Les aortites inflammatoires

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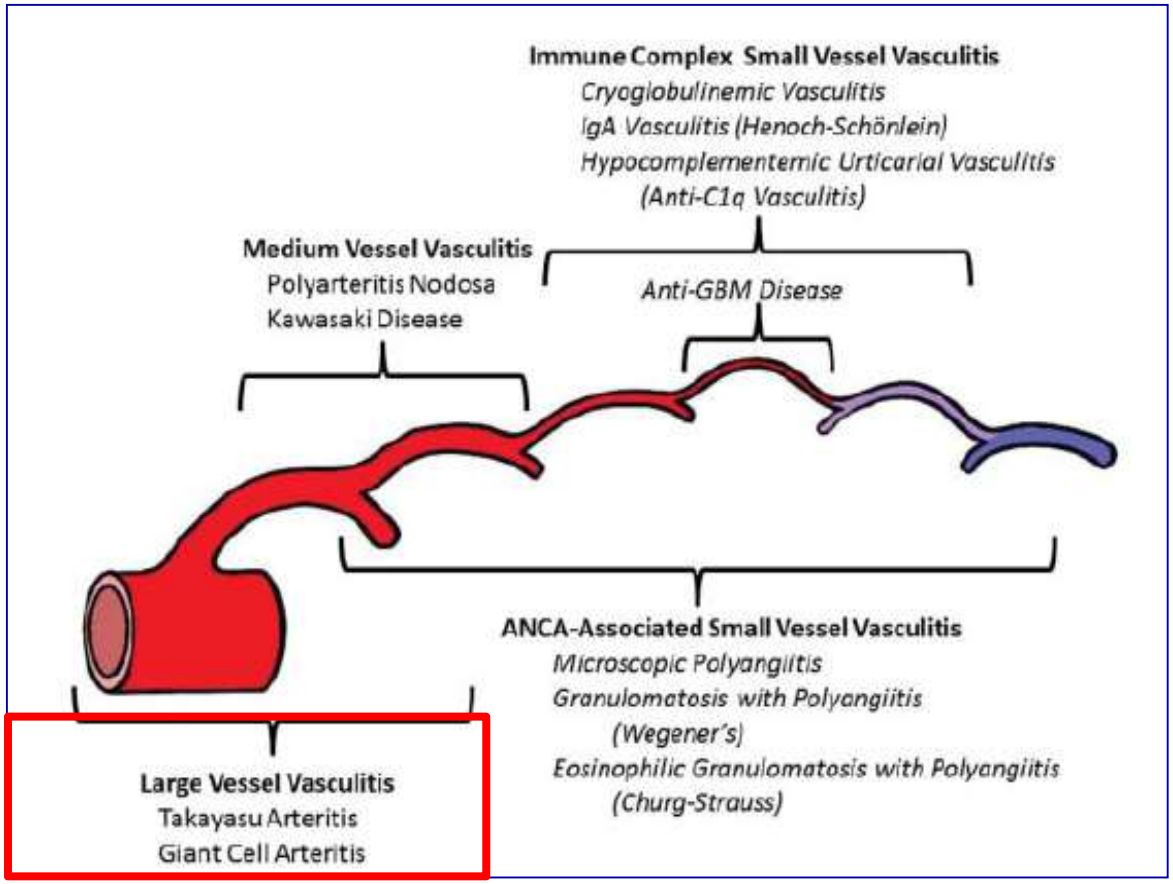
Classification des vascularites inflammatoires
Chapell Hill, 2013



Jennette JC et al. Arthritis Rheum 2013

Aortites inflammatoires
Circonstances du diagnostic

- **Latence**
  - Imagerie « de hasard » (RP, TDM)

--> c'est l'imagerie (TDM, angio-IRM, PET-scan…) qui fait le diagnostic d'une atteinte :

- **aortique**
- **possiblement inflammatoire**

  - Liées à une atteinte associée des gros troncs artériels
- **Complications d'une ectasie aortique**
  - Compression de voisinage
  - Rupture/Dissection

Aortites inflammatoires
Diagnostic positif

Le diagnostic d'aortite inflammatoire et celui de l'affection causale peuvent être simples

- anamnèse ++
- signes généraux, ATCD vasculaires (A-V)
- arthrites, chondrites, céphalées, « œil rouge », ORL, dermato, aphtes ...
- examen physique
- aspects d'imagerie
- biologie (parfois)

AORTITE

Eliminer une infection

- **Syphilis:** Ao thoracique >> abdo
- **Sepsis mediastino-pulmonaire**: pyogènes
- **Endocardite infectieuse**
  - anévrysmes mycotiques: emboles septiques > vasa vasorum
  - extension d'une lésion valve Ao
- **Anévrysmes « primitifs » surinfectés**
  - staphylocoques, streptocoques
  - salmonelles (VIH, hémopathies…)

Eliminer une affection constitutionnelle

- **Marfan**: AAT ascendante
- **Ehlers-Danlos IV**: thorax - abdo
- **Dysplasie ± NF1** ou Bourneville: AAA, sténose Ao thoraco-abdo
- **Homocystinurie**: AAA / AAT
- **AA familiaux** « isolés » (11q23.3-q24)

AORTITE

Eliminer une infection

Eliminer une affection constitutionnelle

Aortite inflammatoire

- **Les incontournables**
  - **Takayasu**
  - **Behçet**
  - **Horton**
  - Maladie IgG4
  - Polychondrite
  - Erdheim-Chester

Beaucoup plus rares

- Lupus
- Polyarthrite, spondylarthrite
- Cogan, Kawasaki, GPA
- Weber Christian
- Sarcoïdose

