Cardioembolic infarction in the Sagrat Cor-Alianza Hospital of Barcelona Stroke Registry

Arboix A, Vericat MC, Pujades R, Massons J, García-Eroles L, Oliveres M.
Cardioembolic infarction in the Sagrat Cor-Alianza Hospital of Barcelona Stroke Registry.
Acta Neurol Scand 1997: 96: 407–412

Table 1. In-hospital mortality according to stroke subtypes

Subtype	Alive	Dead	Percentage
Ischaemic	686	107	13.5
Lacunar	177	none	0
Cardioembolic	113	34	23.1
Atherothrombotic	215	54	20.1
Unusual cause	44	4	8.3
Undetermined origin	137	15	9.8
Haemorrhagic	139	54	27.9
Parenchymal haemorrhage	108	48	30.7
Subarachnoid haemorrhage	20	5	20
Subdural haematoma[1]	10	1	10
Epidural haematoma[1]	1	none	0

[1] Spontaneous, not resulting from injury.

(Arboix et al. Cerebrovasc Dis 1996; 6: 161-165)

Anticoagulación en el infarto cardioembólico

- Anticoagulación oral (INR 2.0-3.0) reduce el riesgo de infarto recurrente en el paciente con ACxFA e infarto cerebral reciente (*European Atrial Fibrillation Study Group, 1995*).
- Prótesis valvulares mecánicas: INR 3.0-4.0 (*Cannegieter et al, 1995*)

Anticoagulación en el infarto cardioembólico (II)

- Se recomienda anticoagulación oral a largo plazo (INR 2.0-3.0) (*EUSI, 2000*):
  - Valvulopatía reumática cardíaca.
  - Infarto de miocardio
  - Insuficiencia cardíaca
  - Cardiomiopatía
  - Otros trastornos del ritmo distintos de ACxFA
  - Foramen Oval permeable

Entidades con un elevado riesgo de recurrencia

Cerebrovasc Dis 2008; 25: 457-507

- "It is recommended that combined low-dose **aspirin and dypiridamole** should be given if oral anticoagulation is contraindicated" (Class IV, GCP)

Cerebrovasc Dis 2008; 25: 457-507

Nous anticoagulants orals

- **Dabigatran** (“*RE-LY*”, NEJM 2009)
- **Rivaroxaban** (“*ROCKET-AF*”, NEJM 2011)
- **Apixaban** (“*ARISTOTLE*”, NEJM 2011 “*AVERROES*” NEJM 2011)
- **Edoxaban**

European Journal of Neurology 1999, **6**:677–683

Early differentiation of cardioembolic from atherothrombotic cerebral infarction: a multivariate analysis

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[a]*Acute Stroke Unit, Department of Neurology,* [b]*Service of Cardiology and* [c]*Intensive Care Unit, Hospital del Sagrat Cor, Barcelona, Spain*

