

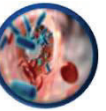
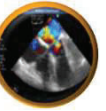
DIU TUSAR

Bordeaux – Mardi 25 mars 2025

Syndrome aortique aigu

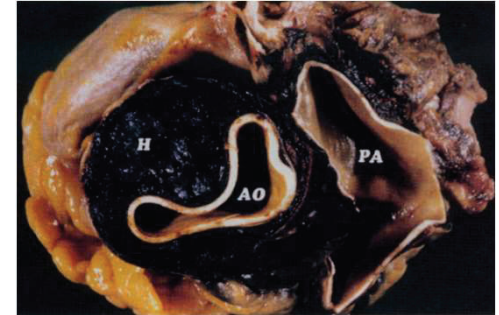
Philippe Vignon

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.



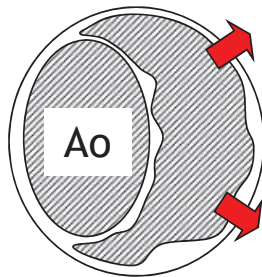
DOULEUR +
EXTRAVASATION =
SYNDROME FISSURAIRE



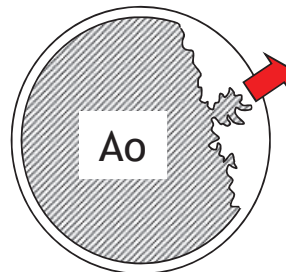
CHIRURGIE URGENTE

Syndrome aortique aigu

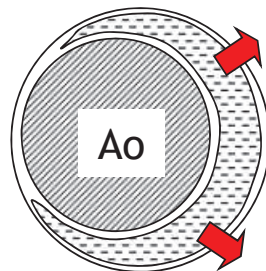
Dissection
aortique



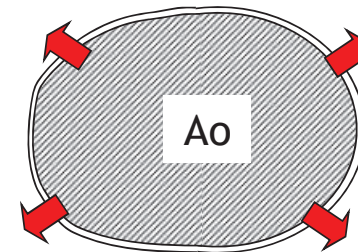
Ulcère athéromateux



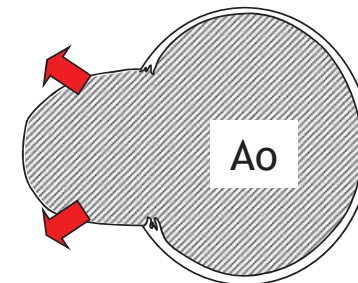
Hématome intramural



Anévrysme

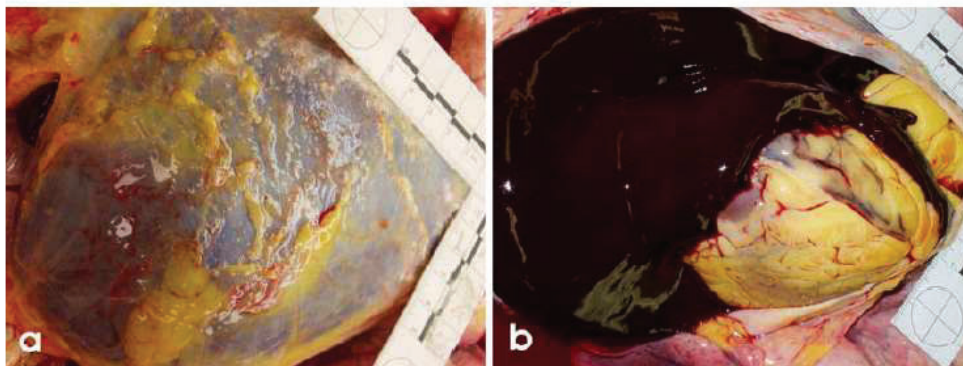


Faux anévrysme

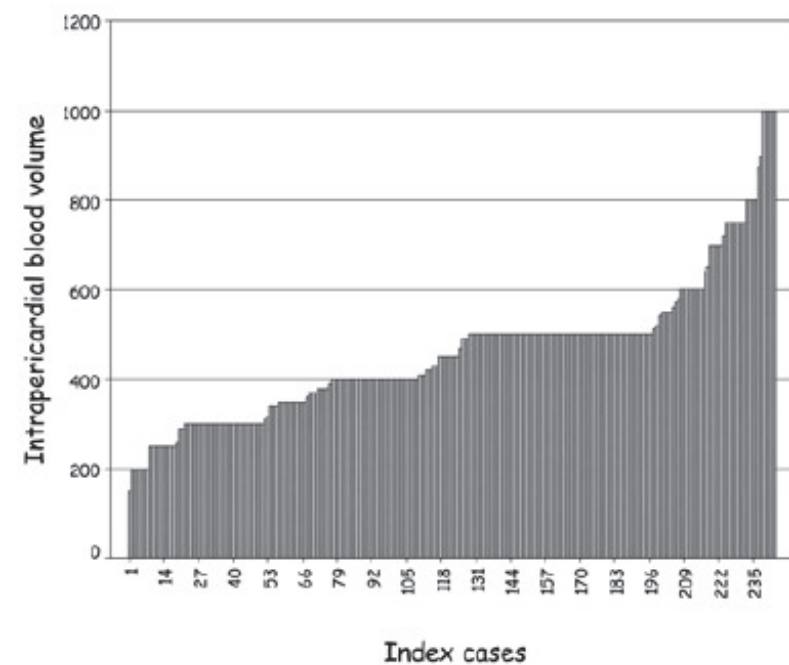


Research article

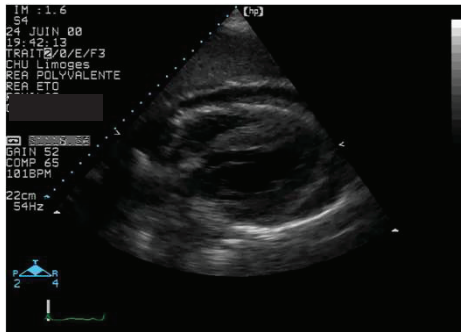
Open Access

Dying from cardiac tamponadeAravind Swaminathan¹, Karikalan Kandaswamy², Manish Powari¹ and Joseph Mathew^{*1}Address: ¹Department of Histopathology, Royal Cornwall Hospital, Truro, UK. TR1 3 LJ and ²Department of Cardiology, Royal Cornwall Hospital, Truro, UK. TR1 3 LJ**Figure 1**

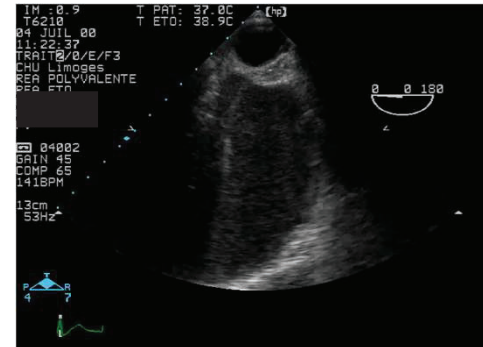
This image depicts a) the characteristic bluish black pericardial distension, observed at postmortem, most often b) containing an admixture of clotted and frank blood.