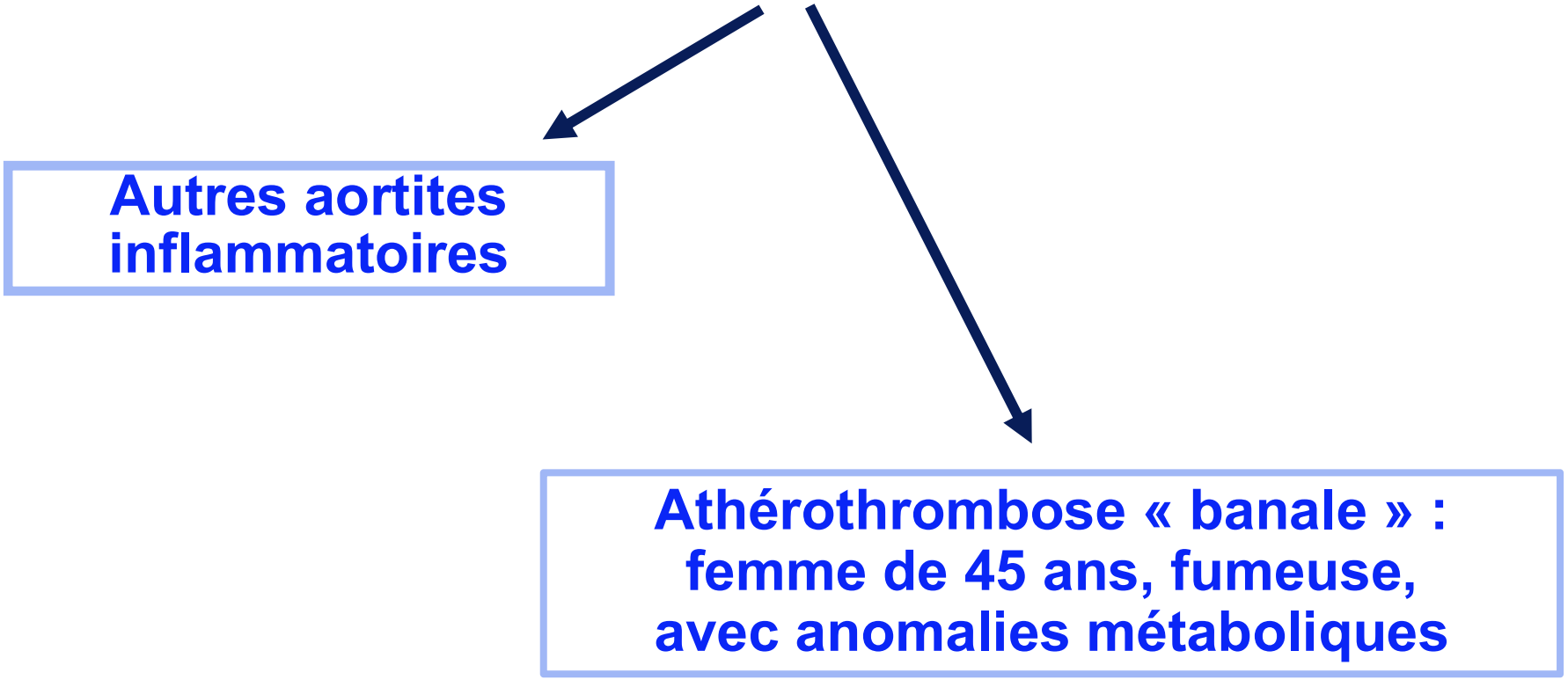
Idiopathiques

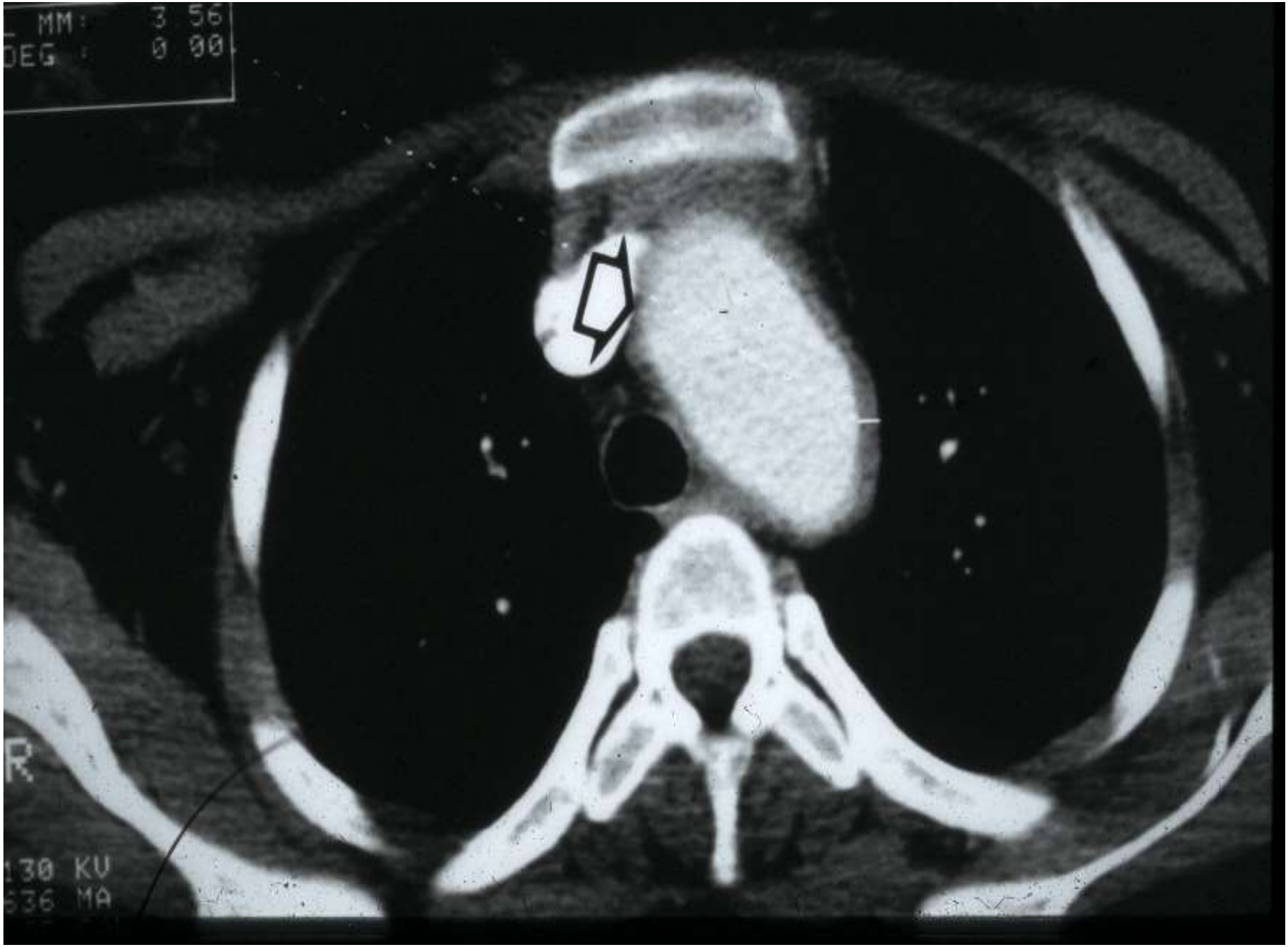
Aortite et Maladie de Takayasu

Maladie de Takayasu
En pratique …

- **Femme « jeune », phase pré-occlusive** (systémique) :
  fébricule, arthro-myalgies, épisclérite, nodosités mb
- **Syndrome inflammatoire** … inconstant
- **Atteinte de l'aorte**
  - sténose(s) et/ou ectasie(s), de sièges variés, parfois isolée
  - TDM / IRM: épaississement circonférentiel
- Autres atteintes artérielles: membres, neuro, œil, HTA, coronaires, insuff. Ao, hémoptysies
- **Histologie :** pan-artérite à prédominance médio-adventitielle; granulome à cellules géantes (si active)

Maladie de Takayasu
Diagnostics différentiels

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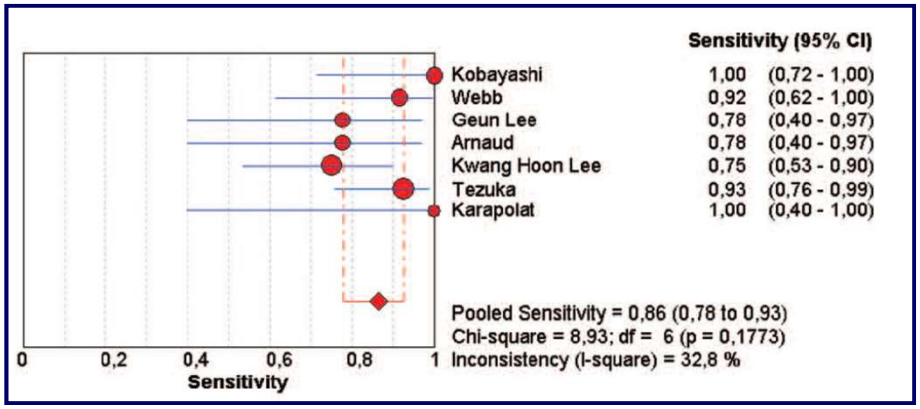
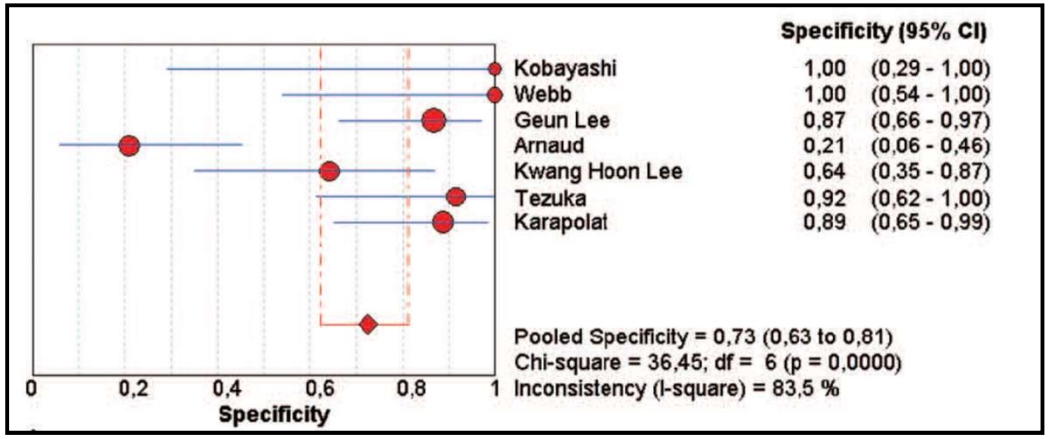
Management of Large-Vessel Vasculitis With FDG-PET

A Systematic Literature Review and Meta-Analysis

Takayasu arteritis





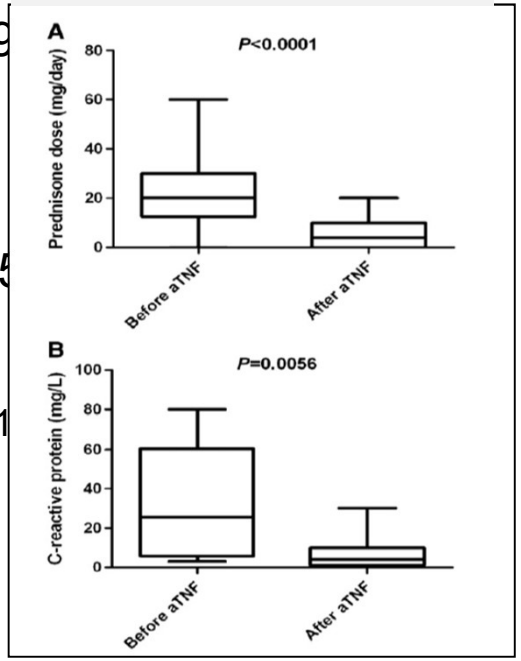
7 studies, 191 patients

Soussan M et al, Medicine 2015

Anti TNF-α in refractory Takayasu's arteritis: Cases series and review of the literature