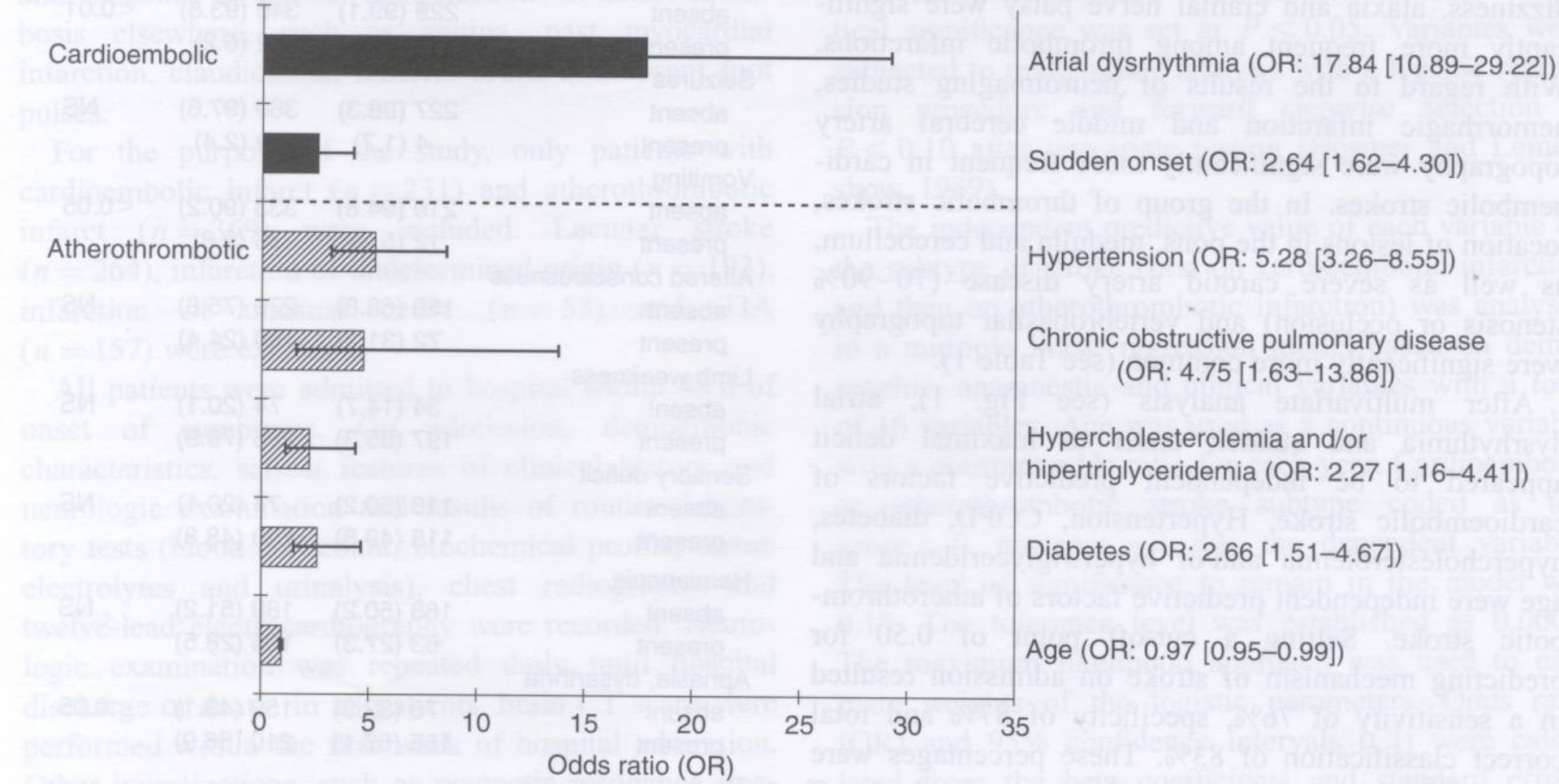

FIGURE 1. Odds ratios (OR) and 95% confidence intervals (CI) for diagnosis of cardioembolic or atherothrombotic infarction estimated from a logistic regression model based on demographic, anamnestic and clinical variables

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International Journal of Cardiology 73 (2000) 33–42

International Journal of Cardiology

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Atrial fibrillation and stroke: clinical presentation of cardioembolic versus atherothrombotic infarction

Adrià Arboix MD[a,*], Lluis García-Eroles MD[b], Juan B. Massons MD[a], Montserrat Oliveres MD[a], Ramón Pujades MD[c], Cecilia Targa MD[a]

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Specific cardiac disorders in 402 consecutive patients with ischaemic cardioembolic stroke☆

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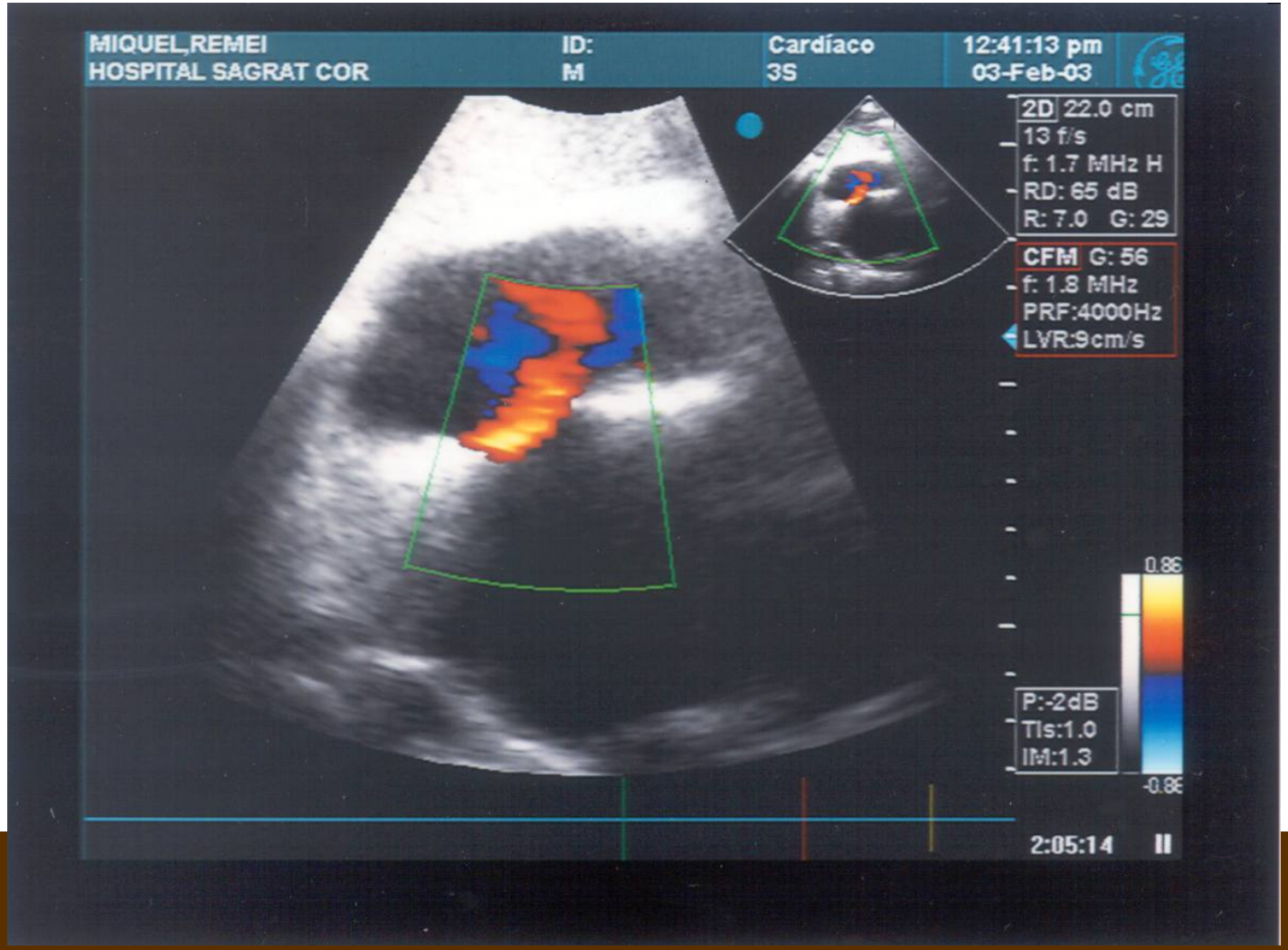
Abstract

