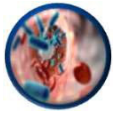
DIU TUSAR

Bordeaux – Mardi 24 mars 2026



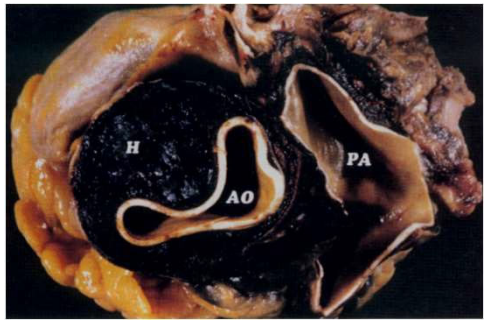
Syndrome aortique aigu

Philippe Vignon

Réanimation Polyvalente
Inserm CIC 1435
CHU Limoges

Généralités

- Terrain **hypertendu**
- Douleur caractéristique : douleur de début **brutal**, **d'emblée maximale**, à type de déchirure, le plus souvent thoracique antérieure mais parfois dorsale ou abdominale
- Signification : **mise sous tension de la paroi aortique** par une pathologie aiguë / chronique en poussée
- Risque commun : **fissuration / rupture** aortique **mortelle.**



DOULEUR + EXTRAVASATION = SYNDROME FISSURAIRE

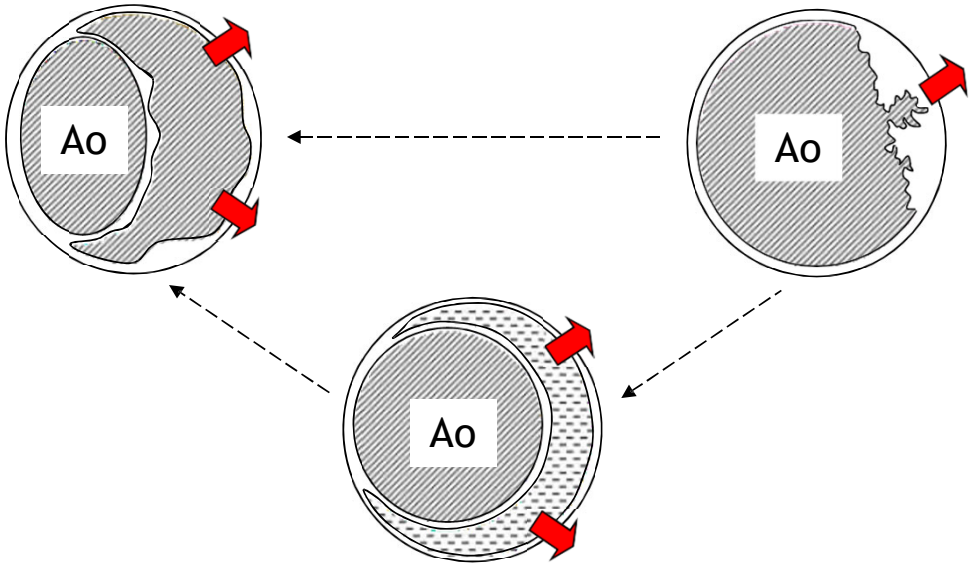
CHIRURGIE URGENTE

Vilacosta I. J Am Coll Cardiol 1998 ; 32 : 83-9
Vilacosta I. Heart 2001 ; 85 : 365-8

Syndrome aortique aigu

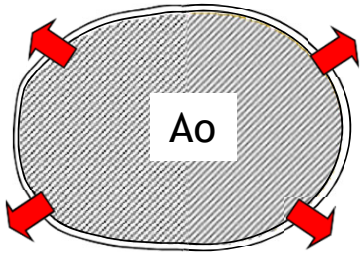
Dissection aortique

Ulcère athéromateux

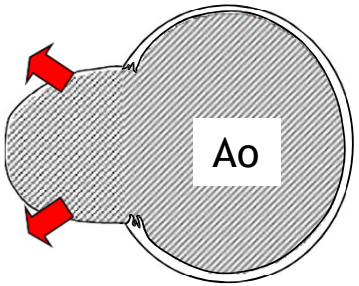


Hématome intramural

Anévrysme



Faux anévrysme



Research article

Open Access

Dying from cardiac tamponade

Aravind Swaminathan[1], Karikalan Kandaswamy[2], Manish Powari[1] and Joseph Mathew*[1]

Address: [1]Department of Histopathology, Royal Cornwall Hospital, Truro, UK. TR1 3 LJ and [2]Department of Cardiology, Royal Cornwall Hospital, Truro, UK. TR1 3 LJ

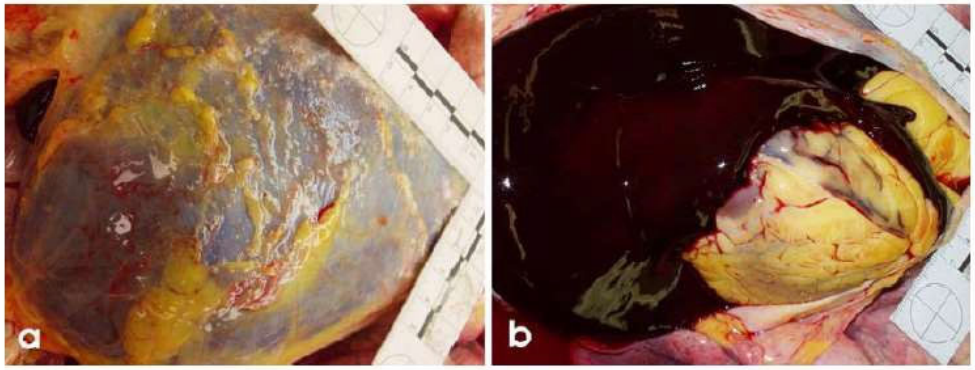
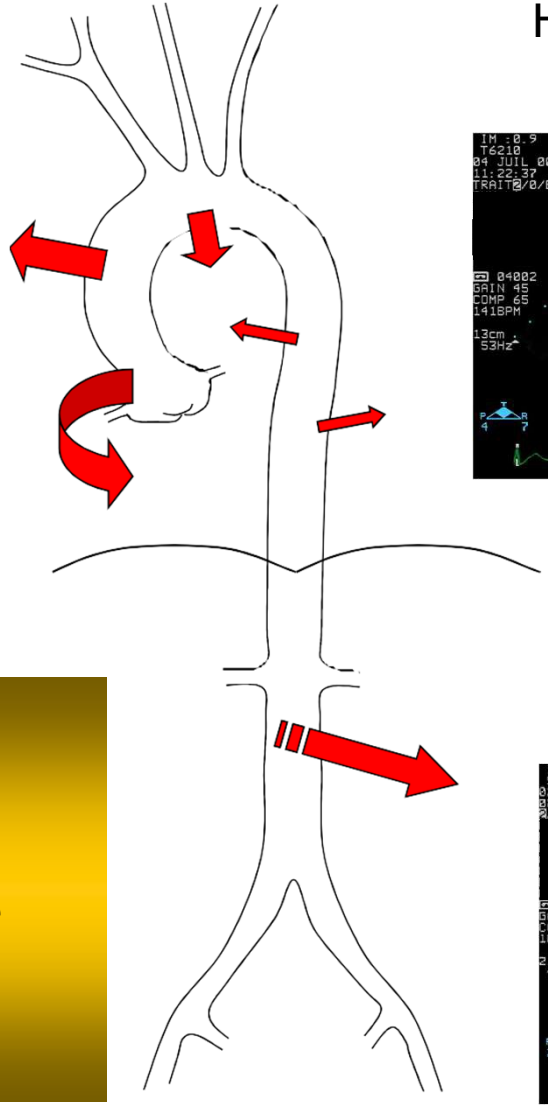


Figure 1
This image depicts a) the characteristic bluish black pericardial distension, observed at postmortem, most often b) containing an admixture of clotted and frank blood.

World J Emerg Surg 2007

Tamponnade

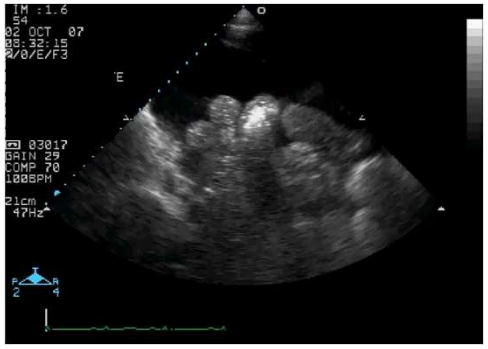


Hémomediastin & hémothorax

Syndrome aortique aigu : risque = extravasation de sang!

- ✓ **Hémopericarde : tamponade (fréquent)**
- ✓ Plèvre gauche : hémothorax (tamponade extra-cardiaque, choc hémorragique)
- ✓ Cavité abdominale : choc hémorragique (rare).

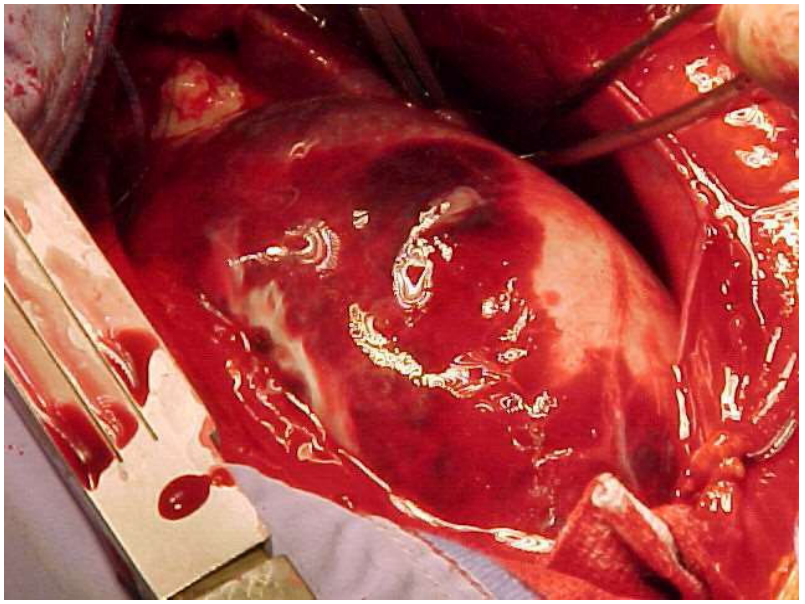
Hémopéritoine

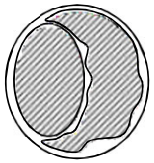


Syndrome d'extravasation

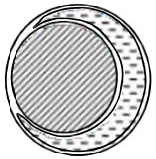
- Péricarde & plèvre (& abdomen) : écho. transthoracique
- Médiastinum: écho. transoesophagienne / TDM

Syndrome aortique aigu + signe d'extravasation
= bloc !!



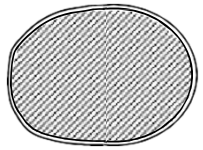


Dissection : aorte **ascendante** > descendante

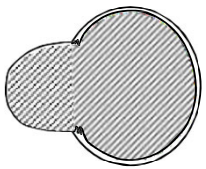


Hématome intramural : aorte **descendante** > asc.