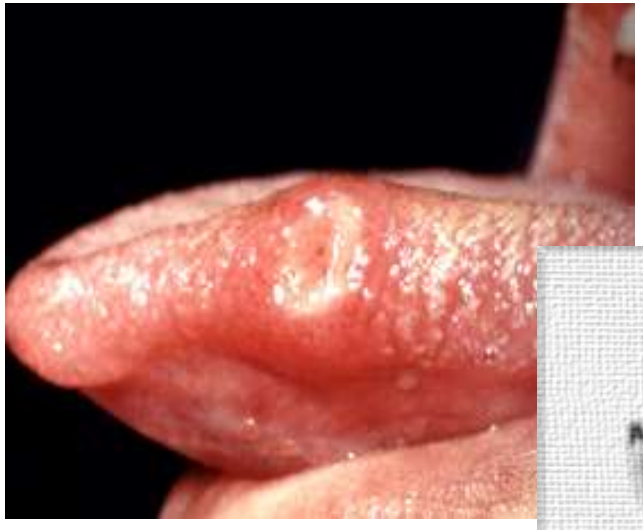
- 74/83 (89%) female; 28.5 (7-61) years
- **First line anti-TNF**: infliximab (81%), etarnecept (19
- **Associated to Steroids and**
  - MTX (69%), AZA (30%), Cyclophosphamide (28%), or MMF (9%)
- **Response** : complete (37%), partial (53.5%), no (9.5
- **Median follow up 10 months** (2-82):
  - increase the dose of anti-TNF (32%), or change of anti-TNF (1
  - 17 side effects led to TNFb withdraw in 8 patients (infection, hypersentitivity).

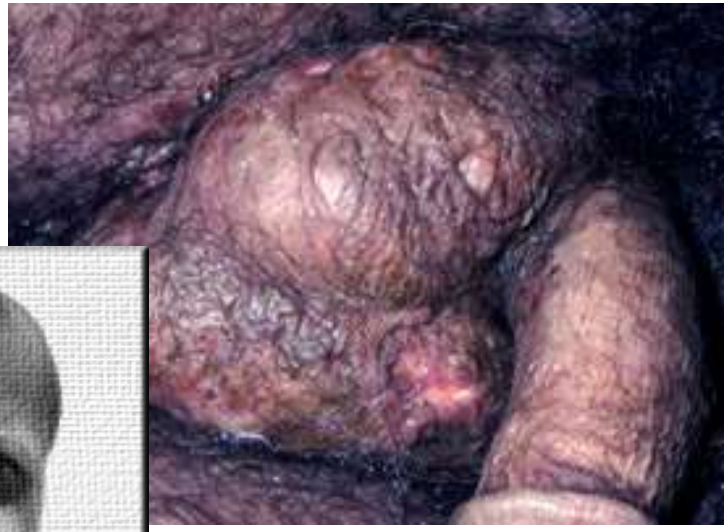
Steroid sparing effect



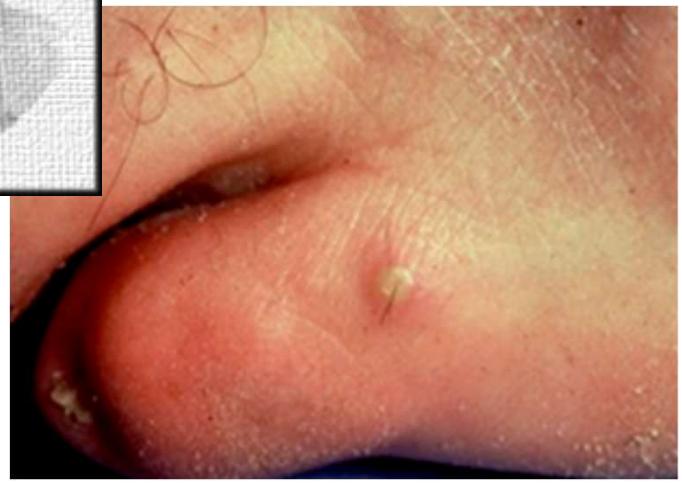
Comarmond C et al, Autoimmunity Rev 2012

Aortite et Maladie de Behçet





Maladie de Behçet



Maladie de Behçet
Manifestations cliniques

• Aphtose buccale	99%
• Ulcérations génitales	70%
• Manifestations cutanées	61.4%
• Atteinte oculaire	62.9%
• Atteinte articulaire	43.3%
• Atteinte veineuse	36.8%
• Atteinte neurologique	26.9%
• **Atteinte artérielle**	**13.9%**
• Atteinte digestive	<5%

N=753 patients

Saadoun D et al. Arthritis Rheum 2010

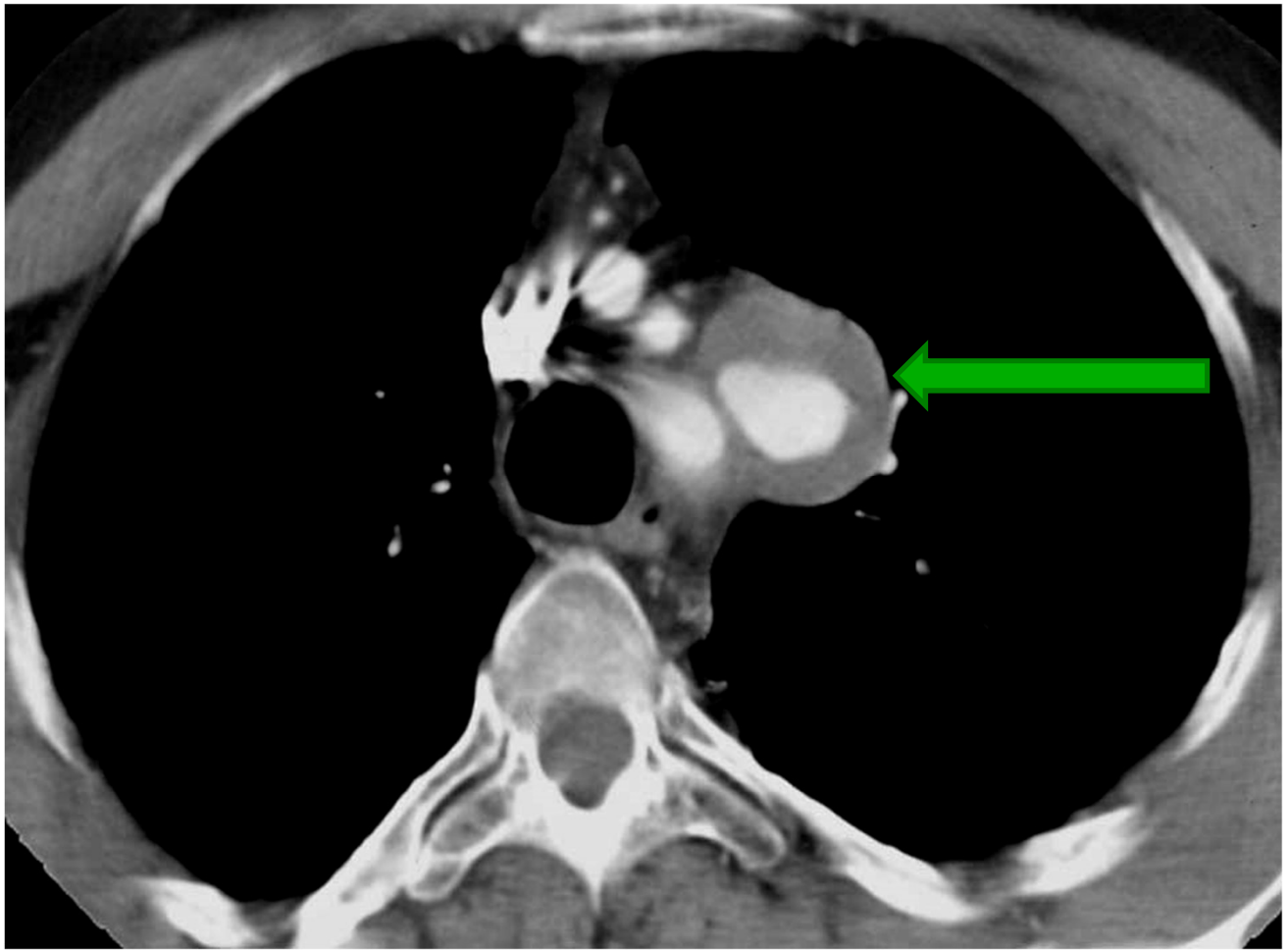
Nouveaux critères de classification de la maladie de Behçet

