ARTERITI E ULTRASUONI

Giuseppe Nicoletti

Ospedale Madonna delle Grazie

Matera

ARTERITI E ULTRASUONI

The vasculitides are categorized according to the size of the blood vessels affected and the histologic appearance of the lesions. Broadly, the different types are divided into those that affect the large, medium-sized, and small blood vessels, and the latter group is further divided into pauci-immune and immune-complex–mediated types. It should be acknowledged that no classification scheme for the vasculitides has been perfect. Some types of vasculitis affect more than one size of vessel.

Kathiresan S et al. N Engl J Med 2005;352:2003-2012.

Classification of Vasculitis.

Table 4. Classification of Vasculitis.*

Type of Vasculitis	Size of Vessels Affected	Most Common Site of Involvement	Results of Test for ANCA	Other Features or Associated Conditions
Large-vessel vasculitis				
Giant-cell (temporal) arteritis	M, L	Aorta, temporal arteries	Negative	Age >50 yr, polymyalgia rheumatica
Takayasu's arteritis	M, L	Aorta and arch vessels	Negative	Age <50 yr
Medium-sized–vessel vasculitis				
Polyarteritis nodosa	M	Visceral arteries	Negative	Idiopathic, hepatitis B
Kawasaki's disease	M	Coronary arteries	Negative	Age <5 yr
Pauci-immune small-vessel vasculitis				
Wegener's granulomatosis	S, M	Lungs, kidneys	Positive	Granulomatous inflammation
Churg–Strauss syndrome	S, M	Lungs	Positive	Asthma, eosinophilia
Microscopic polyangiitis	S, M	Kidneys	Positive	
Immune-complex small-vessel vasculitis				
Henoch–Schönlein purpura	S, M	Skin, musculoskeletal	Negative	IgA immune complexes
Cryoglobulinemic vasculitis	S, M	Skin, musculoskeletal	Negative	Circulating cryoglobulins
Drug-induced vasculitis	S, M	Skin	Negative	Occasionally systemic

* M denotes medium-sized vessels, which are small-to-medium-sized arteries; L large vessels, which are the aorta and proximal branches to the head and extremities; S small vessels, which can be arterioles, capillaries, and venules; and ANCA antineutrophil cytoplasmic antibodies.

Kathiresan S et al. N Engl J Med 2005;352:2003-2012.

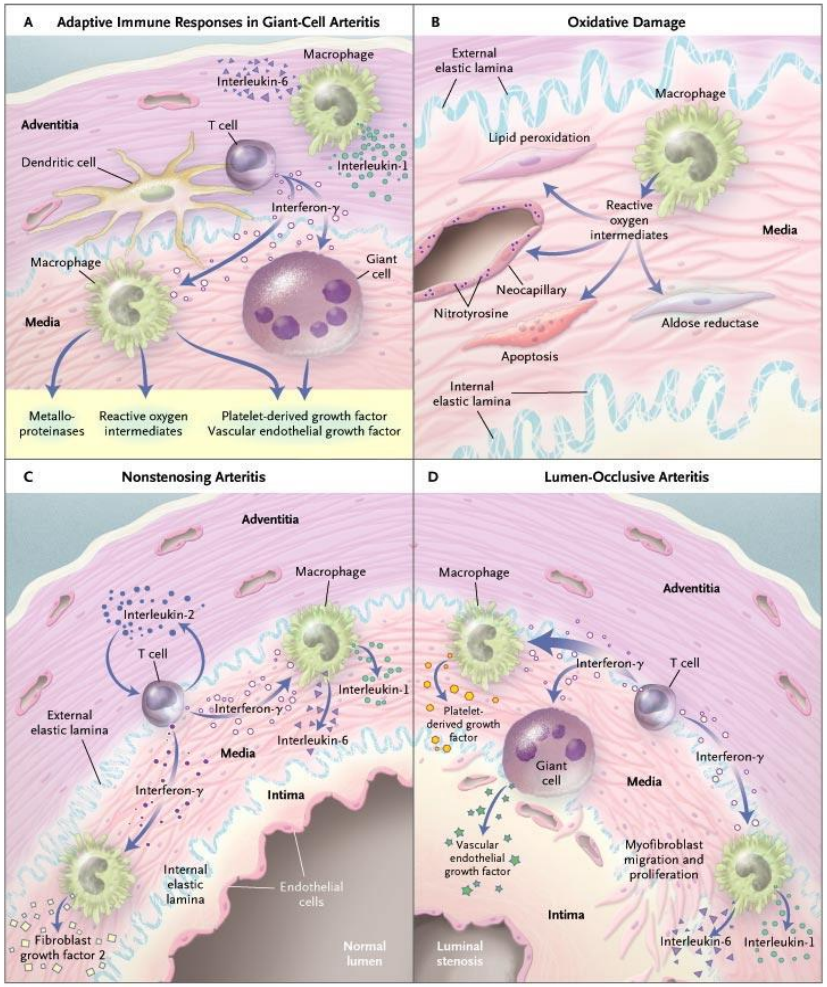
Comparison of Tests for Antineutrophil Cytoplasmic Antibodies with a Cytoplasmic Pattern of Staining (c-ANCA) and a Perinuclear Pattern of Staining (p-ANCA).

TABLE 4. COMPARISON OF TESTS FOR ANTINEUTROPHIL CYTOPLASMIC ANTIBODIES WITH A CYTOPLASMIC PATTERN OF STAINING (c-ANCA) AND A PERINUCLEAR PATTERN OF STAINING (p-ANCA).

p-ANCA	c-ANCA
Antibodies to strong cations	Antibodies to neutral proteins or weak cations (e.g., proteinase 3)
Target antigen is usually myeloperoxidase but nonspecific antigenic interactions may occur	Target antigen is proteinase 3
Most often positive in patients with microscopic polyangiitis or pauci-immune, rapidly progressive glomerulonephritis	Highly specific for Wegener's granulomatosis
Positive in approximately 50% of patients with microscopic polyangiitis	Positive in 70–90% of patients with Wegener's granulomatosis
Positive in 5–30% of patients with Wegener's granulomatosis	Occasionally positive in patients with microscopic polyangiitis or the Churg–Strauss syndrome (15–25%)
May be positive in patients with systemic lupus erythematosus, Goodpasture's syndrome, inflammatory bowel disease, or rheumatoid arthritis	Very rarely positive in patients with certain infectious diseases (e.g., amoebiasis)

O'Sullivan BP et al. N Engl J Med 2002;347:1009-1017.

Adaptive Immune Responses in Vasculitis and the Consequences of Arterial-Wall Injury.



Adaptive Immune Responses in Vasculitis and the Consequences of Arterial-Wall Injury. In Panel A, activation and trapping of dendritic cells in the arterial adventitia generate the conditions required for the recruitment and stimulation of antigen-specific T cells. **CD4+ T cells** that enter the microenvironment of the arterial wall interact with dendritic cells and begin **secreting cytokines**. Interferon-γ is a critical cytokine that regulates the differentiation and function of macrophages. The functional commitment of the macrophages in the vascular infiltrates is closely linked to their location in the arterial wall. Macrophages in the adventitial layer supply the inflammatory cytokines interleukin-1 and interleukin-6. **Macrophages in the media secrete metalloproteinases** and play a critical part in oxidative injury through the production of reactive oxygen intermediates. Three aspects of oxidative damage in the media are shown in Panel B. Protein nitration occurs in endothelial cells lining neocapillaries. Toxic aldehydes are formed in the process of lipid peroxidation, and smooth-muscle cells undergo apoptosis. In parallel, reactive oxygen intermediates also trigger cellular activation, as exemplified by the induction of aldose reductase. The response of the artery to injury is shown in Panels C and D. **Arteritis** does not necessarily result in luminal stenosis and may proceed without compromising blood flow (Panel C). In patients **with ample production of platelet-derived growth factor and vascular endothelial growth factor,** rapid and exuberant **intimal hyperplasia** ensues, causing lumen-occlusive arteritis (Panel D). Accordingly, the clinical presentation of arteritis may or may not include ischemic complications.

Weyand CM, Goronzy JJ. N Engl J Med 2003;349:160-169.