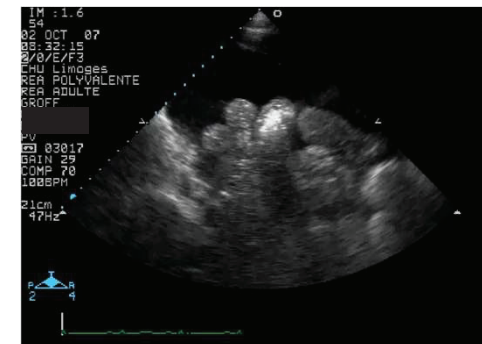
Tamponnade



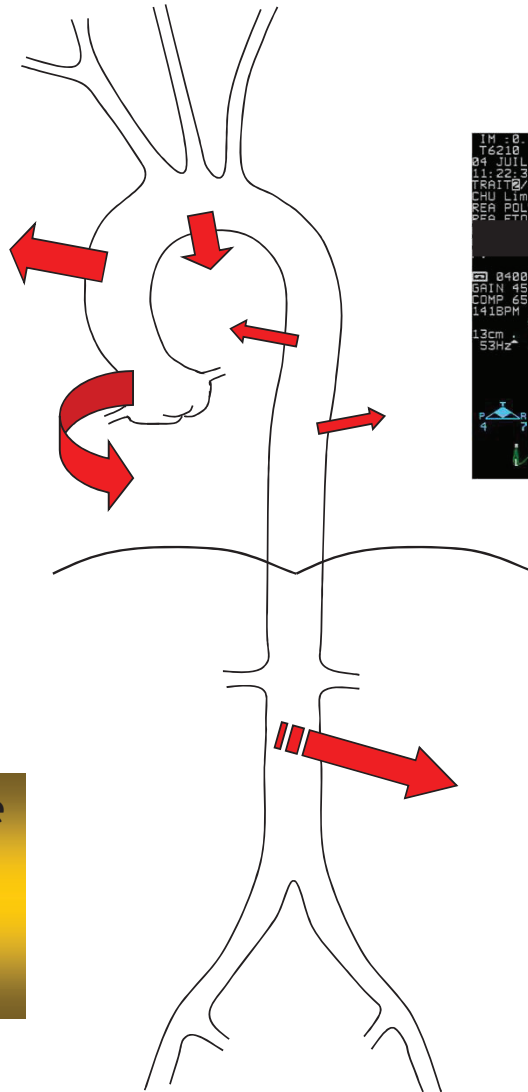
Hémomédiastin & hémothorax



Hémopéritoine



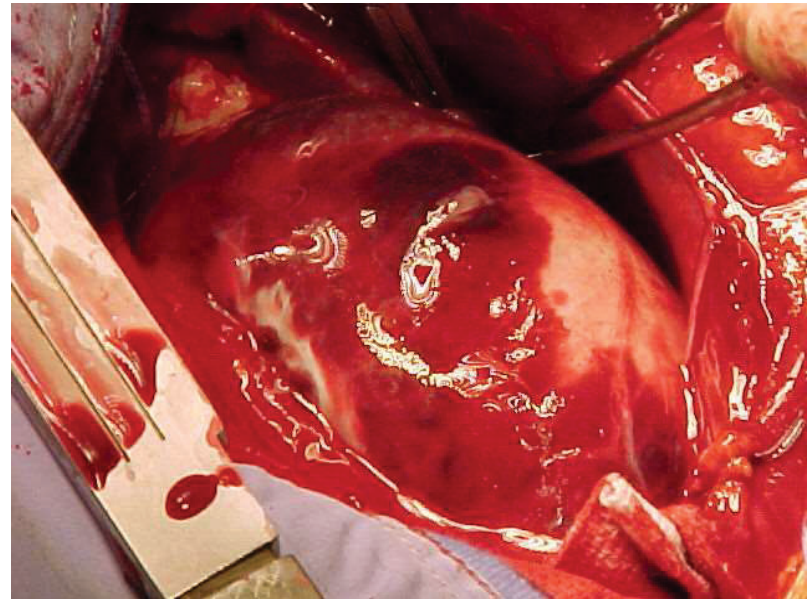
Risque de mort subite
par tamponnade ou
rupture aortique :
AORTE ASCENDANTE



Syndrome d'extravasation

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

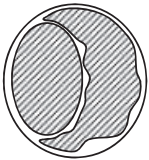
Syndrome aortique aigu + signe d'extravasation
= bloc !!



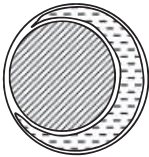
Généralités

Extravasation

Présentation



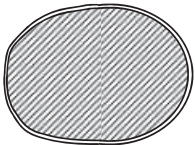
Dissection : aorte ascendante > descendante



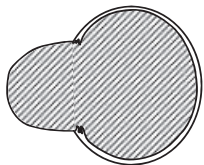
Hématome intramural : aorte descendante > asc.



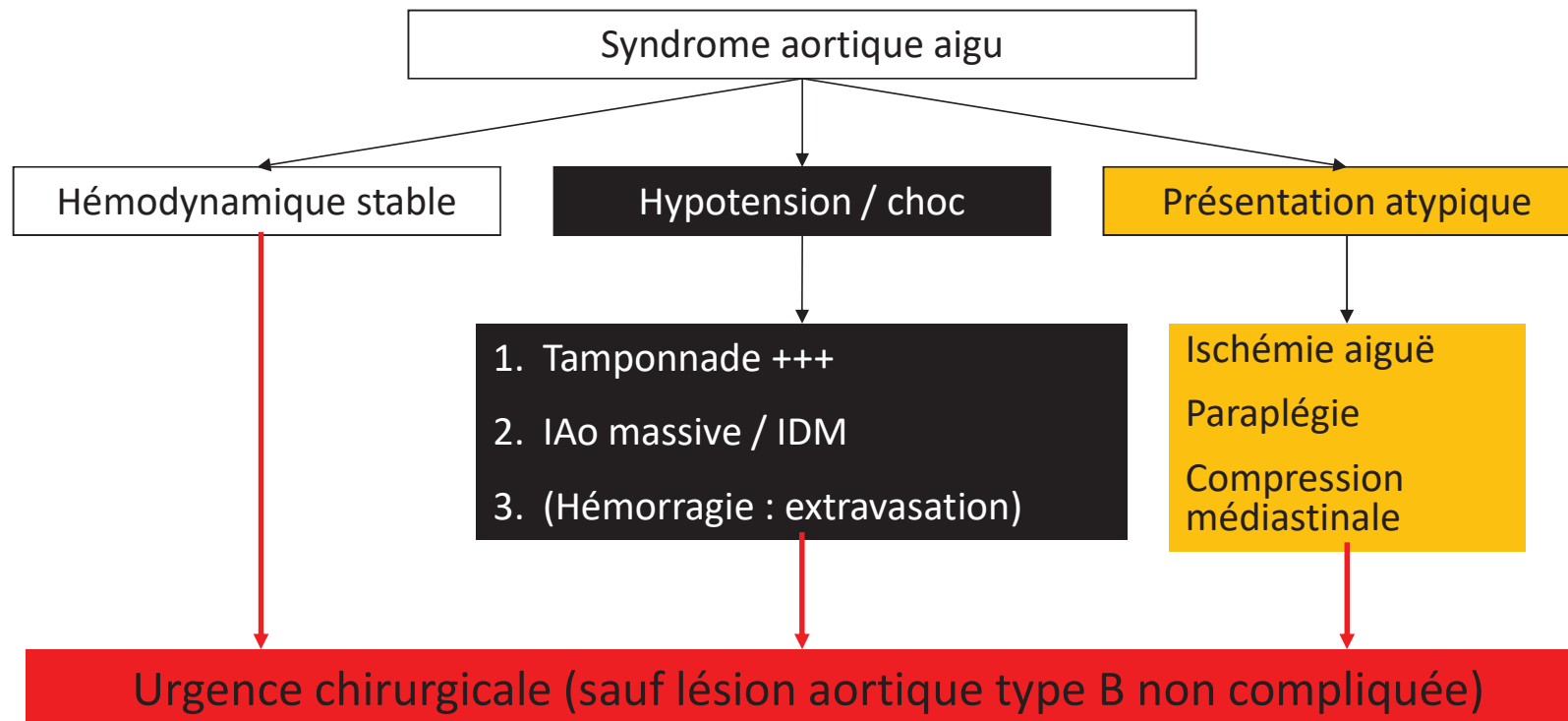
Ulcère athéromateux : aorte descendante > asc.