Aphtose orale	1 point
Apthose génitale	2 points
Lésions cutanées (pseudofolliculite, erythème noueux)	1 point
Atteinte oculaire	2 points
Atteinte vasculaire (thrombophlébite superficielle, TVP, thrombose artérielle, anévrysme)	1 point
Test pathergique positif	1 point

- Diagnostic établi si ≥ 3 points positifs
- Sensibilité (variable selon études): 87-98%
- Spécificité (variable selon études): 74-96%

Davatchi F. Pathology Res Int Epub 2011 Sep 27; doi: 10.1155/2012/607921
Davatchi F et al. Int J Rheum Dis 2010: 13: 55-60

Angio-Behçet et atteinte artérielle



Maladie de Behçet
Facteurs associés au décès

	HR (95% CI)
Sexe masculin	5.81 (0.77;43.7)
Syndrome de Budd Chiari	9.39 (2.05;43.07)
Atteinte cardiaque	3.67 (1.17;11.55)
Atteinte artérielle	**2.51** (1.1;5.9)

N=753 patients

Saadoun D et al Arthritis Rheum 2010

Endovascular treatment of aortic pseudoaneurysm in Behçet disease

Table II. Meta-analysis of published reports detailing open surgical and endovascular management of patients with Behçet disease and aneurysmal lesions

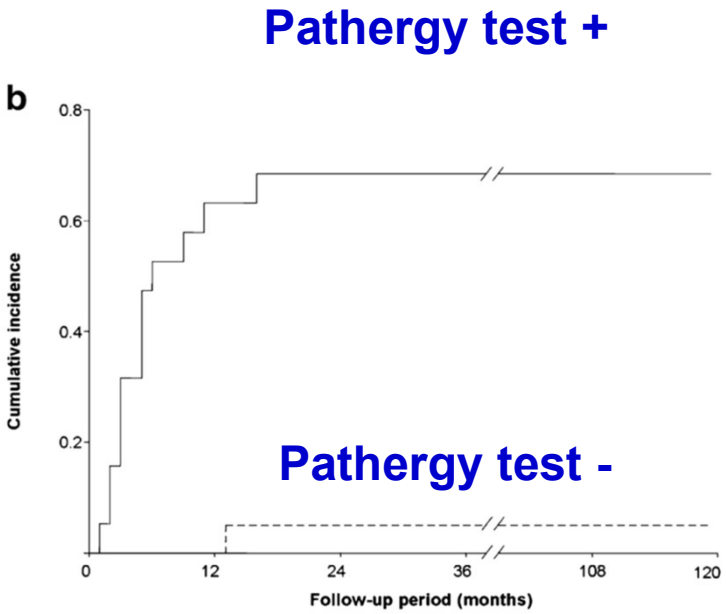
First author	*Year*	*Cases no.*	*Surgical no.*	*Endovascular no.*	*Aneurysm-related death no. (%)*	*Recurrence no. (%)*	*Thrombosis no. (%)*	*Follow-up (Mean)*
Okada[14]	1997	8	14	. . .	1 (12.5)	1 (12.5)	0	6.8 y
Tüzün[15]	1997	24	24	. . .	1 (4.2)	0 (0)	4 (16.7)	47.3 mon
Nitecki[11]	2004	3	3	. . .	1 (33.3)	0	1 (33.3)	4 y
Kalko[6]	2005	16	19	. . .	0 (0)	3 (18.75)	1 (6.25)	17 mon
Iscan[16]	2005	20	25	. . .	2 (10)	10 (50)	9 (45)	44 mon
Kwon[5]	2008	12	21	. . .	2 (16.7)	6 (50)	0	45.4 mon
Park[17]	2001	7	. . .	8	0 (0)	1 (14.3)	2 (28.6)	28 mon
Koo[18]	2003	9	. . .	11	0 (0)	2 (22.2)	2 (22.2)	24.1 mon
Nitecki[11]	2004	2	. . .	2	0 (0)	0 (0)	0 (0)	33 mon

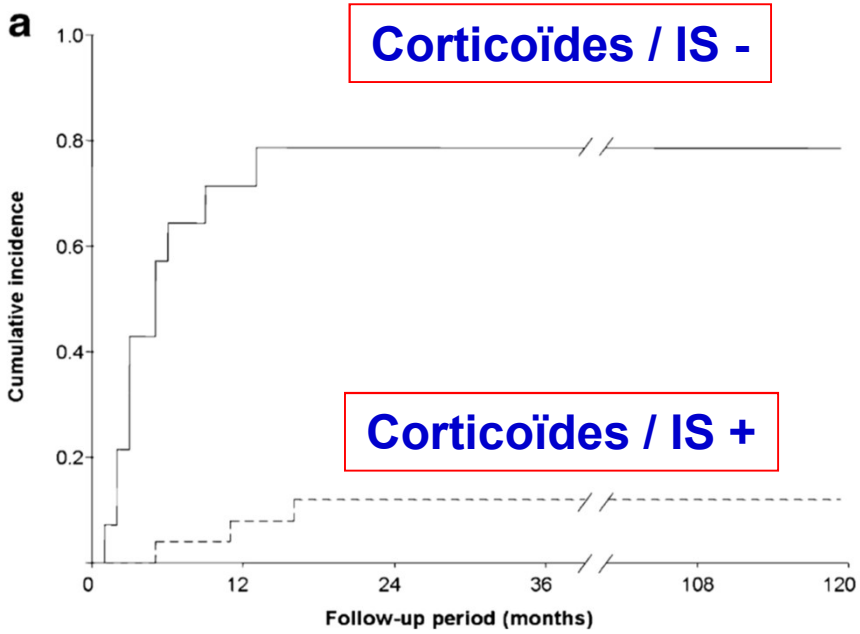
- **Taux de récidive locale: 14 - 50%.**
- **Récidives sur sites de ponctions fémorales**
- **Taux thromboses: 6 – 45%**

Liu CW et al, J Vasc Surg 2009

Anévrysmes aortiques & Behçet: chirurgie

Facteurs associés aux complications post-op: récidive, thrombose





Park MC et al. Clin Rheumatol 2007

Aortite et Maladie de Horton

Maladie de Horton : les symptômes “atypiques”

- sujets jeunes < 50 ans
- atteintes des autres branches de la carotide externe
- polyarthrite périphérique sans PPR
- tr. visuels–cécité “révélatrice”
- fièvre “isolée”
- **atteinte artérielle non–carotide externe**
- toux sèche rebelle
- avec neuropathie periphérique = pseudo–PAN

Maladie de Horton
Sur-risque d'Anévrysmes Aortiques

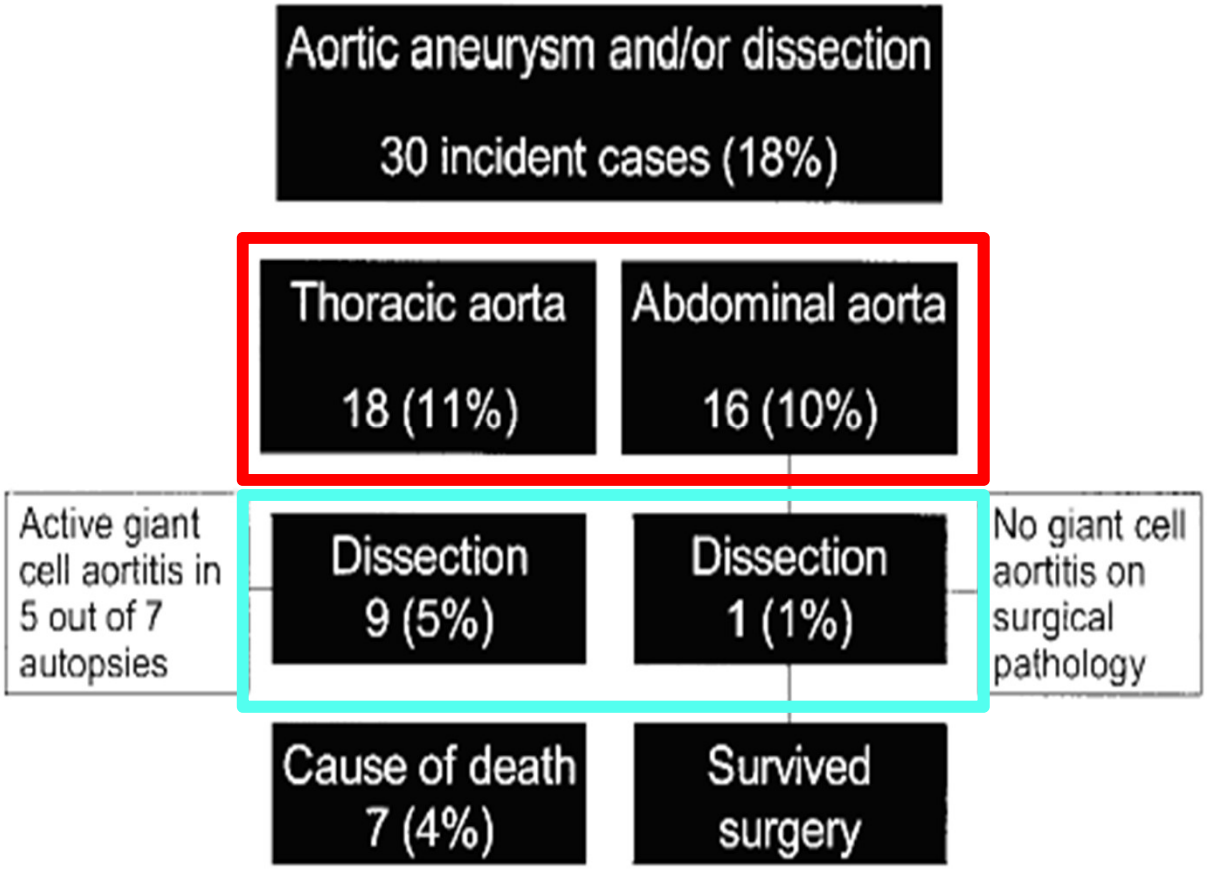
- **Anévrysme Ao Thoracique**
- Délai Horton – AAT= 69 mois (3-241)
- **RR = 17,3 (7,9 - 33,0)**
- 8/9 dissections --> 4 morts brutales
- 3/9 : insuffisance aortique symptomatique