Table 2
Cardiac disorders and pathophysiological mechanisms presumptively associated with cardioembolic stroke in 402 patients (distribution by cardiac source risk groups)

Cardiac source of embolism	Number of patients
Arrhythmia without structural heart disease	89 (22.1%)
Atrial fibrillation	88
Atrial flutter	1
Isolated structural heart disease	81 (20.1%)
Ischaemic heart disease	35
Acute myocardial infarction	3 (thrombus 2)
Left ventricular aneurysm	7 (thrombus 3)
Left ventricular ejection fraction $<40\%$	12
Akinesia/dyskinesia ≥ 2 segments	13 (thrombus 3)
Dilated cardiomyopathy	24 (thrombus 5)
Mitral annular calcification	14[a]
Cardiac tumour	4
Aortic prosthetic valve	4
Endocarditis	2
Atrial septal aneurysm with patent foramen ovale	2
Rheumatic mitral valve disease	1
Mitral valve prolapse	1
Calcified aortic stenosis	1
Moderate mitral valve regurgitation	1
Structural heart disease and atrial arrhythmia	232 (57.7%)
Atrial fibrillation	230
Atrial flutter	2
Hypertrophic hypertensive cardiac disease	120
Rheumatic mitral valve disease	49 (thrombus 7)
Ischaemic heart disease	19
Left ventricular aneurysm	3 (thrombus 1)
Left ventricular ejection fraction $<40\%$	9
Akinesia/dyskinesia ≥ 2 segments	7 (thrombus 1)
Mitral annular calcification	26[b]
Dilated cardiomyopathy	13 (thrombus 2)
Mitral valve prolapse	4
Mitral prosthetic valve	3 (thrombus 2)
Lipomatous hypertrophy of the atrial septum	2
Hypertrophic cardiomyopathy	2
Atrial septal aneurysm and patent foramen ovale	2
Severe mitral regurgitation	2

[a] In 8 patients in association with a structural cardiac source of embolism (dilated cardiomyopathy, $n=2$; ischaemic heart disease with ventricular

Foramen oval permeable



CODICIA

Serena J et al. Stroke 2008; 39: 3131-3136

- Multicéntric: 17 hospitals
- Risc de recurrència en FOP en infarts essencials
- n=486 pacients, seguiment 729 dies
- Risc recurrència molt baix: 5.8% global i 2.5% anual, similar al dels infarts essencials sense FOP
- Risc recurrència menor en joves (3.5% global i 1.7% anual).

Foramen oval permeable

(Cerebrovasc Dis 2008; 25: 457-507)

- Primera condició:
  - Infart cerebral d'etiologia essencial
    - Antiagregació plaquetària
- Segona condició:
  - Associació amb aneurisma septe auricular
  - Trombosi venosa profona
    - Anticoagulació
- Tercera condició:
  - Infart cerebral recurrent
    - Tancament percutani FOP

AHA/ASA Guideline

- "**PFO closure may be considered for patients with recurrent cryptogenic stroke despite optimal medical therapy**"