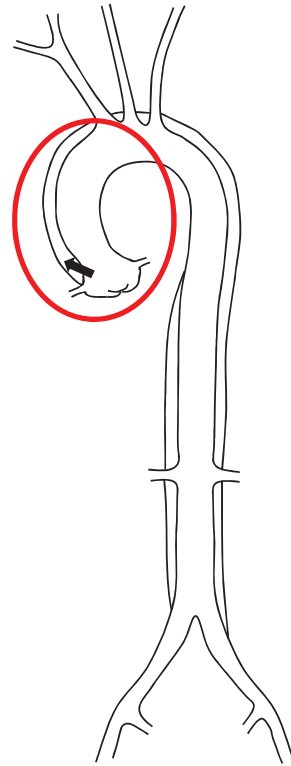
Anévrysme : aorte abdominale >> thoracique



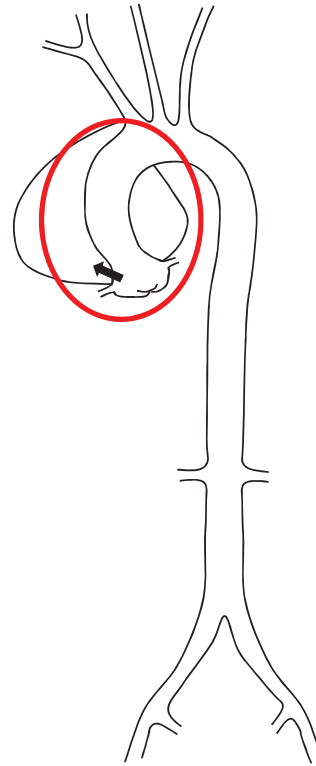
Faux-anévrysme : aorte descendante > asc.



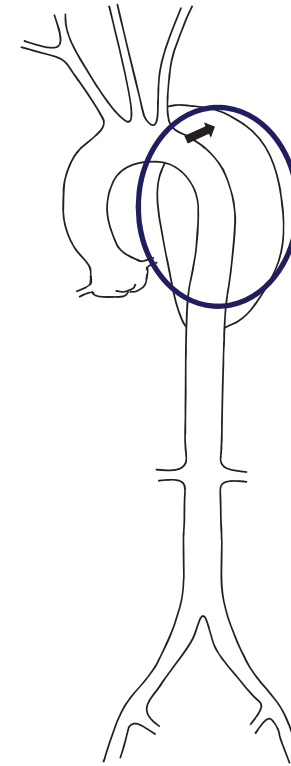
Dissection aortique touchant l'aorte ascendante =
1 à 2% de décès /h pendant les 24 premières heures