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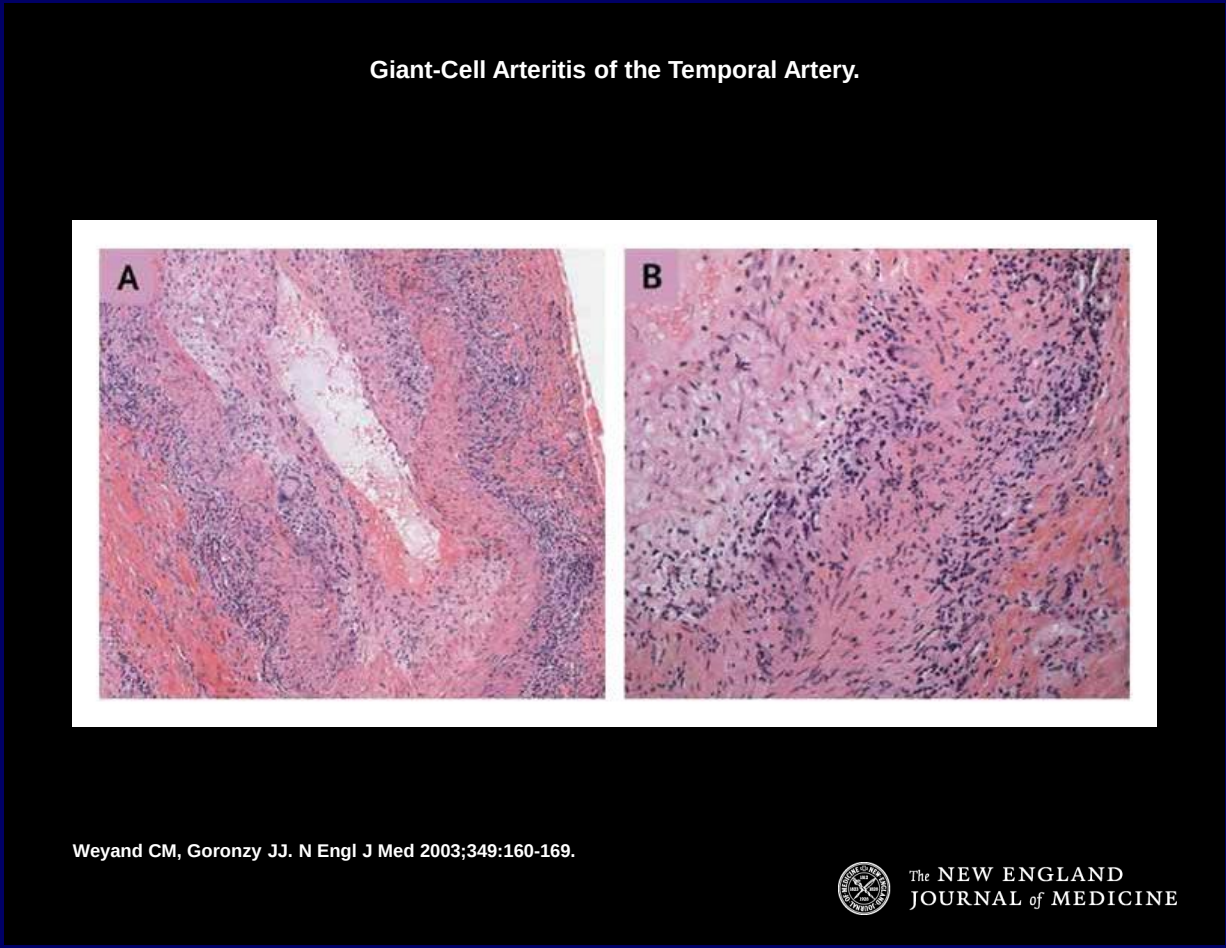
ARTERITI E ULTRASUONI
istologia

ARTERITI DEI VASI DI GRANDE MEDIO CALIBRO
Necrosi fibrinoide della parete vasale con Infiltrato infiammatorio cronico . La lamina elastica può essere distrutta e rimpiazzata con tessuto fibroso. Possono esserci cellule giganti e granulomi

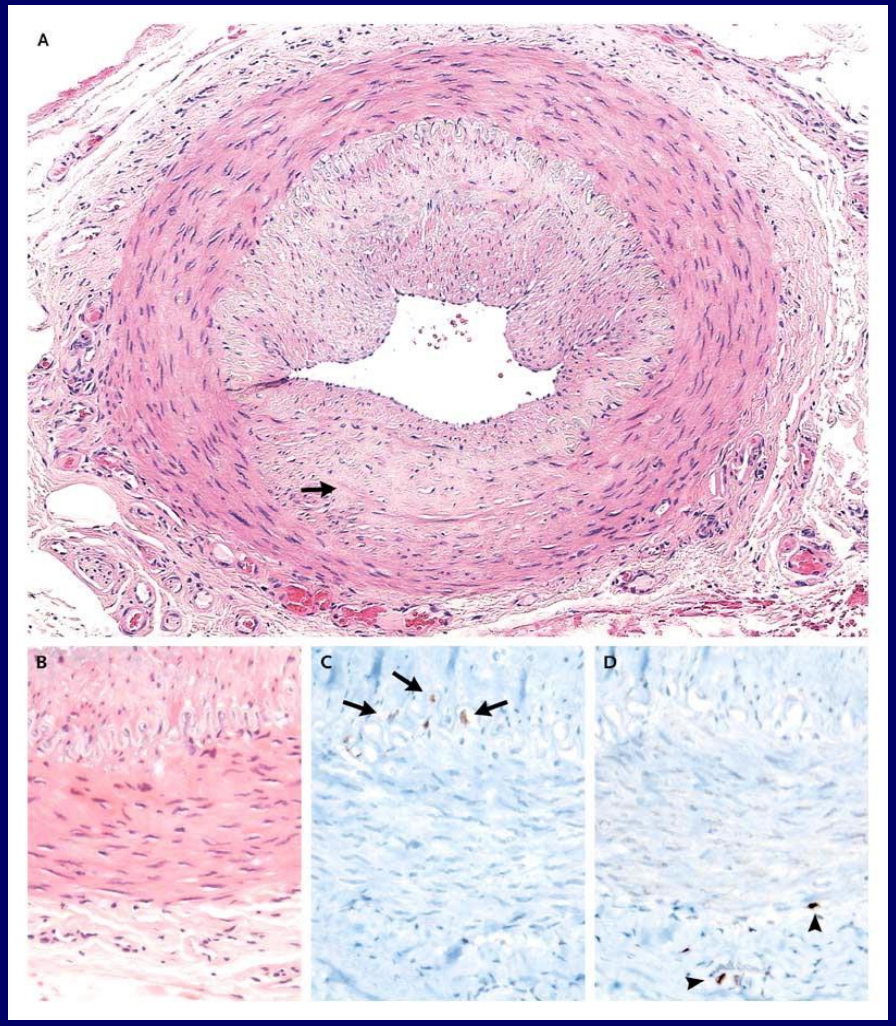
ARTERITI DEI VASI DI PICCOLO CALIBRO
Necrosi , deposizione di fibrina, leucocitoclasia, capillarite, emorragie e granulomi

ARTERITI E ULTRASUONI
istologia

Panel A shows transmural inflammation of the temporal artery with granulomatous infiltrates in the media and giant cells at the media–intima border (hematoxylin and eosin, ×100). The lumen is partially occluded by intimal hyperplasia. Panel B shows a close-up view of a segment of the media with several multinucleated giant cells arranged adjacent to fragments of the internal elastic lamina (hematoxylin and eosin, ×200).



Temporal-Artery Biopsy.



Stone JH et al. N Engl J Med 2010;362:537-546.

ARTERITI E ULTRASUONI

OUTLINE

- ARTERITI VALUTABILI
- a) arterite temporale (GCA)
- b) takayasu
- REVIEW LETTERATURA
- TECNICA DI ESECUZIONE-PITFALL
- TAKE HOME MESSAGE

ARTERITE TEMPORALE (GIGANTOCELLULARE)

Traditional Criteria for the Classification of Giant-Cell (Temporal) Arteritis.

TABLE 2. TRADITIONAL CRITERIA FOR THE CLASSIFICATION OF GIANT-CELL (TEMPORAL) ARTERITIS.*

CRITERION	DEFINITION
Age at onset of disease ≥50 yr	Development of symptoms or findings beginning at the age of 50 or older
New headache	New onset of or new type of localized pain in the head
Temporal-artery abnormality	Tenderness of temporal artery to palpation or decreased pulsation, unrelated to arteriosclerosis of cervical arteries
Elevated erythrocyte sedimentation rate	Erythrocyte sedimentation rate ≥50 mm per hour according to the Westergren method
Abnormal findings on biopsy of temporal artery	Artery-biopsy specimen shows vasculitis characterized by a predominance of mononuclear-cell infiltrates or granulomatous inflammation, usually with multinucleated giant cells

*The criteria were formulated in 1990 by the American College of Rheumatology.[19] For the purposes of classification, a patient with vasculitis is said to have giant-cell (temporal) arteritis if at least three of these five criteria are met. The presence of three or more criteria yields a sensitivity of 93.5 percent and a specificity of 91.2 percent.