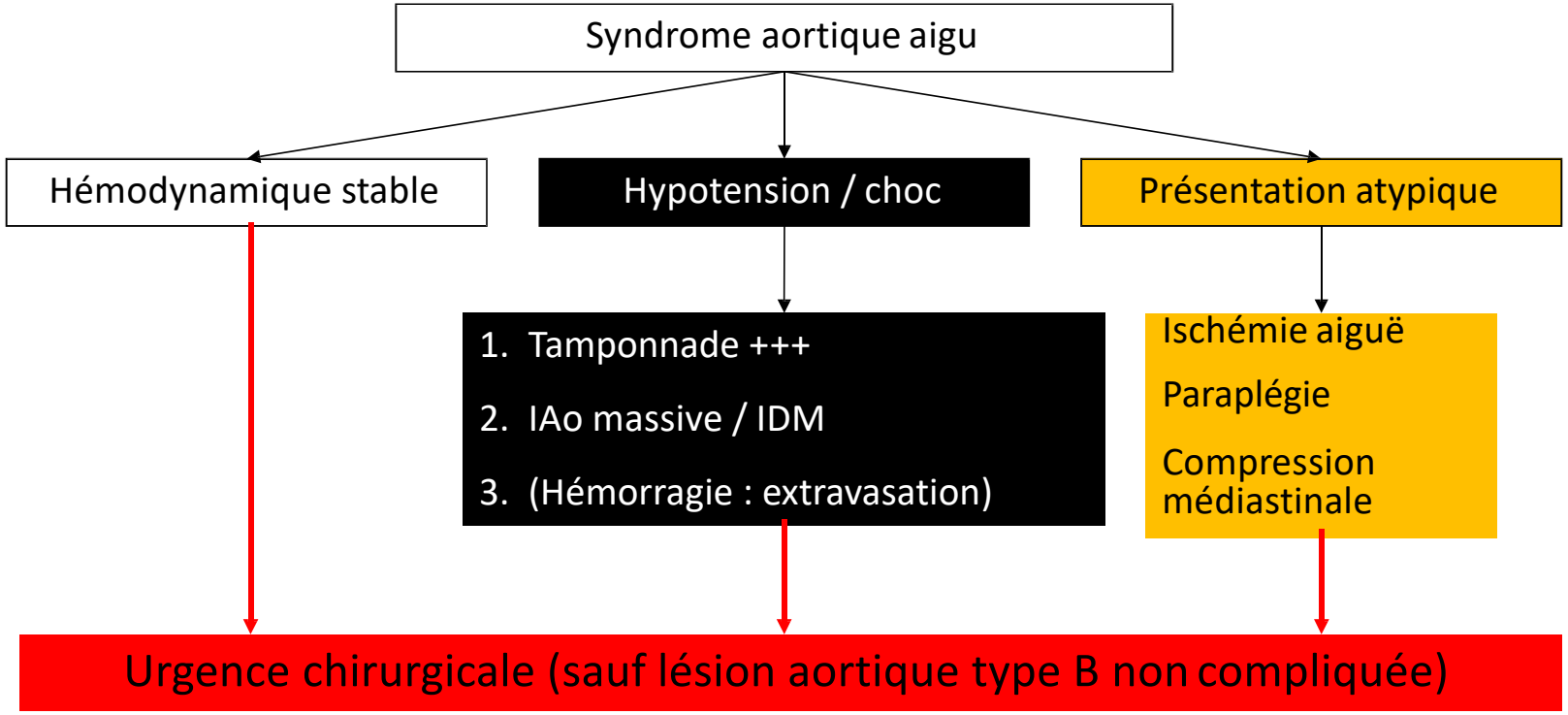
Ulcère athéromateux : aorte **descendante** > asc.



Anévrysme : aorte abdominale >> thoracique

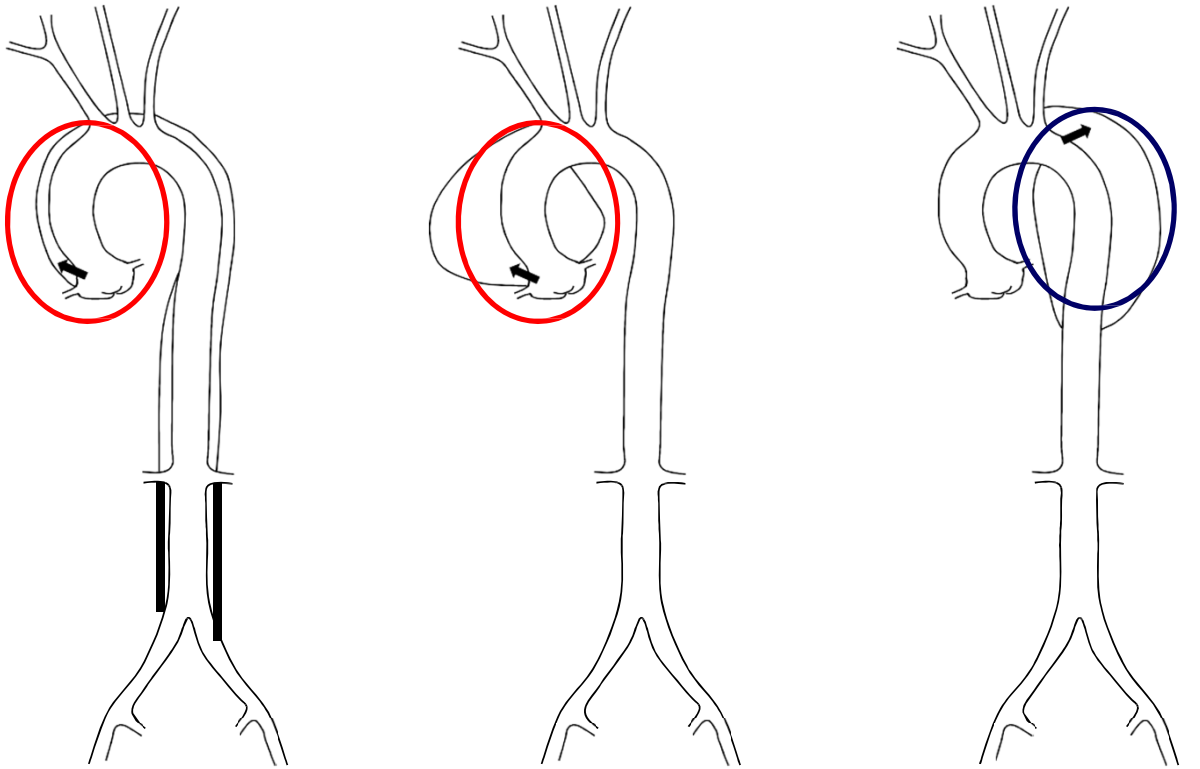


Faux-anévrysme : aorte descendante > asc.



Dissection aortique touchant l'aorte ascendante =

1 à 2% de décès /h pendant les 24 premières heures



De Bakey	Type I	Type II	Type III
Stanford	**Type A**		**Type B**
Traitement	**Chirurgie**		**Medical**

ESC European Society of Cardiology
European Heart Journal (2024) **45**, 3538–3700
https://doi.org/10.1093/eurheartj/ehae179

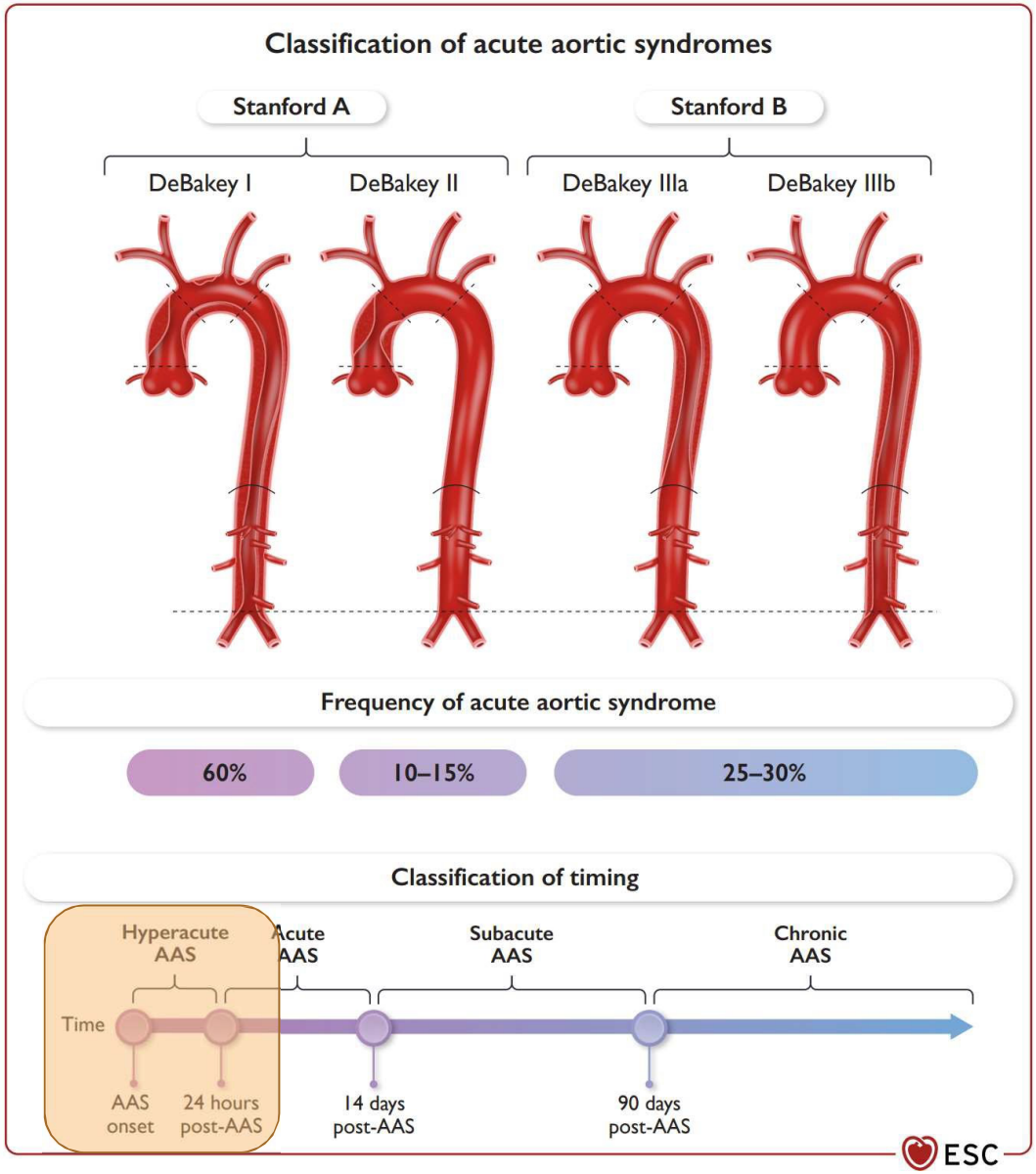
ESC GUIDELINES

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases

Developed by the task force on the management of peripheral arterial and aortic diseases of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS), the European Reference Network on Rare Multisystemic Vascular Diseases (VASCERN), and the European Society of Vascular Medicine (ESVM)

Authors/Task Force Members: Lucia Mazzolai *†, (Chairperson) (Switzerland),



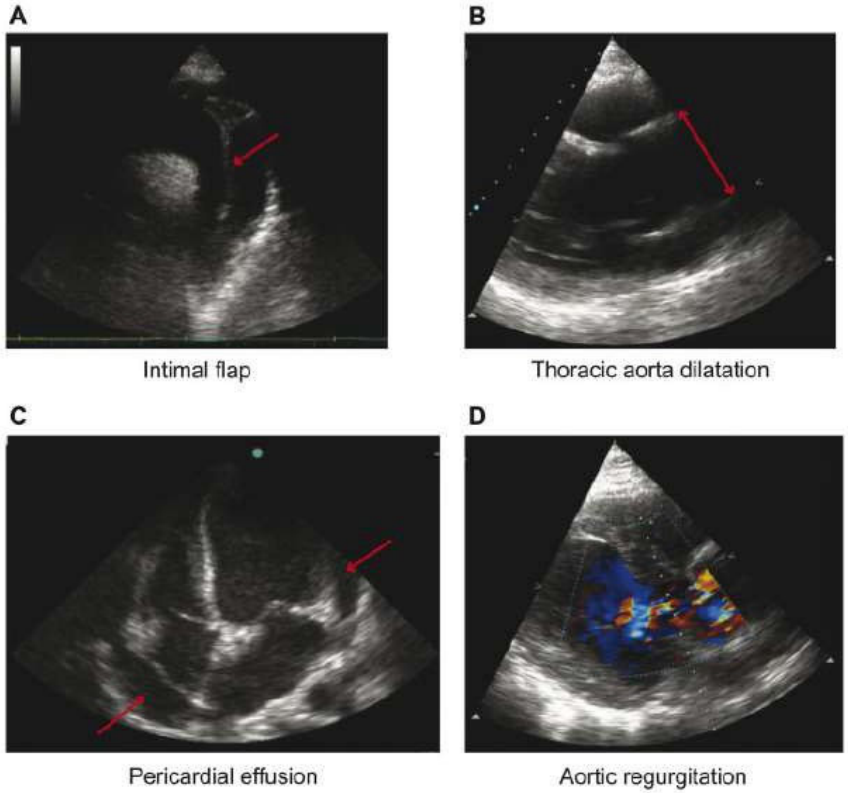
Dissection aortique aiguë : ETT = 1ère étape

