Actualités de l'imagerie au cours de l'artérite à cellules géantes

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Commençons par une situation fréquente

Vous recevez en consultation Paul, 67 ans

ATCD : HTA essentielle sous IEC

Début des symptômes : il y a 3 semaines

Douleur inflammatoire des épaules

Impossibilité de “lever les bras en l’air” le matin

Limitation des mobilités actives des épaules

Pas de signe céphalique d’ACG

Pas de fièvre

CRP à 45mg/L

Imagerie de la PPR

Quelle(s) modalité(s) d'imagerie proposez-vous devant une suspicion de PPR ?

Rien ?
Radiographies standards ?
Echographie (péri)articulaire ?
IRM (péri)articulaire ?
PET-TDM ?
Scan TAP ?
Scintigraphie osseuse ?

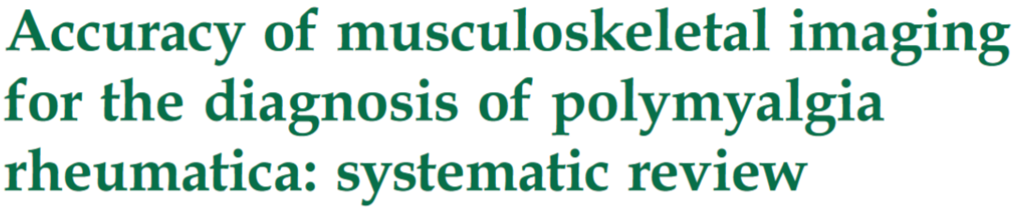
Imagerie de la PPR

Accuracy of musculoskeletal imaging for the diagnosis of polymyalgia rheumatica: systematic review

	Sensibilité	Spécificité
Bursite sous acromiale	80% (55% to 93%)	68% (60%to 75%)
Bursite sous acromiale (bilat)	66% (36% to 87%)	89% (66% to 97%)
Bursite trochanter	Variabilité +++	Variabilité +++
Arthrite gleno-humérale	62% (46% to 76%)	58% (45% to 69%)
Arthrite coxo-fémorale	33% (24% to 43%)	78% (66% to 87%)

Mackie et al. RMD open 2015

Imagerie de la PPR



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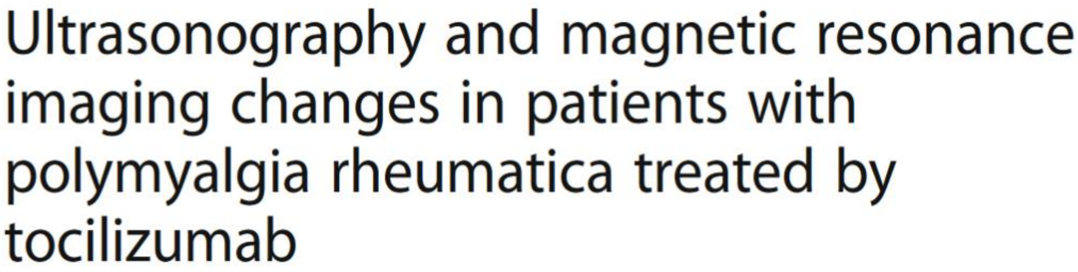
Un peu de liquide dans l'articulation ne remet pas en cause le diagnostic

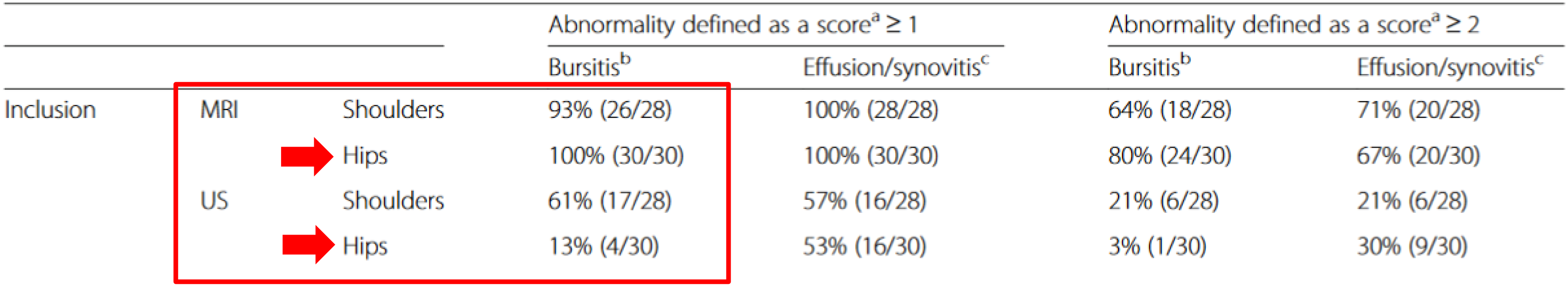
Mackie et al. RMD open 2015

PPR: IRM versus Echo ?



Ultrasonography and magnetic resonance imaging changes in patients with polymyalgia rheumatica treated by tocilizumab

L'IRM est beaucoup plus sensible pour détecter les lésions de PPR, a fortiori aux mINF

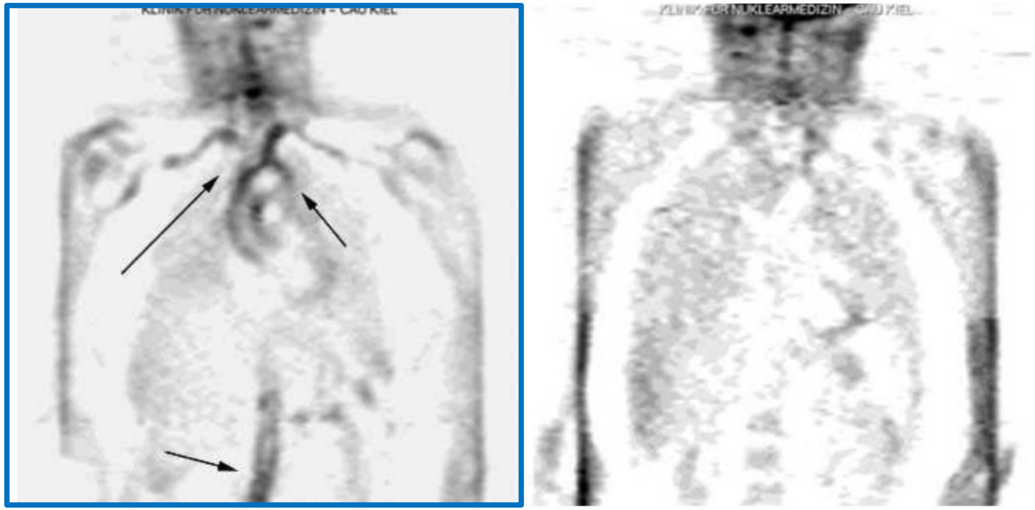


			Abnormality defined as a score[a] ≥ 1		Abnormality defined as a score[a] ≥ 2	
			Bursitis[b]	Effusion/synovitis[c]	Bursitis[b]	Effusion/synovitis[c]
Inclusion	MRI	Shoulders	93% (26/28)	100% (28/28)	64% (18/28)	71% (20/28)
		Hips	100% (30/30)	100% (30/30)	80% (24/30)	67% (20/30)
	US	Shoulders	61% (17/28)	57% (16/28)	21% (6/28)	21% (6/28)
		Hips	13% (4/30)	53% (16/30)	3% (1/30)	30% (9/30)

Huwart et al. ART 2018

PPR : que peut-on voir au PET-scan?

Correlation between 18-fluorodeoxyglucose accumulation in large vessels and serological markers of inflammation in polymyalgia rheumatica: a quantitative PET study

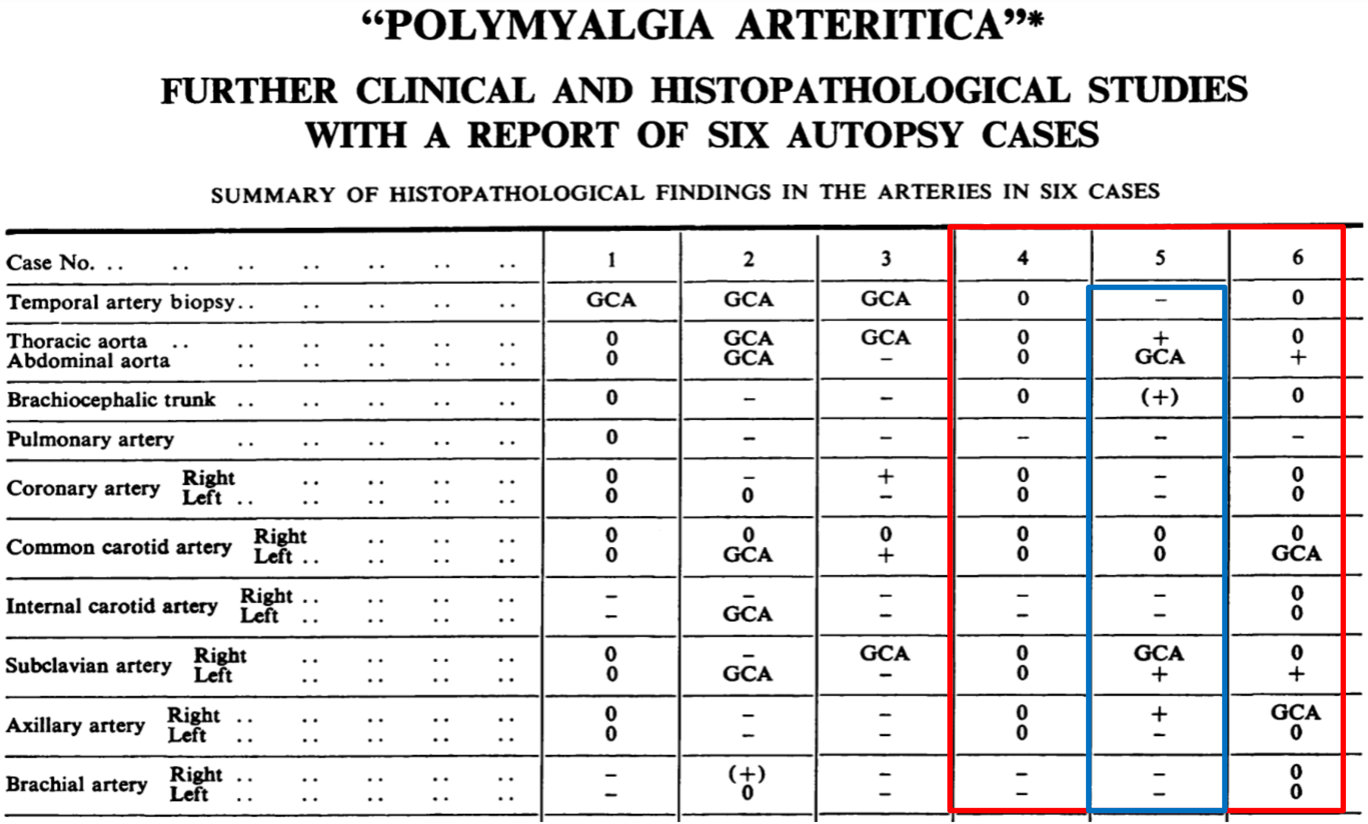

KLINIK FÜR NUKLEARMEDIZIN - CAU KIEL
KLINIK FÜR NUKLEARMEDIZIN - CAU KIEL

Active PMR Remission

Figure 1 Normalisation of tracer uptake in a patient with polymyalgia rheumatica (PMR) on steroid treatment.

Moosig et al. ARD 2004

Autopsie : atteinte vasculaire et PPR ?



"POLYMYALGIA ARTERITICA"*

FURTHER CLINICAL AND HISTOPATHOLOGICAL STUDIES WITH A REPORT OF SIX AUTOPSY CASES

SUMMARY OF HISTOPATHOLOGICAL FINDINGS IN THE ARTERIES IN SIX CASES

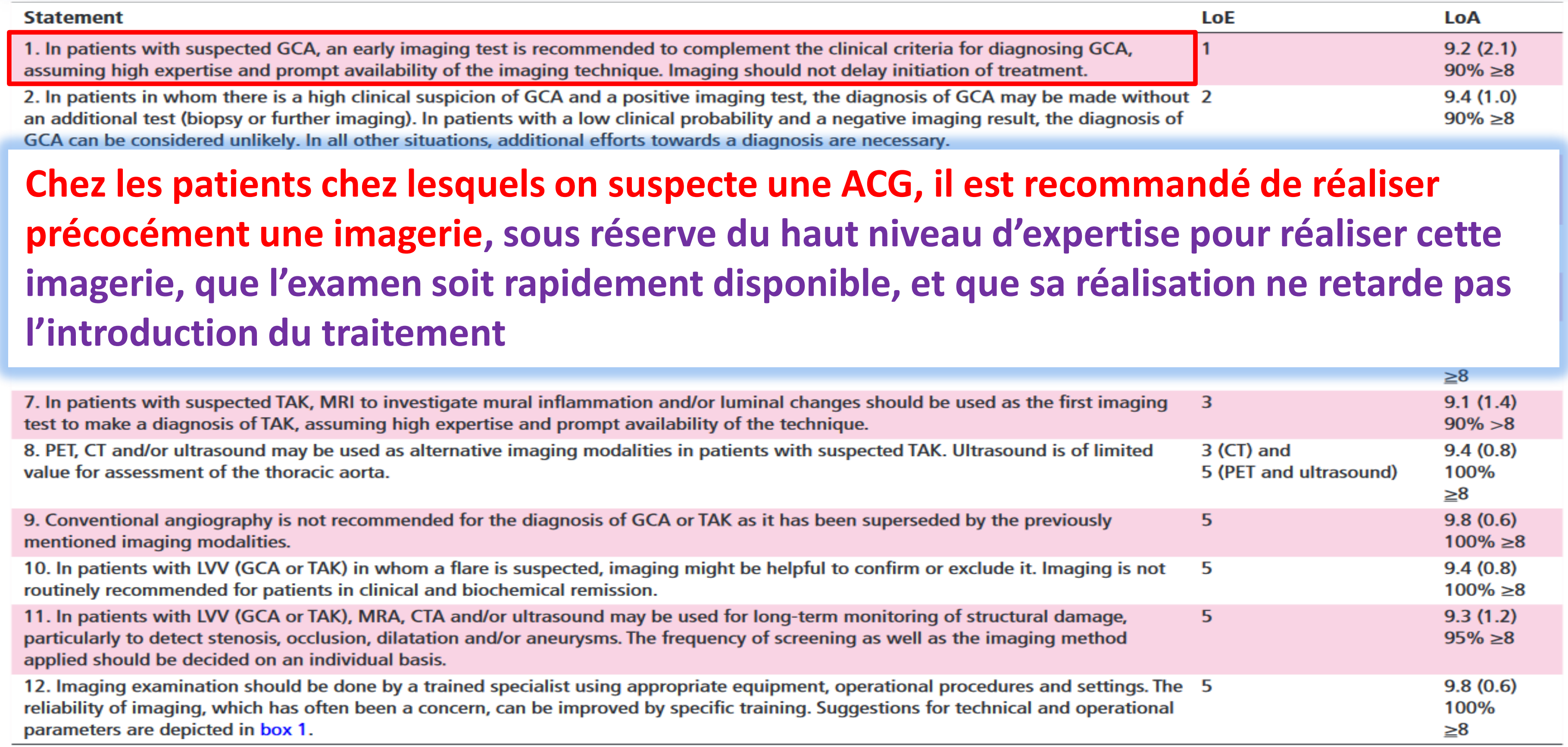
Case No.		1	2	3	4	5	6
Temporal artery biopsy		GCA	GCA	GCA	0	–	0
Thoracic aorta		0	GCA	GCA	0	+	0
Abdominal aorta		0	GCA	–	0	GCA	+
Brachiocephalic trunk		0	–	–	0	(+)	0
Pulmonary artery		0	–	–	–	–	–
Coronary artery	Right	0	–	+	0	–	0
	Left	0	0	–	0	–	0
Common carotid artery	Right	0	0	0	0	0	0
	Left	0	GCA	+	0	0	GCA
Internal carotid artery	Right	–	–	–	–	–	0
	Left	–	GCA	–	–	–	0
Subclavian artery	Right	0	–	GCA	0	GCA	0
	Left	0	GCA	–	0	+	+
Axillary artery	Right	0	–	–	0	+	GCA
	Left	0	–	–	0	–	0
Brachial artery	Right	–	(+)	–	–	–	0
	Left	–	0	–	–	–	0