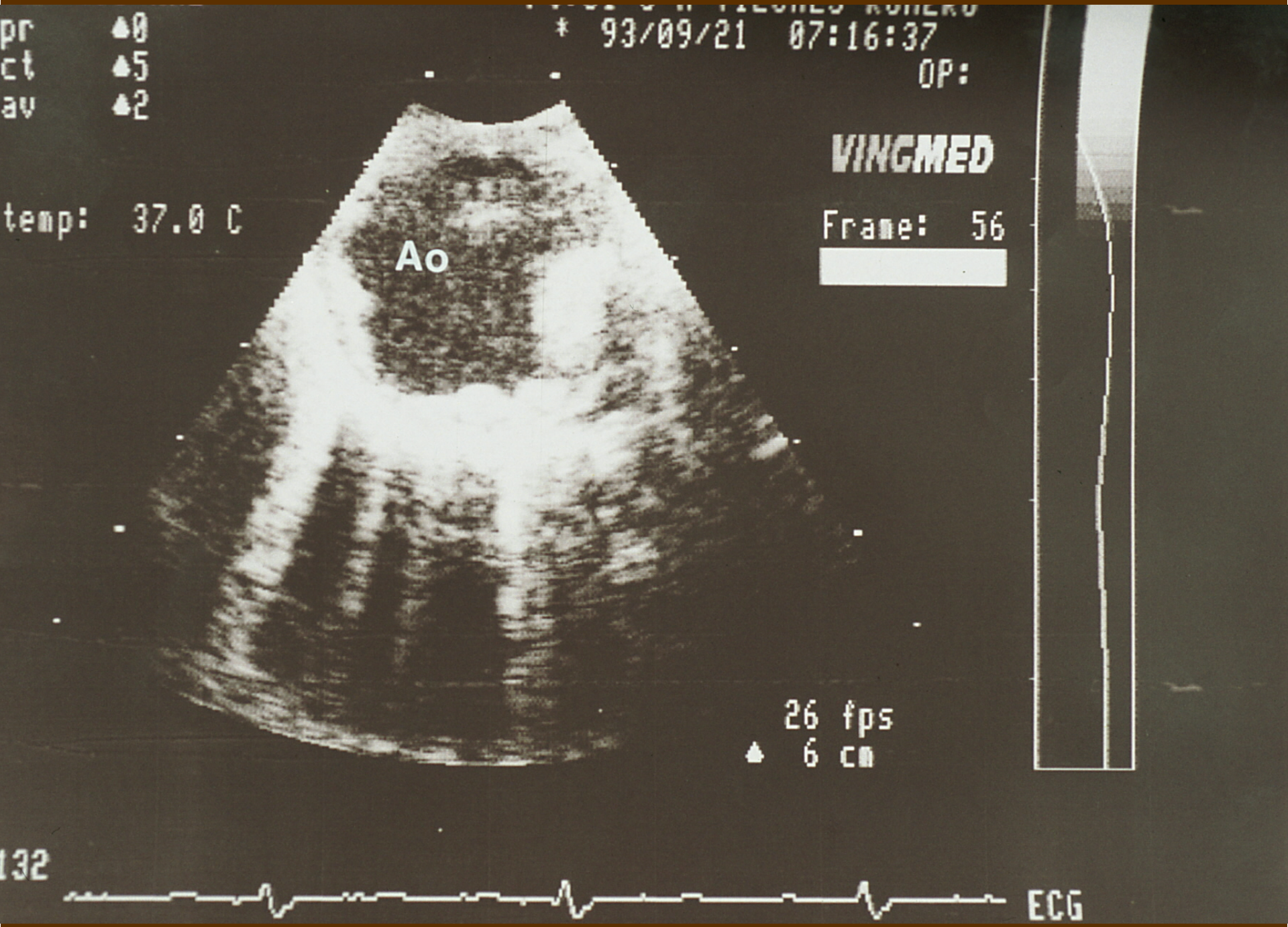
  (*Class II, Level of Evidence C*)

- **CASO CLÍNICO**: Varón de 78 años, manidextro
- Diabetes II; HTA; Cardiopatía isquémica dudosa; Ulcus péptico; EPOC; T Distímico ocasional.
- Episodio súbito, cefalea moderada holocraneal, síntomatología neurovegetativa, disartria, déficit motor braquial izquierdo 3/5 de curso regresivo, hemihipoalgesia asociada.
- TAC y RNM: infarto isquémico parietal derecho.
- Eco-doppler TSA y angio RM: estenosis <40% arteria carótida interna izquierda y del 15% derecha
- Ecocardiografía transtorácica: ligera hipertrofia ventricular izquierda, con fracción eyección conservada y aurícula izquierda 42 mm

DIAGNÓSTICO: ***INFARTO ISQUÉMICO DE ETIOLOGÍA ESENCIAL***

- 9 meses más tarde, reingresa por episodio de afasia mixta de predominio motor secundario a un infarto isquémico silviano posterior izquierdo.

Ecocardiografía transesofágica: extensa placa ateromatosa complicada en cara anterior del cayado aórtico de grosor 7 mm,
compatible con **ateromatosis aórtica grado IV**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TÉCNICAS DE IMAGEN

Papel de las placas complejas de ateroma aórtico en la recurrencia del infarto cerebral de etiología incierta

Ramón Pujadas[a], Adriá Arboix[b], Núria Anguera[a], Montserrat Oliveres[b], Joan Massons[b] y Emilio Comes[b]

[a]Servicio de Cardiología. Hospital del Sagrat Cor. Barcelona.
[b]Servicio de Neurología. Hospital del Sagrat Cor. Barcelona. España.