Type I



Type II



Type III

De Bakey

Stanford

Traitement

Type A

Chirurgie

Type B

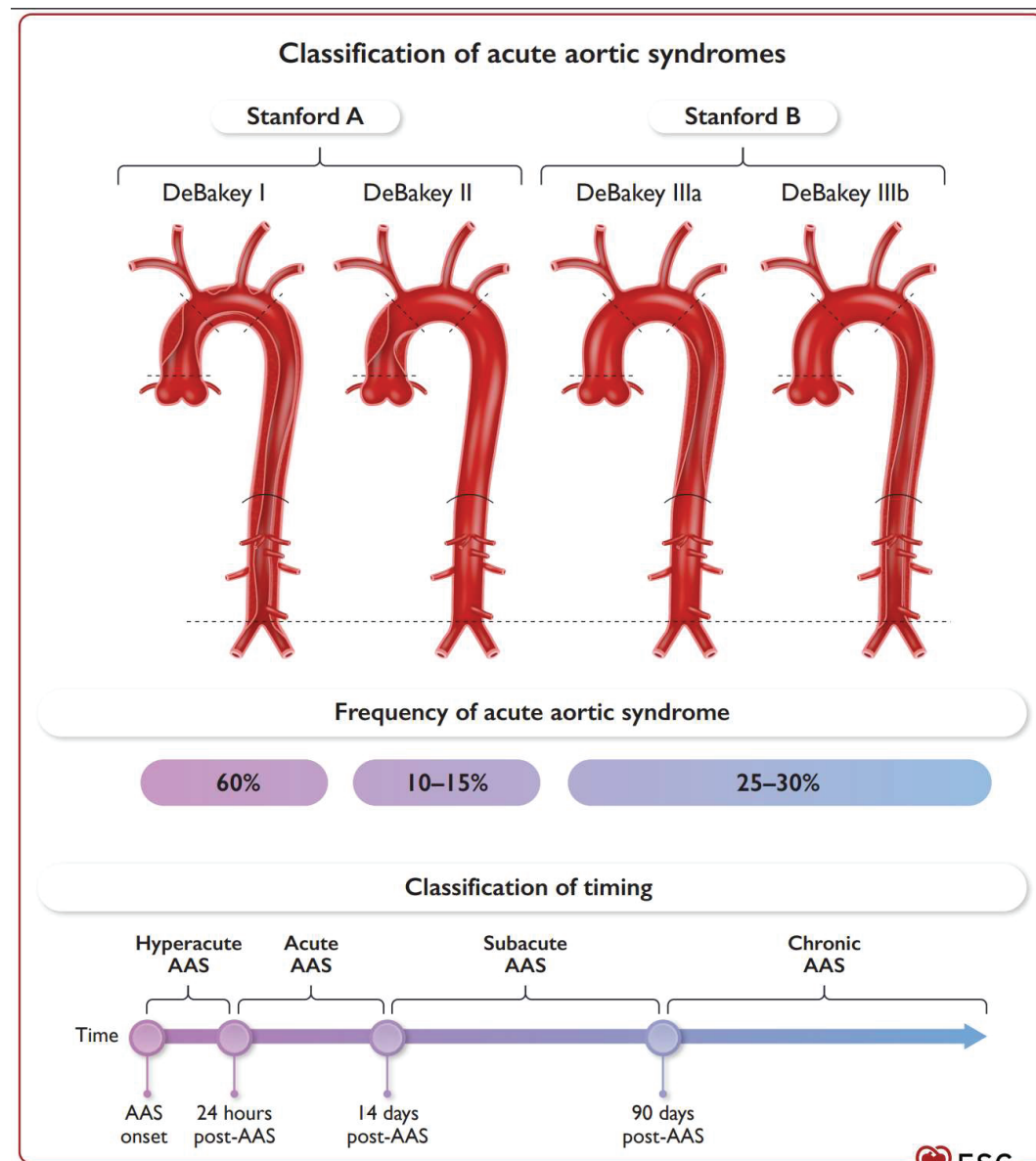
Medical

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

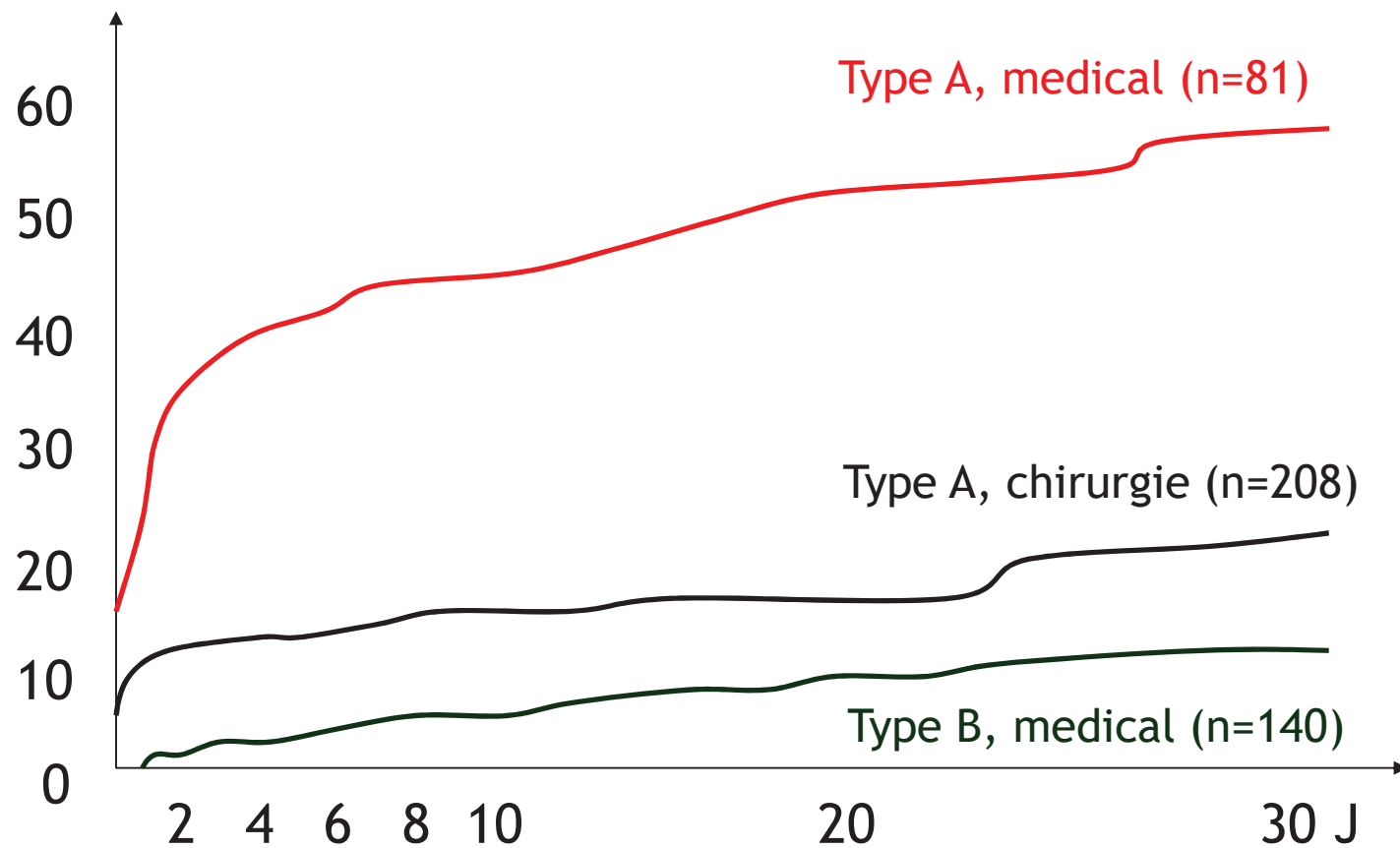
Developed by the task force on the management of peripheral arterial and aortic diseases of the European Society of Cardiology (ESC)

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 ^{ID}*,†, (Chairperson) (Switzerland),



Dissection aortique : pronostic



From Hagan PG JAMA 2000;283:897-903

Simple Risk Models to Predict Surgical Mortality in Acute Type A Aortic Dissection: The International Registry of Acute Aortic Dissection Score

Vincenzo Rampoldi, MD, Santi Trimarchi, MD, Kim A. Eagle, MD, Christoph A. Nienaber, MD, Jae K. Oh, MD, Eduardo Bossone, MD, Truls Myrmel, MD, Giuseppe M. Sangiorgi, MD, Carlo De Vincentiis, MD, Jeanna V. Cooper, MS, Jianming Fang, MD, MS, Dean Smith, PhD, Thomas Tsai, MD, Arun Raghupathy, MD, Rossella Fattori, MD, Udo Sechtem, MD, Michael G. Deeb, MD, Thoralf M. Sundt III, MD, and Eric M. Isselbacher, MD, on behalf of the International Registry of Acute Aortic Dissection (IRAD) Investigators

Table 5. Preoperative Prediction Model

Variable	Overall Type A (%)	% Among Survivors	% Among Death	Coefficient	Score Assigned	p Value	Death OR (95% CI)
Age $\geq$ 70 y	27.3	24.1	37.4	0.68	0.7	<0.01	1.98 (1.19–3.29)
History aortic valve replacement	4.5	3.8	6.6	1.44	1.5	<0.01	4.21 (1.56–13.4)
Presenting hypotension, shock, or tamponade	28.8	22.4	49.0	1.17	1.2	<0.01	3.23 (1.95–5.37)
Migrating chest pain	13.8	12.1	19.3	0.88	0.9	<0.01	2.42 (1.32–4.45)
Preoperative cardiac tamponade	15.5	11.7	28.2	0.97	1.0	<0.01	2.65 (1.48–4.75)
Any pulse deficit	28.6	25.7	37.8	0.56	0.6	0.03	1.75 (1.06–2.88)
ECG infarct, new Q waves, ST elevation, or ischemia	21.1	18.7	29.3	0.57	0.6	0.04	1.76 (1.02–3.03)

CI = confidence interval; ECG = electrocardiogram; OR = odds ratio.

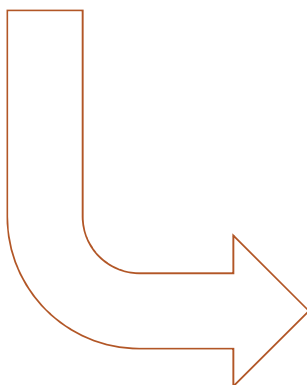


European Heart Journal (2014) **35**, 2873–2926
doi:10.1093/eurheartj/ehu281

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

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

Généralités

Extravasation

Présentation

Diagnostic

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.

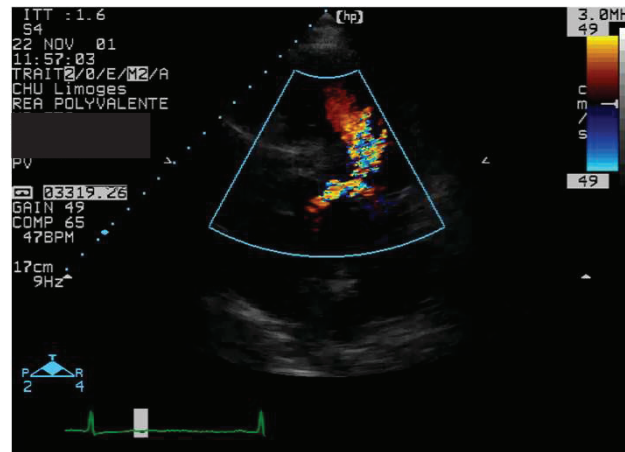
Généralités

Extravasation

Présentation

Diagnostic

Etat de choc : ETT en première intention



Syndrome aortique aigu & insuffisance aortique : éliminer une dissection aortique proximale.