Hamrin et al. ARD 1968

Stratégie diagnostique de l'ACG

Quelle est votre stratégie diagnostique face à une suspicion d'ACG ?

Les guidelines EULAR



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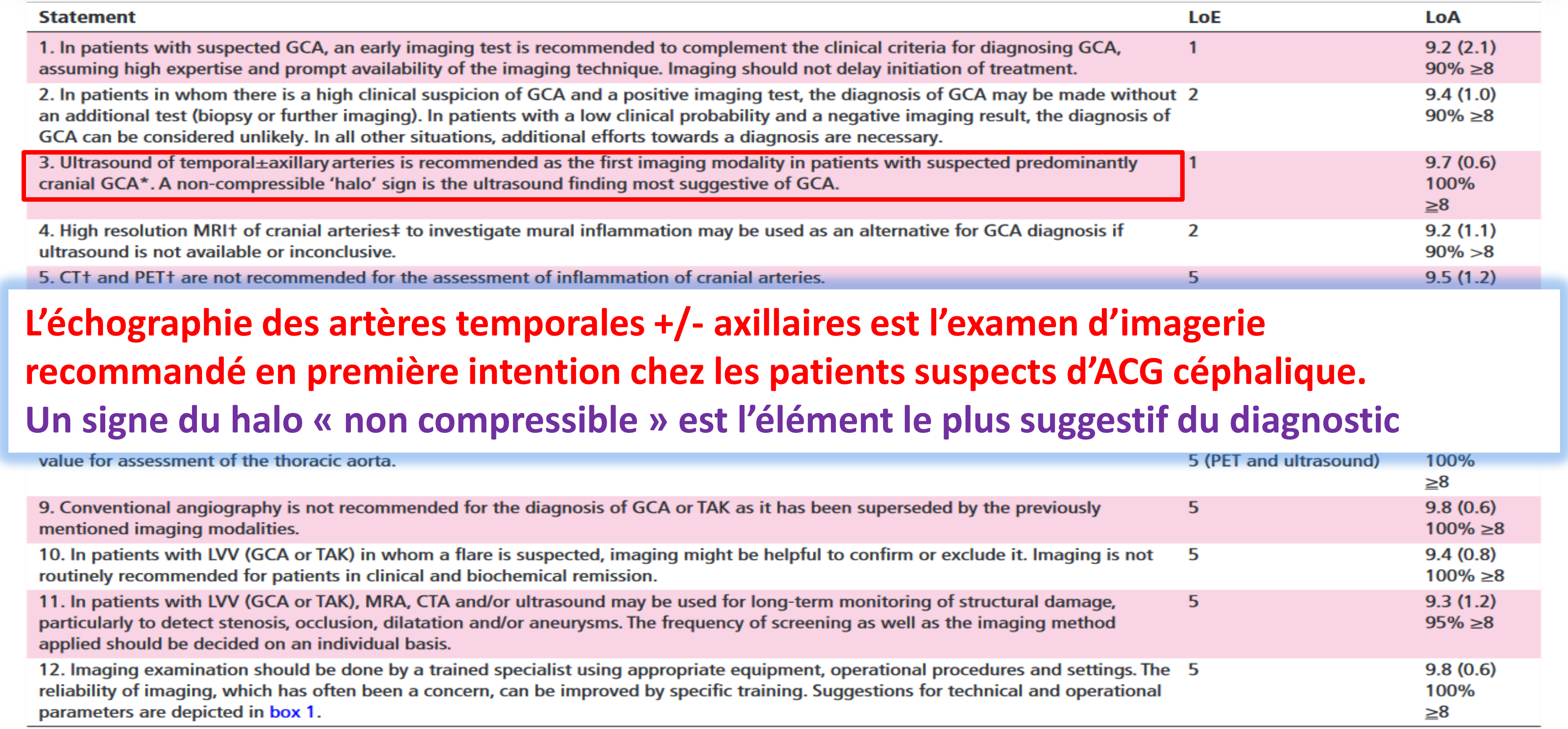
2. In patients in whom there is a high clinical suspicion of GCA and a positive imaging test, the diagnosis of GCA may be made without an additional test (biopsy or further imaging). In patients with a low clinical probability and a negative imaging result, the diagnosis of GCA can be considered unlikely. In all other situations, additional efforts towards a diagnosis are necessary.	2	9.4 (1.0) 90% ≥8
		≥8
7. In patients with suspected TAK, MRI to investigate mural inflammation and/or luminal changes should be used as the first imaging test to make a diagnosis of TAK, assuming high expertise and prompt availability of the technique.	3	9.1 (1.4) 90% >8
8. PET, CT and/or ultrasound may be used as alternative imaging modalities in patients with suspected TAK. Ultrasound is of limited value for assessment of the thoracic aorta.	3 (CT) and 5 (PET and ultrasound)	9.4 (0.8) 100% ≥8
9. Conventional angiography is not recommended for the diagnosis of GCA or TAK as it has been superseded by the previously mentioned imaging modalities.	5	9.8 (0.6) 100% ≥8
10. In patients with LVV (GCA or TAK) in whom a flare is suspected, imaging might be helpful to confirm or exclude it. Imaging is not routinely recommended for patients in clinical and biochemical remission.	5	9.4 (0.8) 100% ≥8
11. In patients with LVV (GCA or TAK), MRA, CTA and/or ultrasound may be used for long-term monitoring of structural damage, particularly to detect stenosis, occlusion, dilatation and/or aneurysms. The frequency of screening as well as the imaging method applied should be decided on an individual basis.	5	9.3 (1.2) 95% ≥8
12. Imaging examination should be done by a trained specialist using appropriate equipment, operational procedures and settings. The reliability of imaging, which has often been a concern, can be improved by specific training. Suggestions for technical and operational parameters are depicted in box 1.	5	9.8 (0.6) 100% ≥8

Chez les patients chez lesquels on suspecte une ACG, il est recommandé de réaliser précocément une imagerie, sous réserve du haut niveau d'expertise pour réaliser cette imagerie, que l'examen soit rapidement disponible, et que sa réalisation ne retarde pas l'introduction du traitement

Dejaco et al. ARD 2018

Les guidelines EULAR



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4. High resolution MRI† of cranial arteries‡ to investigate mural inflammation may be used as an alternative for GCA diagnosis if ultrasound is not available or inconclusive.	2	9.2 (1.1) 90% >8
5. CT† and PET† are not recommended for the assessment of inflammation of cranial arteries.	5	9.5 (1.2)
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L'échographie des artères temporales +/- axillaires est l'examen d'imagerie recommandé en première intention chez les patients suspects d'ACG céphalique.

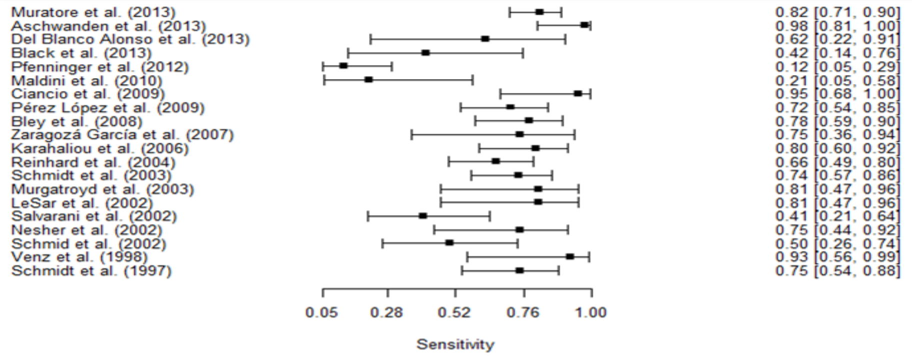
Un signe du halo « non compressible » est l'élément le plus suggestif du diagnostic

Dejaco et al. ARD 2018

Quelle performance de l’échographie ?

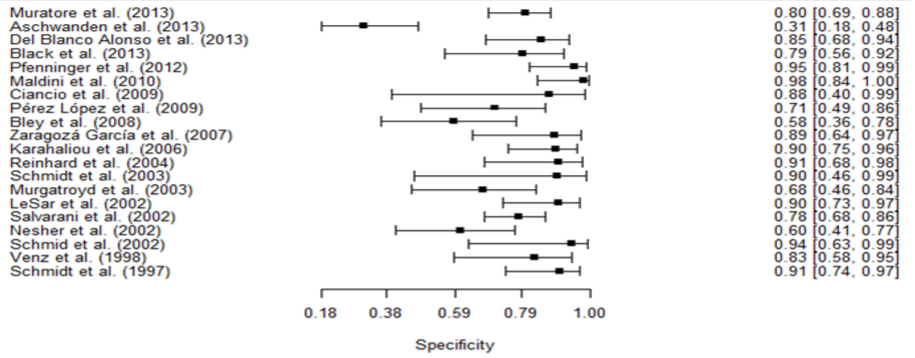
Revue systématique de la littérature et méta-analyse

Sensibilité (halo)



69% (95% CI: 57-79)

Specificité (halo)



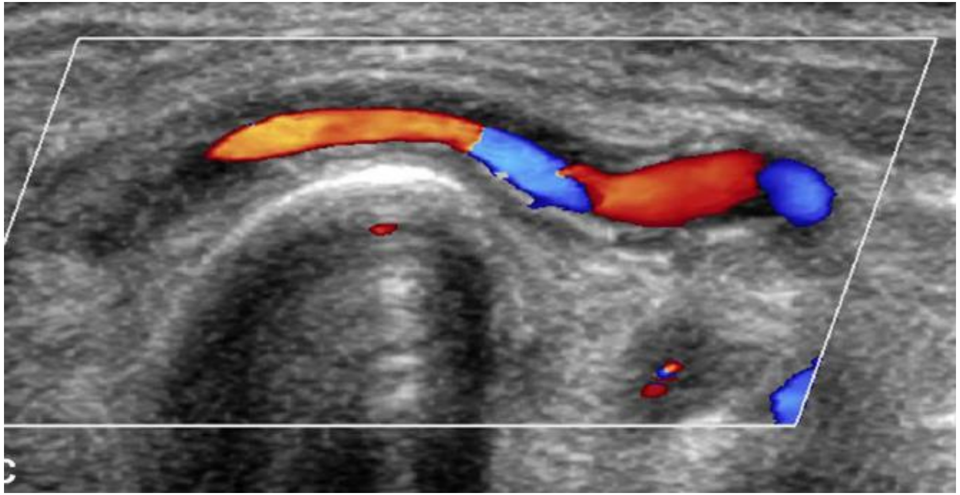
81% (95%CI: 87-90)