Salvarani C et al. N Engl J Med 2002;347:261-271.

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Possible Reasons for False Negative Results of Temporal-Artery Biopsies Performed for the Diagnosis of Giant-Cell Arteritis.

Table 2. Possible Reasons for False Negative Results of Temporal-Artery Biopsies Performed for the Diagnosis of Giant-Cell Arteritis.

Reason	Explanation
Inadequate length of biopsy specimen	Experts recommend a minimum of 2 cm in length for temporal-artery–biopsy specimens[35,36]; in clinical practice, the length of artery obtained is often shorter.[37]
Skip lesions	Skip lesions occur in giant-cell arteritis, increasing the likelihood of sampling error.[38]
No performance of a biopsy on the involved side	Discordance between sides has been estimated to occur in 10 to 20% of patients[39-41]; the physical examination is normal in up to one third of patients with biopsy specimens that are positive for giant-cell arteritis[42] and is therefore imperfect as a guide to the biopsy site.
Lack of involvement of temporal arteries	The prevalence of temporal-artery involvement among patients with large-vessel giant-cell arteritis has been estimated to be as low as 56%.[43]
Performance of a biopsy of the portion of the vessel with a palpable pulse (i.e., a segment more likely to be normal)	Skill and experience are required to identify potentially abnormal vessels in situ; inexperienced surgeons are more likely to identify and perform a biopsy of a pulsatile artery, which is easier to find and more likely to be normal than a nodular, pulseless vessel.
Incorrect pathological interpretation	Substantial variability of opinion exists among pathologists with respect to the characteristic histopathological features of giant-cell arteritis; pathologists sometimes disregard lymphoplasmacytic infiltrates in the adventitia, which may be the earliest histopathological finding in giant-cell arteritis.
Incomplete pathological evaluation	No consensus exists among pathologists with regard to the processing of temporal-artery–biopsy specimens, and in some cases substantial portions of the artery remain in paraffin blocks.

Stone JH et al. N Engl J Med 2010;362:537-546.

ARTERITE TEMPORALE

BIOPSIA (1)

LESIONI NERVO FACIALE
NECROSI CUTANEA
STROKE
COINVOLGIMENTO SEGMENTARIO

In assenza di alterato pattern US il risultato della biopsia raramente positivo (2)

(1)Siemssen SJ On the occurrence of necrotising lesions in temporal arteritis: review of the literature with a note on the potential risk of a biopsy. Br J Plast. Surg 1987 40:73-82

2Barrier J et al. The use of doppler flow studies in the diagnosis of giant cell arteritis. Selection of temporal artery biopsy site is facilitated. JAMA 1982; 5:248(17) 2158-9.

The New England Journal of Medicine

COLOR DUPLEX ULTRASONOGRAPHY IN THE DIAGNOSIS OF TEMPORAL ARTERITIS

WOLFGANG A. SCHMIDT, M.D., HELGA E. KRAFT, M.D., KLAUS VORPAHL, M.D., LUTZ VÖLKER, M.D., AND ERIKA J. GROMNICA-IHLE, M.D.

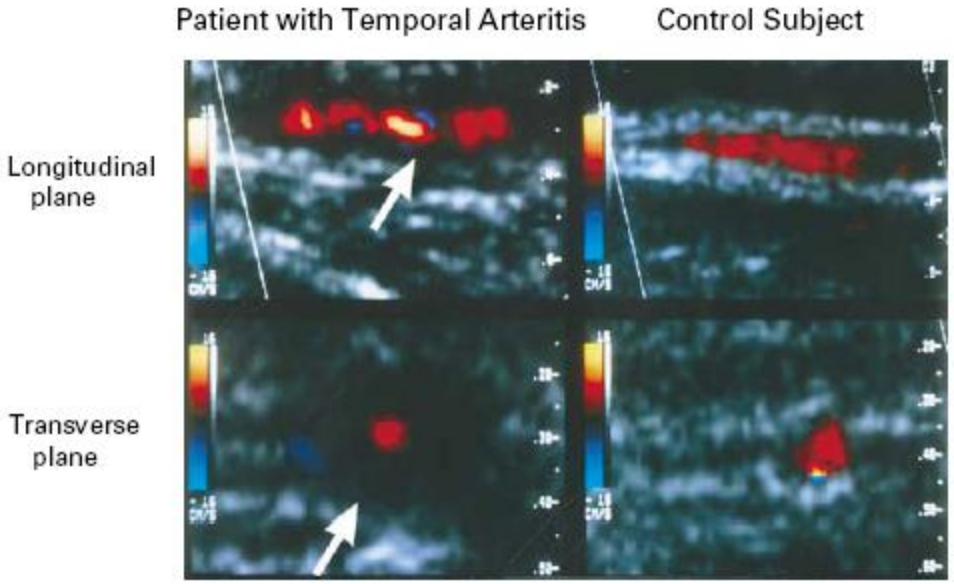

Figure 2. Parietal Ramus of the Superficial Temporal Artery in a Patient with Temporal Arteritis and a Control Subject in a Longitudinal and a Transverse Plane.
The hypoechoic (black) area is indicated by the arrows.

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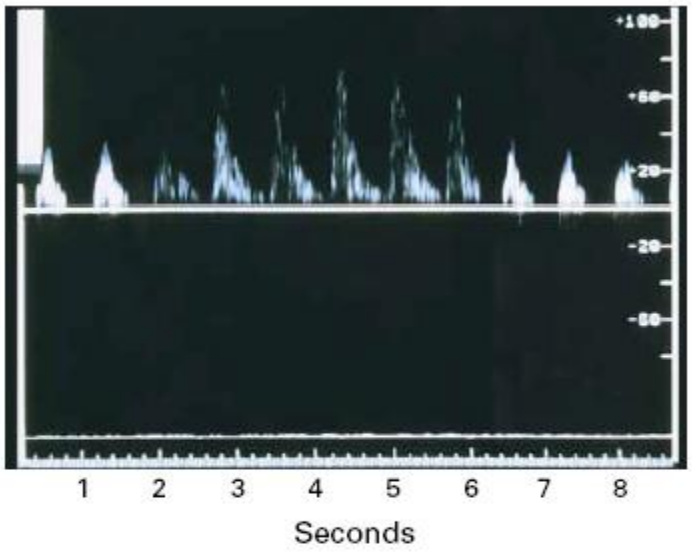
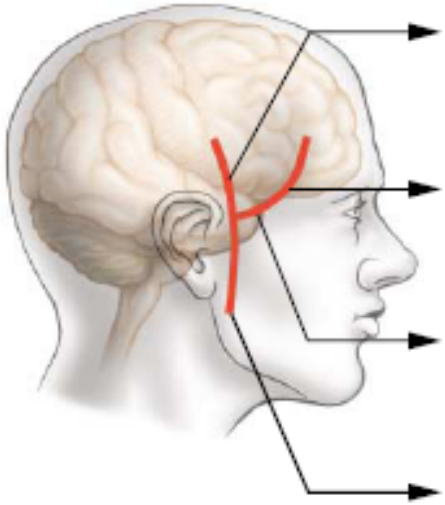


Figure 3. Stenosis of the Superficial Temporal Artery.

On the left-hand side, blood flow before the stenosis is normal. As the pulsed-wave Doppler beam moves through the stenosis, blood flow velocity increases. In the area to the right beyond the stenosis, blood flow velocity again decreases.



Site	Patients with Temporal Arteritis (N=30)	Patients with Polymyalgia Rheumatica (N=37)	Control Subjects (N=30)	Patients with Negative Histologic Findings and Other Diagnoses (N=15)
Parietal ramus (15 mm distal to bifurcation)				
Systolic lumen (mm)	0.79±0.29	0.76±0.20	0.89±0.24	0.81±0.30
Wall (mm)	0.94±0.28*	0.70±0.08	0.72±0.13	0.79±0.11
Maximal velocity (cm/sec)	52±18	59±14	54±14	57±18
Frontal ramus (25 mm distal to bifurcation)				
Systolic lumen (mm)	0.67±0.20	0.66±0.22	0.74±0.24	0.68±0.23
Wall (mm)	0.95±0.20*	0.66±0.07	0.65±0.13	0.72±0.09
Maximal velocity (cm/sec)	48±13	53±16	47±15	55±19
Frontal ramus (10 mm distal to bifurcation)				
Systolic lumen (mm)	0.74±0.24	0.71±0.17	0.86±0.26	0.78±0.30
Wall (mm)	0.95±0.22*	0.69±0.09	0.71±0.13	0.76±0.10
Maximal velocity (cm/sec)	50±14	56±15	48±13	59±20
Common superficial temporal artery (8 mm below skin surface)				
Systolic lumen (mm)	1.51±0.44	1.54±0.41	1.70±0.35	1.85±0.54
Maximal velocity (cm/sec)	62±22	61±16	55±13	64±16

Figure 1. Measurement of the Superficial Temporal Arteries.