- **Anévrysme Ao Abdominale**
- Délai Horton - AAA = 30 mois (16-92)
- **RR = 2,4 (0,8-5,5)**
- 4/5 : AAA asymptomatiques
- 1/5 : AAA rompu A+6 --> chirurgie

96 patients, 78 F, 56-92 ans, 1950-1985, Minnesota

Evans JM et al. Ann Intern Med 1995; 122: 502-7

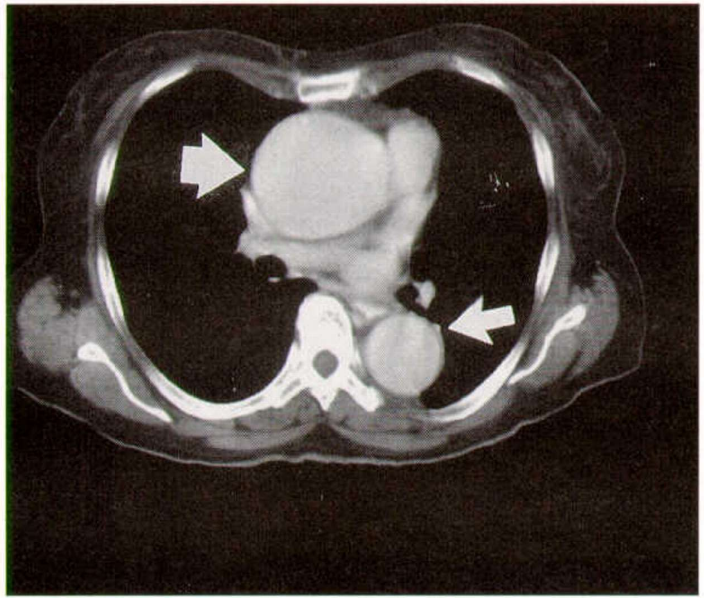
Aortic Aneurysm and/or Dissection in Giant Cell Arteritis.

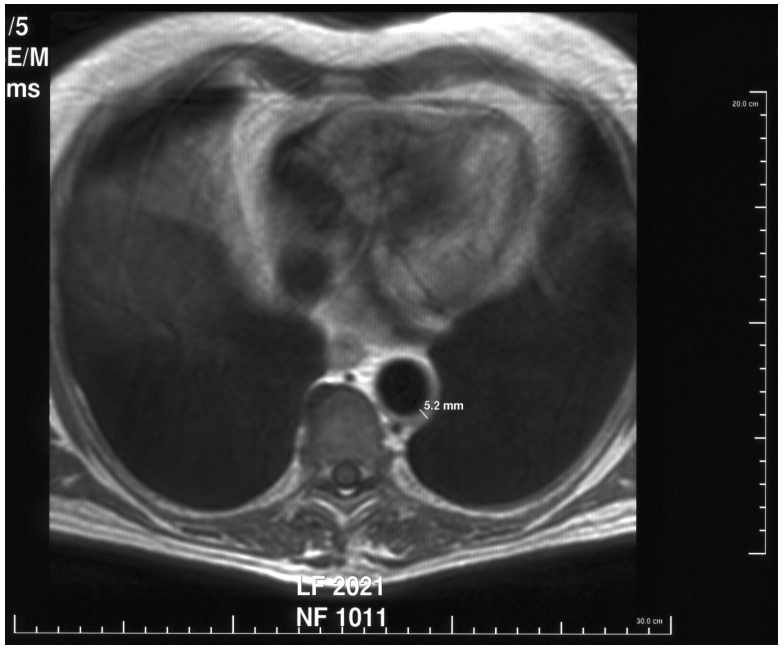


- 17/18 patients with TAoA had mild/moderate aortic insufficiency
- 4 patients had both incident TAoA & AAoA
- median time : GCA diagnosis–TAA = 5.1 yrs; GCA diagnosis–AAA = 6.3 yrs

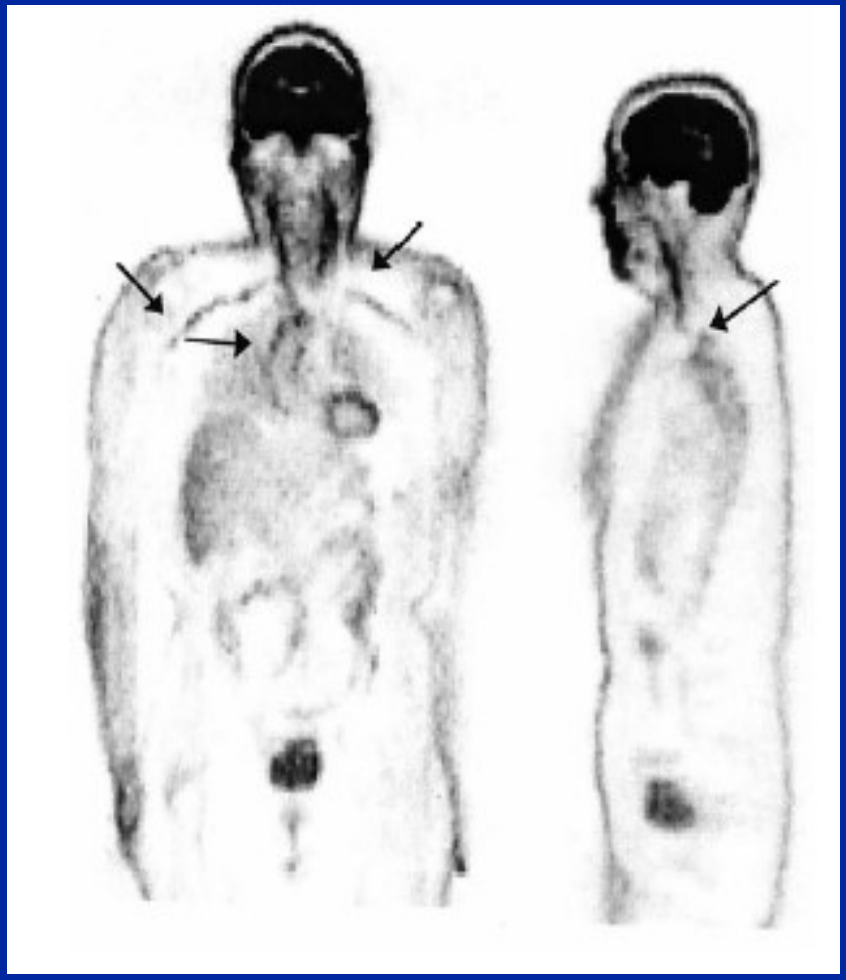
Nuenninghoff DM, Arthritis Rheum 2003

Aortitis in Giant Cell Arteritis (CTscan & MRI)





Increased 18F-glucose uptake in the aortic arch and the subclavian arteries of a patient with isolated polymyalgia rheumatica.



Blockmans D. al. Am J Med 2000

Atteinte aortique de la maladie de Horton angio-TDM (CTA) ou PET-scan (FDG-PET) ?

Table 2

Diagnostic performance of CTA and FDG-PET imaging.