INFARTO ESENCIAL

(*Pujadas R et al.* ***Rev Esp Cardiol 2005; 58: 34-40***)

(n = 248, AAS 300/d)

RECURRENTE PRECOZ n=25

Eco transesofagico

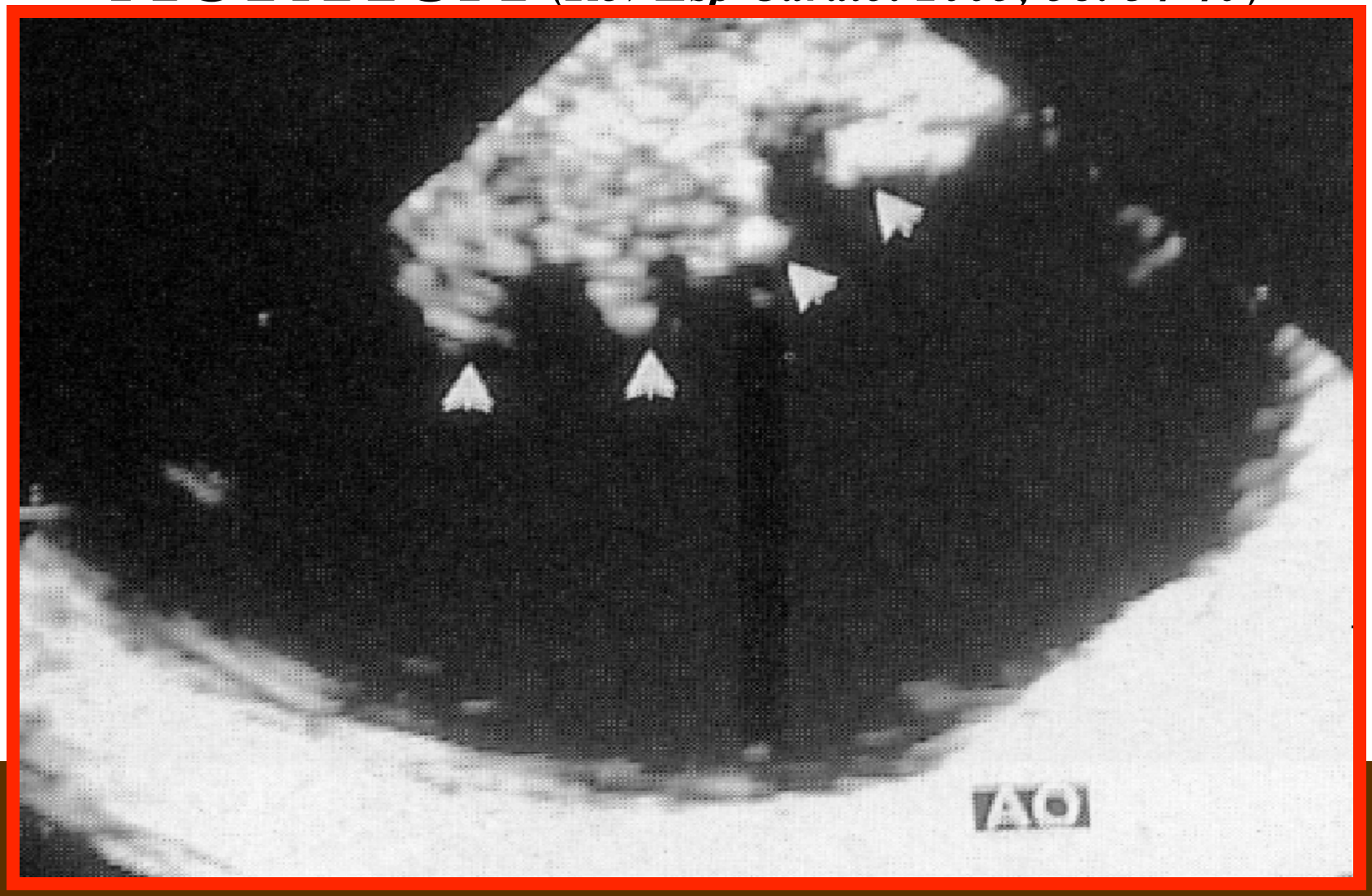
HVI, "smoke" trombo orejuela en RS (1)

Normal (7)