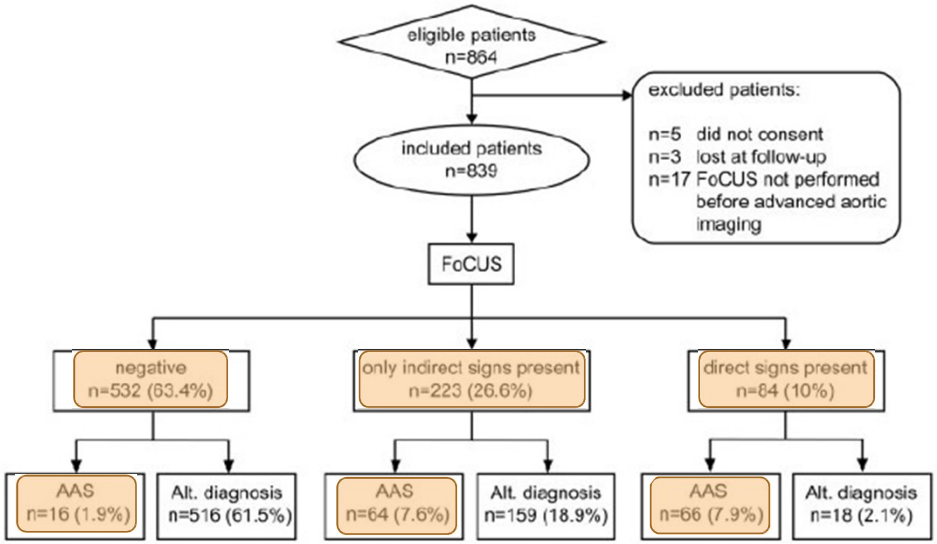
ESC European Society of Cardiology
European Heart Journal (2019) 40, 1952–1960
doi:10.1093/eurheartj/ehz207
CLINICAL RESEARCH
Vascular medicine

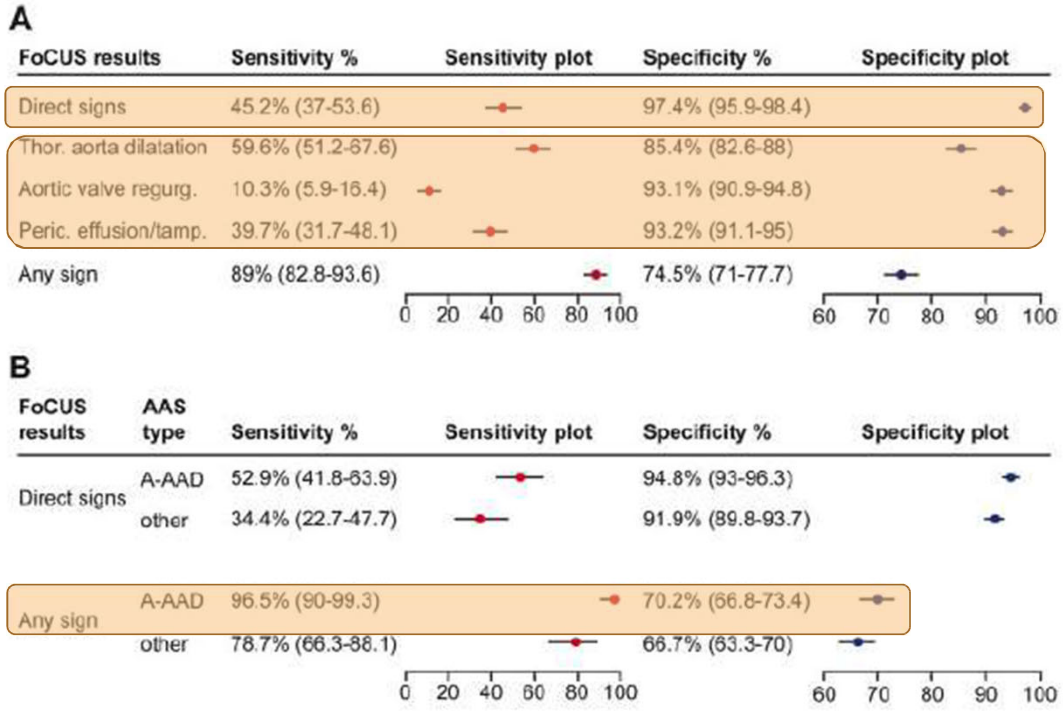
Integration of transthoracic focused cardiac ultrasound in the diagnostic algorithm for suspected acute aortic syndromes

Peiman Nazerian[1]*†, Christian Mueller[2], Simone Vanni[1], Alexandre de Matos Soeiro[3], Bernd A. Leidel[4], Gabriele Cerini[1], Enrico Lupia[5], Andrea Palazzo[1], Stefano Grifoni[1], and Fulvio Morello[5]

Direct findings of AAS: intimal flap, intramural aortic hematoma
Indirect findings of AAS: thoracic aorta dilatation (diameter ≥4 cm), pericardial effusion or tamponade, aortic regurgitation (color Doppler).

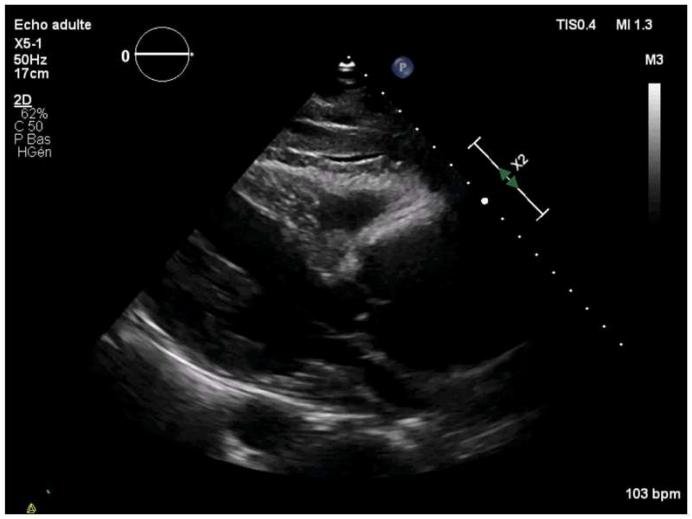


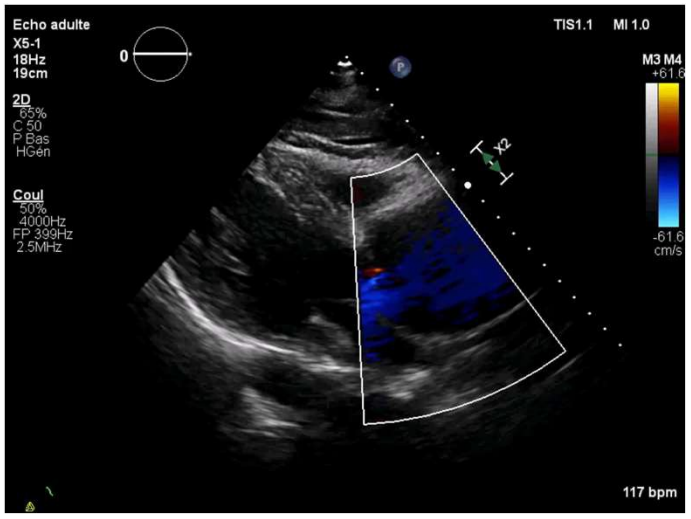


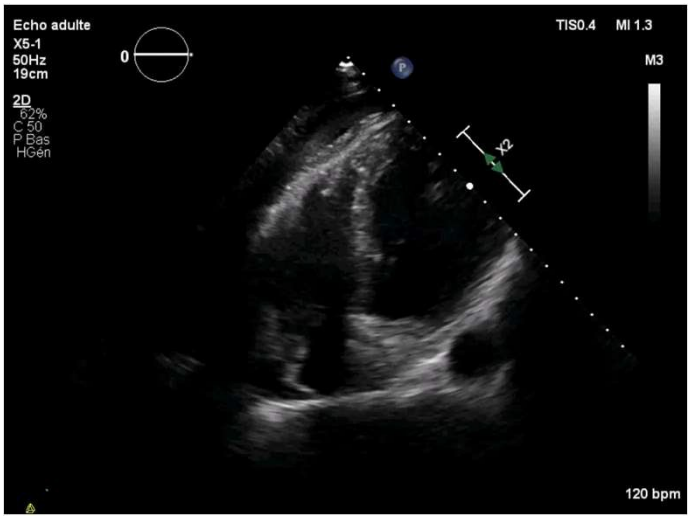


AAS: Acute Aortic Syndrome
A-AAD: Type A Acute Aortic Dissection

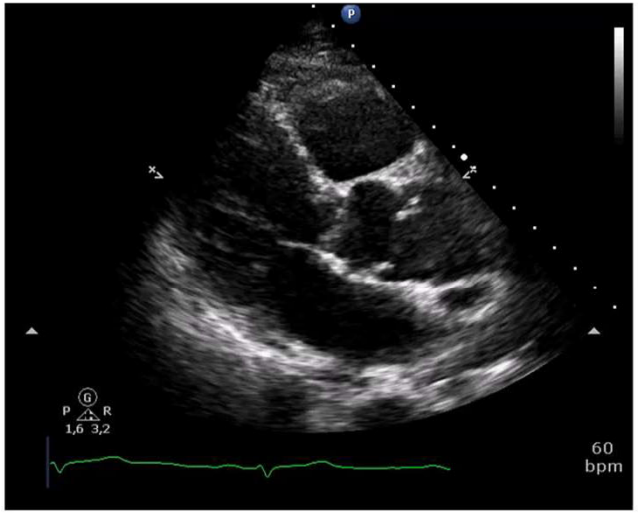
Syndrome aortique aigu : ETT = 1ère étape

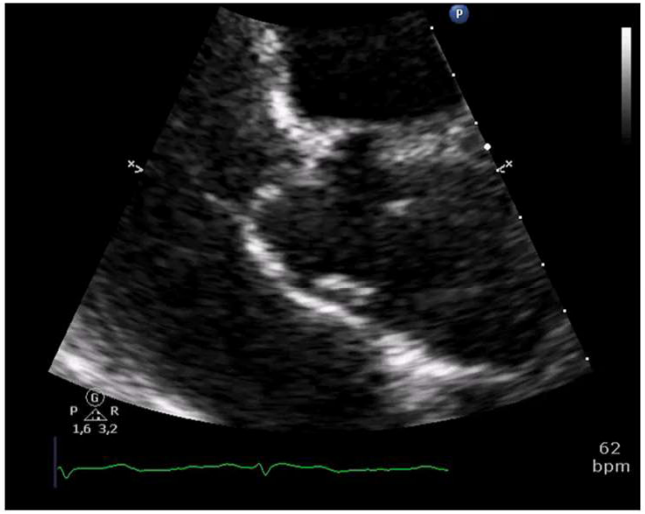


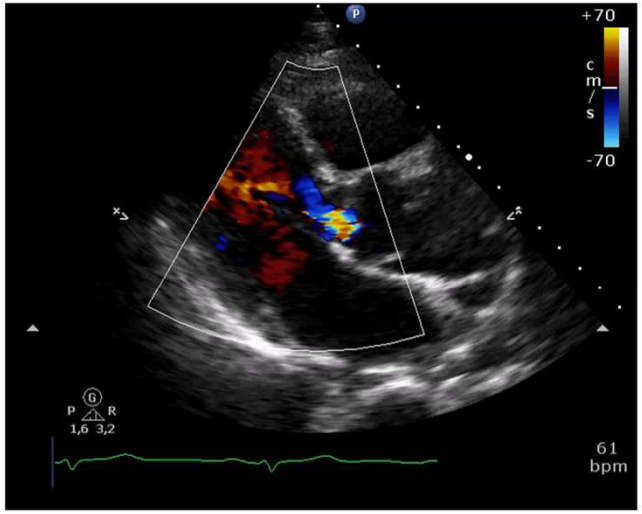


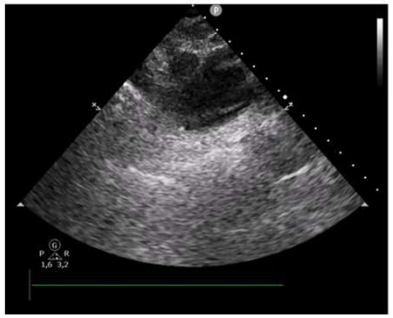


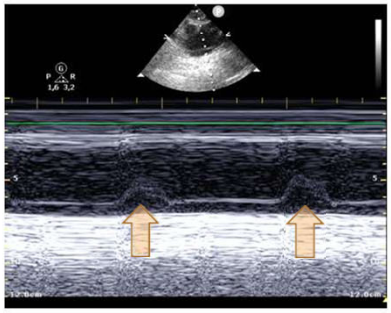
Dissection aortique aiguë : ETT = 1ère étape