versus BAT+

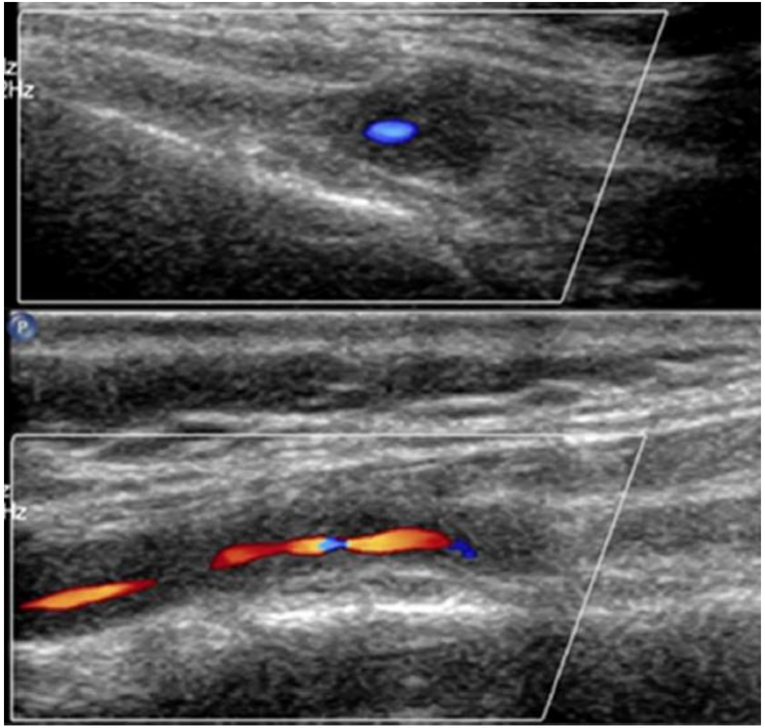
Marina RINAGEL et al. JBS 2019

Echographie des artères faciales et occipitales

Halo sur l’artère faciale



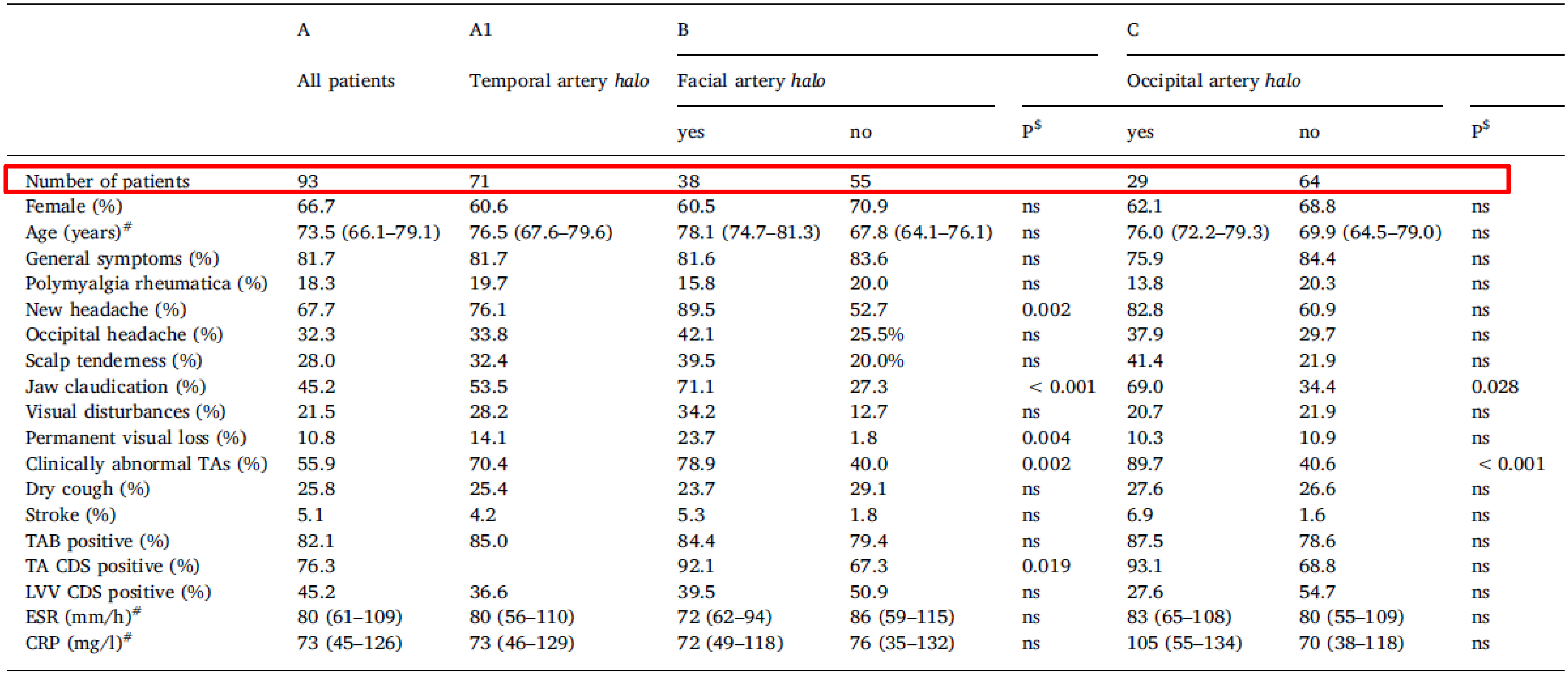
Halo sur l’artère occipitale



Jese et al. Eur J Radiol 2017

Quels territoires passer à l'écho ?

Atteinte des artères faciales ou occipitales chez 4/22 (18.2%) patients sans atteinte des A. temporales

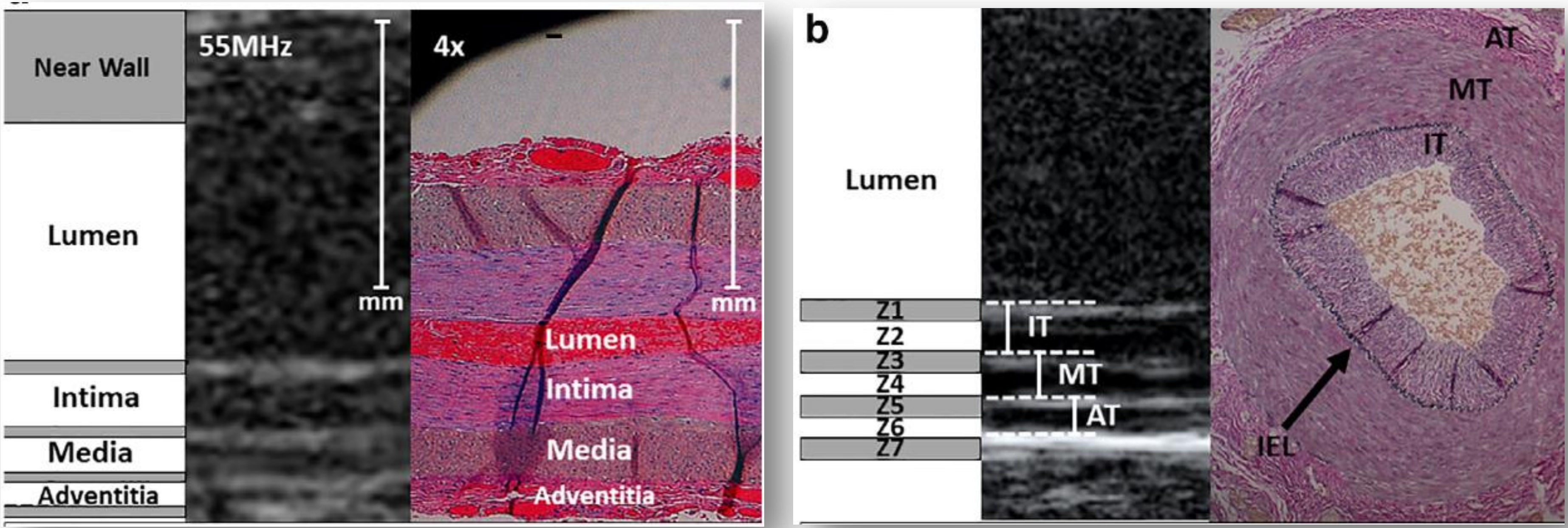


	A	A1	B			C		
	All patients	Temporal artery *halo*	Facial artery *halo*			Occipital artery *halo*		
			yes	no	$P^{\$}$	yes	no	$P^{\$}$
Number of patients	93	71	38	55		29	64	
Female (%)	66.7	60.6	60.5	70.9	ns	62.1	68.8	ns
Age (years)$^{\#}$	73.5 (66.1–79.1)	76.5 (67.6–79.6)	78.1 (74.7–81.3)	67.8 (64.1–76.1)	ns	76.0 (72.2–79.3)	69.9 (64.5–79.0)	ns
General symptoms (%)	81.7	81.7	81.6	83.6	ns	75.9	84.4	ns
Polymyalgia rheumatica (%)	18.3	19.7	15.8	20.0	ns	13.8	20.3	ns
New headache (%)	67.7	76.1	89.5	52.7	0.002	82.8	60.9	ns
Occipital headache (%)	32.3	33.8	42.1	25.5%	ns	37.9	29.7	ns
Scalp tenderness (%)	28.0	32.4	39.5	20.0%	ns	41.4	21.9	ns
Jaw claudication (%)	45.2	53.5	71.1	27.3	< 0.001	69.0	34.4	0.028
Visual disturbances (%)	21.5	28.2	34.2	12.7	ns	20.7	21.9	ns
Permanent visual loss (%)	10.8	14.1	23.7	1.8	0.004	10.3	10.9	ns
Clinically abnormal TAs (%)	55.9	70.4	78.9	40.0	0.002	89.7	40.6	< 0.001
Dry cough (%)	25.8	25.4	23.7	29.1	ns	27.6	26.6	ns
Stroke (%)	5.1	4.2	5.3	1.8	ns	6.9	1.6	ns
TAB positive (%)	82.1	85.0	84.4	79.4	ns	87.5	78.6	ns
TA CDS positive (%)	76.3		92.1	67.3	0.019	93.1	68.8	ns
LVV CDS positive (%)	45.2	36.6	39.5	50.9	ns	27.6	54.7	ns
ESR (mm/h)$^{\#}$	80 (61–109)	80 (56–110)	72 (62–94)	86 (59–115)	ns	83 (65–108)	80 (55–109)	ns
CRP (mg/l)$^{\#}$	73 (45–126)	73 (46–129)	72 (49–118)	76 (35–132)	ns	105 (55–134)	70 (38–118)	ns

Jese et al. Eur J Radiol 2017

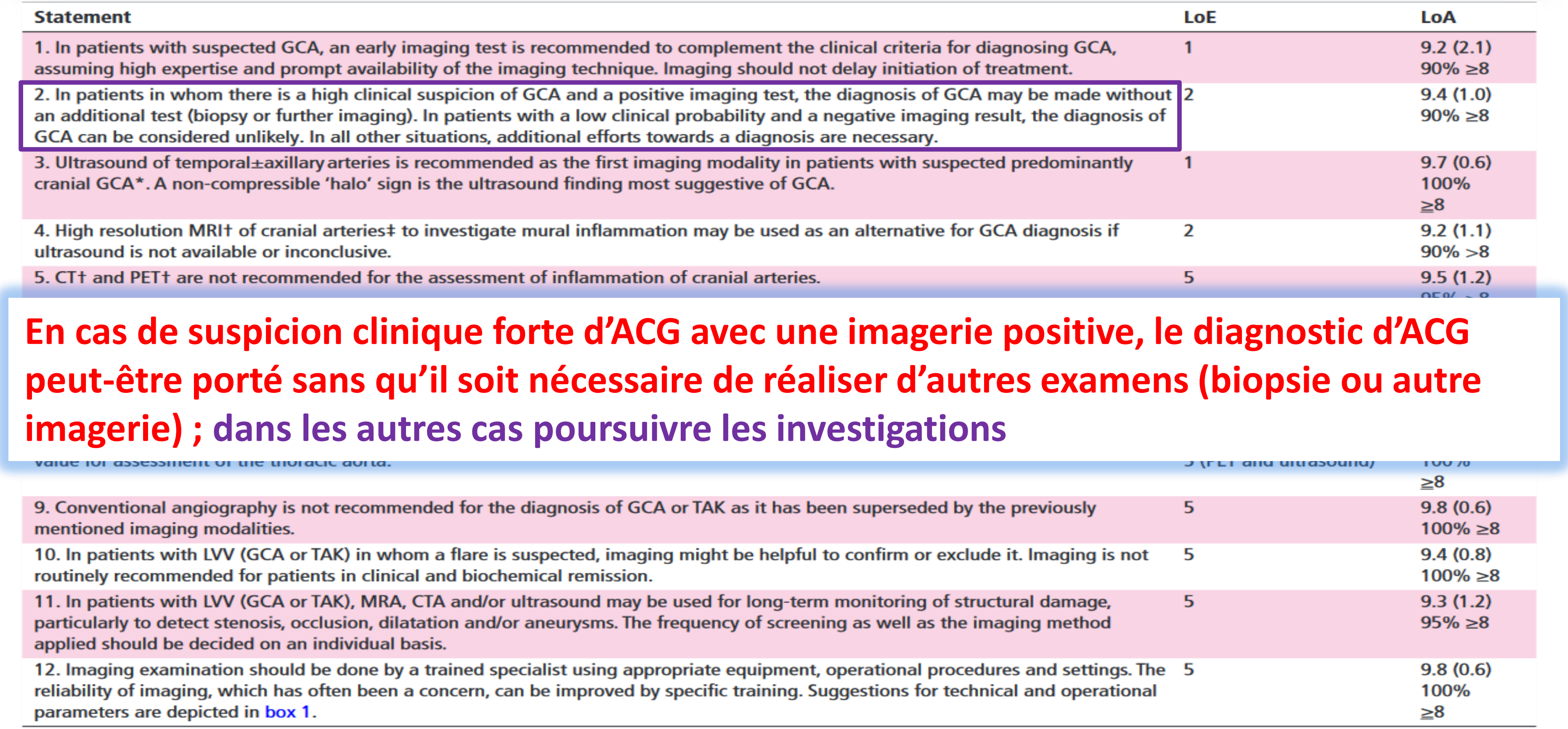
Avenir : échographie très haute résolution?