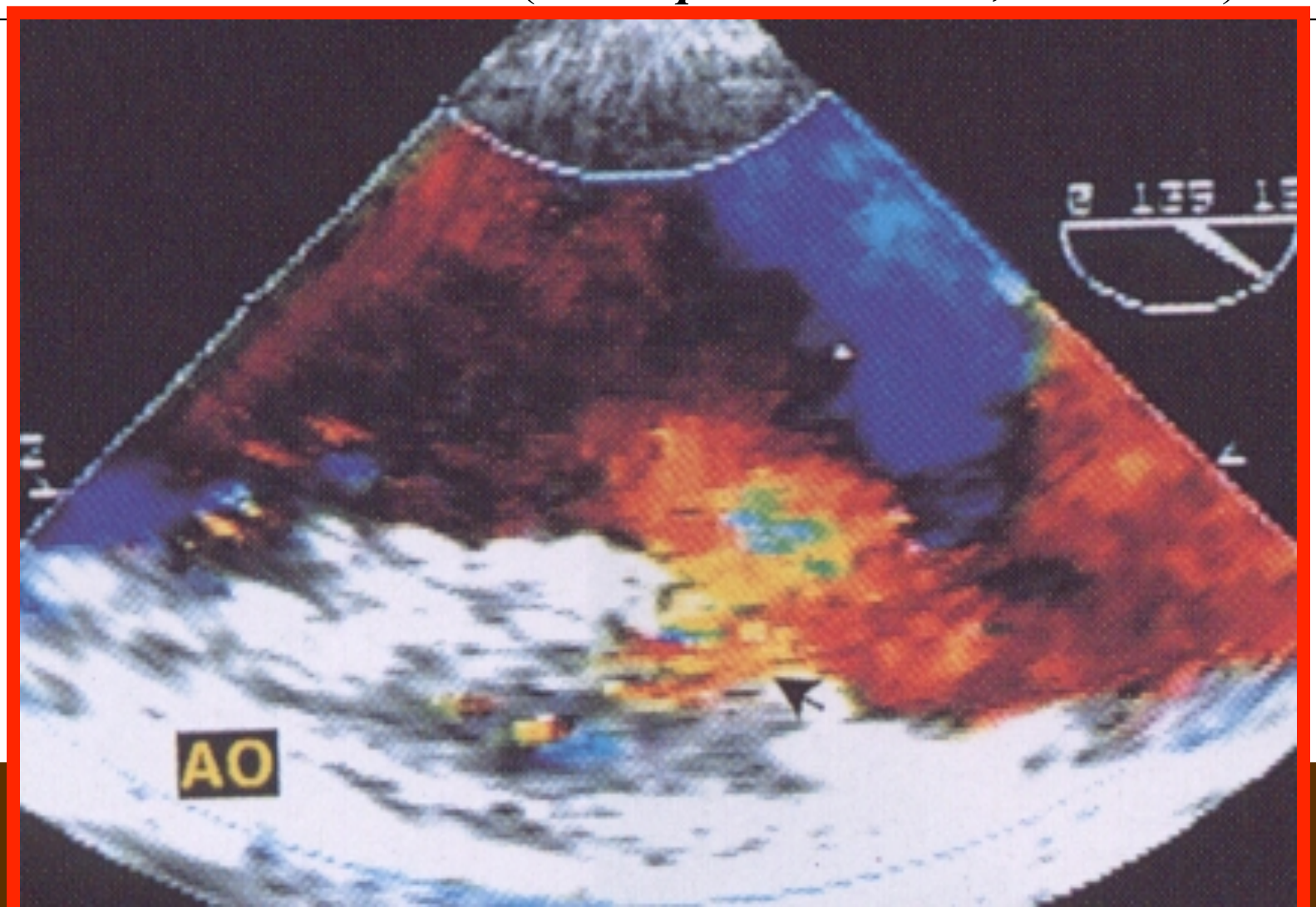
Aterotrombosis de aorta ascendente y/o cayado (16)

Foramen oval per-meable + ASA (1)

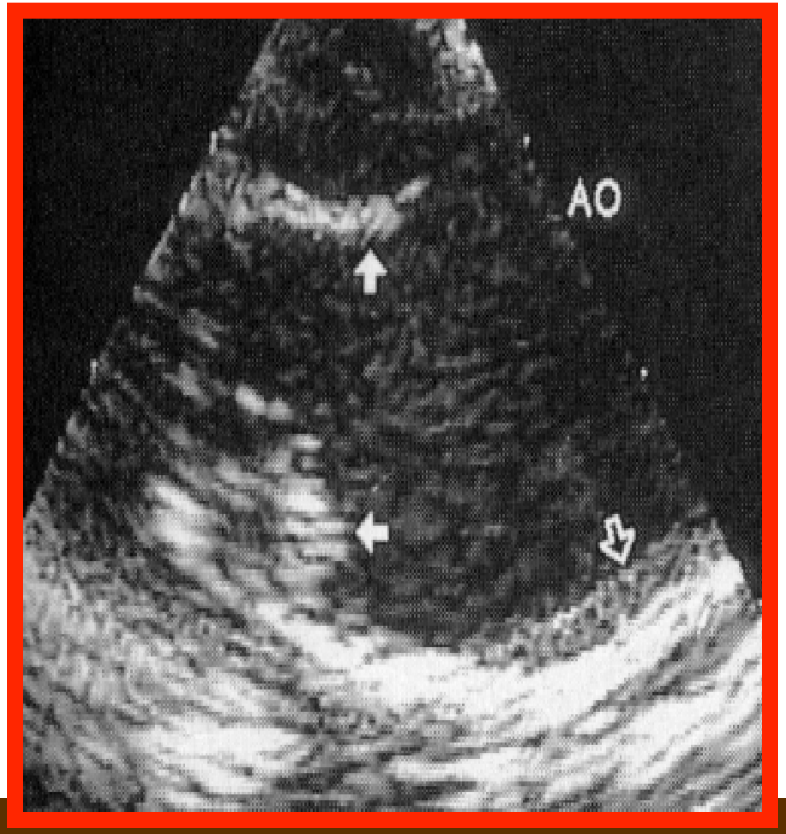
ATEROMATOSIS COMPLEJA AORTICA (*Rev Esp Cardiol 2005; 58: 34-40*)