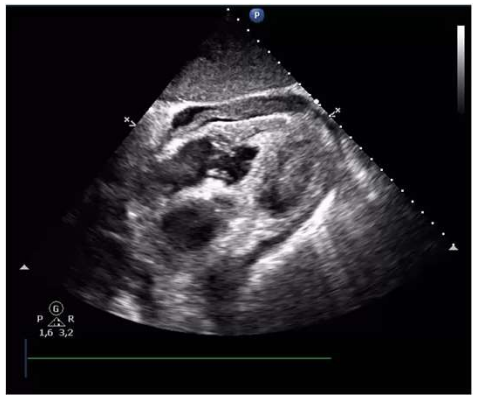
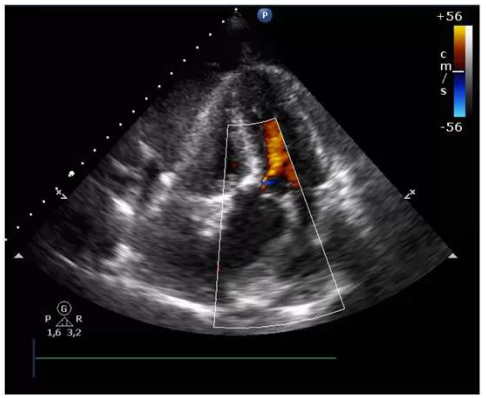


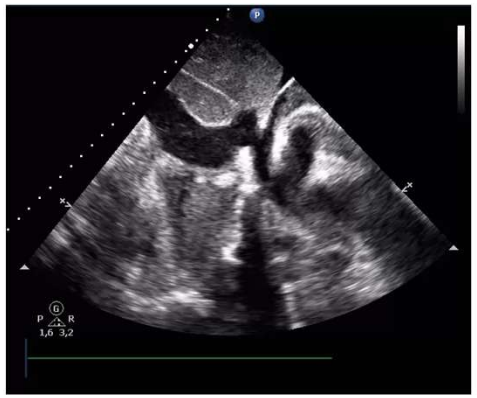
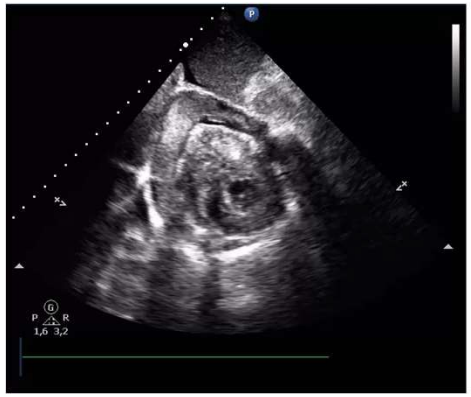
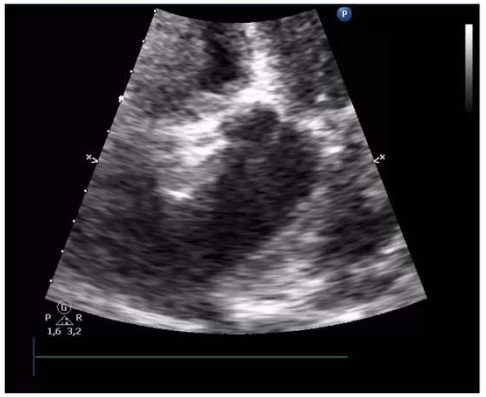
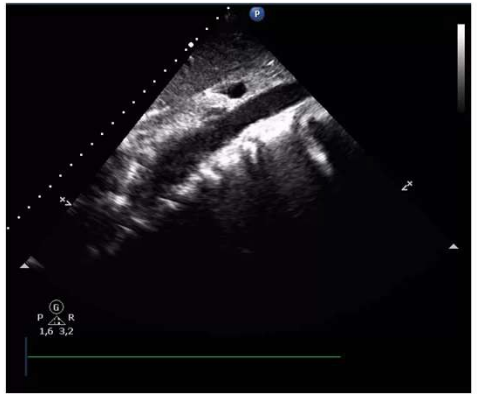
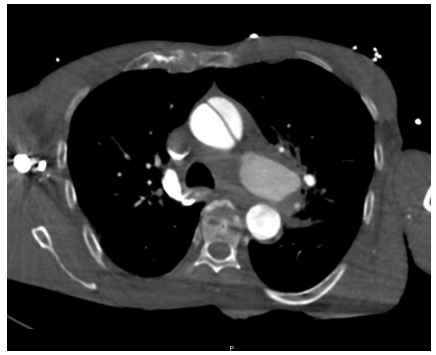
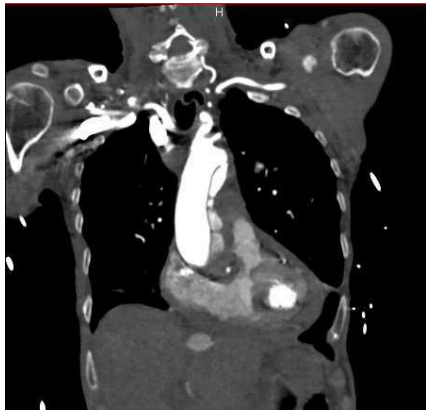




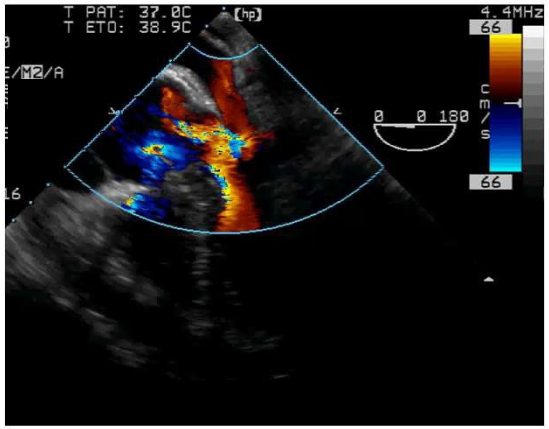


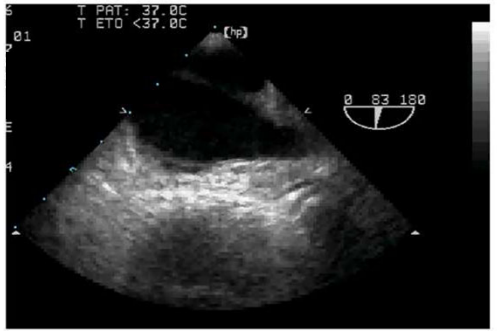
Dissection aortique aiguë : ETT = 1ère étape

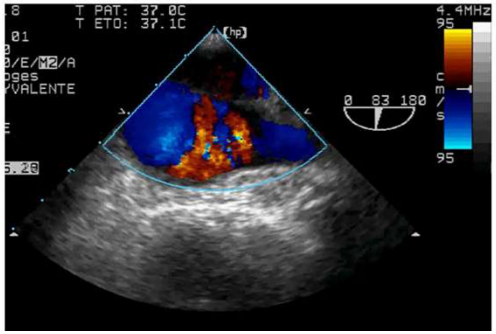



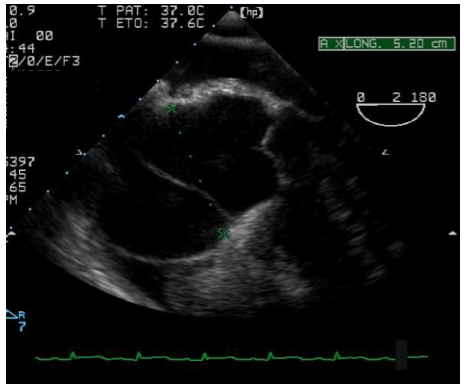







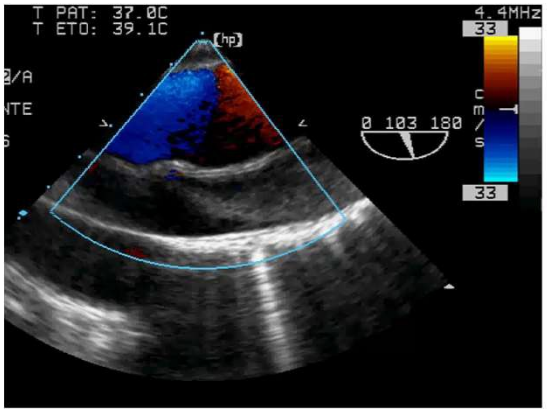
Dissection aortique aiguë : ETO per-op. = 2ème étape