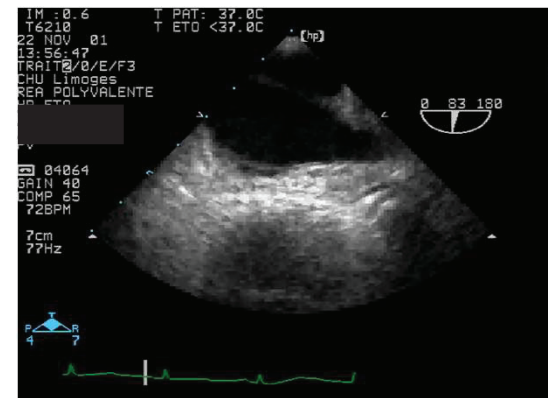
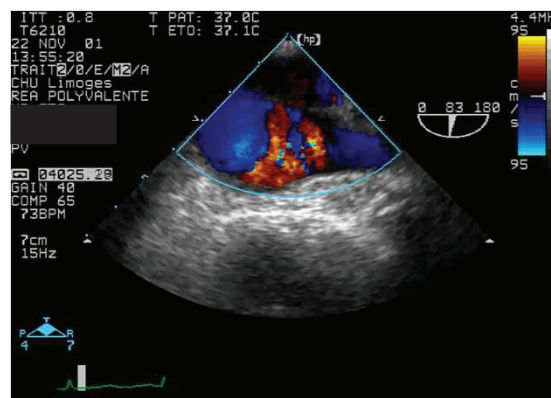
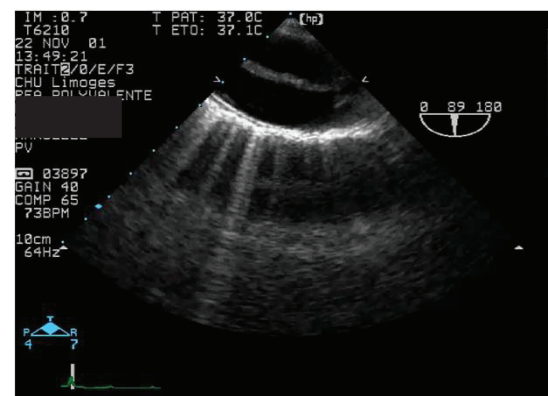
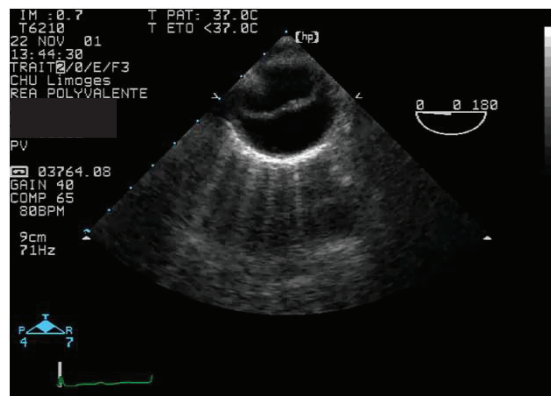
Généralités

Extravasation

Présentation

Diagnostic

ETO en deuxième intention au bloc opératoire

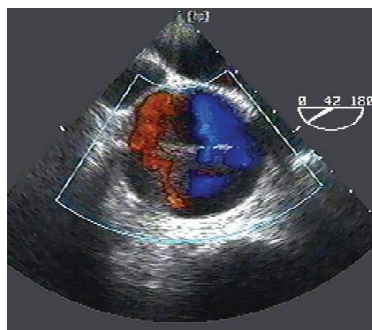
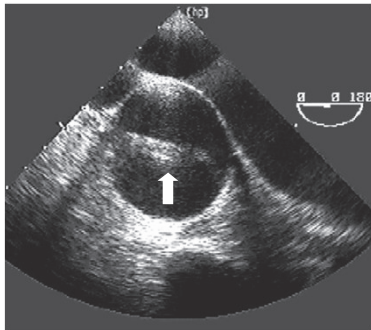


Artefact linéaire vs. flap intimal

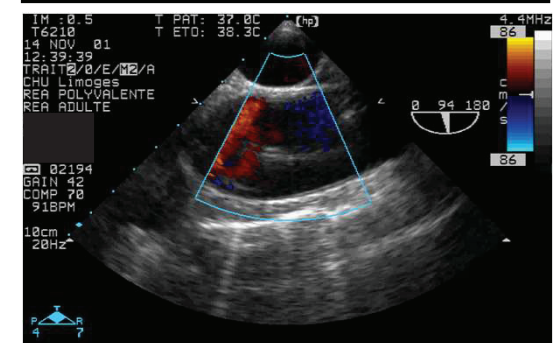
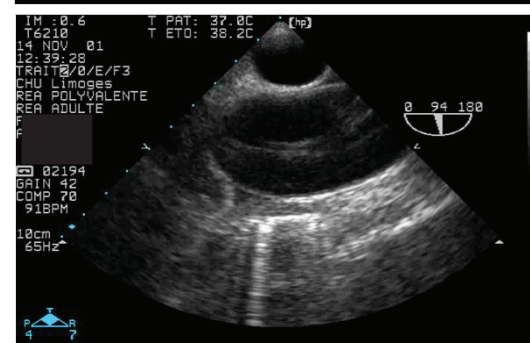
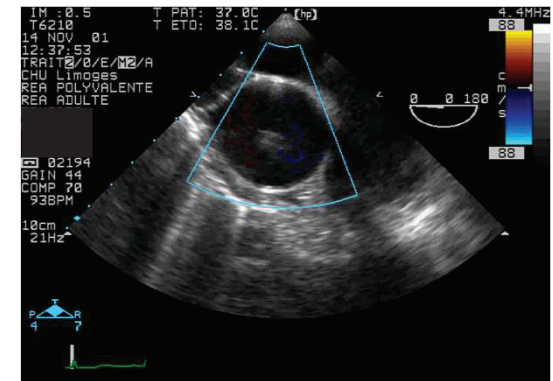
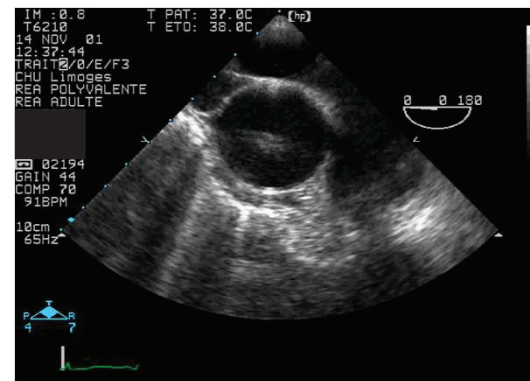
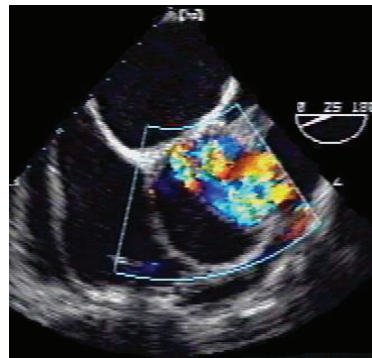
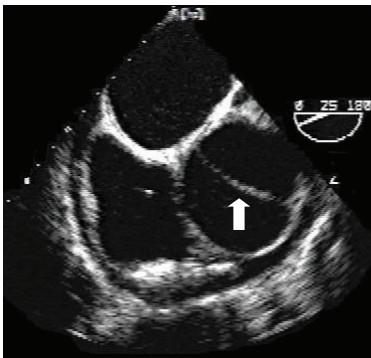
Aorte ascendante

Artefact linéaire

Linear
(multipath)
artifact



Intimal flap



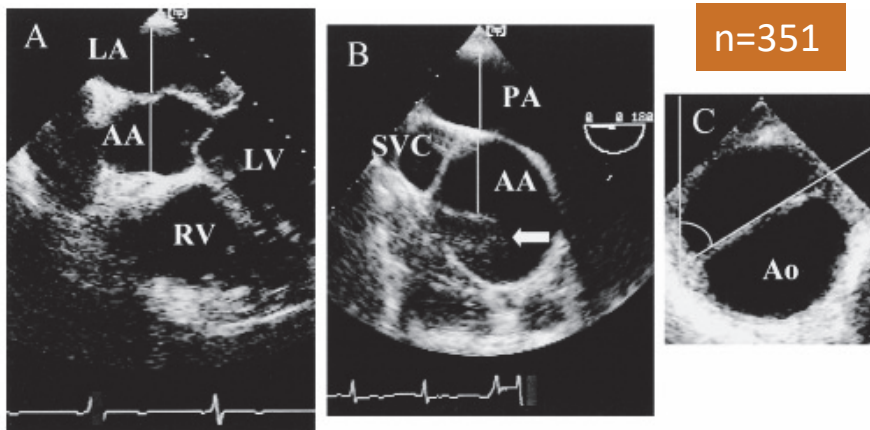
Critères diagnostiques d'artefact linéaire

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)



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
- ❖ At least 3 of these criteria fulfilled:

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

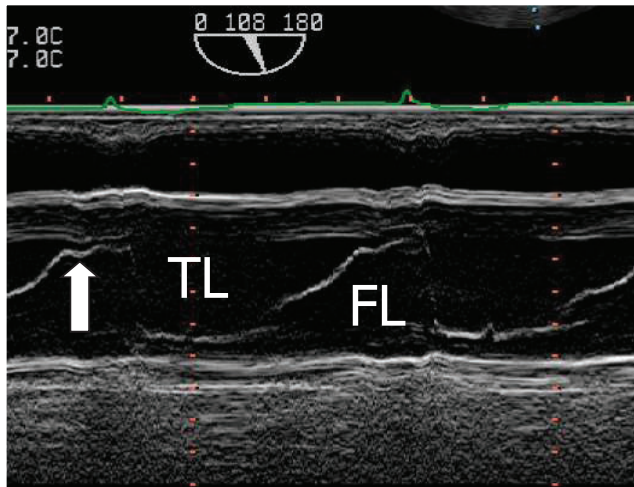
Diagnosis of Ascending Aortic Dissection by Transesophageal Echocardiography: Utility of M-Mode in Recognizing Artifacts

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

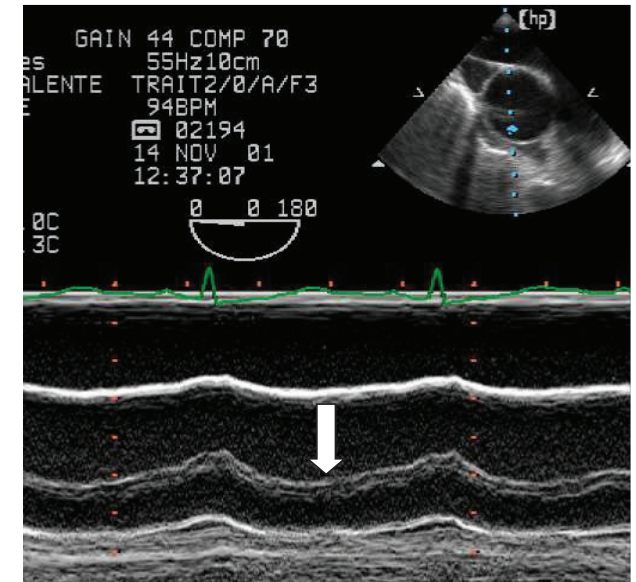
JACC Vol. 27, No. 1
January 1996:102-7

Intimal flap

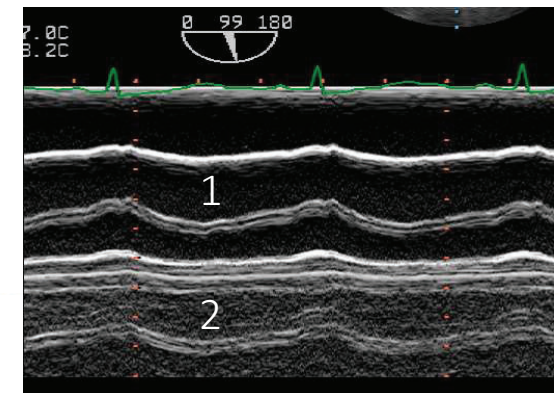


- ❖ Free motion of actual aortic flap (according to pressure gradient between true & false lumen)
- ❖ Variable angle with aortic wall (transverse view)
- ❖ Usually thin structure (intimal flap)
- ❖ Frequent difference of blood flow velocity (true vs. false lumen)

Linear artifact



Linear + mirror artifact



Origine des artefacts linéaires de réverbération

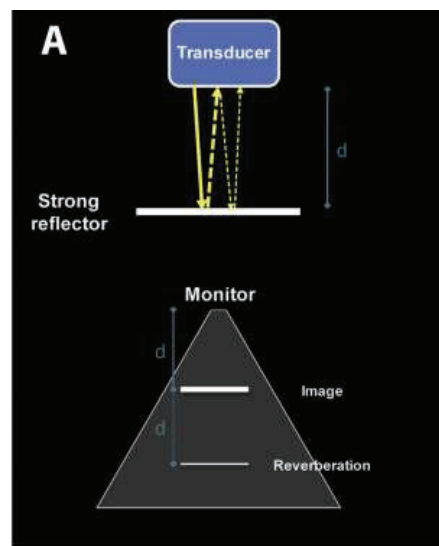
Aorte ascendante

STATE-OF-THE-ART REVIEW ARTICLE

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

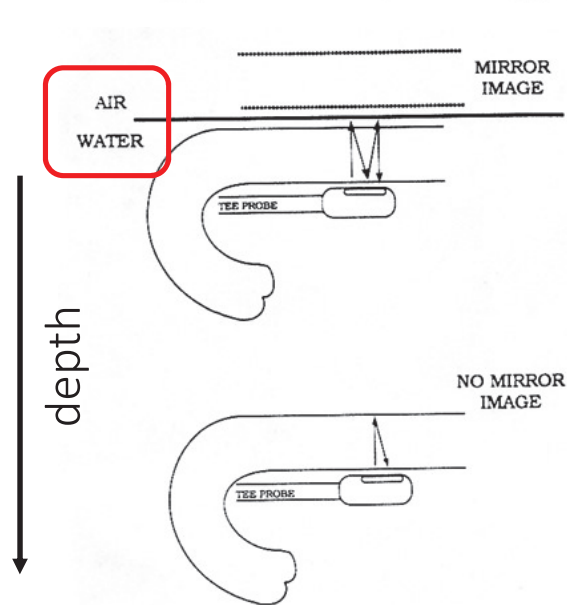
Philippe B. Bertrand, MD, MSc, Robert A. Levine, MD, Eric M. Iselbacher, MD, MSc,
and Pieter M. Vandervoort, MD, Genk and Hasselt, Belgium; and Boston, Massachusetts

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

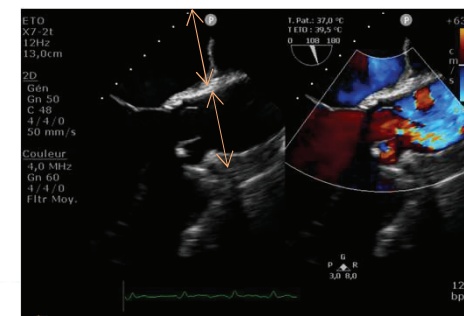
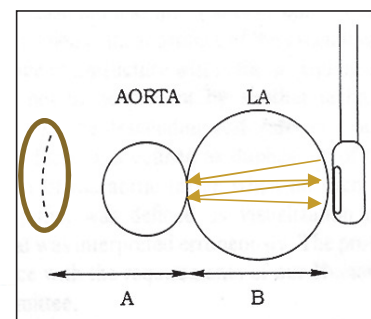
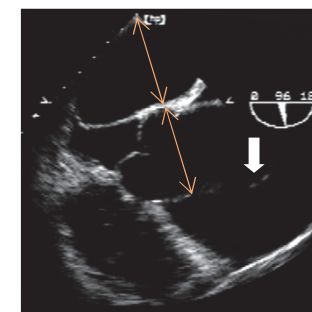
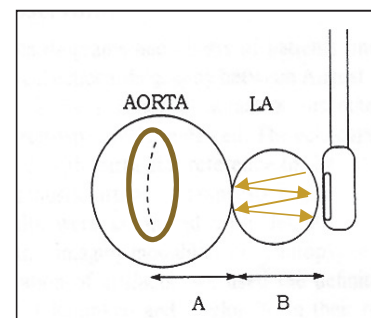


Clinical Significance and Origin of Artifacts in Transesophageal Echocardiography of the Thoracic Aorta