	Sensitivity, %	Specificity, %	NPV, %	PPV, %
Clinical diagnosis as the reference standard				
CTA	73.3	77.8	63.6	84.6
FDG-PET	66.7	100	64.3	100

CTA = computed tomography angiography, NPV = negative predictive value, PET = positron emission tomography combined with computed tomography, PPV = positive predictive value.

n=10 n=11 n=5 n=4 n=0 n=2 n=9 n=7

Rivière D et al, Medicine 2016

AORTITE

Eliminer une infection

Eliminer une affection constitutionnelle

Aortite inflammatoire

- **Les incontournables**
  - **Takayasu**
  - **Behçet**
  - **Horton**
  - Maladie IgG4
  - Polychondrite
  - Erdheim-Chester

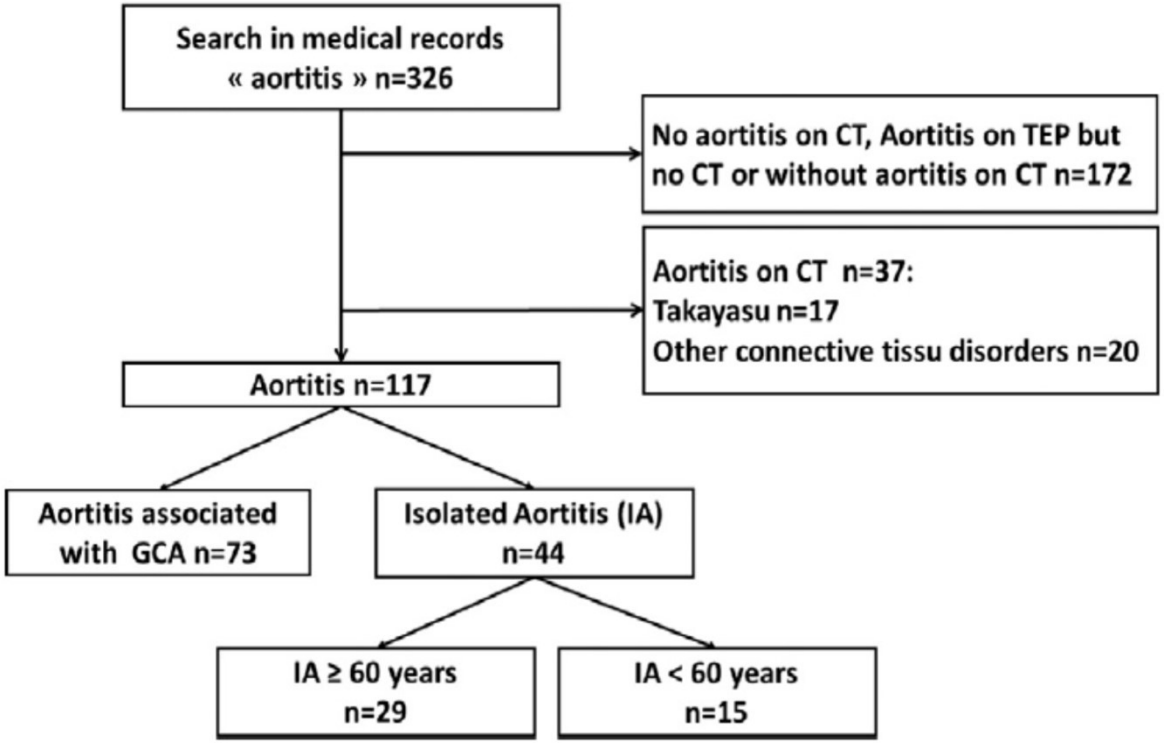
Beaucoup plus rares

- Lupus
- Polyarthrite, spondylarthrite
- Cogan, Kawasaki, GPA
- Weber Christian
- Sarcoïdose

Idiopathiques

Comparison of idiopathic (isolated) aortitis and giant cell arteritis-related aortitis. A French retrospective multicenter study of 117 patients

Olivier Espitia [a], Maxime Samson [b], Thomas Le Gallou [c], Jérôme Connault [a], Cedric Landron [d], Christian Lavigne [e], Cristina Belizna [e], Julie Magnant [f], Claire de Moreuil [g], Pascal Roblot [d], François Maillot [f], Elisabeth Diot [f], Patrick Jégo [c], Cécile Durant [a], A. Masseau [a], Jean-Marie Brisseau [a], Pierre Pottier [a], Alexandra Espitia-Thibault [a], Anabele Dos Santos [h], François Perrin [a], Mathieu Artifoni [a], Antoine Néel [a], Julie Graveleau [i], Philippe Moreau [j], Hervé Maisonneuve [k], Georges Fau [l], Jean-Michel Serfaty [l], Mohamed Hamidou [a], Christian Agard [a,*]



GCA-Aortitis *versus* Idiopathic Aortitis
Aortic events

Aortic events identified at diagnosis and during follow-up (median follow-up = 34 months) among 117 patients with aortitis, including 73 patients with GCA-related aortitis and 44 with idiopathic aortitis (IA).

	GCA-Ao n = 73	IA n = 44	*p*-value
Aortic aneurysm, n (%)	19 (26.0)	22 (50.0)	0.008
Aortic ectasia, n (%)	3 (4.1)	2 (4.5)	1.00
Aortic dissection, n (%)	6 (8.2)	6 (13.1)	0.36
Aortic stenosis, n (%)	0 (0)	1 (2.3)	0.37
Aortic surgery, n (%)	10 (13.7)	16 (36.4)	0.004

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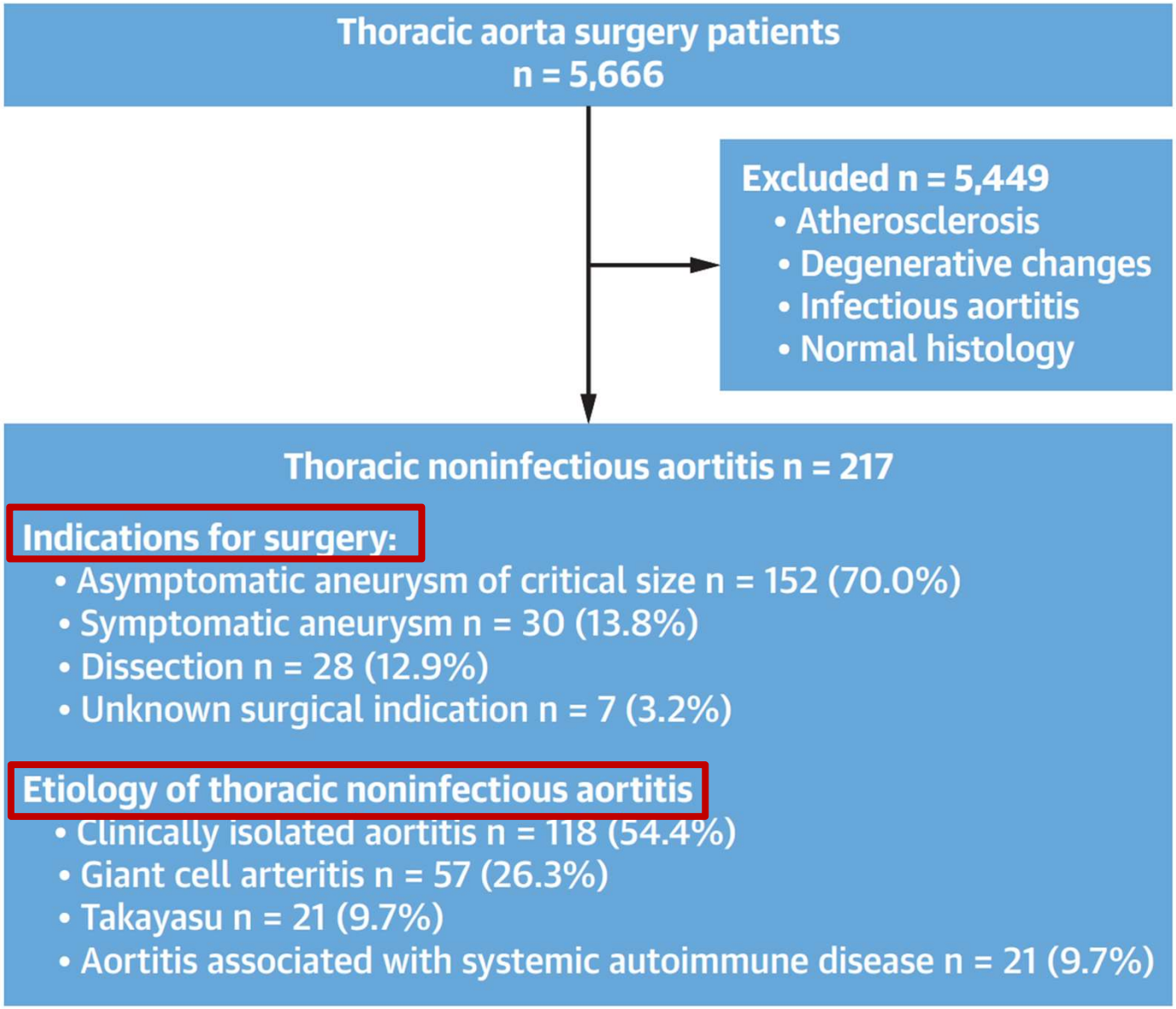
ORIGINAL INVESTIGATIONS