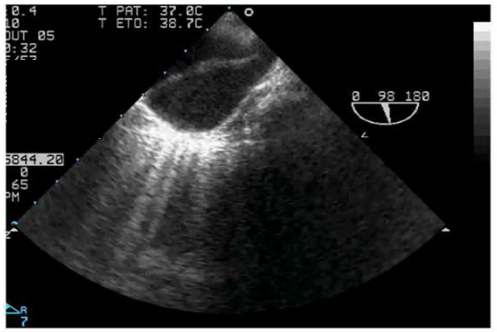


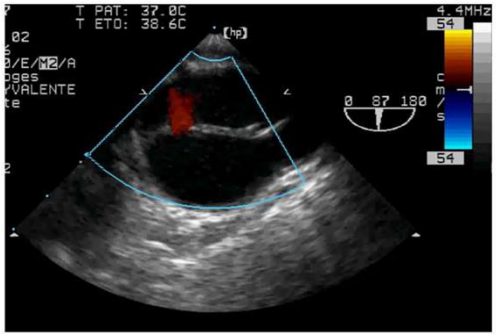




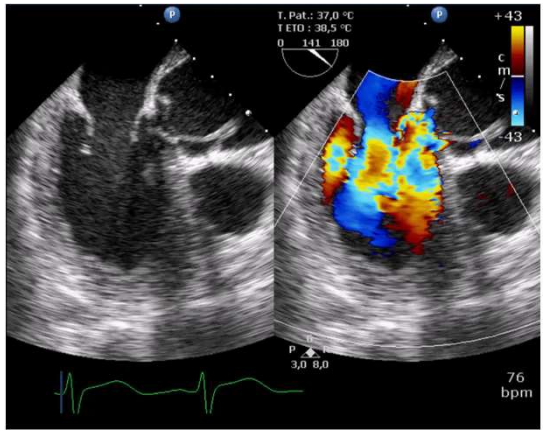




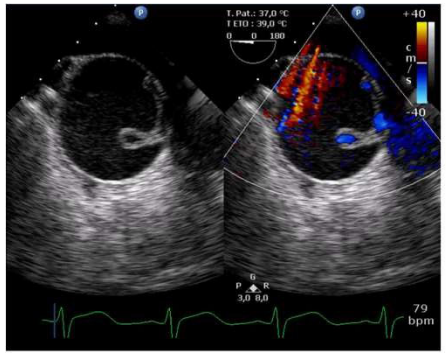




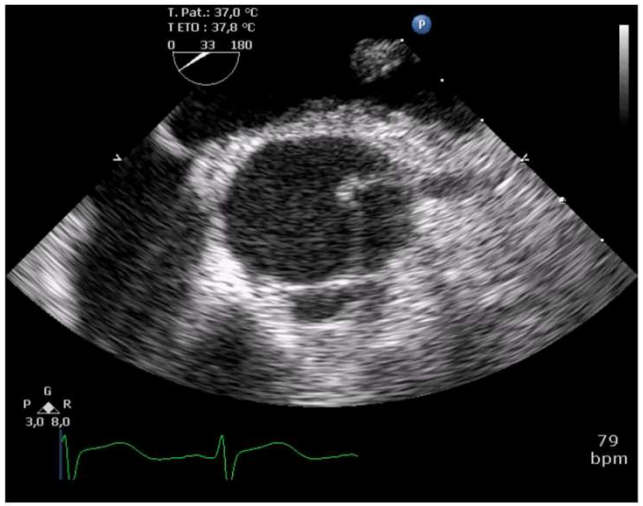
Flap intussusception & AR



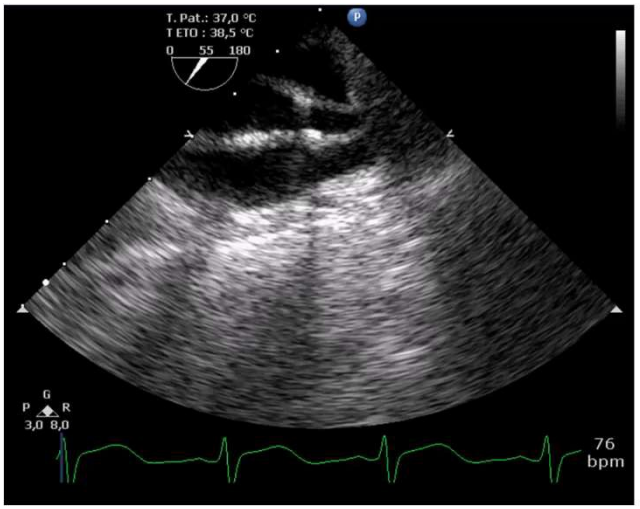
Small true lumen

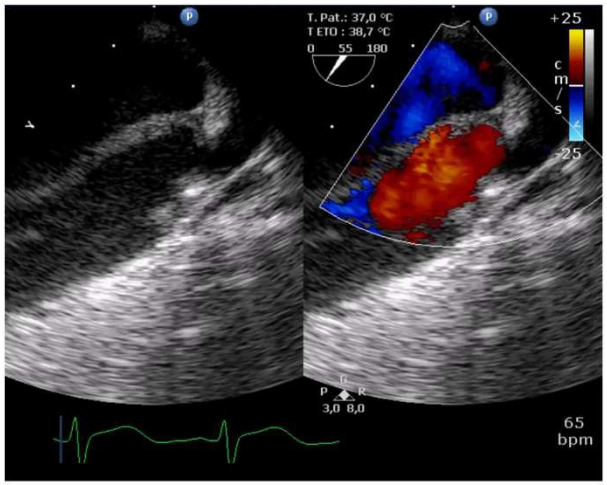


Left coronary artery is not involved

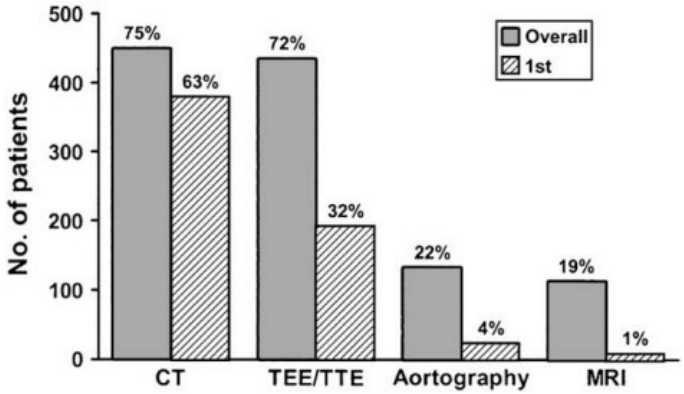


Left subclavian artery & left carotid are not involved





Dissection aortique aiguë : imagerie



Am J Cardiol 2002;89:1235-8

JACC: CARDIOVASCULAR IMAGING
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VOL. 7, NO. 4, 2014
ISSN 1936-878X/$36.00
http://dx.doi.org/10.1016/j.jcmg.2013.10.015

VIEWS

STATE-OF-THE-ART PAPER

The Role of Imaging in Aortic Dissection and Related Syndromes

Ragavendra R. Baliga, MD, MBA,* Christoph A. Nienaber, MD, PHD,† Eduardo Bossone, MD, PHD,‡ Jae K. Oh, MD,§ Eric M. Isselbacher, MD,‖ Udo Sechtem, MD,¶ Rossella Fattori, MD, PHD,# Subha V. Raman, MD,** Kim A. Eagle, MD††

Table 3. Comparisons of Diagnostic Imaging Techniques

	TTE/TEE	MDCT	MRI
Sensitivity	+++	+++	+++
Specificity	+++	+++	+++
Classification	+++	+++	+++
Tear localization	+++	+++	++
Aortic regurgitation	+++	–	++
Pericardial effusion	+++	+++	+++
Mediastinal hematoma	++	+++	+++
Side branch involvement	++	+++	++
Coronary artery involvement	++	+++	++
X-ray exposure	–	++	–
Patient comfort	+	+++	+
Follow-up studies	++	+++	+++
Intraoperative availability	+++	–	–

- ✓ TEE must be performed by (highly) experienced hands in SB patients
- ✓ TEE should be discouraged if hypotension/shock is present as TTE provides immediate confirmation of tamponade physiology
- ✓ CT remains the reference imaging modality.

European Heart Journal (2014) 35, 2873–2926
doi:10.1093/eurheartj/ehu281

ESC GUIDELINES

2014 ESC Guidelines on the diagnosis and treatment of aortic diseases

ESC European Society of Cardiology
European Heart Journal (2024) 45, 3538–3700
https://doi.org/10.1093/eurheartj/ehae179

ESC GUIDELINES

2024 ESC Guidelines for the management of peripheral arterial and aortic diseases

Developed by the task force on the management of peripheral arterial and aortic diseases of the European Society of Cardiology (ESC)

Endorsed by the European Association for Cardio-Thoracic Surgery (EACTS), the European Reference Network on Rare Multisystemic Vascular Diseases (VASCERN), and the European Society of Vascular Medicine (ESVM)

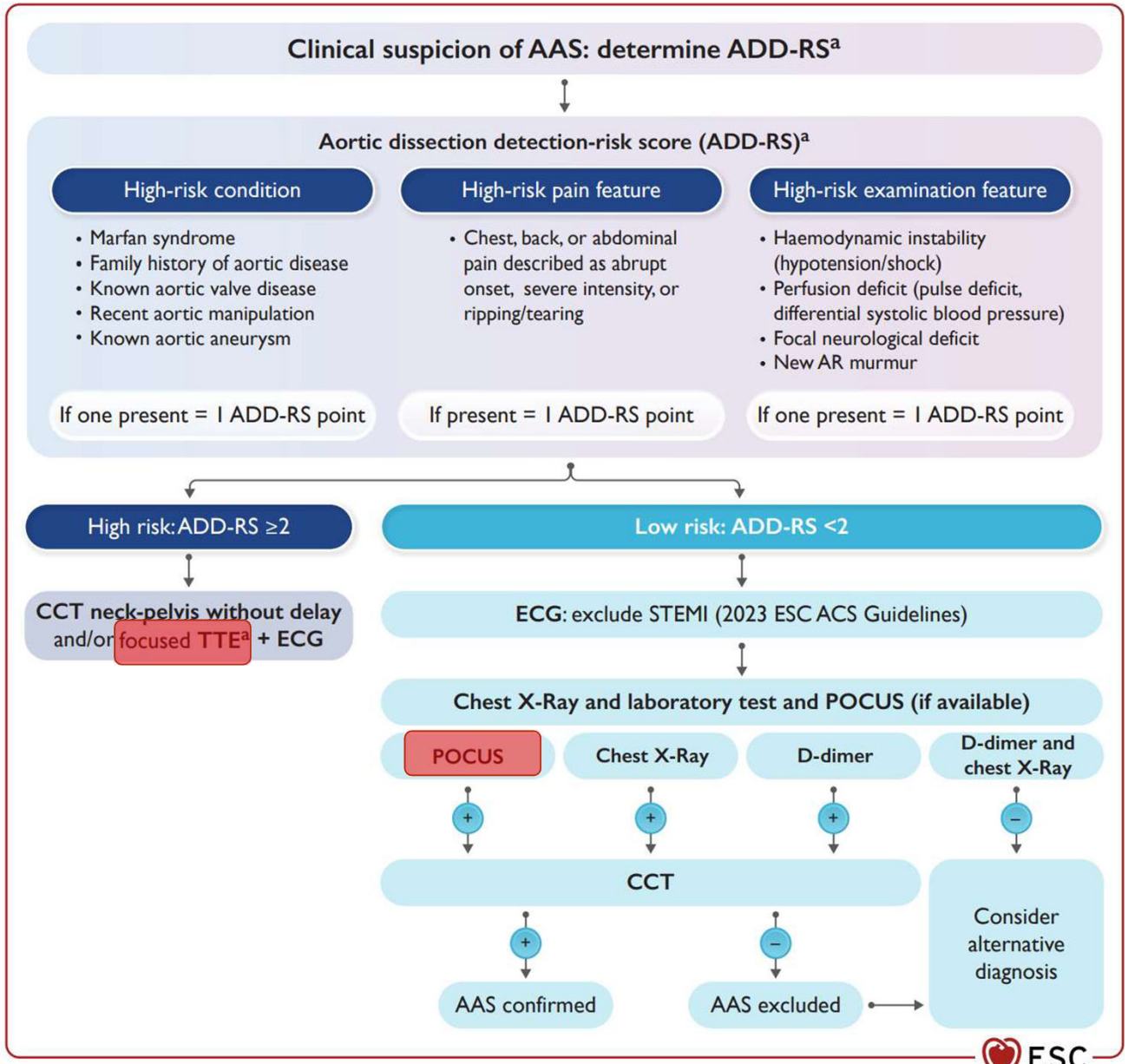
Authors/Task Force Members: Lucia Mazzolai *†, (Chairperson) (Switzerland),

Recommendations for diagnostic work-up of acute aortic syndrome		
CCT from neck to pelvis is recommended as the first-line imaging technique in patients with suspected AAS since it is widely available accurate, and provides information about the entry tear, extension, and possible complications (malperfusion, dilatation, or rupture).	I	C
In patients with suspected AAS, TOE is recommended to guide peri-operative management and detect complications.	I	C

Table 4 Revised recommendations

Recommendations in 2017 (PAD) and 2014 (Aortic)	Class	Level	Recommendations in 2024	Class	Level
Recommendations for diagnostic work-up of acute aortic syndrome					
TTE is recommended as an initial imaging investigation. In stable patients with a suspicion of AAS, the following imaging modalities are recommended (or should be considered according to local availability and expertise):	I	C	In patients with suspected AAS, focused TTE (with use of contrast if feasible) is recommended during the initial evaluation.	I	C
MRI	I	C	In patients with suspected AAS, CMR should be considered as an alternative imaging technique if CCT is not available.	IIa	C
TOE	IIa	C	In patients with suspected AAS, TOE is recommended to guide peri-operative management and detect complications.	I	C

TEE is best & safely performed in the OR under general anesthesia (opened pericardium)


Clinical suspicion of AAS: determine ADD-RS[a]
Aortic dissection detection-risk score (ADD-RS)[a]
High-risk condition
• Marfan syndrome
• Family history of aortic disease
• Known aortic valve disease
• Recent aortic manipulation
• Known aortic aneurysm
If one present = 1 ADD-RS point
High-risk pain feature
• Chest, back, or abdominal pain described as abrupt onset, severe intensity, or ripping/tearing
If present = 1 ADD-RS point
High-risk examination feature
• Haemodynamic instability (hypotension/shock)
• Perfusion deficit (pulse deficit, differential systolic blood pressure)
• Focal neurological deficit
• New AR murmur
If one present = 1 ADD-RS point
High risk: ADD-RS ≥2
CCT neck-pelvis without delay and/or focused TTE[a] + ECG
Low risk: ADD-RS <2
ECG: exclude STEMI (2023 ESC ACS Guidelines)
Chest X-Ray and laboratory test and POCUS (if available)
POCUS
Chest X-Ray
D-dimer
D-dimer and chest X-Ray
+
+
+
−
CCT
+
−
AAS confirmed
AAS excluded
Consider alternative diagnosis
ESC

Dissection aortique aiguë

- Flap intimal (**piège : artefact linéaire**) :
  - ✓ flap : image linéaire traversant la lumière aortique
  - ✓ sépare vrai et faux chenal & extension variable (type A ou B)
  - ✓ valeur des calcifications (signent l'origine intimale)
  - ✓ porte(s) entrée / réentrée
- Signes indirects :
  - ✓ dilatation (régulière) de l'aorte
  - ✓ insuffisance aortique (aiguë / non connue)

TYPE A(± CHOC)

- ✓ épanchement péricardique (hémopéricarde)
- ✓ anomalie contraction segmentaire (dissection coronaire)
- ✓ hémomédiastin, hémothorax gauche.