Plus–minus values are means ±SD of the right and left sides. The arterial wall was defined to include the intima, media, adventitia, and temporal fascia. Asterisks indicate a significant difference ($P<0.01$ by the Mann–Whitney U test) between the patients with temporal arteritis and the other three groups.

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TABLE 2. SENSITIVITY AND SPECIFICITY OF DUPLEX ULTRASONOGRAPHY OF THE TEMPORAL ARTERIES FOR THE DIAGNOSIS OF TEMPORAL ARTERITIS AND TO CONFIRM HISTOLOGIC FINDINGS.

FINDING	DIAGNOSIS*		CONFIRMATION OF HISTOLOGIC FINDINGS†	
	SENSITIVITY	SPECIFICITY	SENSITIVITY	SPECIFICIT
	positive tests/total (%)	negative tests/total (%)	positive tests/total (%)	negative tests/tota (%)
Halo	22/30 (73)	82/82 (100)	16/21 (76)	24/26 (92)
Stenosis or occlusion	24/30 (80)	76/82 (93)	18/21 (86)	23/26 (88)
Halo, stenosis, or occlusion	28/30 (93)	76/82 (93)	20/21 (95)	22/26 (85)

*Thirty patients had temporal arteritis, and 82 patients had been give other diagnoses.

†Twenty-one patients had positive histologic findings, and 26 patient had negative histologic findings (4 in the temporal-arteritis group, 7 in th group with polymyalgia rheumatica, and 15 with other diagnoses).

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COLOR DUPLEX ULTRASONOGRAPHY IN THE DIAGNOSIS OF TEMPORAL ARTERITIS

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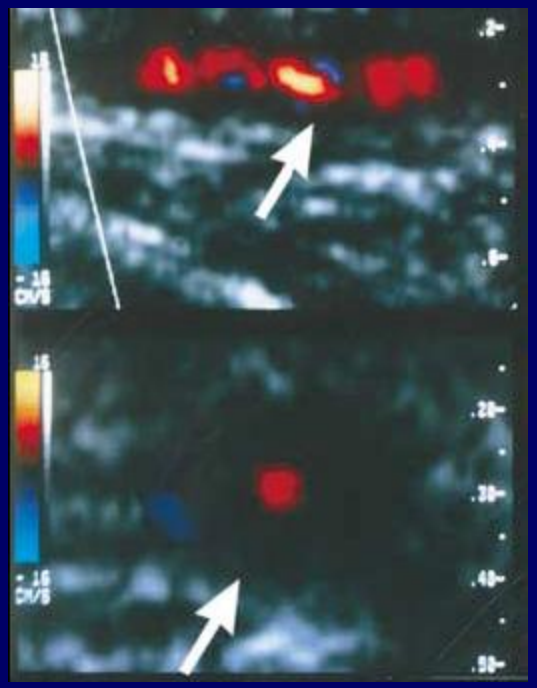
Conclusions There are characteristic signs of temporal arteritis that can be visualized by color duplex ultrasonography. The most specific sign is a dark halo, which may be due to edema of the artery wall. In patients with typical clinical signs and a halo on ultrasonography, it may be possible to make a diagnosis of temporal arteritis and begin treatment without performing a temporal-artery biopsy. (N Engl J Med 1997;337:1336-42.)



ECOCOLORDOPPLER TRANSCRANICO E PATOLOGIE ARTERITICHE

Un alone ipoecogeno all'ecodoppler, pur raggiungendo una specificità del 93% non migliora l'accuratezza diagnostica di u esame fisico accurato

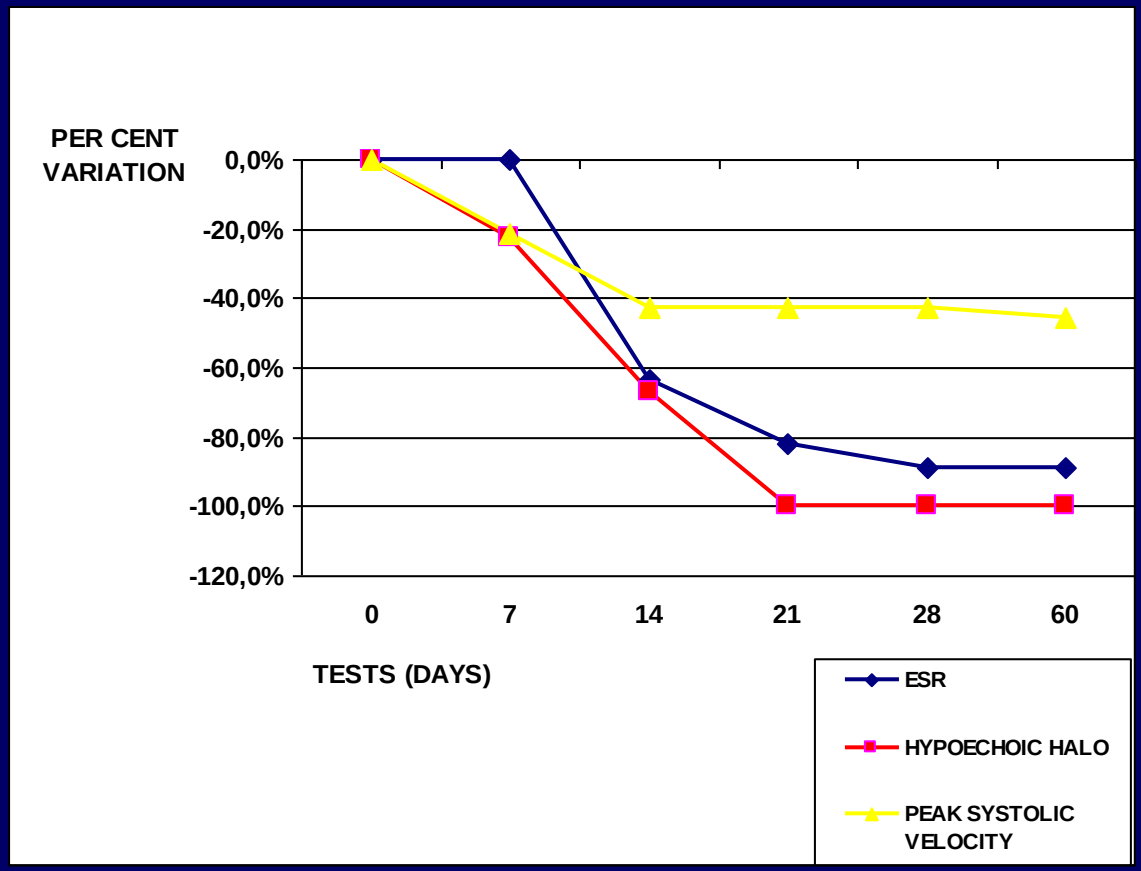
(1)Salvarani C., et al. Is duplex ultrasonography useful for the diagnosis of giant cell arteritis? Ann. Intern. Med. 2002; 137:232-8

ECOCOLORDOPPLER TRANSCRANICO E PATOLOGIE ARTERITICHE

COLOUR DUPLEX ULTRASONOGRAPHY IN THE MANAGEMENT OF GIANT CELL ARTERITIS

Giuseppe Nicoletti[1], Giovanni Ciancio[2], Salvatore Tardi[1], Ignazio Olivieri[2]

Clinical Rheumatology2003



ECOCOLORDOPPLER TRANSCRANICO E PATOLOGIE ARTERITICHE

Display Settings: Abstract Send to:

Ann Rheum Dis. 2010 Jul;69(7):1356-9. Epub 2010 May 24.

Vascular involvement in patients with giant cell arteritis determined by duplex sonography of 2x11 arterial regions.

Aschwanden M, Kesten F, Stern M, Thalhammer C, Walker UA, Tyndall A, Jaeger KA, Hess C, Daikeler T.
Department of Rheumatology, University Hospital Basel, Petersgraben 4, Basel CH-4031, Switzerland.