NON-INVASIVE VASCULAR VERY-HIGH RESOLUTION ULTRASOUND TO QUANTIFY ARTERY INTIMA LAYER THICKNESS: VALIDATION OF THE FOUR-LINE PATTERN


Near Wall
Lumen
Intima
Media
Adventitia
55MHz
mm
4x
mm
Lumen
Intima
Media
Adventitia
b
Lumen
Z1
Z2
Z3
Z4
Z5
Z6
Z7
IT
MT
AT
AT
MT
IT
IEL

Sundholm et al. Ultrasound Med Biol 2019

Les guidelines EULAR



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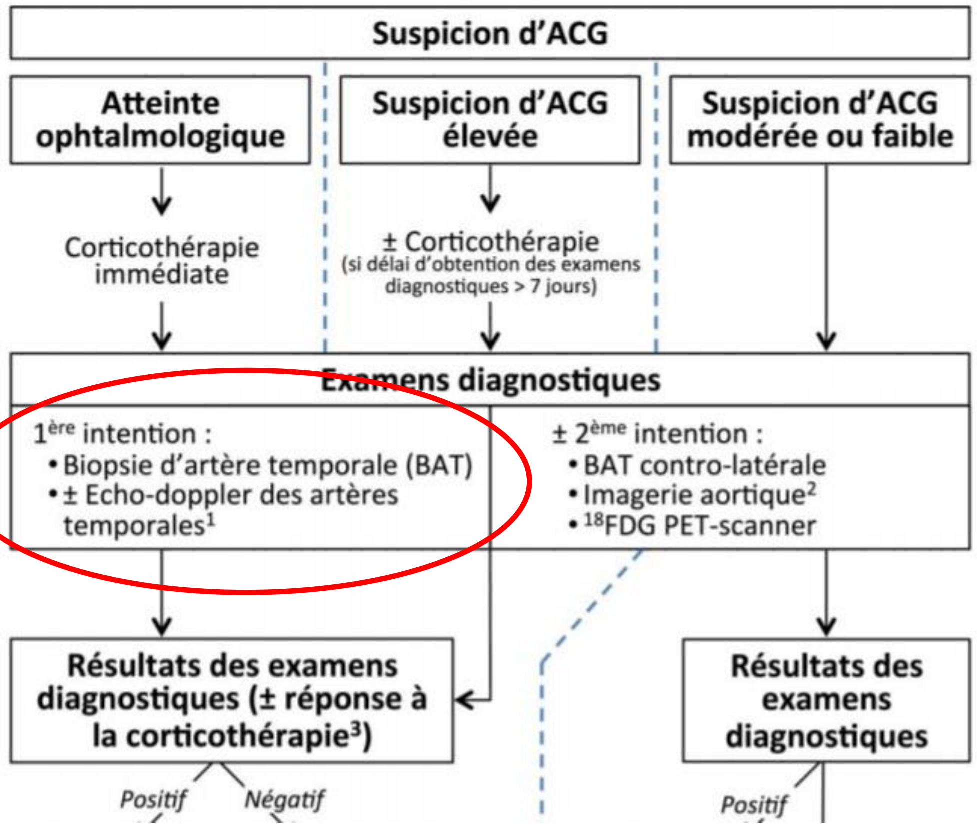
En cas de suspicion clinique forte d'ACG avec une imagerie positive, le diagnostic d'ACG peut-être porté sans qu'il soit nécessaire de réaliser d'autres examens (biopsie ou autre imagerie) ; dans les autres cas poursuivre les investigations

Dejaco et al. ARD 2018

PNDS « Horton »

Les reco Françaises ne disent pas la même chose !!!

Figure 1. Algorithme diagnostique.



Suspicion d'ACG

Atteinte ophtalmologique

Corticothérapie immédiate

Suspicion d'ACG élevée

± Corticothérapie (si délai d'obtention des examens diagnostiques > 7 jours)

Suspicion d'ACG modérée ou faible

Examens diagnostiques

1ère intention :
- Biopsie d'artère temporale (BAT)
- ± Echo-doppler des artères temporales[1]

± 2ème intention :
- BAT contro-latérale
- Imagerie aortique[2]
- ^{18}FDG PET-scanner

Résultats des examens diagnostiques (± réponse à la corticothérapie[3])

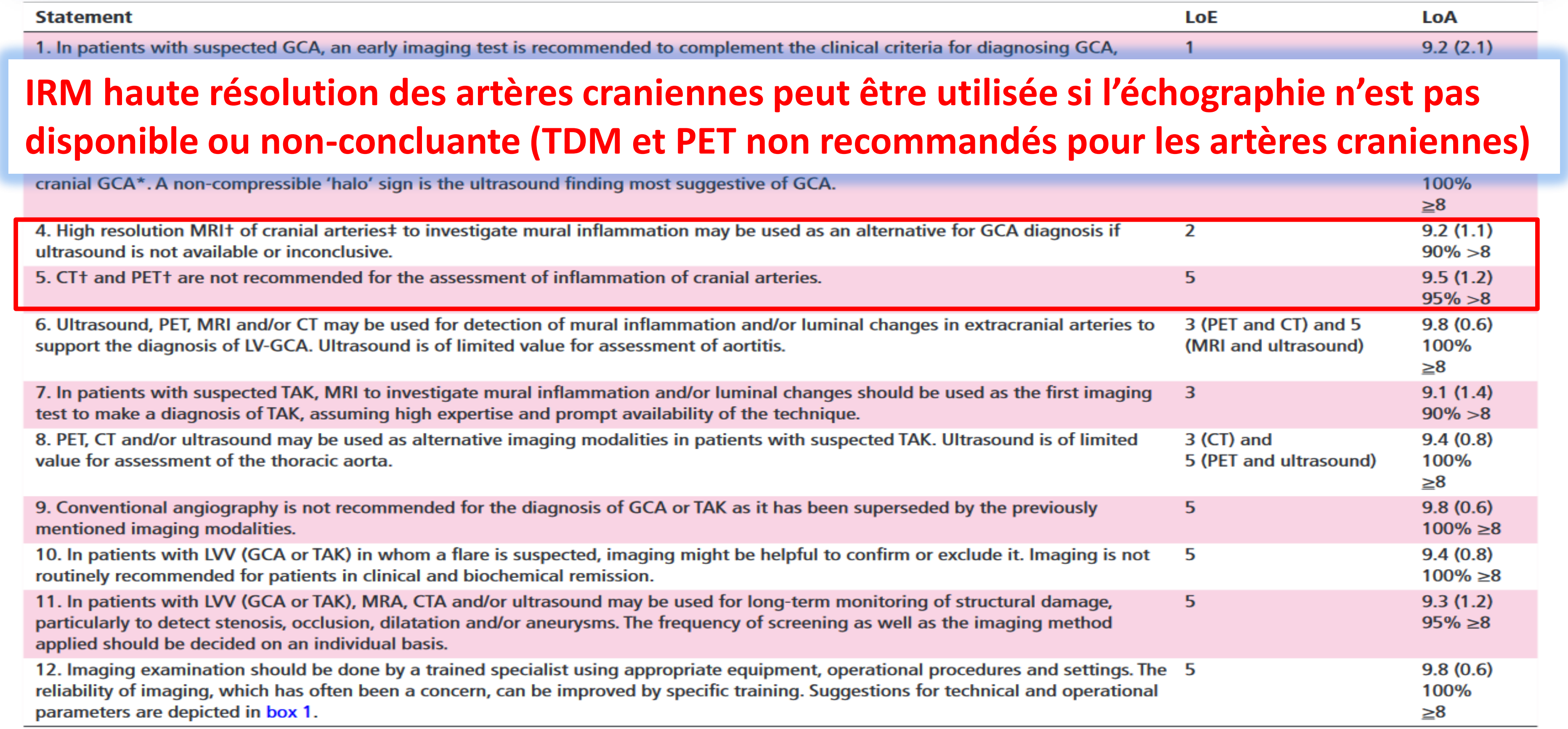
Positif *Négatif*

Résultats des examens diagnostiques

Positif

Les guidelines EULAR

IRM haute résolution des artères craniennes peut être utilisée si l'échographie n'est pas disponible ou non-concluante (TDM et PET non recommandés pour les artères craniennes)



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cranial GCA*. A non-compressible 'halo' sign is the ultrasound finding most suggestive of GCA.		100% ≥8
4. High resolution MRI† of cranial arteries‡ to investigate mural inflammation may be used as an alternative for GCA diagnosis if ultrasound is not available or inconclusive.	2	9.2 (1.1) 90% >8
5. CT† and PET† are not recommended for the assessment of inflammation of cranial arteries.	5	9.5 (1.2) 95% >8
6. Ultrasound, PET, MRI and/or CT may be used for detection of mural inflammation and/or luminal changes in extracranial arteries to support the diagnosis of LV-GCA. Ultrasound is of limited value for assessment of aortitis.	3 (PET and CT) and 5 (MRI and ultrasound)	9.8 (0.6) 100% ≥8
7. In patients with suspected TAK, MRI to investigate mural inflammation and/or luminal changes should be used as the first imaging test to make a diagnosis of TAK, assuming high expertise and prompt availability of the technique.	3	9.1 (1.4) 90% >8
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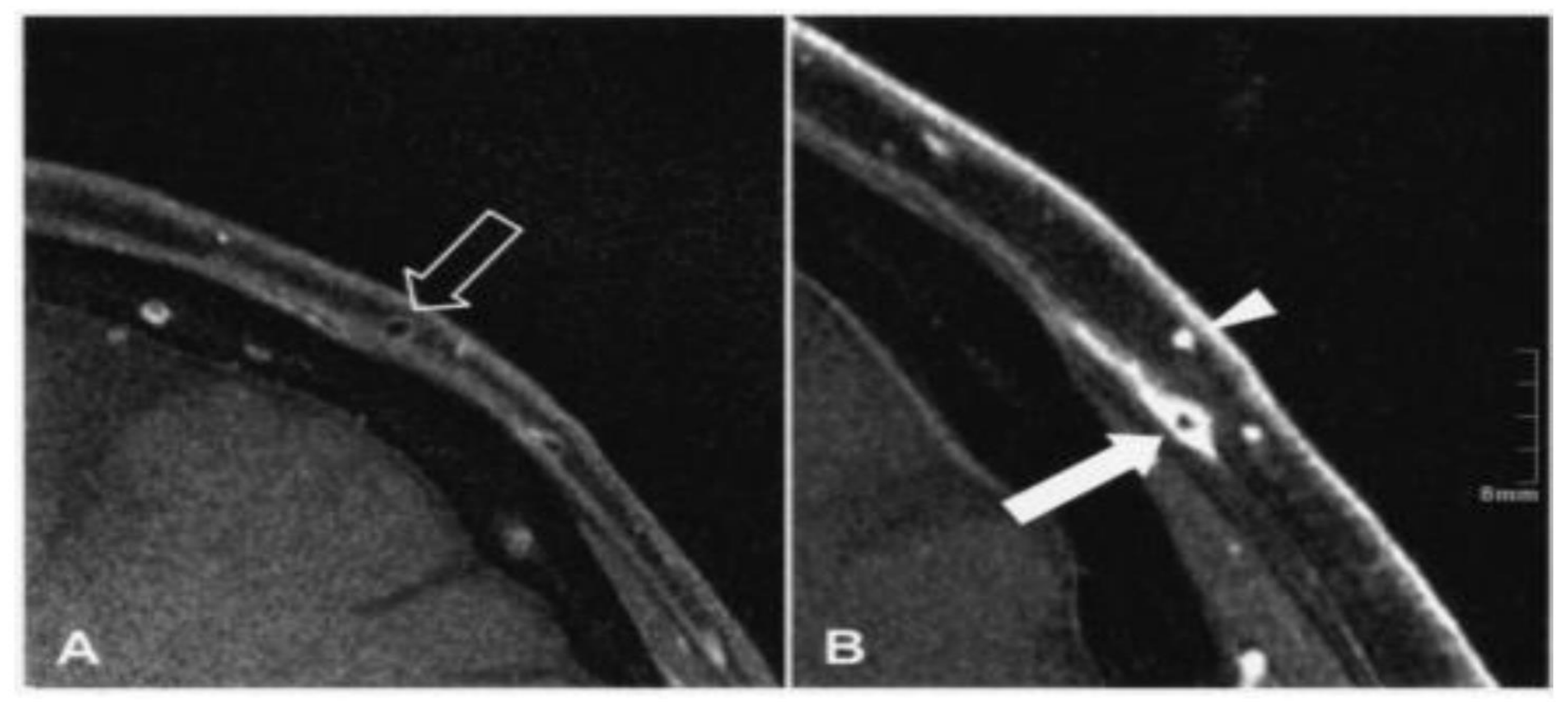
Dejaco et al. ARD 2018

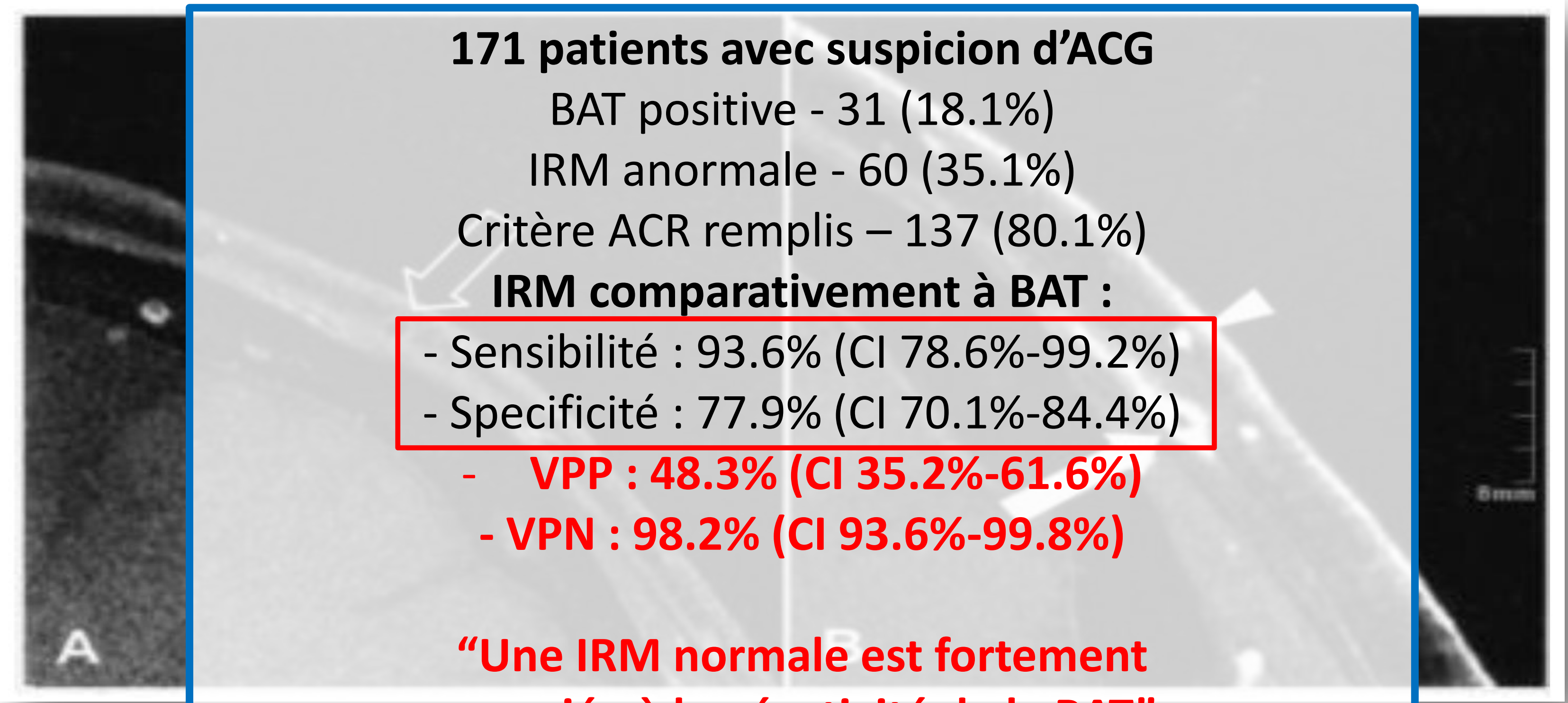
L’apport de l’IRM



3T MRI of the temporal artery - contrast-enhanced, fat-sat, transversal, T1-weighted, 2-d spin-echo sequence