Long-Term Outcome and Prognosis of Noninfectious Thoracic Aortitis

Olivier Espitia, MD, PhD,[a,b] Patrick Bruneval, MD, PhD,[c] Morgane Assaraf, MD,[d,e,f] Jacques Pouchot, MD, PhD,[g] Eric Liozon, MD, PhD,[h] Hubert de Boysson, MD, PhD,[i] Julien Gaudric, MD,[j] Laurent Chiche, MD, PhD,[j] Paul Achouh, MD, PhD,[k] Jean-Christian Roussel, MD, PhD,[l] Sébastien Miranda, MD, PhD,[m] Tristan Mirault, MD, PhD,[n] Samia Boussouar, MD,[o] Alban Redheuil, MD, PhD,[o] Jean-Michel Serfaty, MD, PhD,[p] Antoine Bénichou, MD,[a,b] Christian Agard, MD, PhD,[a,b] Alexis F. Guédon, MD,[a,b] Patrice Cacoub, MD, PhD,[d,e,f] François Paraf, MD, PhD,[q] Pierre-Jean Fouret, MD, PhD,[r] Claire Toquet, MD, PhD,[s] Lucie Biard, MD, PhD,[t,u] David Saadoun, MD, PhD,[d,e,f] for the French Study Group for Large Vessel Vasculitides (GEFA)

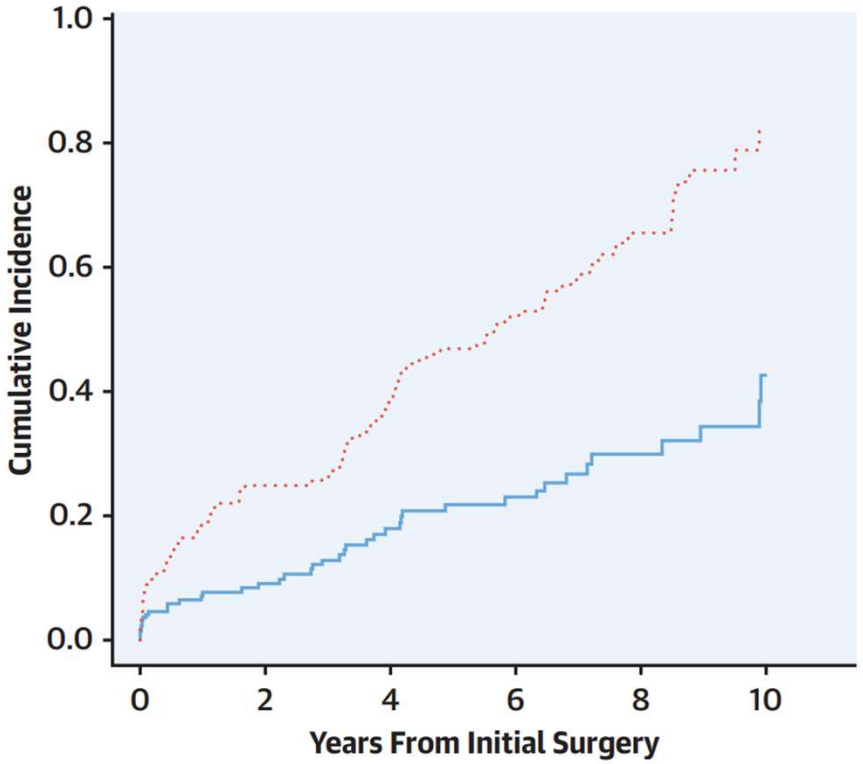


Espitia O et al, JACC 2023

TABLE 1 Main Characteristics of the 217 Patients With Noninfectious Surgical Thoracic Aortitis (N = 217)

Male	92 (43)
Median age at diagnosis, y	70 (58-76)
Median CRP level (mg/L) before aortic surgery	5 (2-12)
Cardiovascular risk factors	
Hypertension	142/215 (66)
Smokers	54/210 (26)
Dyslipidemia	54/216 (25)
Diabetes mellitus	11/215 (5)
Median BMI, kg/m^2	24 (22-28)
Indication for aortic surgery	
Asymptomatic aneurysm with a critical size	152 (70)
Symptomatic aortic aneurysm	30 (14)
Aortic dissection	28 (13)
Unknown surgical indication	7 (3)
Topography of aortic lesions	
Ascending aorta	197/215 (92)
Aortic arch	32/215 (15)
Descending aorta	26/212 (12)
Etiologies of aortitis	
Clinically isolated aortitis	118 (54)
Giant cell arteritis	57 (26)
Takayasu arteritis	21 (10)
Other systemic autoimmune diseases	21 (10)
Histological aortitis pattern	
Granulomatous/giant cell pattern	138/216 (64)
Lymphoplasmacytic pattern	67/216 (31)
Mixed inflammatory pattern	11/216 (5)
Suppurative pattern	2/216 (1)
Treatment before surgery[a]	
Corticosteroids	65/216 (30)
Immunosuppressive therapy	18/209 (9)
cDMARDS	17/209 (8)
bDMARDS	5/209 (2)
Antiplatelet therapy	81/206 (39)
Statin	8/212 (4)
Treatment after surgery	
Change or initiation of corticosteroid or immunosuppressive therapy	54/215 (25)
Change or initiation of immunosuppressive therapy	32/213 (15)
Antiplatelet therapy	164/213 (77)
Statin	96/212 (42)
ACE inhibitor	94/209 (42)

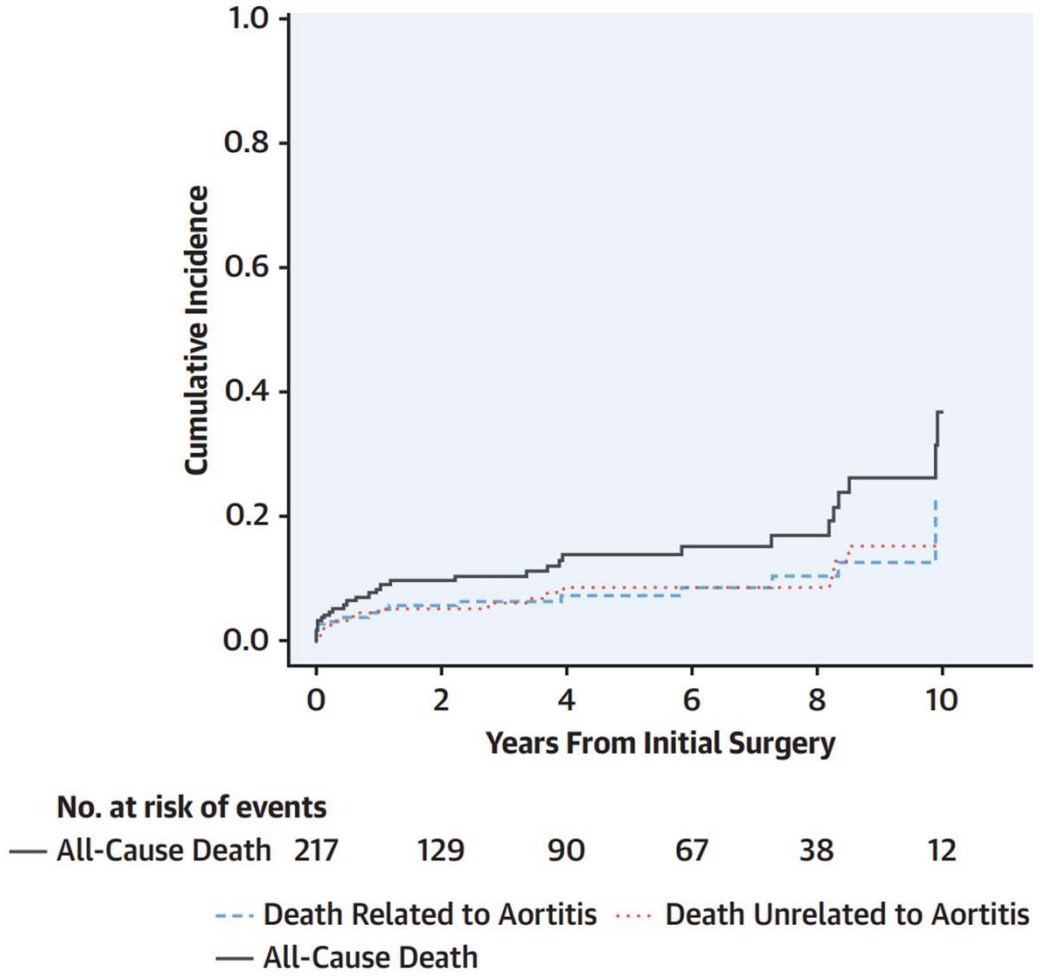
Second Vascular Procedure, Vascular Complication, and Aortitis-Related Death in Non-Infectious Aortitis