Abstract

OBJECTIVE: To define the specificity and extent of duplex sonography (DS) findings suggestive of vessel wall inflammation in patients with giant cell arteritis (GCA).

METHODS: Patients admitted between December 2006 and April 2009 to the University Hospital Basel with a suspicion of GCA were eligible for the study. DS of 2x11 arterial regions was performed in all study participants, and American College of Rheumatology criteria were applied to classify patients into GCA or non-GCA groups.

RESULTS: GCA was diagnosed in 38 of the 72 participants (53%). A DS pattern suggestive of vessel wall inflammation was not observed in any of the patients in the non-GCA group but, in 21 of the 38 patients with GCA (55%), DS signs suggestive of vessel wall inflammation of > or =1 vessel region were detected. In 12 of the 38 patients with GCA (32%), DS signs of large vessel vasculitis (LVV) were found in > or =1 vessel region(s) of both upper and lower limb vessels. Follow-up DS was performed 6 months after the baseline examination in 9 of the 12 patients with LVV and showed the persistence of most findings despite normalised signs of systemic inflammation.

CONCLUSION: DS detects changes in the vessel wall that appear to be specific for GCA; they can be present in upper and lower limb arteries of patients with GCA. Surprisingly, DS-detectable LVV and signs of systemic inflammation are largely dissociated.

PMID: 20498213 [PubMed - indexed for MEDLINE]

ECOCOLORDOPPLER TRANSCRANICO E PATOLOGIE ARTERITICHE

Meta-analysis:test performance of ultrasonography for giant cell arteritis

Ultrasonography may be helpful in diagnosing giant cell arteritis.

(Fotini B.Karassa et al.Ann. Intern. Med. 2005; 142:359-369

ARTHRITIS & RHEUMATISM
Vol. 58, No. 8, August 2008, pp 2574–2578
DOI 10.1002/art.23699

Comparison of Duplex Sonography and High-Resolution Magnetic Resonance Imaging in the Diagnosis of Giant Cell (Temporal) Arteritis

T. A. Bley,[1] M. Reinhard,[2] C. Hauenstein,[2] M. Markl,[2] K. Warnatz,[2] A. Hetzel,[2] M. Uhl,[2] P. Vaith,[2] and M. Langer[2]

Objective. To compare the diagnostic performance of high-resolution magnetic resonance imaging (MRI) and color-coded duplex sonography (CCDS) in patients with giant cell (temporal) arteritis (GCA).

Methods. Results of high-resolution MRI and CCDS in 59 patients with suspected GCA were compared with the final clinical diagnosis (based on the American College of Rheumatology GCA criteria and a 6-month followup study). Sensitivity, specificity, and positive and negative predictive values (PPV, NPV) were calculated for each method. In 41 of the patients, imaging results were also compared with the findings of a temporal artery (TA) biopsy.

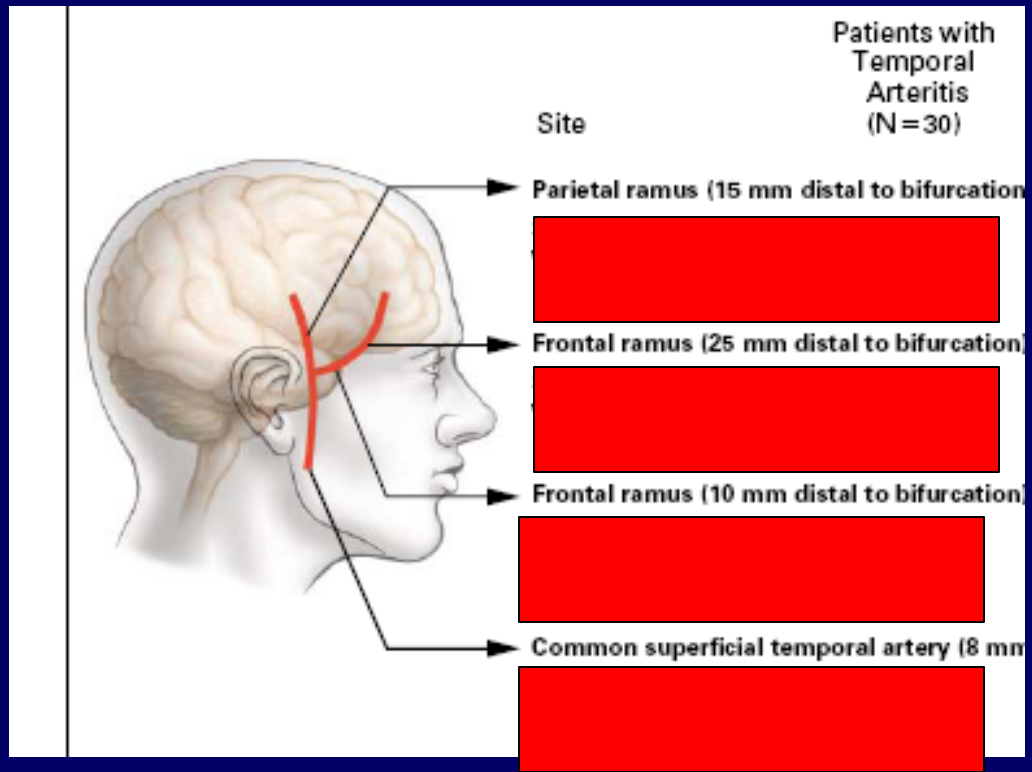
Results. Thirty-six of the 59 patients (61%) were differences between high-resolution MRI and CCDS were not significant.

Conclusion. The diagnostic power of high-resolution MRI and CCDS in detecting GCA was comparable. Either of these noninvasive techniques may have value in the evaluation of patients with suspected GCA, and decisions regarding which technique to use may depend on the clinical setting.

Noninvasive diagnosis of giant cell (temporal) arteritis (GCA) is a challenge, and the positive predictive value (PPV) of the American College of Rheumatology (ACR) GCA criteria (1) was low in a clinical setting (2). Temporal artery (TA) biopsy is still consid-

NOTE

- adeguare la PRF poiché VPS piuttosto alte (anche 100cm/sec)
- steering
- Il colore deve riempire il lume perfettamente (se copre solo il centro dell'arteria l'area non coperta può essere erroneamente scambiata per dark halo)
- l'esame deve iniziare dal tronco comune
- eseguire anche scansioni trasversali



ARTERITE DI TAKAYASU

TAKAYASU'S ARTERITIS

Vasculite dell'aorta e dei suoi vasi di origine

3 casi/1000000 anno in Europa
Fattori ereditari, autoimmuni ed infettivi sono stati messi in rapporto ma la eziologia è tutt'ora sconosciuta

La malattia determina stenosi, occlusioni o anche aneurismi dei vasi affetti

TAKAYASU'S ARTERITIS

Nelle fasi iniziali i sintomi vascolari sono assenti
Il paziente accusa malessere, astenia, perdita di peso, febbre
Laboratorio: VES e PCR aumentate
Con il progredire della malattia i sintomi sono quelli derivanti dal distretto vascolare coinvolto, frequentemente ictus ischemico

TAKAYASU'S ARTERITIS

DIAGNOSI 3 criteri (American College of Rheumatology)

1) età<40
2) Claudicatio
3) Ridotto polso brachiale
4) Differenza significativa della pressione fra i due arti superiori
5) Soffio sulla succlavia o sull'aorta
6) Evidenza arteriografica di stenosi e/o occlusioni dell'aorta o dei vasi di origine da essa, arterie di medio e grosso calibro degli arti sup e inferiori.

Diagnosis of Takayasu's Arteritis.

TABLE 2. DIAGNOSIS OF TAKAYASU'S ARTERITIS.

CATEGORY	ISHIKAWA CRITERIA*	AMERICAN COLLEGE OF RHEUMATOLOGY CRITERIA†
Age (yr)	<40 (Obligatory)	<40
Major criteria	Mid-subclavian lesion	Limb claudication, decreased brachial pulse
Minor criteria	High erythrocyte sedimentation rate, high blood pressure, tenderness of carotid artery	Asymmetry of the brachial blood pressure, subclavian or aortic bruit
Arterial lesions	Lesions of the aorta, brachiocephalic artery, common carotid artery, or pulmonary artery	Narrowing of the large arteries

*The criteria are described by Ishikawa.[32] Two major criteria, one major and two minor criteria, or four minor criteria must be met; the diagnostic sensitivity of these criteria is 84 percent.

†The criteria are described by Arend et al.[33] Three criteria must be met; the diagnostic sensitivity of these criteria is 90.5 percent.

