
New recommendations:

I C
Anticoagulation using a VKA and/or UFH is recommended in bioprosthetic valve thrombosis before considering reintervention.

I C
Reoperation is recommended if paravalvular leak is related to endocarditis or causes haemolysis requiring repeated blood transfusions or leading to severe symptoms.

IIb C
Transcatheter closure may be considered for paravalvular leaks with clinically significant regurgitation in surgical high-risk patients (Heart Team decision).

IIa C
Transcatheter valve-in-valve implantation in aortic position should be considered by the Heart Team depending on the risk of reoperation and the type and size of prosthesis.

Gracias