No. at risk of events						
Second Vascular Procedure or Aortitis-Related Death	217	124	80	60	33	11
Vascular Complication or Aortitis-Related Death	217	108	66	44	19	5

Espitia O et al, JACC 2023

Death in Non-Infectious Aortitis



Espitia O et al, JACC 2023

Long-Term Outcome and Prognosis of Noninfectious Surgical Thoracic Aortitis

Thoracic Noninfectious Aortitis

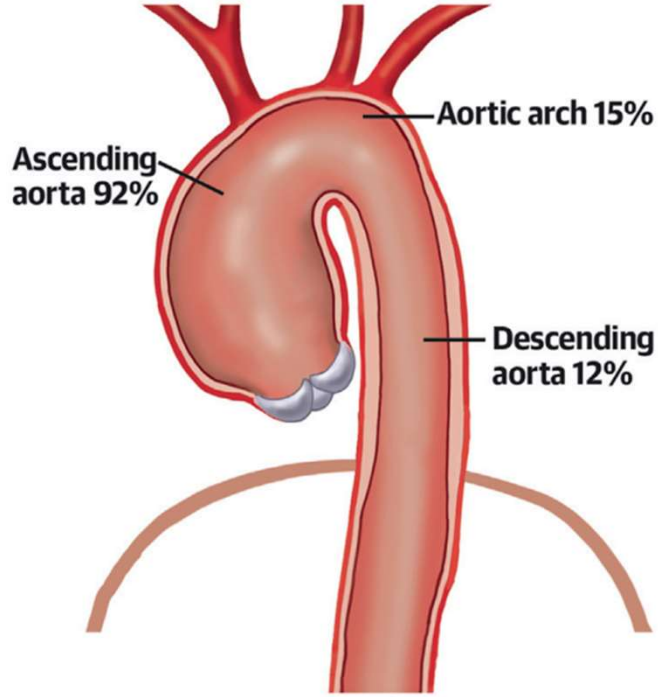
- Incidence 3.8%
of 5,666 thoracic aortic surgeries

Etiologies of Aortitis

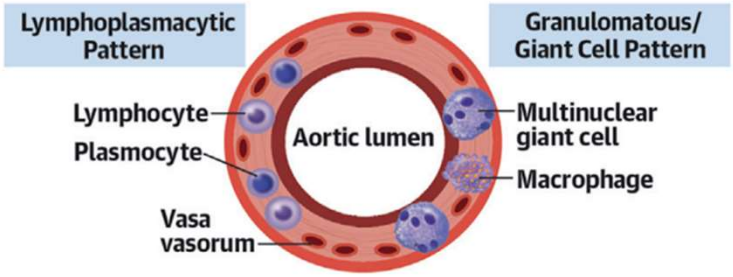
- Clinically isolated aortitis 54.4%
- Giant cell arteritis 26.3%
- Takayasu arteritis 9.7%

Histological Aortitis Pattern

- Granulomatous/giant cell 64%
- Lymphoplasmacytic 31%



Aortitis Location



Surgical Indication

- Aortic aneurysm 83.8%
- Aortic dissection 12.9%

Vascular Complications

5-year cumulative incidence: 46.7%

Predictive factors:
- Aortic arch HR: 2.08
- CRP HR: 1.09

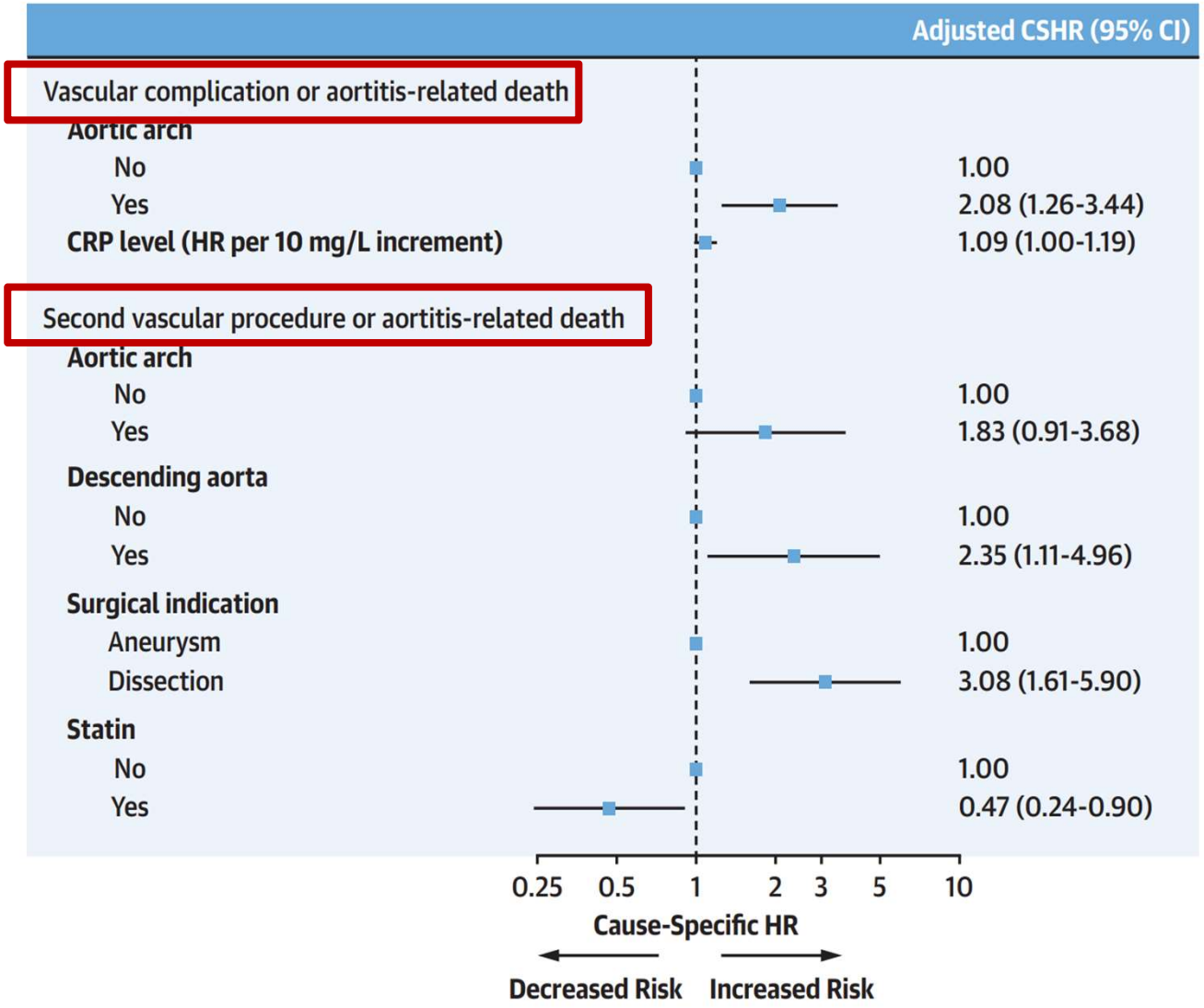
Second Vascular Procedure

5-year cumulative incidence: 21.8%

Predictive factors:
- Aortic arch HR: 1.83
- Descending aorta HR: 2.35
- Aortic dissection HR: 3.08
- Statin HR: 0.47

Espitia O, et al. J Am Coll Cardiol. 2023;82(11):1053-1064.

Poor Prognosis Factors in Non-Infectious Aortitis



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Devenir des aortites inflammatoires non-infectieuses “primitives”

- **Les complications vasculaires (82.1%)**
- **Les ré-interventions vasculaires (42.6%)**
- Après un suivi median post-opératoire de 3,9 ans:
  - **19/118 (16.1%) patients ont développé une maladie systémique inflammatoire** :
    - 9 GCA,
    - 4 Takayasu,
    - 2 Behçet,
    - 2 IgG4-related disease,
    - 1 ANCA vasculitis,
    - 1 rheumatoid arthritis

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Les aortites inflammatoires
Conclusion

- Diagnostic de plus en plus fréquent: imagerie.
- **Large spectre** de pathologies inflammatoires y compris formes « primitives »… qui peuvent devenir secondaires !
- **Stratégie diagnostique combinée**:
  - angio-TDM, angio-IRM, Pet-scan.
- **Biomarqueurs:** à développer …
- **Traitements:**
  - Cortico-sensibilité habituelle
  - Thérapies ciblées: anti-TNF, anti-IL6
  - Chirurgie: après traitement médical efficace