Rigby WF et al. N Engl J Med 2002;347:2057-2065.

Radiographic Classification of Takayasu's Arteritis.

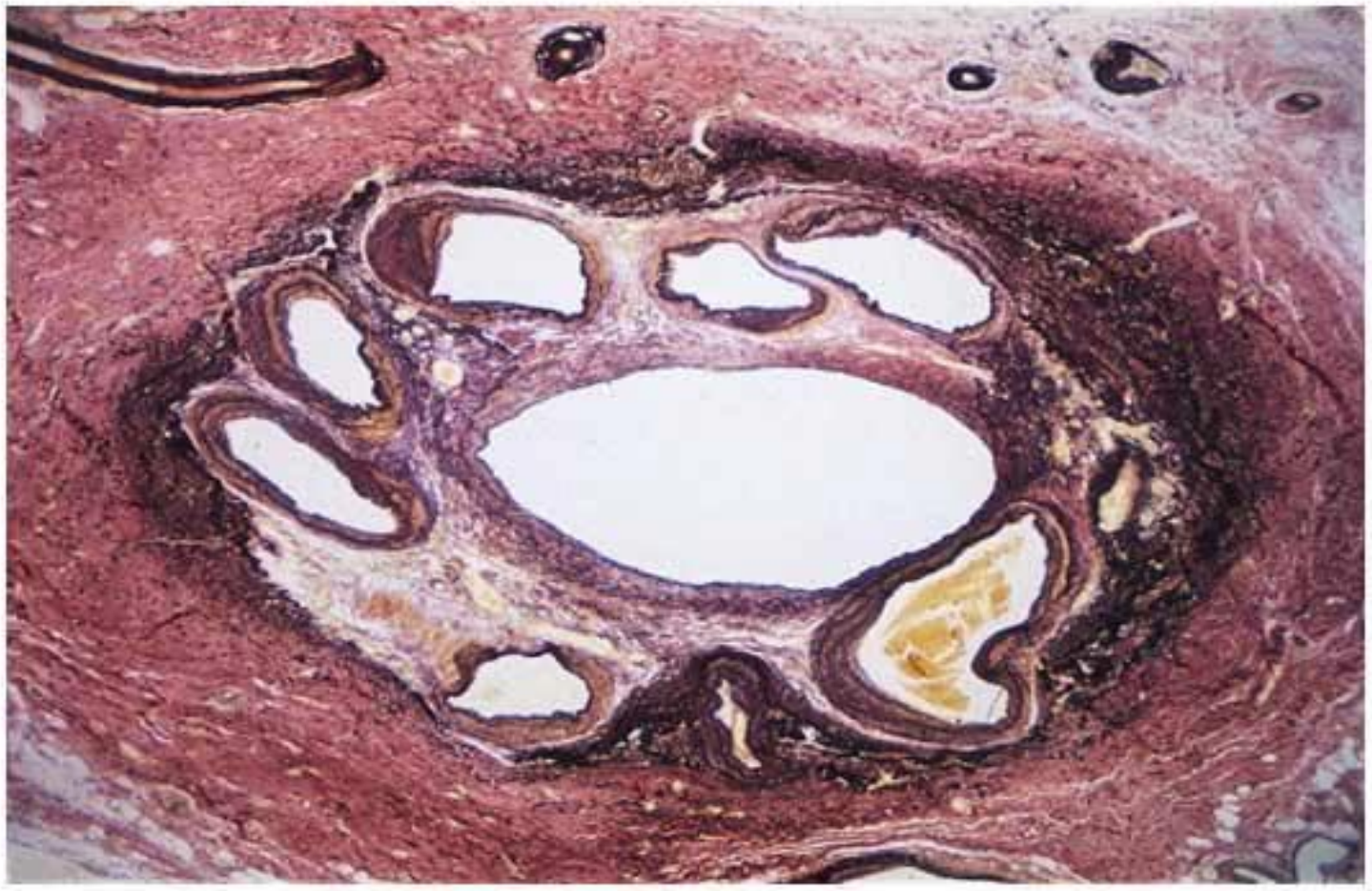
TABLE 4. RADIOGRAPHIC CLASSIFICATION OF TAKAYASU'S ARTERITIS.*

TYPE	RADIOGRAPHIC FEATURES
I (Pulseless disease)	Stenosis of the aortic arch and its branches
II (Mixed type)	Stenosis of the aortic arch and its branches and of the thoracoabdominal aorta
III (Atypical coarctation type)	Stenosis of the descending thoracic and abdominal aortas
IV (Dilated type)	Aneurysmal dilatation of vessels

*This information is adapted from Park et al.[39]

Rigby WF et al. N Engl J Med 2002;347:2057-2065.

Medium-Sized Artery from Another Patient with Takayasu's Arteritis, Showing the Vessel-in-Vessel Phenomenon (Hematoxylin and Eosin, ×50).



Rigby WF et al. N Engl J Med 2002;347:2057-2065.

TAKAYASU'S ARTERITIS

DIAGNOSI

Arteriografia:

- metodica utilizzata da molti anni
- permette di visualizzare anche i piccoli vasi
- può avere finalità terapeutiche

- è invasiva
- comporta un minimo rischio di complicanze
- utilizza mezzi di contrasto
- espone a radiazioni
- non riesce a delineare la parete vasale

pertanto non visualizza le iniziali alterazioni parietali vascolari che non determinano ancora stenosi importanti e che possono durare anche 3 anni

da riservare essenzialmente ai casi in cui si prospetta una associazione terapeutica

TAKAYASU'S ARTERITIS

DIAGNOSI

RMN:

- riesce a delineare la parete vasale
- non dà informazioni sui vasi più piccoli
- non dice nulla sulla medio intima
- costi superiori rispetto all'ecodoppler

TC:

- riesce a delineare la parete vasale
- espone a notevoli radiazioni

PET:

- evidenzia bene le aree infiammatorie
- è forse il più sensibile metodo per il follow up
- è però costosa
- non evidenzia i dettagli della parete vasale
- non fornisce indicazioni, per il suo limite risolutivo, sui vasi con diametro < 4 mm

TAKAYASU'S ARTERITIS

Nella Takayasu l'angio RMN e l'ecocolordoppler sono sovrapponibili all'angiografia nell'evidenziare lesioni steno ostruttive dei vasi sovraaortici. L'ecodoppler evidenzia l' ispessimento della parete della carotide comune anche nei vasi considerati normali dall'arteriografia (1)

(1) ***Noninvasive cerebrovascular assessment of Takayasu arteritis. Cantu C, Pineda C et al. Stroke 2000***