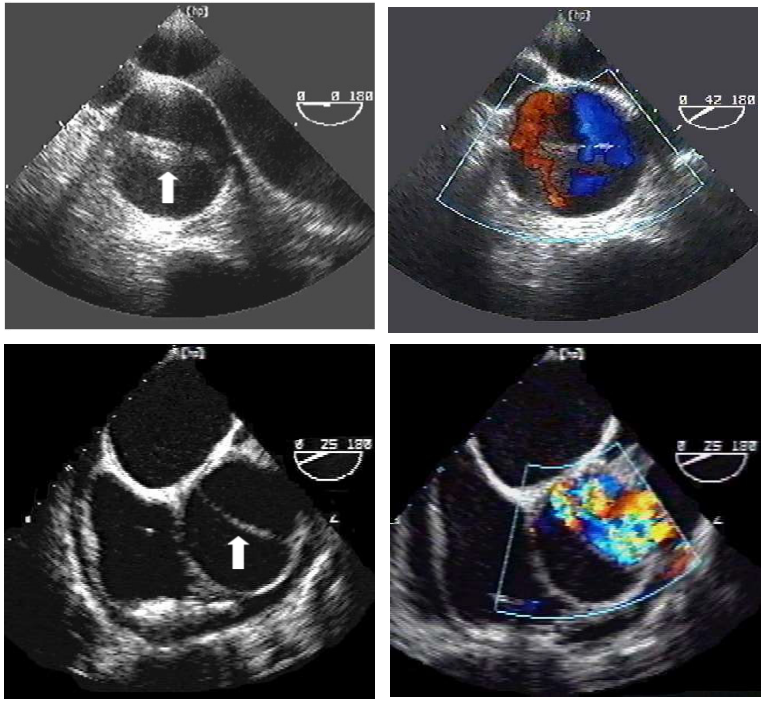
Roudaut R. In : Echocardiographie clinique de l'adulte. Ed Estem, 2003 ; PP : 953-73

Artefact linéaire vs. flap intimal

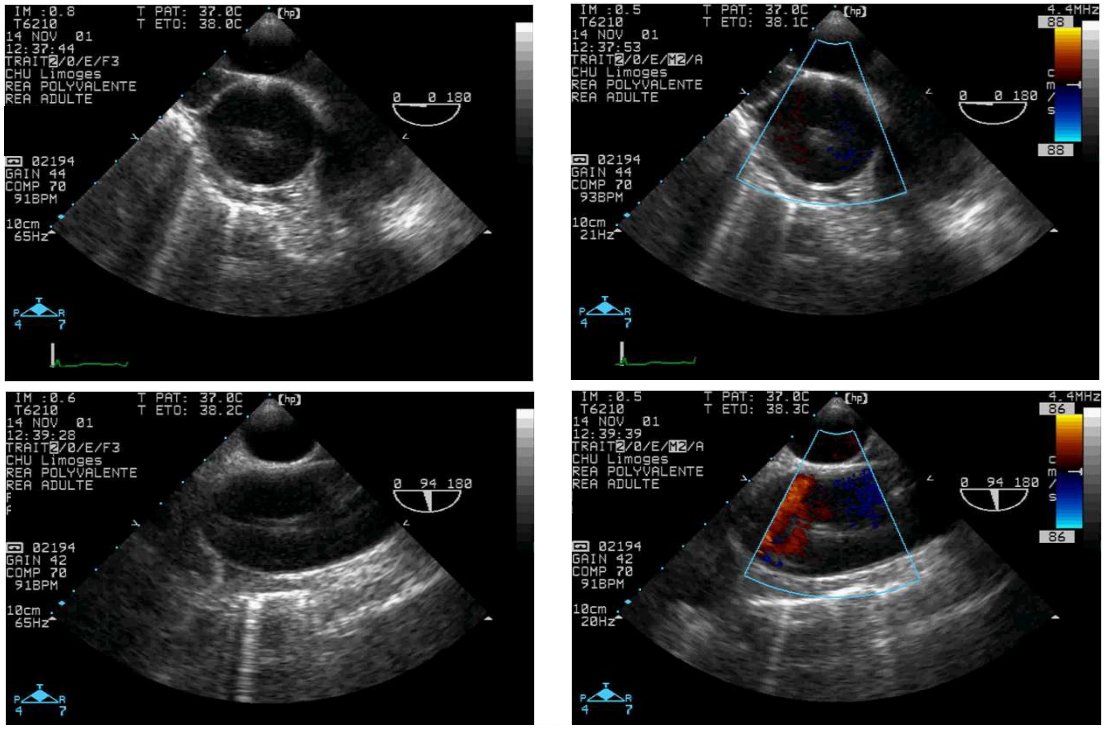
Aorte ascendante

Linear (multipath) artifact

Intimal flap



Artefact linéaire



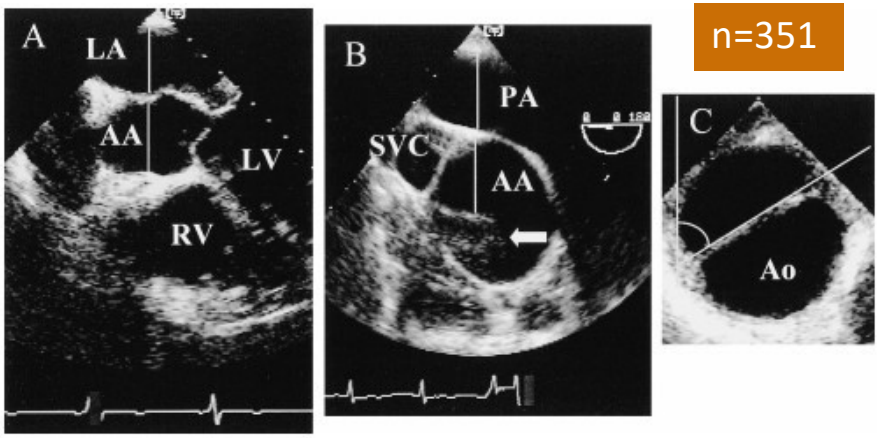
Critères diagnostiques d'artefact linéaire

Aorte ascendante

Differential Transesophageal Echocardiographic Diagnosis Between Linear Artifacts and Intraluminal Flap of Aortic Dissection or Disruption*

Philippe Vignon, MD; Kirk T. Spencer, MD; Geoffray Rambaud, MD; Pierre-Marie Preux, MD; Daniel Krauss, MD; Beth Balasia, BS; and Roberto M. Lang, MD

(CHEST 2001; 119:1778–1790)



n=351

Intra-aortic linear artifact only if aortic diameter > diameter of adjacent anatomical structure (RAP, LA)

- **Prevalence: 23%**
- Diagnostic criteria:
  - moves parallel to aortic walls
  - angle with aortic wall > 85°
  - thickness > 2.5 mm
  - similar velocities on both sides
- <u>At least 3 of these criteria fulfilled</u>:

  Specificity: 100%; positive predictive value: 100%.

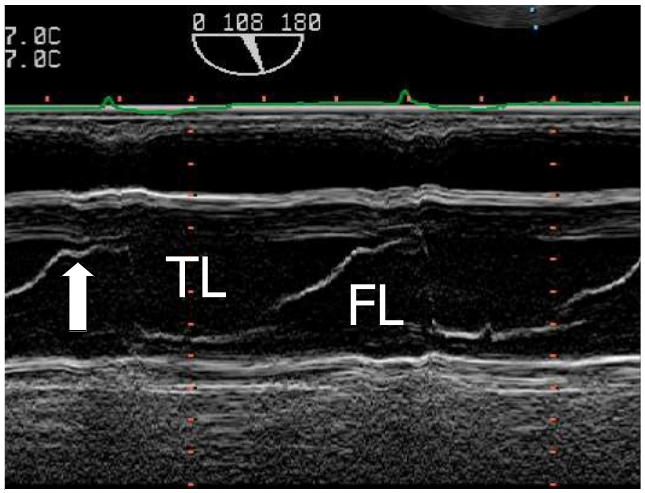
Diagnosis of Ascending Aortic Dissection by Transesophageal Echocardiography: Utility of M-Mode in Recognizing Artifacts

ARTURO EVANGELISTA, MD, HERMINIO GARCIA-DEL-CASTILLO, MD, TERESA GONZALEZ-ALUJAS, MD, ROSA DOMINGUEZ-ORONOZ, MD, ARMANDO SALAS, MD, GAIETA PERMANYER-MIRALDA, MD, JORDI SOLER-SOLER, MD, FACC

Barcelona, Spain

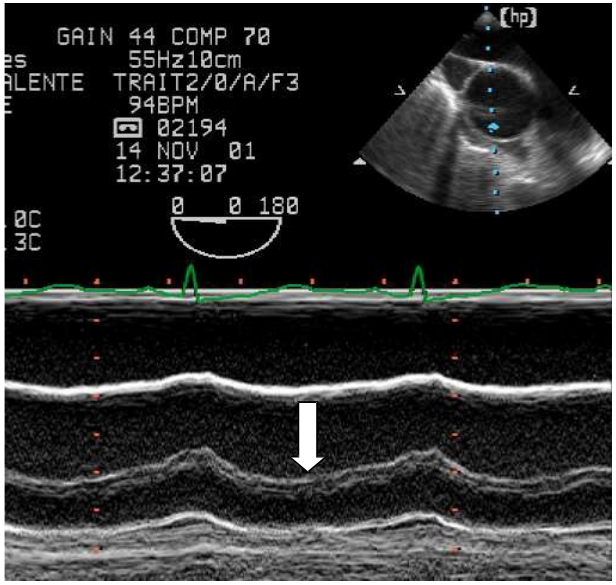
JACC Vol. 27, No. 1
January 1996:102–7

Intimal flap

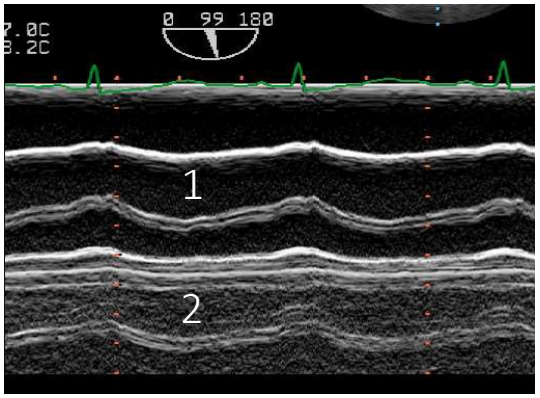


- Free motion of actual aortic flap (according to pressure gradient between true & false lumen)
- Variable angle with aortic wall (transverse view)
- Usually thin structure (intimal flap)
- Frequent difference of blood flow velocity (true *vs.* false lumen)

Linear artifact



Linear + mirror artifact



Origine des artefacts linéaires de réverbération

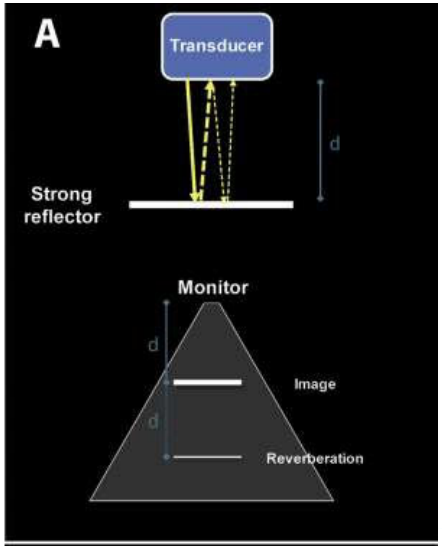
Aorte ascendante

STATE-OF-THE-ART REVIEW ARTICLE

Fact or Artifact in Two-Dimensional Echocardiography: Avoiding Misdiagnosis and Missed Diagnosis

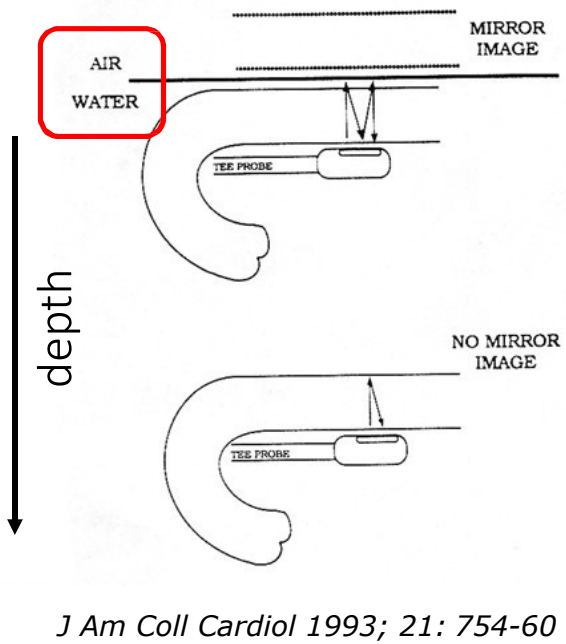
Philippe B. Bertrand, MD, MSc, Robert A. Levine, MD, Eric M. Isselbacher, MD, MSc, and Pieter M. Vandervoort, MD, *Genk and Hasselt, Belgium; and Boston, Massachusetts*

(J Am Soc Echocardiogr 2016;29:381-91.)