Bley TA, et al. Assessment of the cranial involvement pattern of giant cell arteritis
with 3T magnetic resonance imaging. Arthritis Rheum 2005

L’apport de l’IRM



171 patients avec suspicion d’ACG

BAT positive - 31 (18.1%)

IRM anormale - 60 (35.1%)

Critère ACR remplis – 137 (80.1%)

IRM comparativement à BAT :

- Sensibilité : 93.6% (CI 78.6%-99.2%)
- Specificité : 77.9% (CI 70.1%-84.4%)
- **VPP : 48.3% (CI 35.2%-61.6%)**
- **VPN : 98.2% (CI 93.6%-99.8%)**

“Une IRM normale est fortement associée à la négativité de la BAT”

3T MRI of the temporal artery - contrast-enhanced, fat-sat, transversal, T1-weighted, 2-d spin-echo sequence

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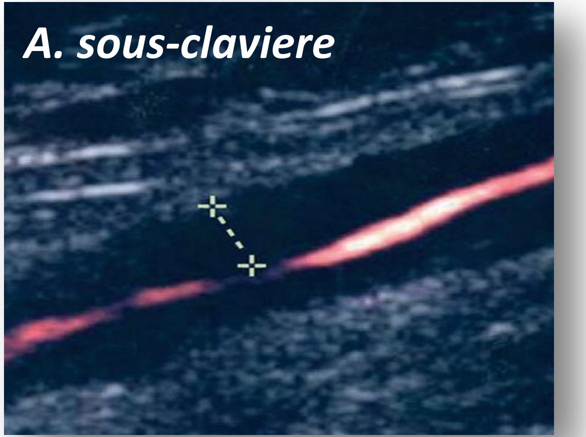
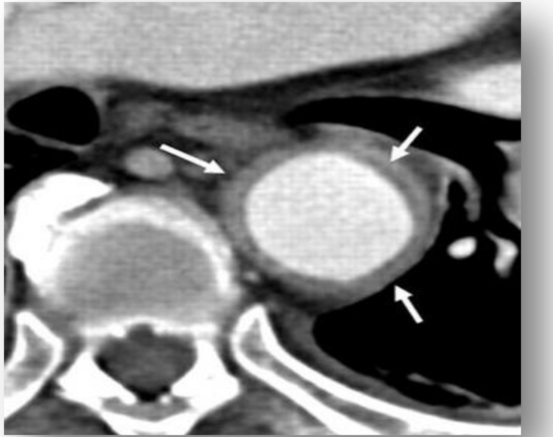
Atteinte des gros vaisseaux et ACG

Dépend de la modalité d'imagerie utilisée…

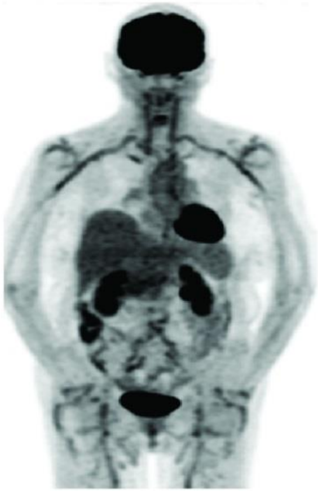
Echo-doppler
30-55%



Angio-TDM
60-70%



PET-scan
jusqu'à 85%



Prieto-González S, et al. Effect of glucocorticoid treatment on CTA detected large-vessel inflammation in GCA. A prospective, longitudinal study. Medicine (Baltimore). 2015

Blockmans D, et al. Repetitive 18F-fluorodeoxyglucose positron emission tomography in giant cell arteritis: a prospective study of 35 patients. Arthritis Rheum 2006

PNDS « Horton »

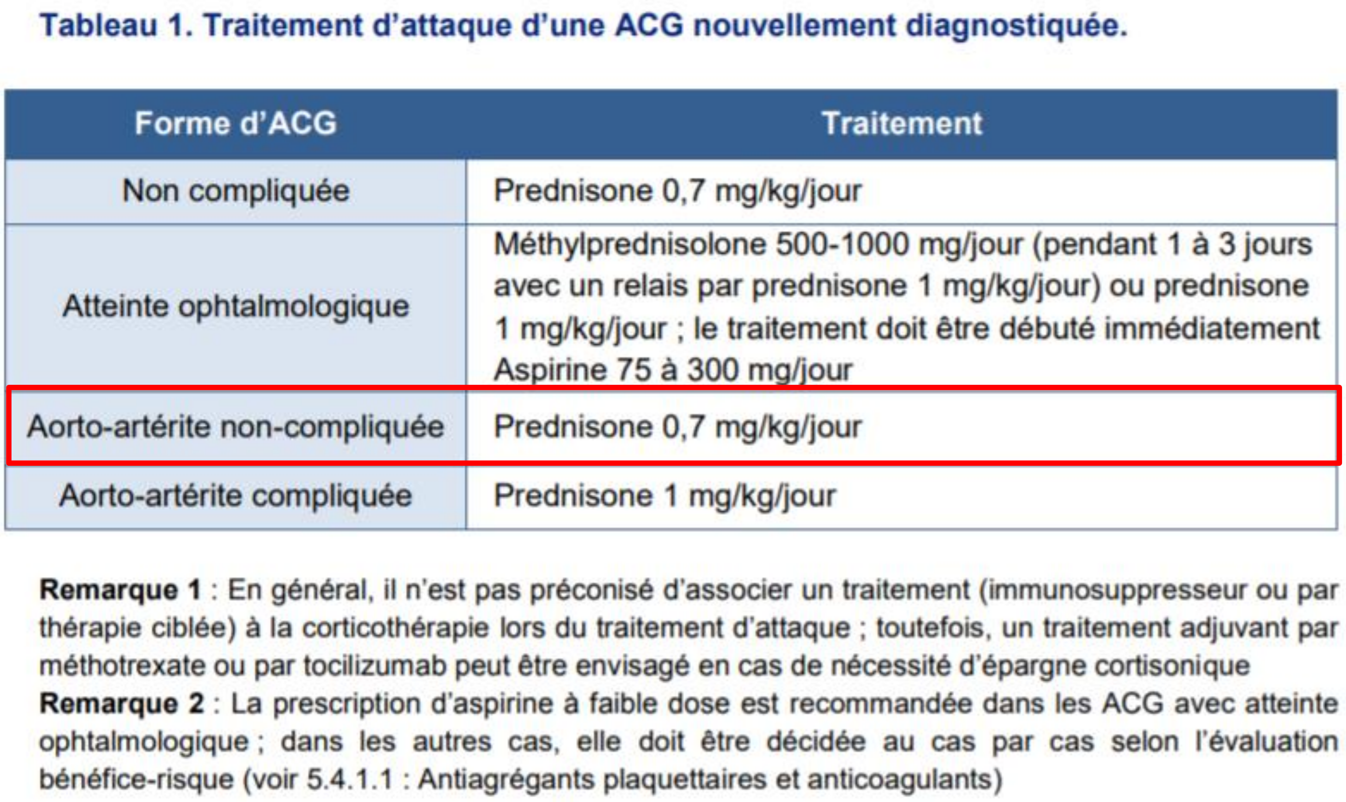


Tableau 1. Traitement d'attaque d'une ACG nouvellement diagnostiquée.

Forme d'ACG	Traitement
Non compliquée	Prednisone 0,7 mg/kg/jour
Atteinte ophtalmologique	Méthylprednisolone 500-1000 mg/jour (pendant 1 à 3 jours avec un relais par prednisone 1 mg/kg/jour) ou prednisone 1 mg/kg/jour ; le traitement doit être débuté immédiatement Aspirine 75 à 300 mg/jour
Aorto-artérite non-compliquée	Prednisone 0,7 mg/kg/jour
Aorto-artérite compliquée	Prednisone 1 mg/kg/jour

Remarque 1 : En général, il n'est pas préconisé d'associer un traitement (immunosuppresseur ou par thérapie ciblée) à la corticothérapie lors du traitement d'attaque ; toutefois, un traitement adjuvant par méthotrexate ou par tocilizumab peut être envisagé en cas de nécessité d'épargne cortisonique
Remarque 2 : La prescription d'aspirine à faible dose est recommandée dans les ACG avec atteinte ophtalmologique ; dans les autres cas, elle doit être décidée au cas par cas selon l'évaluation bénéfice-risque (voir 5.4.1.1 : Antiagrégants plaquettaires et anticoagulants)

TDM aortique : une bonne épaisseur ?

Thickness (mm)	Sensitivity	Specificity	Thickness (mm)	Sensitivity	Specificity
≥1.5	100.00%	0.00%	≥2.7	34.38%	100.00%
≥1.6	98.44%	7.27%	≥2.8	31.25%	100.00%
≥1.7	98.44%	27.27%	≥2.9	29.69%	100.00%
≥1.8	95.31%	50.91%	≥3.1	28.13%	100.00%
≥1.9	87.50%	71.82%	≥3.2	20.31%	100.00%
≥2.0	81.25%	80.91%	≥3.3	14.06%	100.00%
≥2.1	71.88%	92.73%	≥3.4	9.38%	100.00%
≥2.2	67.19%	98.18%	≥3.6	7.81%	100.00%
≥2.3	64.06%	99.09%	≥3.7	6.25%	100.00%
≥2.4	53.13%	99.09%	≥3.9	4.69%	100.00%
≥2.5	51.56%	99.09%	≥4.1	3.13%	100.00%
≥2.6	43.75%	100.00%	≥4.2	1.56%	100.00%

2.2mm

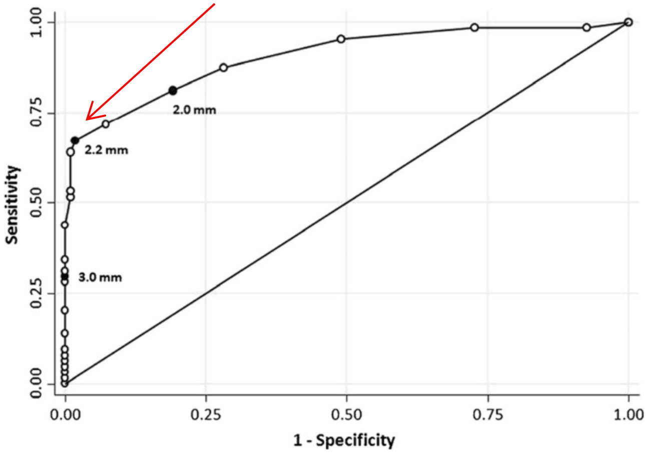
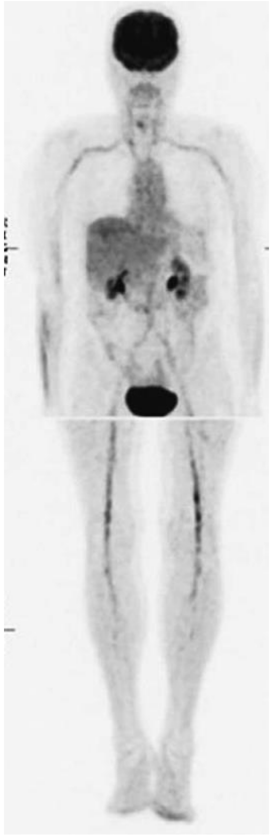


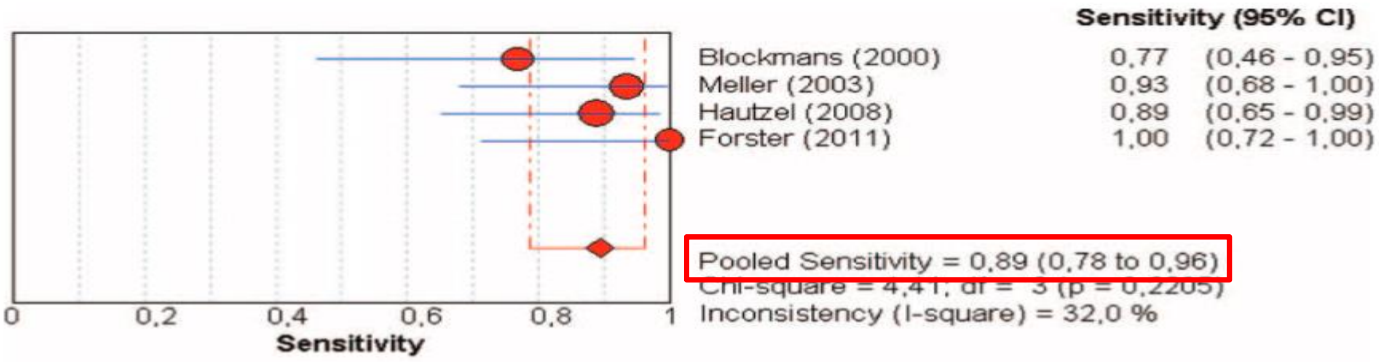
Table 3 Location of aortic wall thickening in the 64 patients with giant cell arteritis, with two different thresholds, ≥2 mm or ≥3 mm