TAKAYASU'S ARTERITIS

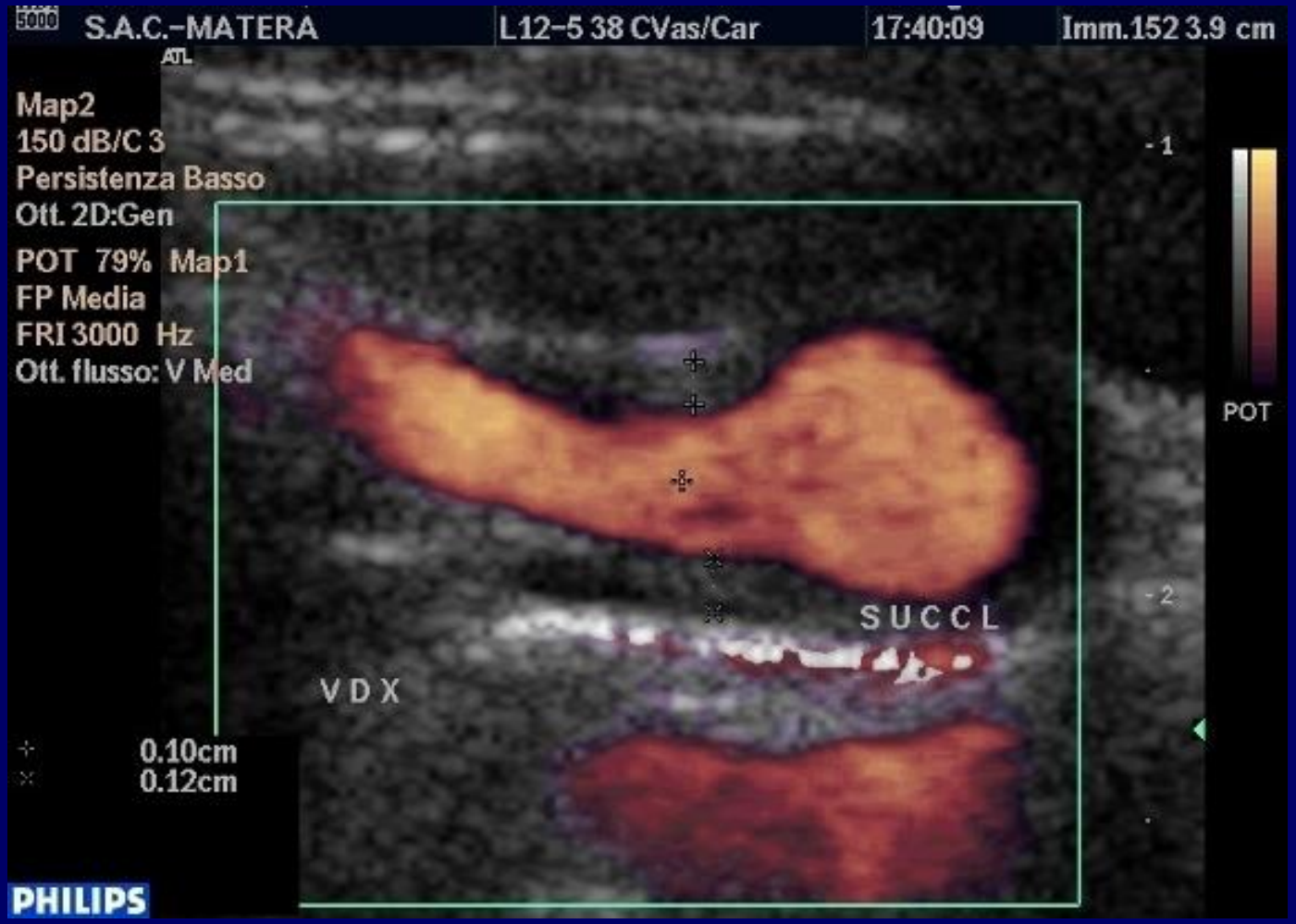
paziente di 19 anni
giunta alla nostra osservazione per un esame ecodoppler dei tronchi sovraortici.
In anamnesi risultava una astenia ingravescente, malessere, anemia di n.d.d., vertigini
Laboratorio: anemia normocitica, VES 104, PCR 18 (v.n. <5)

L'ecodoppler mise in evidenza un ispessimento concentrico medio intimale di tipo non ateroasclerotico a carico delle carotidi comuni ed interne, delle vertebrali all'origine e della succlavia, ascellare ed omerale sx

TAKAYASU'S ARTERITIS

TAKAYASU'S ARTERITIS

TAKAYASU'S ARTERITIS



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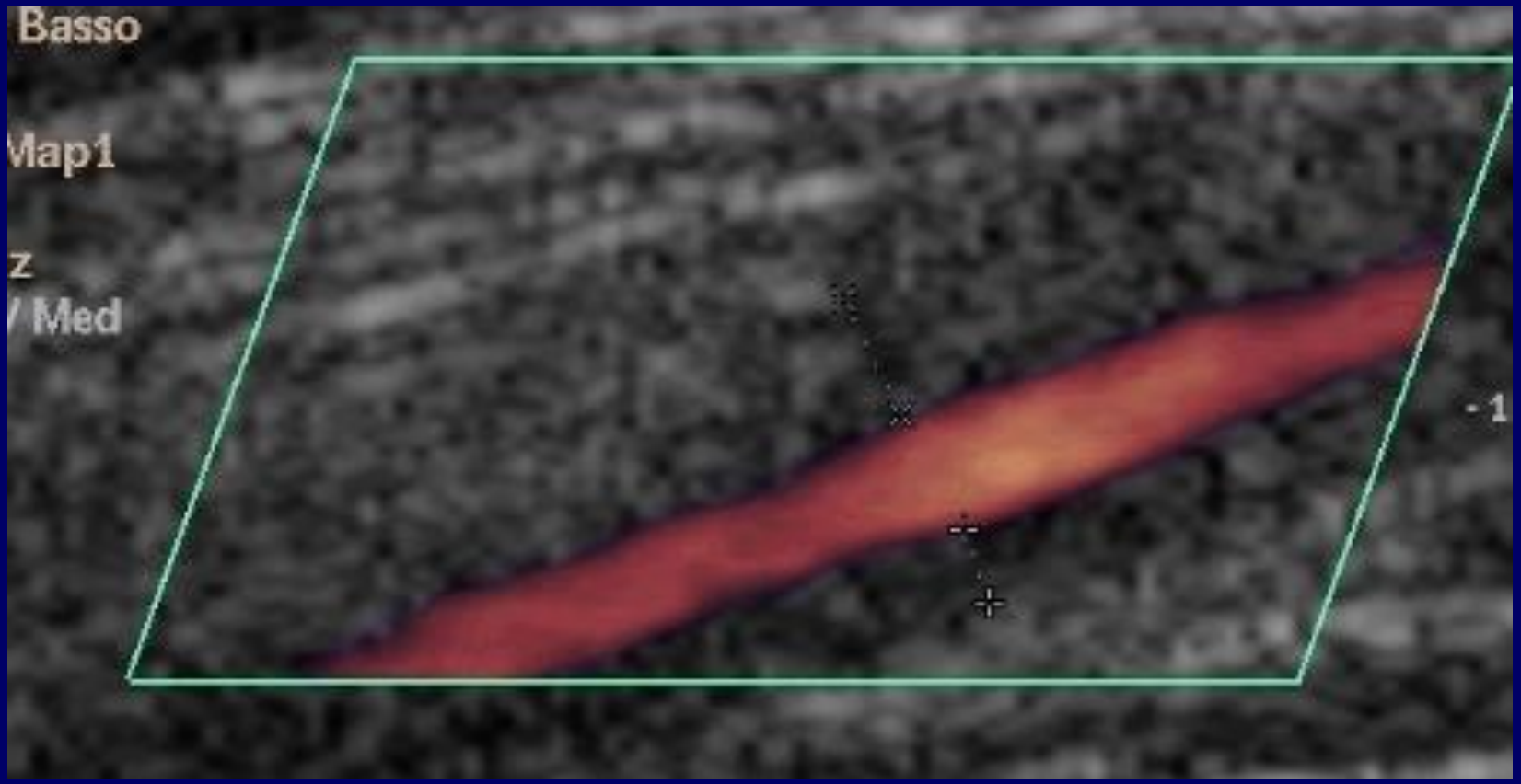

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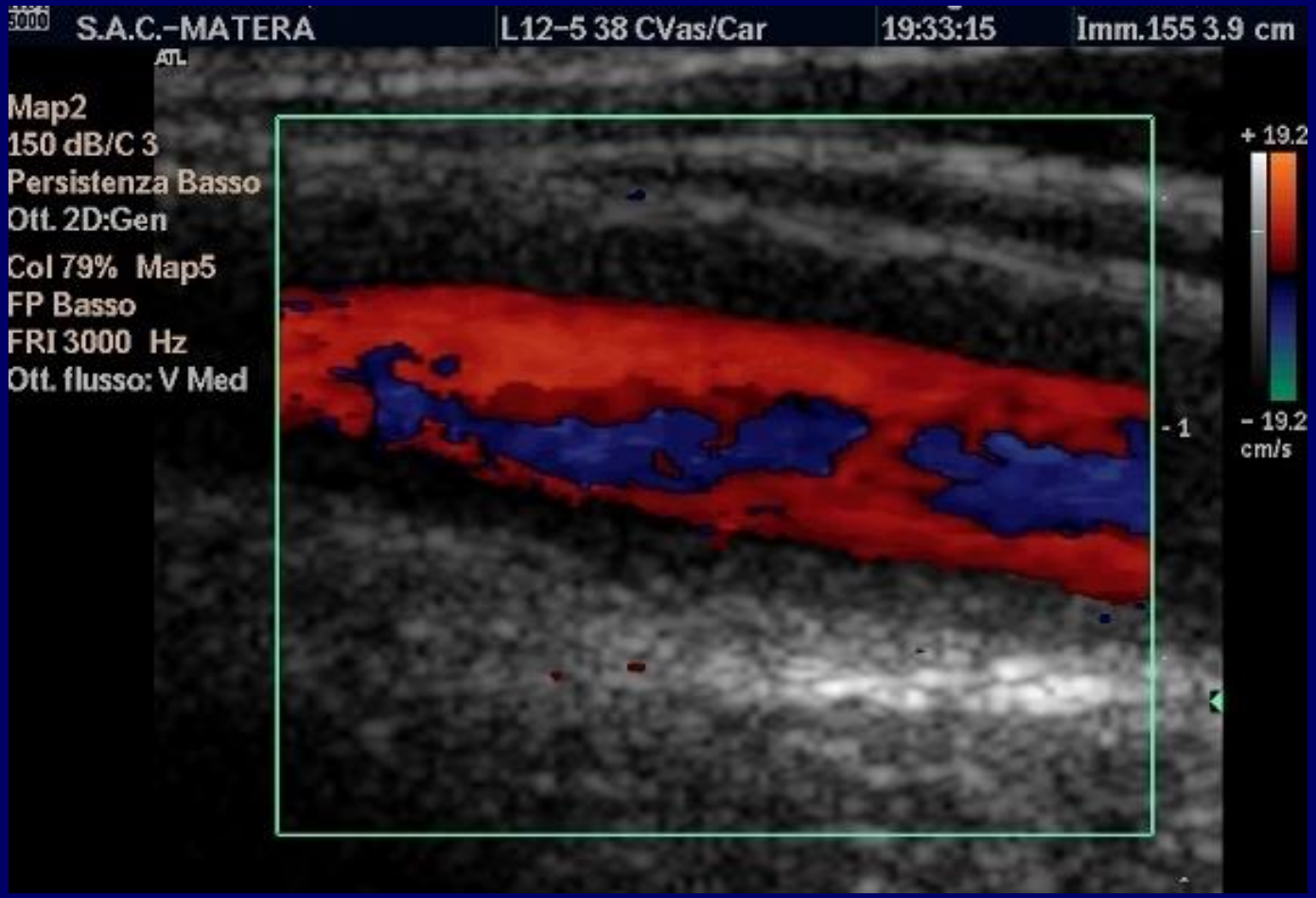