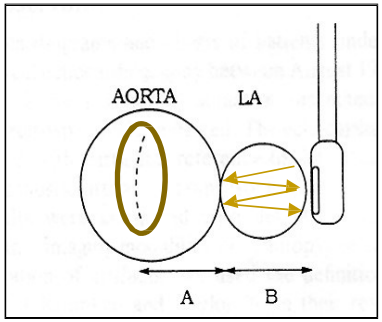


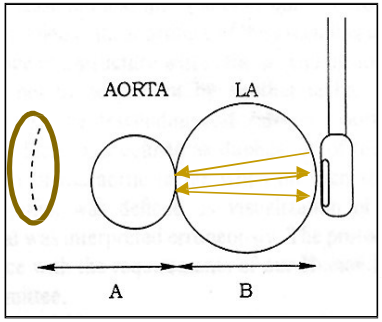
Clinical Significance and Origin of Artifacts in Transesophageal Echocardiography of the Thoracic Aorta

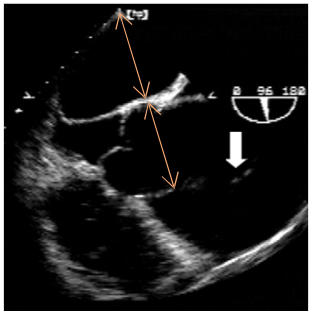
ALAN F. APPELBE, MBBS, PETER G. WALKER, PHD,* J. K. YEOH, MD, ANTHONY BONITATIBUS, BS* AJIT P. YOGANATHAN, PHD,* RANDOLPH P. MARTIN, MD, FACC
Atlanta, Georgia

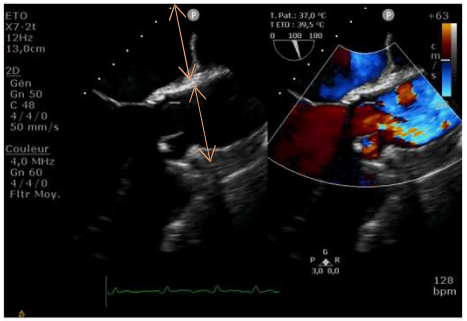


J Am Coll Cardiol 1993; 21: 754-60









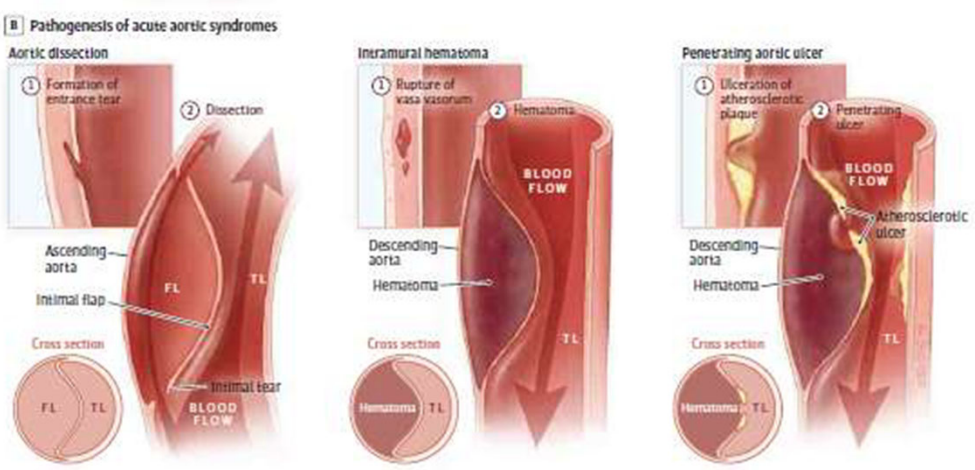
Syndrome aortique aigu

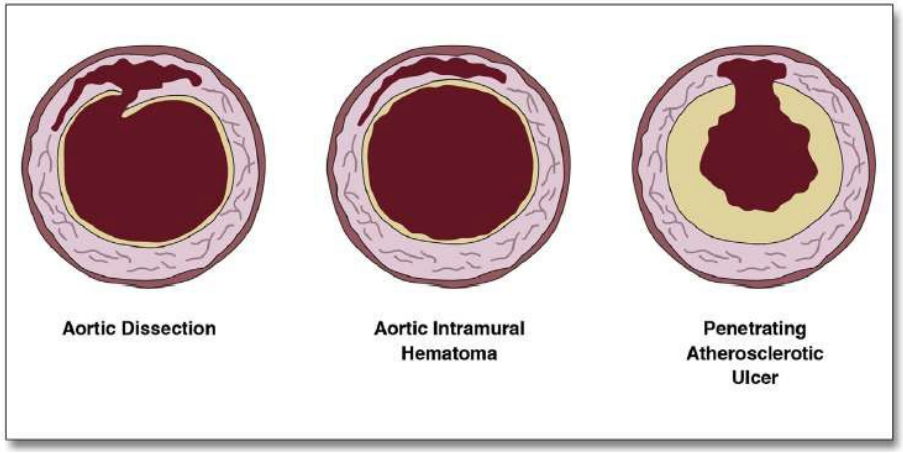
Clinical Review & Education

JAMA | Review

Acute Aortic Dissection and Intramural Hematoma
A Systematic Review

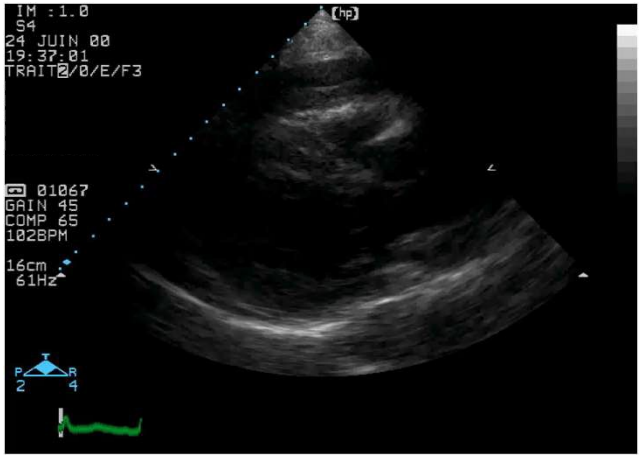
Firas F. Mussa, MD; Joshua D. Horton, MD; Rameen Moridzadeh, MD; Joseph Nicholson, PhD; Santi Trimarchi, MD, PhD; Kim A. Eagle, MD



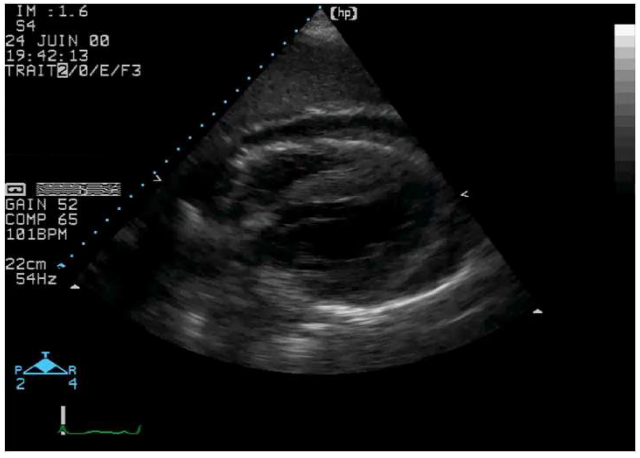


Hématome de paroi (intra-aortique) aigu

ETT immédiate aux urgences



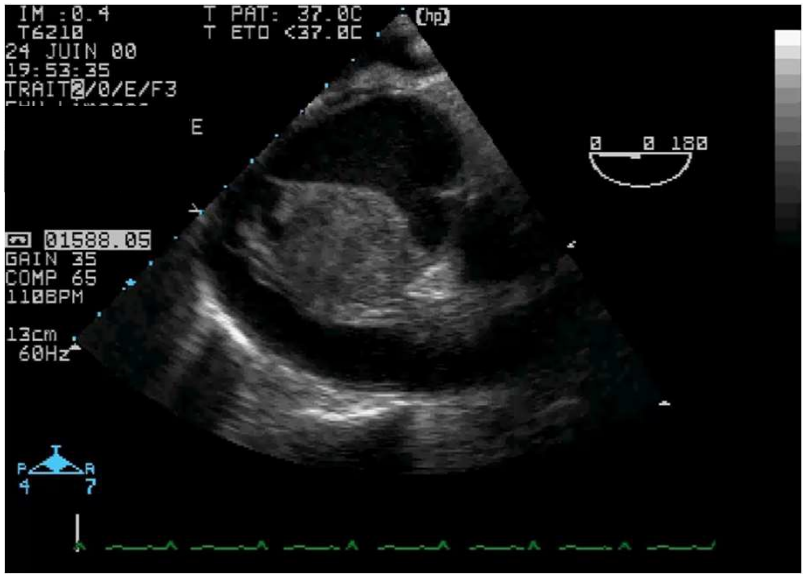
Vue parasternale



Vue sous-costale

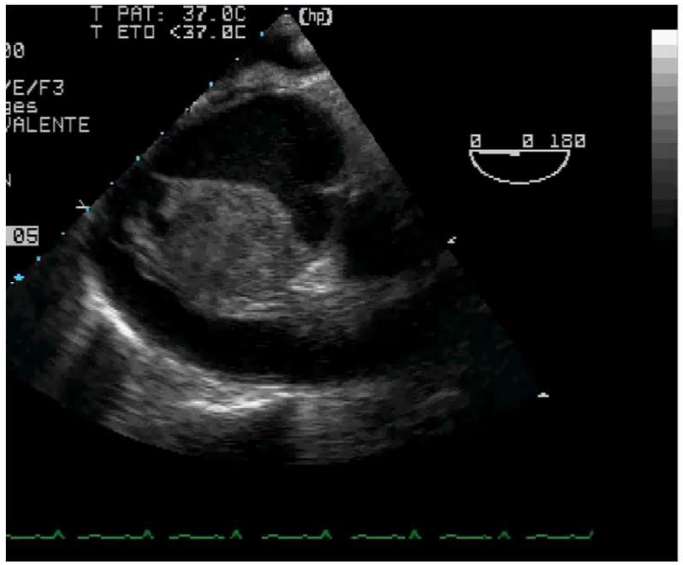
Hématome de paroi (intra-aortique) aigu

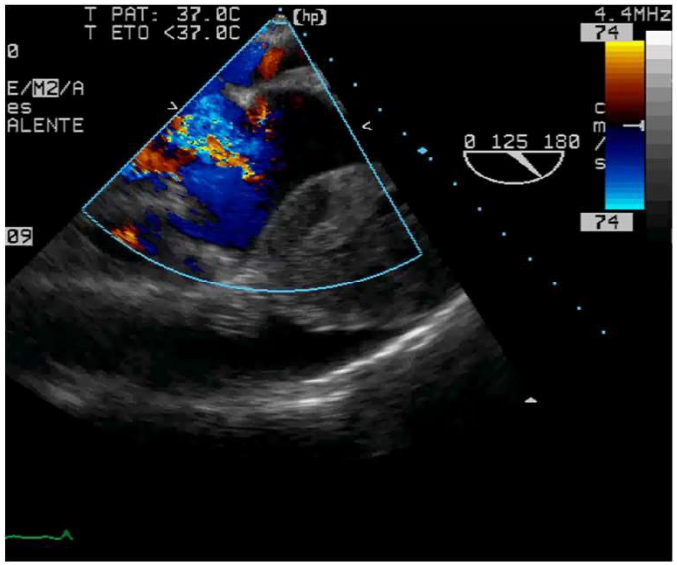
- Epaississement en croissant ou circonférentiel de la paroi aortique (> 7 mm) : « granité » ou hétérogène
- Extension variable (idem dissection)
- Intima refoulée (calcifications)
- Elargissement (régulier) de l'aorte (inconstant)
- Signes d'extravasation possibles :
  - ✓ Hémopéricarde
  - ✓ Hémomédiastin
  - ✓ Hémothorax
- Pas porte entrée, non circulant.

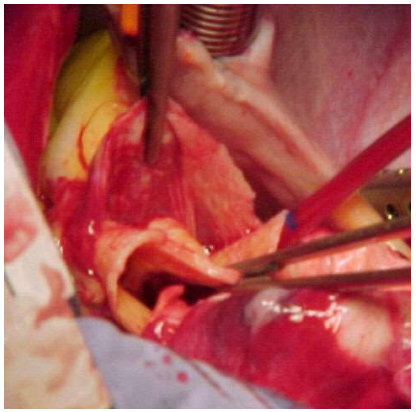


Mohr-Kahaly S et al. J Am Coll Cardiol 1994 ; 23 : 658-64

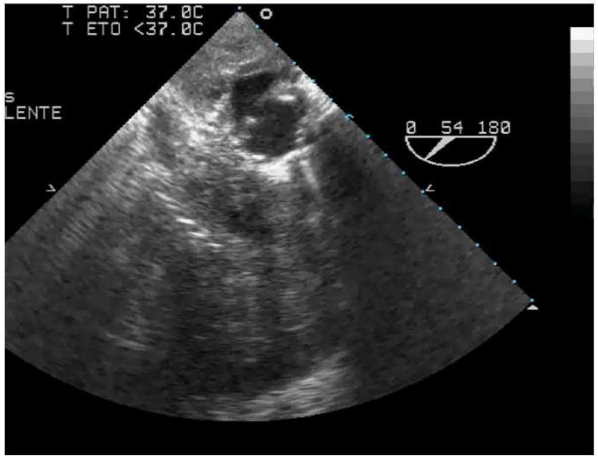
Hématome intrapariétal aortique (ETO per-op.)