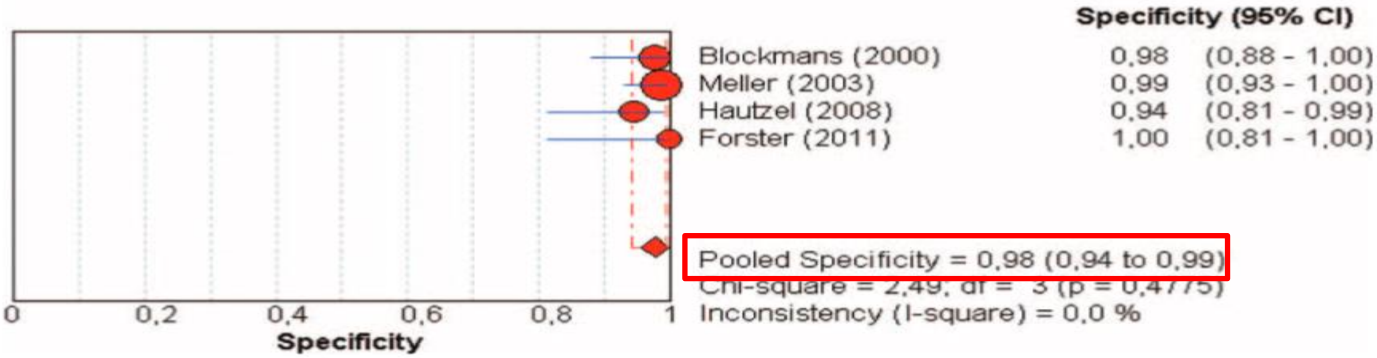
	Ascending aorta	Arch	Descending thoracic aorta	Suprarenal abdominal aorta	Infrarenal abdominal aorta	Thoracic aorta	Abdominal aorta
Wall ≥3 mm (%)	0 (0.0)	3 (4.7)	13 (20.3)	11 (17.2)	11 (17.2)	14 (21.9)	14 (21.9)
Wall ≥2 mm (%)	20 (31.2)	35 (54.7)	49 (76.6)	35 (54.7)	27 (42.2)	51 (79.7)	38 (59.4)

Berthod et al. European radiology 2018

PET-TDM et ACG



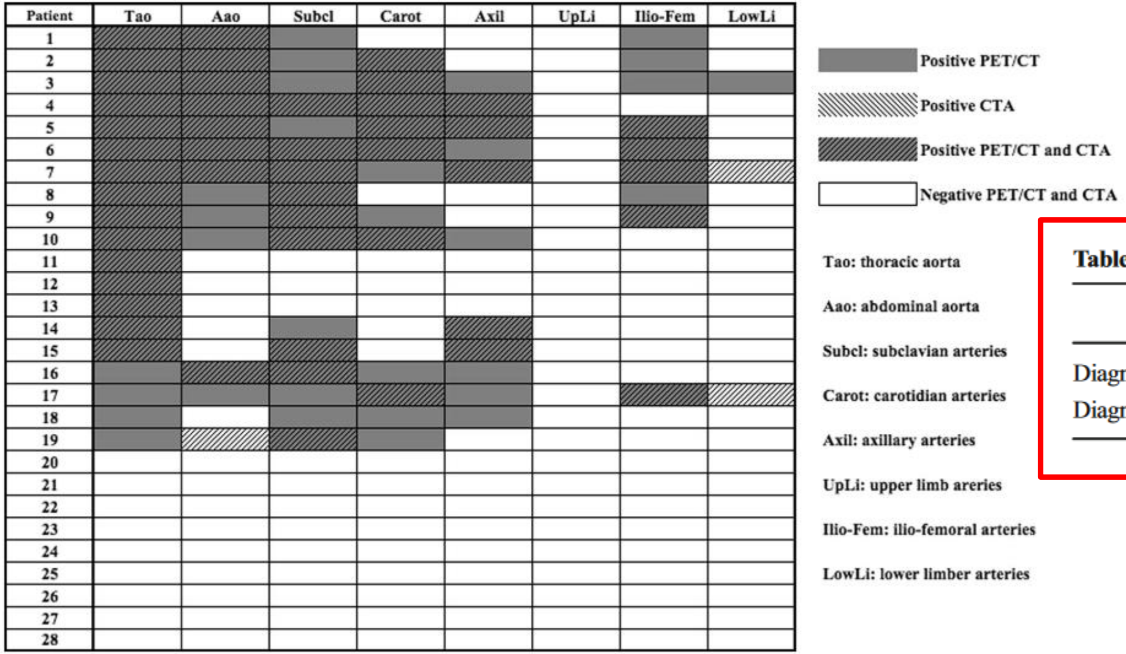

Sensitivity (95% CI)
Blockmans (2000) 0,77 (0,46 - 0,95)
Meller (2003) 0,93 (0,68 - 1,00)
Hautzel (2008) 0,89 (0,65 - 0,99)
Forster (2011) 1,00 (0,72 - 1,00)
Pooled Sensitivity = 0,89 (0,78 to 0,96)
Chi-square = 4,41; df = 3 (p = 0,2205)
Inconsistency (I-square) = 32,0 %
0
0,2
0,4
0,6
0,8
1
Sensitivity



Soussan et al. Medicine 2015

TEP ou scanner pour le bilan ?

Giant-cell arteritis: concordance study between aortic CT angiography and FDG-PET/CT in detection of large-vessel involvement



Patient	Tao	Aao	Subcl	Carot	Axil	UpLi	Ilio-Fem	LowLi
1	▨	▨	■	□	□	□	■	□
2	▨	▨	■	▨	□	□	■	□
3	▨	▨	■	▨	■	□	■	■
4	▨	▨	▨	▨	▨	□	□	□
5	▨	▨	■	▨	▨	□	▨	□
6	▨	▨	▨	▨	■	□	▨	□
7	▨	▨	▨	■	▨	□	▨	▧
8	▨	■	▨	□	□	□	■	□
9	▨	■	▨	■	□	□	▨	□
10	▨	■	▨	▨	■	□	□	□
11	▨	□	□	□	□	□	□	□
12	▨	□	□	□	□	□	□	□
13	▨	□	□	□	□	□	□	□
14	▨	□	■	□	▨	□	□	□
15	▨	□	▨	□	▨	□	□	□
16	■	▨	▨	■	■	□	□	□
17	■	■	■	▨	■	□	▨	▧
18	■	□	■	■	■	□	□	□
19	■	▧	▨	■	□	□	□	□
20	□	□	□	□	□	□	□	□
21	□	□	□	□	□	□	□	□
22	□	□	□	□	□	□	□	□
23	□	□	□	□	□	□	□	□
24	□	□	□	□	□	□	□	□
25	□	□	□	□	□	□	□	□
26	□	□	□	□	□	□	□	□
27	□	□	□	□	□	□	□	□
28	□	□	□	□	□	□	□	□

■	Positive PET/CT
▧	Positive CTA
▨	Positive PET/CT and CTA
□	Negative PET/CT and CTA

Tao: thoracic aorta

Aao: abdominal aorta

Subcl: subclavian arteries

Carot: carotidian arteries

Axil: axillary arteries

UpLi: upper limb areries

Ilio-Fem: ilio-femoral arteries

LowLi: lower limber arteries

COMPARAISON DIRECTE :

Le PET détecte plus d'artères atteintes que l'angio-TDM mais le nombre de patient avec atteinte artérielle reste similaire

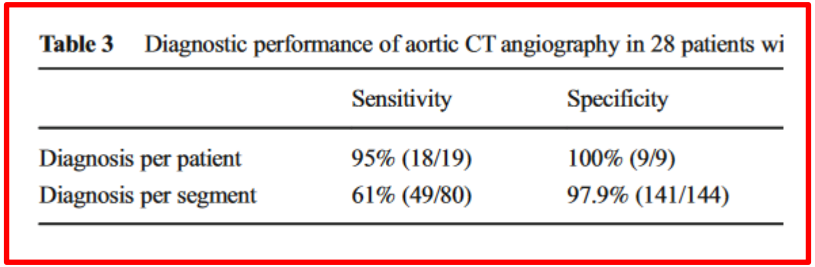
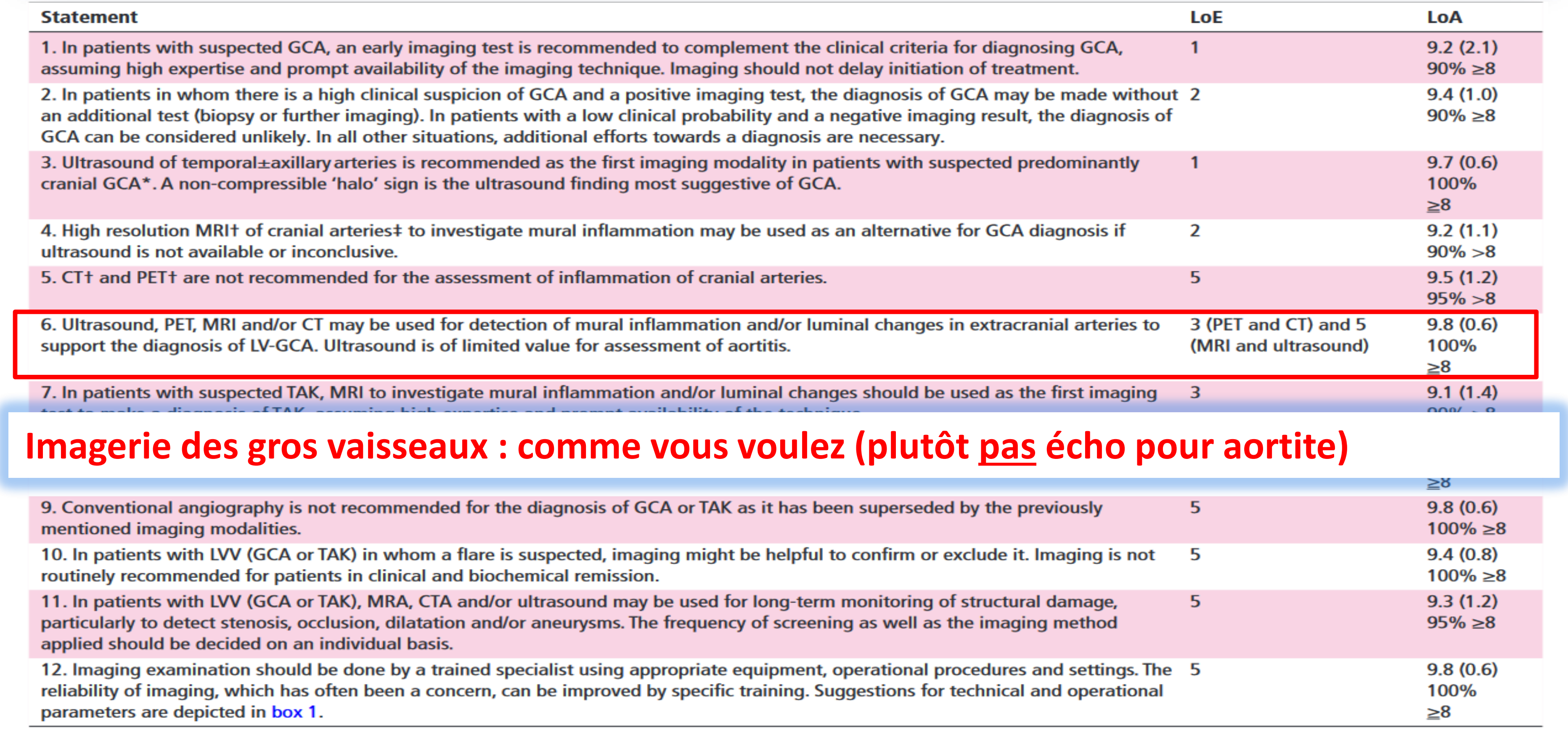


Table 3 Diagnostic performance of aortic CT angiography in 28 patients wi

	Sensitivity	Specificity
Diagnosis per patient	95% (18/19)	100% (9/9)
Diagnosis per segment	61% (49/80)	97.9% (141/144)

De Boysson et al. Eur J Nucl Med Mol Imaging 2017

Les guidelines EULAR



Statement	LoE	LoA
1. In patients with suspected GCA, an early imaging test is recommended to complement the clinical criteria for diagnosing GCA, assuming high expertise and prompt availability of the imaging technique. Imaging should not delay initiation of treatment.	1	9.2 (2.1) 90% ≥8
2. In patients in whom there is a high clinical suspicion of GCA and a positive imaging test, the diagnosis of GCA may be made without an additional test (biopsy or further imaging). In patients with a low clinical probability and a negative imaging result, the diagnosis of GCA can be considered unlikely. In all other situations, additional efforts towards a diagnosis are necessary.	2	9.4 (1.0) 90% ≥8
3. Ultrasound of temporal±axillary arteries is recommended as the first imaging modality in patients with suspected predominantly cranial GCA*. A non-compressible 'halo' sign is the ultrasound finding most suggestive of GCA.	1	9.7 (0.6) 100% ≥8
4. High resolution MRI† of cranial arteries‡ to investigate mural inflammation may be used as an alternative for GCA diagnosis if ultrasound is not available or inconclusive.	2	9.2 (1.1) 90% >8
5. CT† and PET† are not recommended for the assessment of inflammation of cranial arteries.	5	9.5 (1.2) 95% >8
6. Ultrasound, PET, MRI and/or CT may be used for detection of mural inflammation and/or luminal changes in extracranial arteries to support the diagnosis of LV-GCA. Ultrasound is of limited value for assessment of aortitis.	3 (PET and CT) and 5 (MRI and ultrasound)	9.8 (0.6) 100% ≥8
7. In patients with suspected TAK, MRI to investigate mural inflammation and/or luminal changes should be used as the first imaging	3	9.1 (1.4)
		≥8
9. Conventional angiography is not recommended for the diagnosis of GCA or TAK as it has been superseded by the previously mentioned imaging modalities.	5	9.8 (0.6) 100% ≥8
10. In patients with LVV (GCA or TAK) in whom a flare is suspected, imaging might be helpful to confirm or exclude it. Imaging is not routinely recommended for patients in clinical and biochemical remission.	5	9.4 (0.8) 100% ≥8
11. In patients with LVV (GCA or TAK), MRA, CTA and/or ultrasound may be used for long-term monitoring of structural damage, particularly to detect stenosis, occlusion, dilatation and/or aneurysms. The frequency of screening as well as the imaging method applied should be decided on an individual basis.	5	9.3 (1.2) 95% ≥8
12. Imaging examination should be done by a trained specialist using appropriate equipment, operational procedures and settings. The reliability of imaging, which has often been a concern, can be improved by specific training. Suggestions for technical and operational parameters are depicted in box 1.	5	9.8 (0.6) 100% ≥8