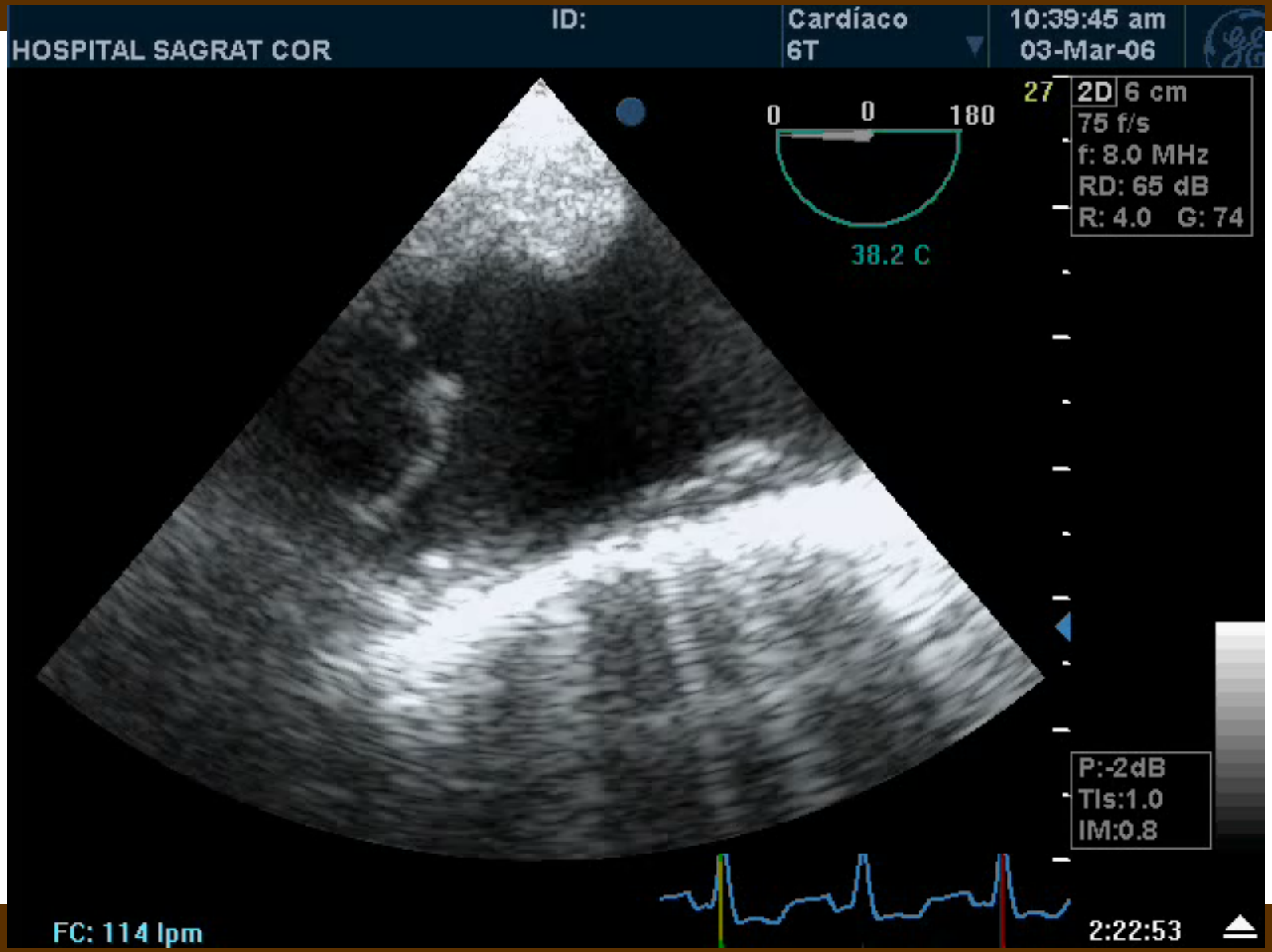


ATEROMATOSIS COMPLEJA AORTICA (*Rev Esp Cardiol 2005; 58: 34-40*)



ATEROMATOSIS COMPLEJA AORTICA (*Rev Esp Cardiol 2005; 58: 34-40*)

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Mitral Annular Calcification as a Marker of Complex Aortic Atheroma in Patients with Stroke of Uncertain Etiology

Ramón Pujadas, M.D.,* Adrià Arboix, M.D.,† Núria Anguera, M.D.,* Josefa Rafel, M.D.,* Federico Sagués, M.D.,* and Roser Casañas, M.D.*

Departments of *Cardiology and †Neurology, Hospital Universitari del Sagrat Cor, Viladomat, Barcelona, Spain

The aim of this study was to evaluate the presence of dense mitral annular calcification as a marker of complex aortic atherosclerosis in patients with stroke of uncertain etiology. One hundred twenty-one patients with stroke of uncertain etiology were evaluated for complex aortic atherosclerotic plaques; their presence and severity were correlated with transthoracic echocardiographic findings, demographic data, and cardiovascular risk factors. Complex plaques in the ascending aorta or aortic arch were found in 72 of the 121 patients (59.5%). The only difference seen in patients with or without plaques was the presence of dense mitral annular calcification (58.3 vs 16.3%; $P < 0.001$). Dense mitral annular calcification ($n = 50$) was associated with higher prevalence of complex aortic plaques (84.0% vs 42.3%; $P < 0.001$), mobile components (28.0% vs 9.9%; $P < 0.01$), and protruding (80.0% vs 36.6%; $P < 0.001$), ulcerated (16.0% vs 1.4%; $P < 0.01$), and multisite complex plaques (46.0% vs 9.0%; $P < 0.001$). Therefore, in patients with stroke of uncertain etiology dense mitral annular calcification is an important marker of aortic atherosclerosis with high risk of embolism, and this association may explain in part the high prevalence of stroke and peripheral embolism in patients with mitral annular calcification. (ECHOCARDIOGRAPHY, Volume 25, February 2008)