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



Généralités

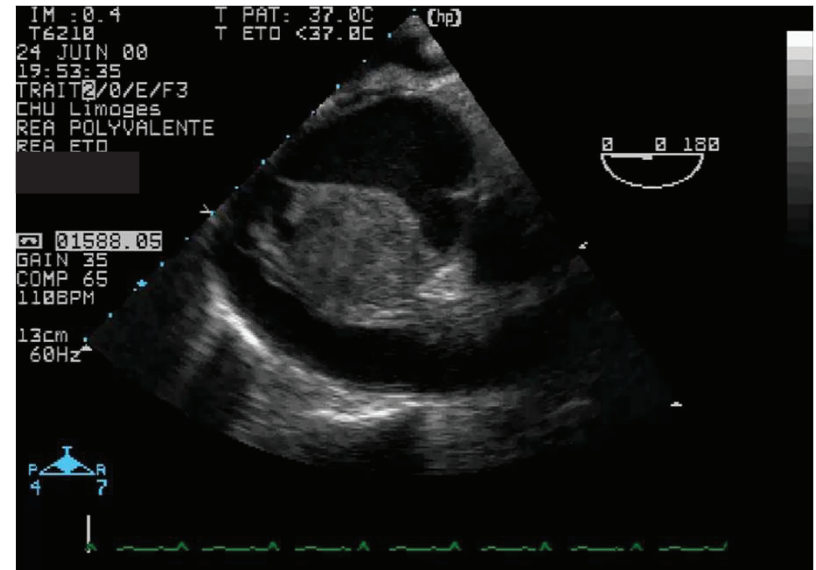
Extravasation

Présentation

Diagnostic

Hématome de paroi (intra-aortique) aigu

- ❖ Épaississement 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.



Généralités

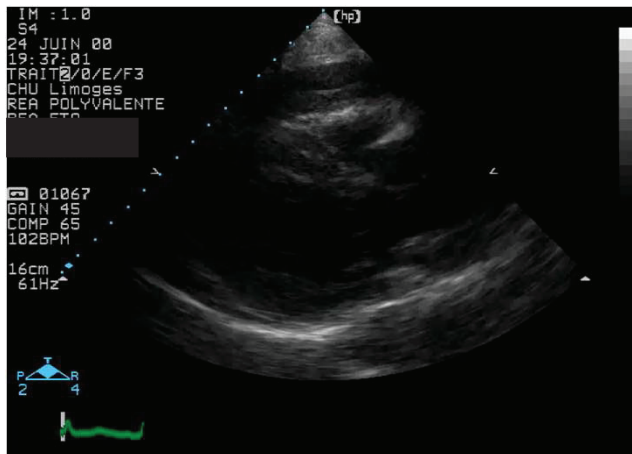
Extravasation

Présentation

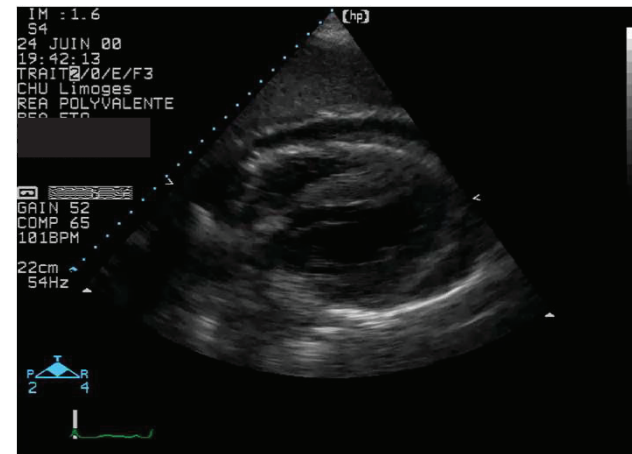
Diagnostic

Hématome de paroi (intra-aortique) aigu

ETT immédiate aux urgences



Vue parasternale



Vue sous-costale

Généralités

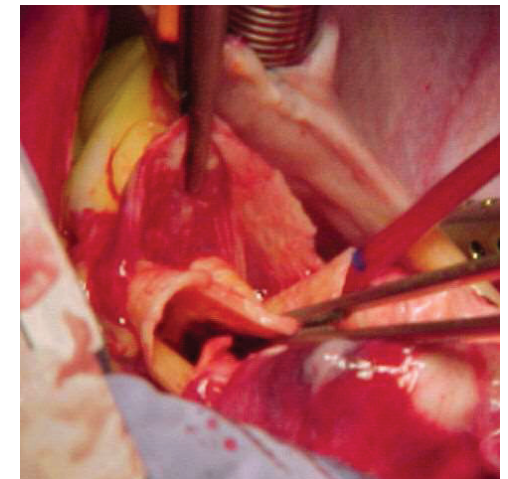
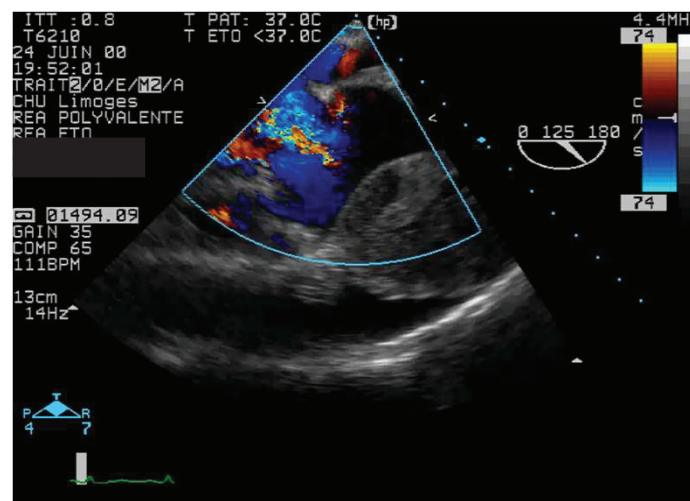
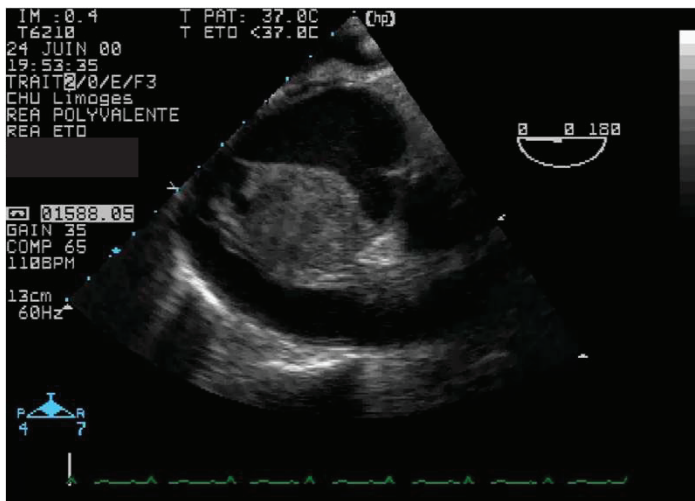
Extravasation