Imagerie des gros vaisseaux : comme vous voulez (plutôt pas écho pour aortite)

Dejaco et al. ARD 2018

Conséquences de l'atteinte aortique

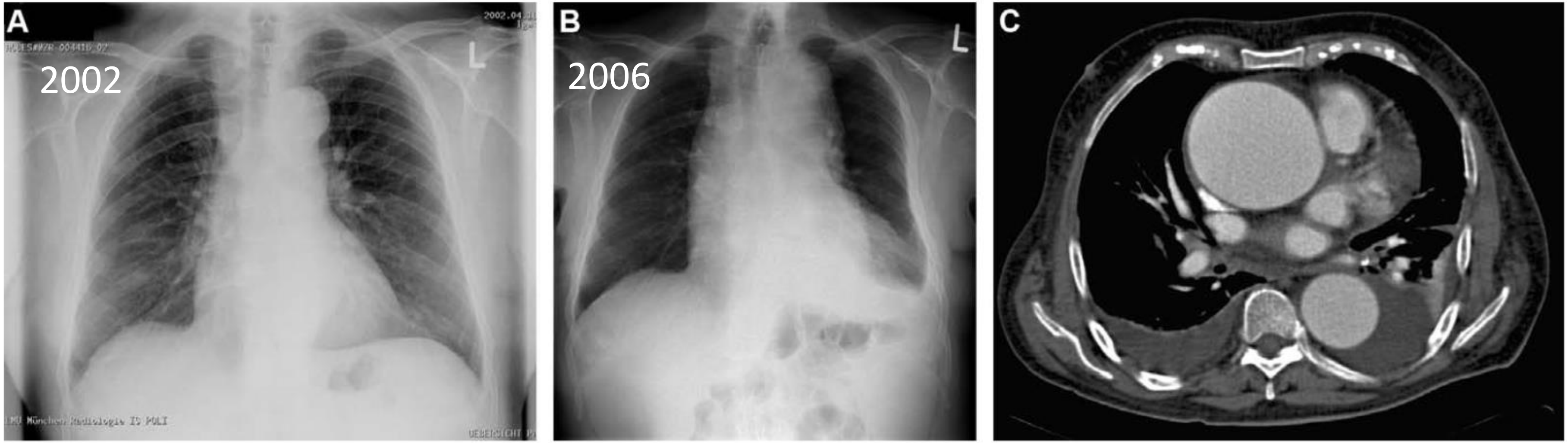


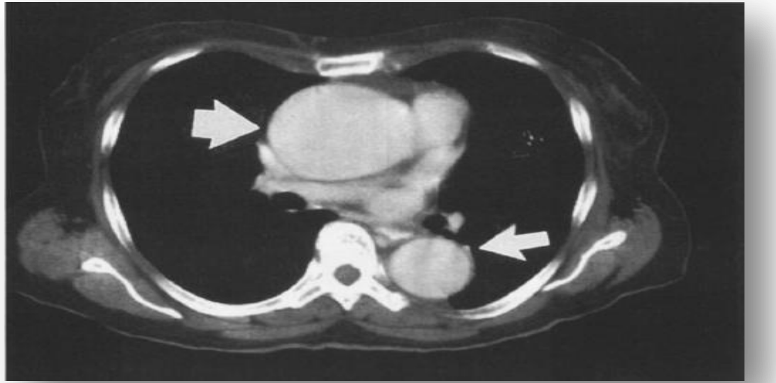
Figure 1 Chest radiograph of a 70-year-old man at the time of diagnosis of GCA in 2002 (A). Four years later the chest radiograph of the same patient shows new mediastinal broadening (B). A CT scan demonstrates a large aneurysm of the thoracic aorta with a maximum diameter of 9.3 cm in the ascending segment (C).

Hoffmann et al. Vasc Med 2008

Atteinte des gros vaisseaux et ACG

Risque d'évolution anévrismale

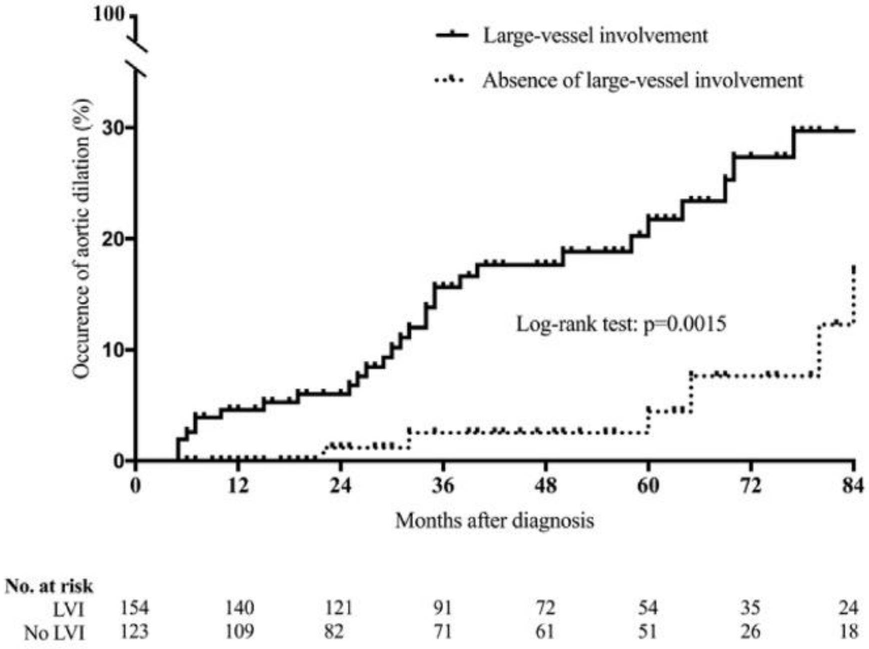
Topographie	**Sur-risque (versus population générale)**
Aorte thoracique	**OR : 17.3 (IC95% : 7.9 - 33.0)**
Aorte abdominale	**OR : 2.4 (IC95%: 0.8 - 5.5)**



Evans et al. Ann Intern Med 1995

L’aortite prédit la survenue des anévrismes

Large-vessel involvement and aortic dilation in giant-cell arteritis. A multicenter study of 549 patients



La relative linéarité de la courbe justifie une surveillance annuelle

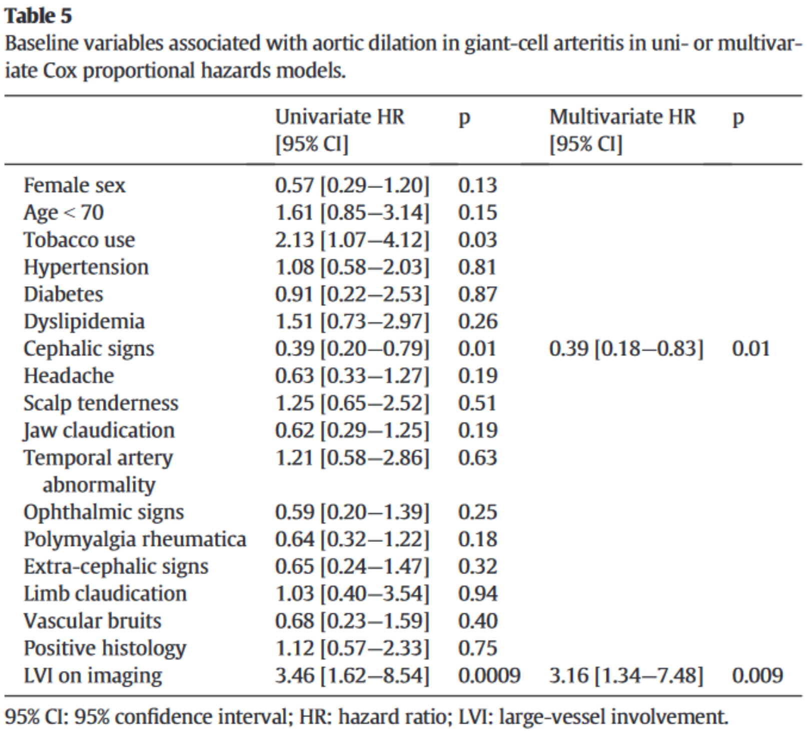


Table 5

Baseline variables associated with aortic dilation in giant-cell arteritis in uni- or multivariate Cox proportional hazards models.

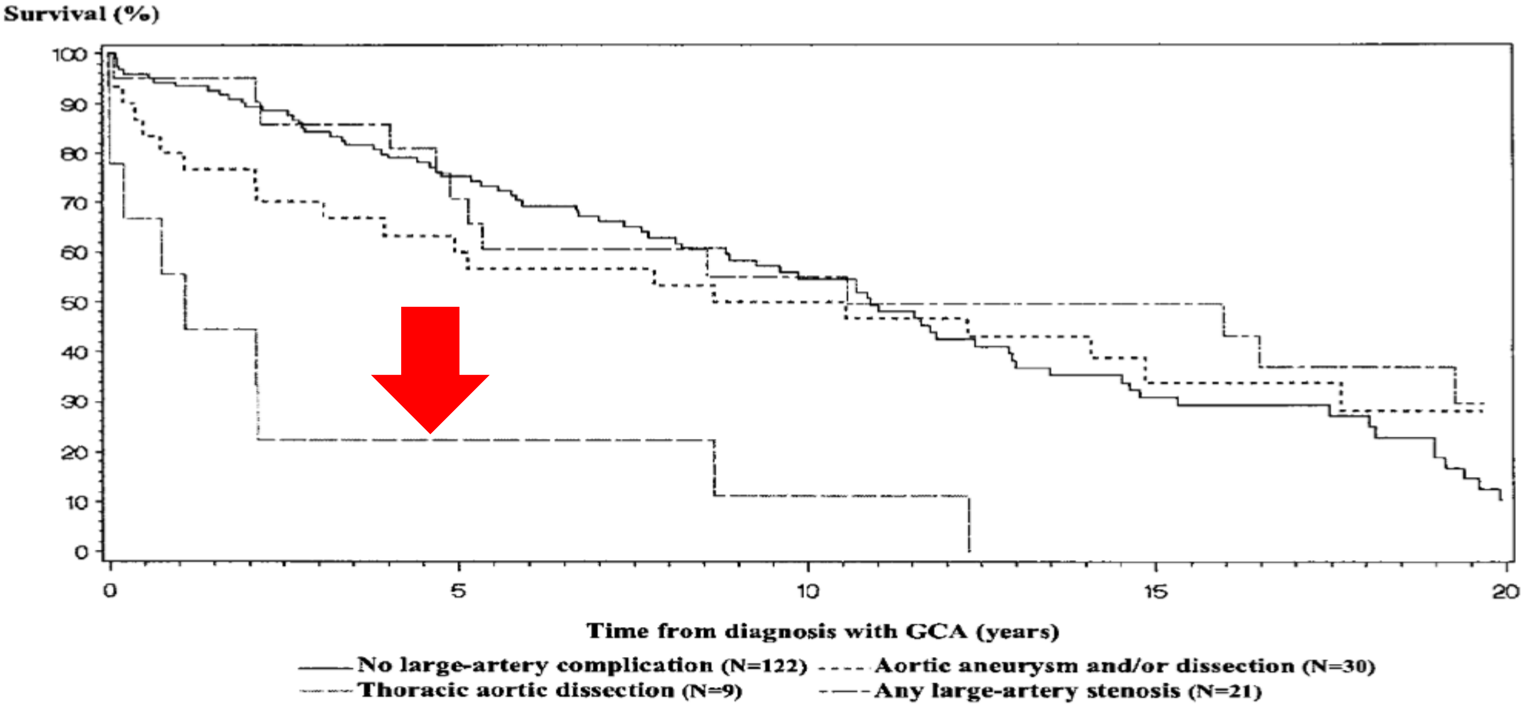
	Univariate HR [95% CI]	p	Multivariate HR [95% CI]	p
Female sex	0.57 [0.29–1.20]	0.13		
Age < 70	1.61 [0.85–3.14]	0.15		
Tobacco use	2.13 [1.07–4.12]	0.03		
Hypertension	1.08 [0.58–2.03]	0.81		
Diabetes	0.91 [0.22–2.53]	0.87		
Dyslipidemia	1.51 [0.73–2.97]	0.26		
Cephalic signs	0.39 [0.20–0.79]	0.01	0.39 [0.18–0.83]	0.01
Headache	0.63 [0.33–1.27]	0.19		
Scalp tenderness	1.25 [0.65–2.52]	0.51		
Jaw claudication	0.62 [0.29–1.25]	0.19		
Temporal artery abnormality	1.21 [0.58–2.86]	0.63		
Ophthalmic signs	0.59 [0.20–1.39]	0.25		
Polymyalgia rheumatica	0.64 [0.32–1.22]	0.18		
Extra-cephalic signs	0.65 [0.24–1.47]	0.32		
Limb claudication	1.03 [0.40–3.54]	0.94		
Vascular bruits	0.68 [0.23–1.59]	0.40		
Positive histology	1.12 [0.57–2.33]	0.75		
LVI on imaging	3.46 [1.62–8.54]	0.0009	3.16 [1.34–7.48]	0.009

95% CI: 95% confidence interval; HR: hazard ratio; LVI: large-vessel involvement.