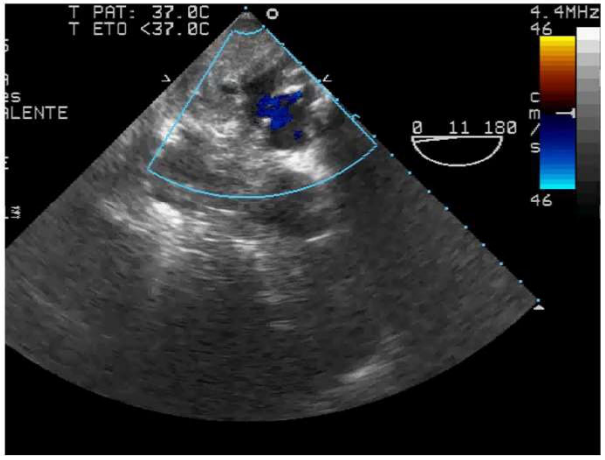


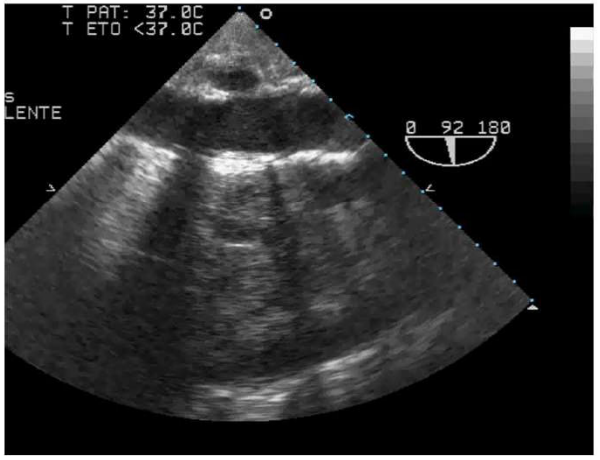


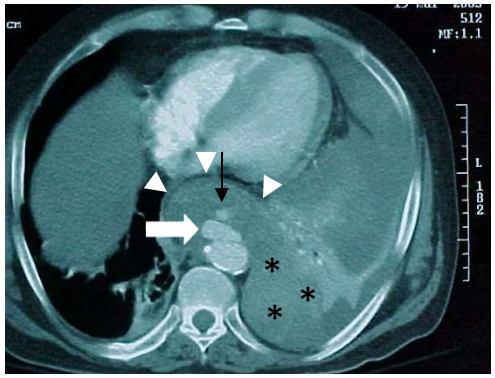


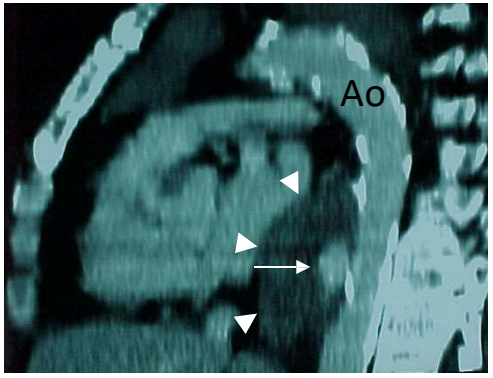
Ulcère athéroscléreux aortique penetrant (ETO per-op.)

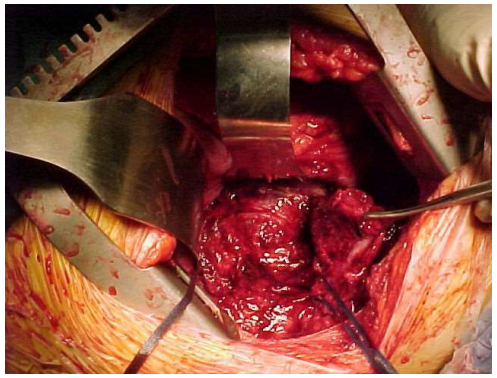




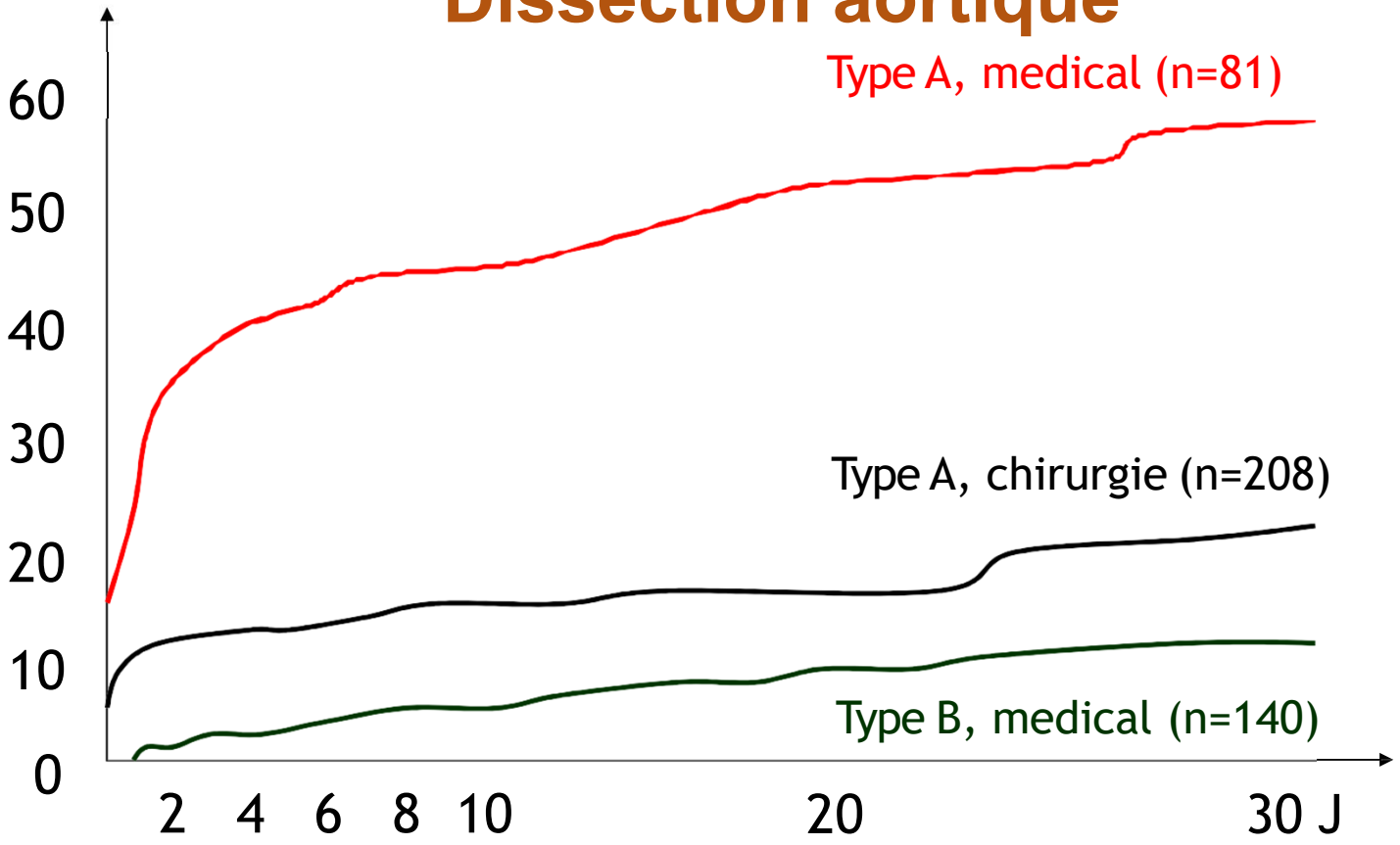








Dissection aortique



From Hagan PG JAMA 2000;283:897-903

Contemporary results of surgery in acute type A aortic dissection: The International Registry of Acute Aortic Dissection experience

Santi Trimarchi, MD
Christoph A. Nienaber, MD
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Eduardo Bossone, MD
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Alessandro Frigiola, MD
Jae K. Oh, MD
Michael G. Deeb, MD
Eric M. Isselbacher, MD
Kim A. Eagle, MD
On behalf of the International Registry of Acute Aortic Dissection Investigators*

The Journal of Thoracic and Cardiovascular Surgery • January 2005

Mortality & Type A aortic dissection

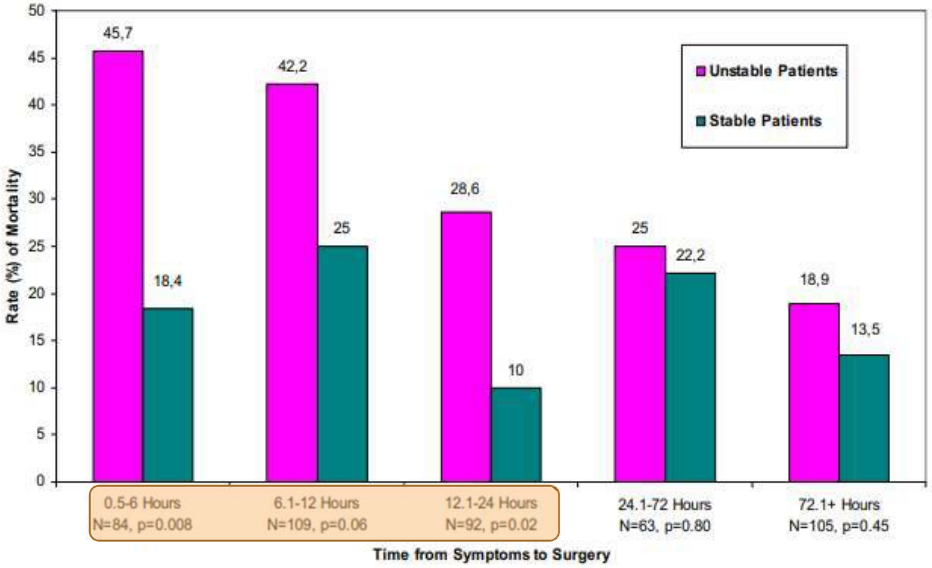

Figure 2. Death rates for unstable patients in group I and group II according to hours from symptoms to surgery. *N*, Patient total; *p*, *P* value for contrast in death rates.

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Presenting Systolic Blood Pressure and Outcomes in Patients With Acute Aortic Dissection

Eduardo Bossone, MD, PhD,[a] Riccardo Gorla, MD, PhD,[b] Troy M. LaBounty, MD,[c] Toru Suzuki, MD, PhD,[d] Dan Gilon, MD,[e] Craig Strauss, MD, MPH,[f] Andrea Ballotta, MD,[g] Himanshu J. Patel, MD,[h] Arturo Evangelista, MD,[i] Marek P. Ehrlich, MD,[j] Stuart Hutchison, MD,[k] Eva Kline-Rogers, MS, NP,[c] Daniel G. Montgomery, BS,[c] Christoph A. Nienaber, MD,[l] Eric M. Isselbacher, MD,[m] Kim A. Eagle, MD[c]

TABLE 3 Multivariate Predictors of In-Hospital Mortality in Type A AAD

	OR	95% CI	p Value
SBP >150 mm Hg*	1.16	0.83-1.62	0.38
SBP 81-100 mm Hg*	1.21	0.81-1.80	0.36
SBP ≤80 mm Hg*	1.90	1.29-2.81	0.001
Age >65 yrs	2.39	1.82-3.13	<0.001
Any pulse deficit	1.73	1.31-2.28	<0.001
Mesenteric ischemia/infarction	8.05	4.96-13.05	<0.001
Cardiac tamponade (in-hospital)	2.24	1.62-3.09	<0.001
Myocardial infarction/ischemia	2.03	1.46-2.82	<0.001
Coma (in-hospital)	6.37	4.03-10.07	<0.001

Syndrome aortique aigu

Syndrome aortique aigu + hypotension / choc = urgence vitale

- But # 1 : diagnostic précoce
- But # 2 : identifier les signes d'extravasation en **ETT**
- But # 3 : chirurgie immédiate si aorte ascendante (compléter les informations par une **ETO au BO**).