Présentation

Diagnostic

Hématome de paroi (intra-aortique) aigu

ETO au bloc opératoire chez un patient anesthésié



Généralités

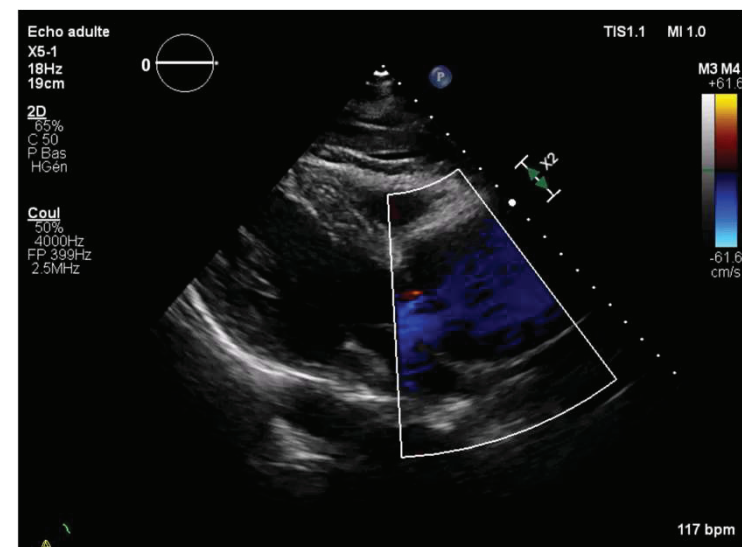
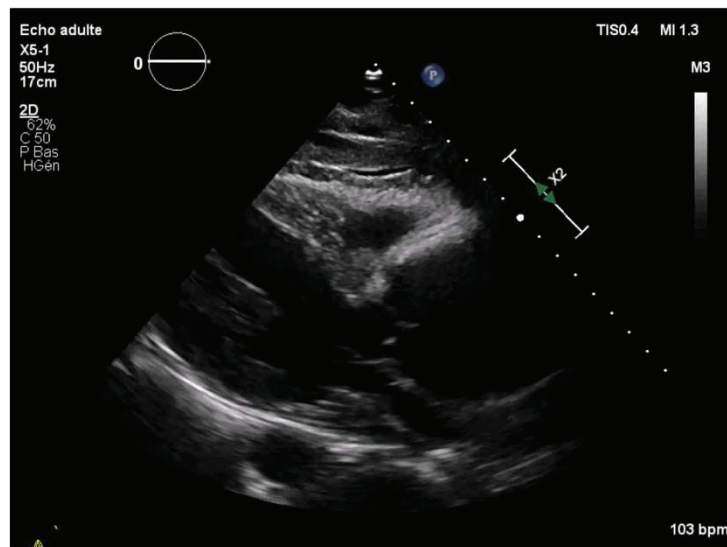
Extravasation

Présentation

Diagnostic

Fissuration d'anévrisme de l'aorte ascendante

ETT aux Urgences car douleur thoracique + hypotension



Généralités

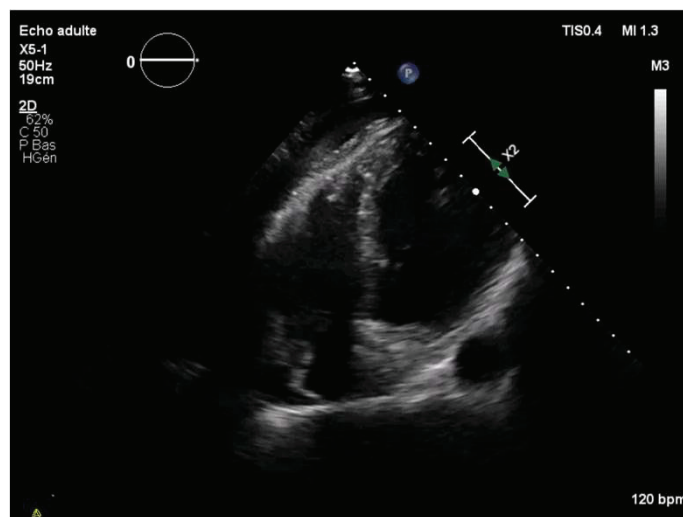
Extravasation

Présentation

Diagnostic

Fissuration d'anévrisme de l'aorte ascendante

ETT aux Urgences car douleur thoracique + hypotension



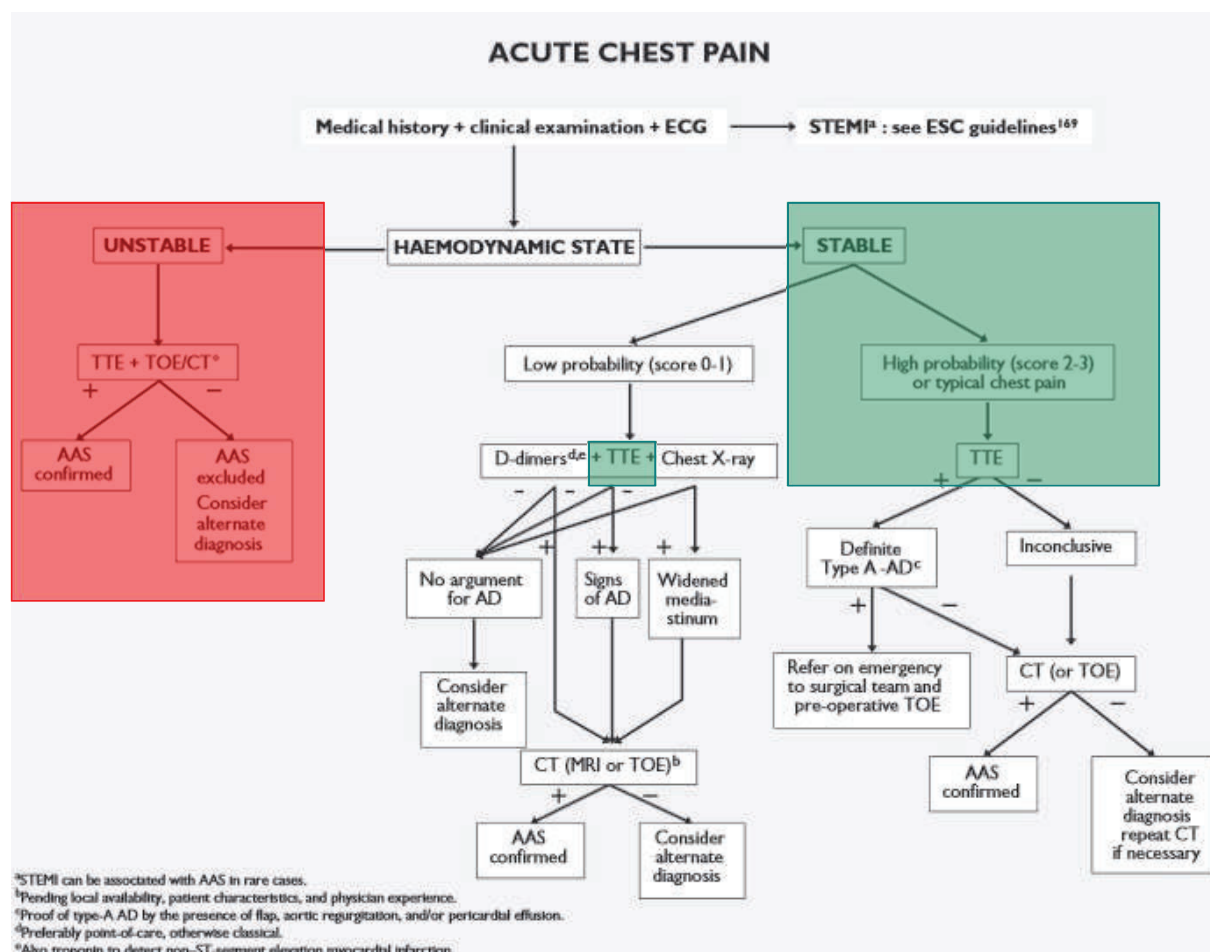


Syndrome aortique aigu

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).

2014 ESC Guidelines on the diagnosis and treatment of aortic diseases



Sensitivity of the Aortic Dissection Detection Risk Score, a Novel Guideline-Based Tool for Identification of Acute Aortic Dissection at Initial Presentation

Results From the International Registry of Acute Aortic Dissection

Adam M. Rogers, MD; Luke K. Hermann, MD; Anna M. Booher, MD; Christoph A. Nienaber, MD; David M. Williams, MD; Ella A. Kazerooni, MD; James B. Froehlich, MD; Patrick T. O'Gara, MD; Daniel G. Montgomery, BS; Jeanna V. Cooper, MS; Kevin M. Harris, MD; Stuart Hutchison, MD; Arturo Evangelista, MD; Eric M. Isselbacher, MD; Kim A. Eagle, MD; on behalf of the IRAD Investigators