TABLE II

Prevalence of Cardiovascular Risk Factors and Echocardiographic Findings and Complex Atheroma Plaques in the Proximal Aorta in Patients with Stroke of Uncertain Etiology with and without Dense Mitral Annular Calcification

Variable	With Dense MAC (n = 50)	Without Dense MAC (n = 71)	P
Age	70.6 ± 8	70.5 ± 8	NS
Men (%)	26 (52.0%)	41 (57.7%)	NS
Hypertension	17 (34.0%)	27 (38.0%)	NS
Hypercholesterolemia	9 (18.0%)	13 (18.3%)	NS
Smoking	6 (12.0%)	10 (14.1%)	NS
Diabetes mellitus	4 (8.0%)	5 (7.0%)	NS
Coronary heart disease	1 (2.0%)	2 (2.8%)	NS
Peripheral arteriopathy	1 (2.0%)	1 (1.4%)	NS
Left ventricular hypertrophy (overall)	22 (44.0%)	32 (45.1%)	NS
Mild	10 (20.0%)	14 (19.7%)	NS
Moderate	8 (16.0%)	11 (15.5%)	NS
Severe	4 (8.0%)	7 (9.9%)	NS
Maximal diameter of the left atrium (mm)	40 ± 4	38 ± 4	NS
Calcification of the mitral leaflets	6 (12.0%)	8 (11.3%)	NS
Maximal diameter of the proximal aorta (mm)	35 ± 3	35 ± 3	NS
Aortic complex atheroma plaques (grades II and III)	42 (84.0%)	30 (42.3%)	<0.001
Plaques with mobile component (grade III)	14 (28.0%)	7 (9.9%)	<0.01
Ulcerated plaques	8 (16.0%)	1 (1.4%)	<0.01
Grades II or III plaques with intraluminal protrusion	40 (80.0%)	26 (36.6%)	<0.001

Dense MAC = mitral annular calcification (≥5 mm); NS = nonsignificant.

- “It is recommended that patients who have a stroke on antiplatelet therapy should be re-evaluated for pathophysiology and risk factors”
  - (*Cerebrovasc Dis 2008; 25: 457-507*)

Conclusions

- **Quan**?: en el moment del seu diagnostic. Descartada l'hemorragia cerebral amb neuroimatge.
- **Amb que**?
  - Tractament antiagregant plaquetari (lacunars/gran vas)
  - Tractament anticoagulant (cardioembolics)
  - Tractament individualitzat (infart d'etiologia inhabitual)
- **Quan de temps**?
  - Resistència al tractament antitrombòtic: "un moment de reflexió"

- **Guidelines for Management of Ischaemic Stroke and Transient Ischaemic Attack 2008**
  - *The European Stroke Organisation (ESO) Executive Committee and the ESO Writing Committee*
    - *(Cerebrovasc Dis 2008; 25: 457-507)*

- **ESPRIT** (AAS plus dipyridamole vs AAS)
  Lancet 2006; 367:1665-73.

- **PRoFESS** *(Eur Heart J 2008; 29: 1086-92)*

- **FASTER** *(Lancet Neurol 2007; 6: 961-9)*

Visita Médica. Luís Jiménez Aranda 1897. El Prado

CODICIA

- RLM no relació entre recurrència i FOP
- Anticoagulació no major eficàcia antiagregació
- Ictus associat FOP menor gravetat: menor volum, millor recuperació funcional, més recurrències com AIT

Serena J et al. Stroke 2008; 39: 3131-3136

CODICIA (Conclusions)

- Baix risc de recurrències, menor gravetat i eficàcia similar de l'anticoagulació front l'antiagregació: cal donar el tractament més innocu (antiagregació).
- No hi ha evidència per recomanar oclusió percutània FOP (aspecte en fase d'assaig clínic)

- **GUIES MÈDIQUES OFICIALS DE DIAGNÒSTIC I TRACTAMENT** (2ª edició). *Societat Catalana de Neurologia*, 2011.
  - Tema IV. *Diagnòstic i tractament de les* ***MALALTIES VASCULARS CEREBRALS***

No se puede mostrar la imagen. Puede que su equipo no tenga suficiente memoria para abrir la imagen o que ésta esté dañada. Reinicie el equipo y, a continuación, abra el archivo de nuevo. Si sigue apareciendo la x roja, puede que tenga que borrar la imagen e insertarla de nuevo.

Hemorragias intracerebrales en sus diferentes topografías.

Arboix et al. ***Acta Neurol Scand 2002; 105: 282-8***