De Boysson et al. Autoimmunity reviews 2018

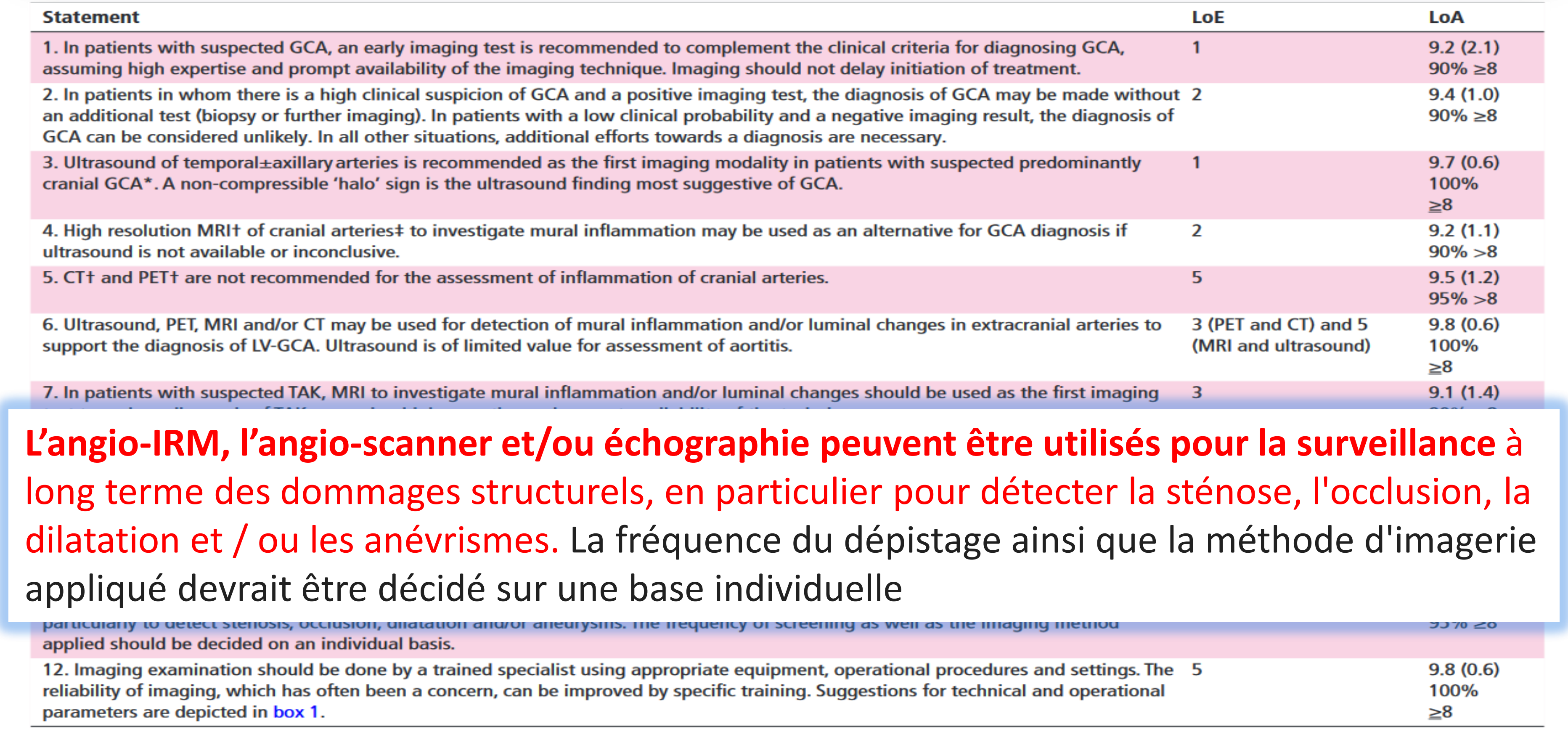
Atteinte des gros vaisseaux et ACG

Risque de dissection engageant le pronostic vital



Nuenninghoff et al. Arthritis Rheum 2003

La surveillance…



Statement	LoE	LoA
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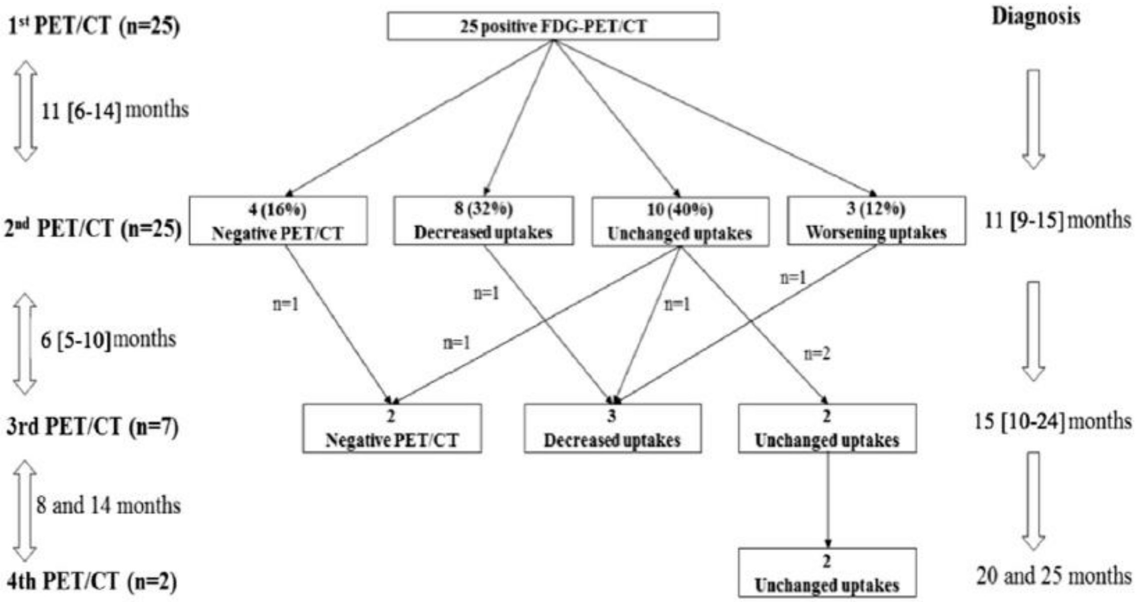
3. Ultrasound of temporal±axillary arteries is recommended as the first imaging modality in patients with suspected predominantly cranial GCA*. A non-compressible 'halo' sign is the ultrasound finding most suggestive of GCA.	1	9.7 (0.6) 100% ≥8
4. High resolution MRI† of cranial arteries‡ to investigate mural inflammation may be used as an alternative for GCA diagnosis if ultrasound is not available or inconclusive.	2	9.2 (1.1) 90% >8
5. CT† and PET† are not recommended for the assessment of inflammation of cranial arteries.	5	9.5 (1.2) 95% >8
6. Ultrasound, PET, MRI and/or CT may be used for detection of mural inflammation and/or luminal changes in extracranial arteries to support the diagnosis of LV-GCA. Ultrasound is of limited value for assessment of aortitis.	3 (PET and CT) and 5 (MRI and ultrasound)	9.8 (0.6) 100% ≥8
7. In patients with suspected TAK, MRI to investigate mural inflammation and/or luminal changes should be used as the first imaging	3	9.1 (1.4)
particularly to detect stenosis, occlusion, dilatation and/or aneurysms. The frequency of screening as well as the imaging method applied should be decided on an individual basis.		95% ≥8
12. Imaging examination should be done by a trained specialist using appropriate equipment, operational procedures and settings. The reliability of imaging, which has often been a concern, can be improved by specific training. Suggestions for technical and operational parameters are depicted in box 1.	5	9.8 (0.6) 100% ≥8

L'angio-IRM, l'angio-scanner et/ou échographie peuvent être utilisés pour la surveillance à long terme des dommages structurels, en particulier pour détecter la sténose, l'occlusion, la dilatation et / ou les anévrismes. La fréquence du dépistage ainsi que la méthode d'imagerie appliqué devrait être décidé sur une base individuelle

Dejaco et al. ARD 2018

Ne PAS refaire le PET-TDM au cours du suivi

Repetitive ^{18}F-FDG-PET/CT in patients with large-vessel giant-cell arteritis and controlled disease

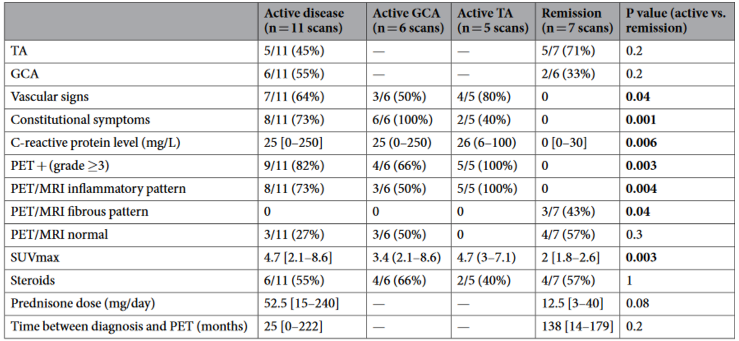

1st PET/CT (n=25)
25 positive FDG-PET/CT
Diagnosis
11 [6-14] months
2nd PET/CT (n=25)
4 (16%) Negative PET/CT
8 (32%) Decreased uptakes
10 (40%) Unchanged uptakes
3 (12%) Worsening uptakes
11 [9-15] months
n=1
n=1
n=1
n=1
n=1
n=2
6 [5-10] months
3rd PET/CT (n=7)
2 Negative PET/CT
3 Decreased uptakes
2 Unchanged uptakes
15 [10-24] months
8 and 14 months
4th PET/CT (n=2)
2 Unchanged uptakes
20 and 25 months

FDG uptakes remained positive in >80% of the 25 patients and in the 7 GCA patients who had clinical and biological controlled disease and were screened with second and third PET/CTs at 11 and 15 months after diagnosis, respectively.

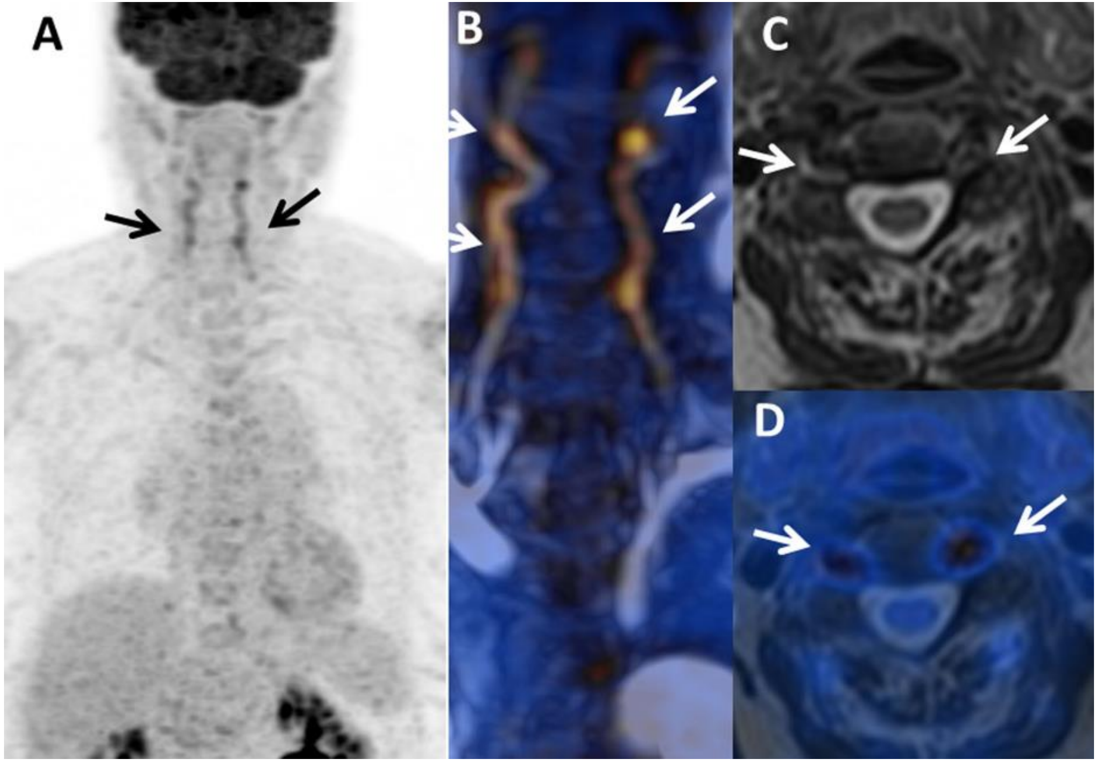
De Boysson et al. Eur J Internal Med 2017

L’avenir ? Fusion PET/IRM

PET/MRI in large-vessel vasculitis: clinical value for diagnosis and assessment of disease activity



	Active disease (n = 11 scans)	Active GCA (n = 6 scans)	Active TA (n = 5 scans)	Remission (n = 7 scans)	P value (active vs. remission)
TA	5/11 (45%)	—	—	5/7 (71%)	0.2
GCA	6/11 (55%)	—	—	2/6 (33%)	0.2
Vascular signs	7/11 (64%)	3/6 (50%)	4/5 (80%)	0	**0.04**
Constitutional symptoms	8/11 (73%)	6/6 (100%)	2/5 (40%)	0	**0.001**
C-reactive protein level (mg/L)	25 [0–250]	25 (0–250)	26 (6–100)	0 [0–30]	**0.006**
PET + (grade ≥3)	9/11 (82%)	4/6 (66%)	5/5 (100%)	0	**0.003**
PET/MRI inflammatory pattern	8/11 (73%)	3/6 (50%)	5/5 (100%)	0	**0.004**
PET/MRI fibrous pattern	0	0	0	3/7 (43%)	**0.04**
PET/MRI normal	3/11 (27%)	3/6 (50%)	0	4/7 (57%)	0.3
SUVmax	4.7 [2.1–8.6]	3.4 (2.1–8.6)	4.7 (3–7.1)	2 [1.8–2.6]	**0.003**
Steroids	6/11 (55%)	4/6 (66%)	2/5 (40%)	4/7 (57%)	1
Prednisone dose (mg/day)	52.5 [15–240]	—	—	12.5 [3–40]	0.08
Time between diagnosis and PET (months)	25 [0–222]	—	—	138 [14–179]	0.2



Laurent et al. Sci Rep 2019

Conclusion

Imagerie de la PPR :

- en cas de doute, échographie (bursite ?) ou IRM
- rarement néoplasique
- mais intérêt de l'angio-TDM pour détecter une atteinte artérielle

Imagerie de l'ACG :

- Atteinte des gros vaisseaux : jusqu'à 80% des patients
- 15% des patients ont une atteinte des gros vaisseaux sans signe céphalique
- Diagnostic de l'aortite si épaisseur aorte > 2,2mm
- Pas d'intérêt du PET-TDM pour le suivi
- Ne pas oublier l'imagerie annuelle à vie (détection dilatation)

MERCI !!!

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