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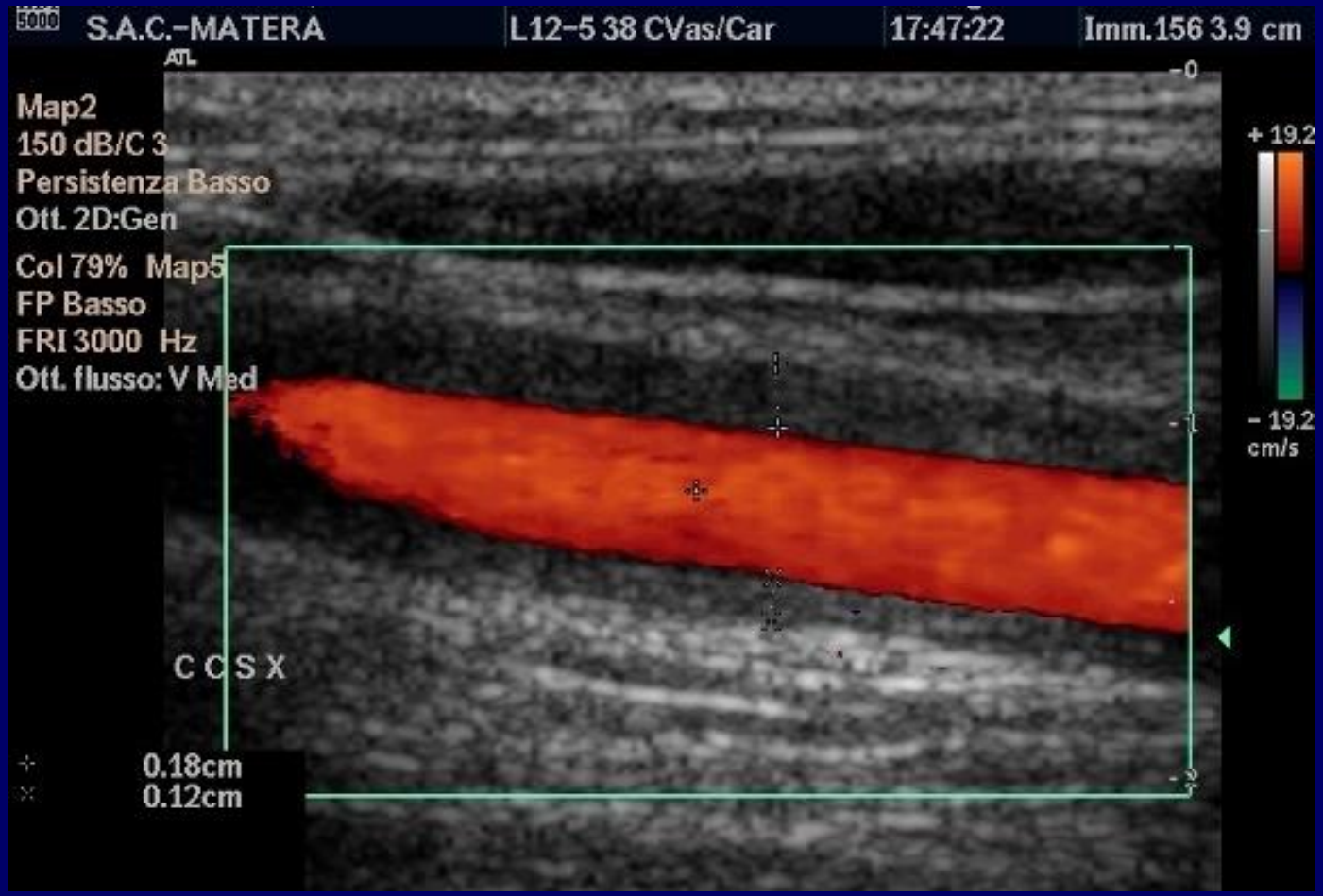

Images in Rheumatology

The "Macaroni Sign" of Takayasu's Arteritis

GIUSEPPE NICOLETTI, MD, Researcher, Geriatric Division; CLARA MANNARELLA, MD, Senior Registrar, Department of Internal Medicine, Madonna delle Grazie Hospital; ANGELO NIGRO, MD, Researcher, Rheumatology Department of Lucania, San Carlo Hospital of Potenza and Madonna delle Grazie Hospital of Matera; ANDREA SACCO, MD, Consultant, Director, Department of Internal Medicine, Madonna delle Grazie Hospital, Matera; IGNAZIO OLIVIERI, MD, Consultant, Director, Rheumatology Department of Lucania, San Carlo Hospital of Potenza and Madonna delle Grazie Hospital of Matera, Potenza and Matera, Italy. Address correspondence to Dr. I. Olivieri, Rheumatology Department of Lucania, Ospedale S. Carlo, Contrada Macchia Romana, 85100, Potenza, Italy. E-mail: ignazioolivieri@tiscalinet.it. J Rheumatol 2009;36:2042–3; doi:10.3899/jrheum.081305

Takayasu's arteritis is a large-vessel vasculitis occurring mainly in adolescent girls and young women. Ultrasound of the carotid and subclavian arteries can aid in early diagnosis of the disease.

A 19-year-old woman presented with a 4-month history of fatigue, weight loss, and thrombocytosis. Examination showed a difference of 40 mm Hg in systolic blood pressure between the 2 arms, together with a decreased pulse in the left. Noteworthy laboratory results included erythrocyte sedimentation rate 100 mm/h and C-reactive protein 50 mg/l (normal < 5). Color Doppler ultrasonography of the upper-limb extracranial arteries showed homogeneous mid-echoic circumferential wall-thickening of the common and internal carotid arteries of both arms (Figure 1A) and the vertebral (Figure 1B) and axillary arteries and the proximal part of the brachial artery of the left side (Figure 1C). Intracranial ultrasound was normal. The examination was performed using an AT5500 device with a 12-5 MHz linear probe for extracranial vessels and a 2-4 MHz array probe for intracranial vessels. Flow was detected using the power Doppler mode.

Positron emission tomography (PET) showed inflamed areas on the common carotid artery.

This uncommon ultrasonographic finding is typical of Takayasu's arteritis and has been designated the "macaroni sign"[1,2]. This finding is brighter than the typical "dark halo" sign of giant cell arteritis. Current ultrasound technology allows visualization of large vessels and discrete vessel-wall alterations, and also distinguishes inflamed from atherosclerotic wall lesions. In Takayasu's arteritis, angiography can show important luminal stenoses in many vessels including small arteries. However, this technique cannot visualize the vessel wall and may not reveal mild wall lesions without stenosis. PET shows inflamed arterial areas but cannot show information on vessels with diameter < 4 mm and details of the vessel wall.

Thus, ultrasound represents an adequate method for diagnosis of Takayasu's arteritis in young patients with chronic inflammation of unknown origin[3].

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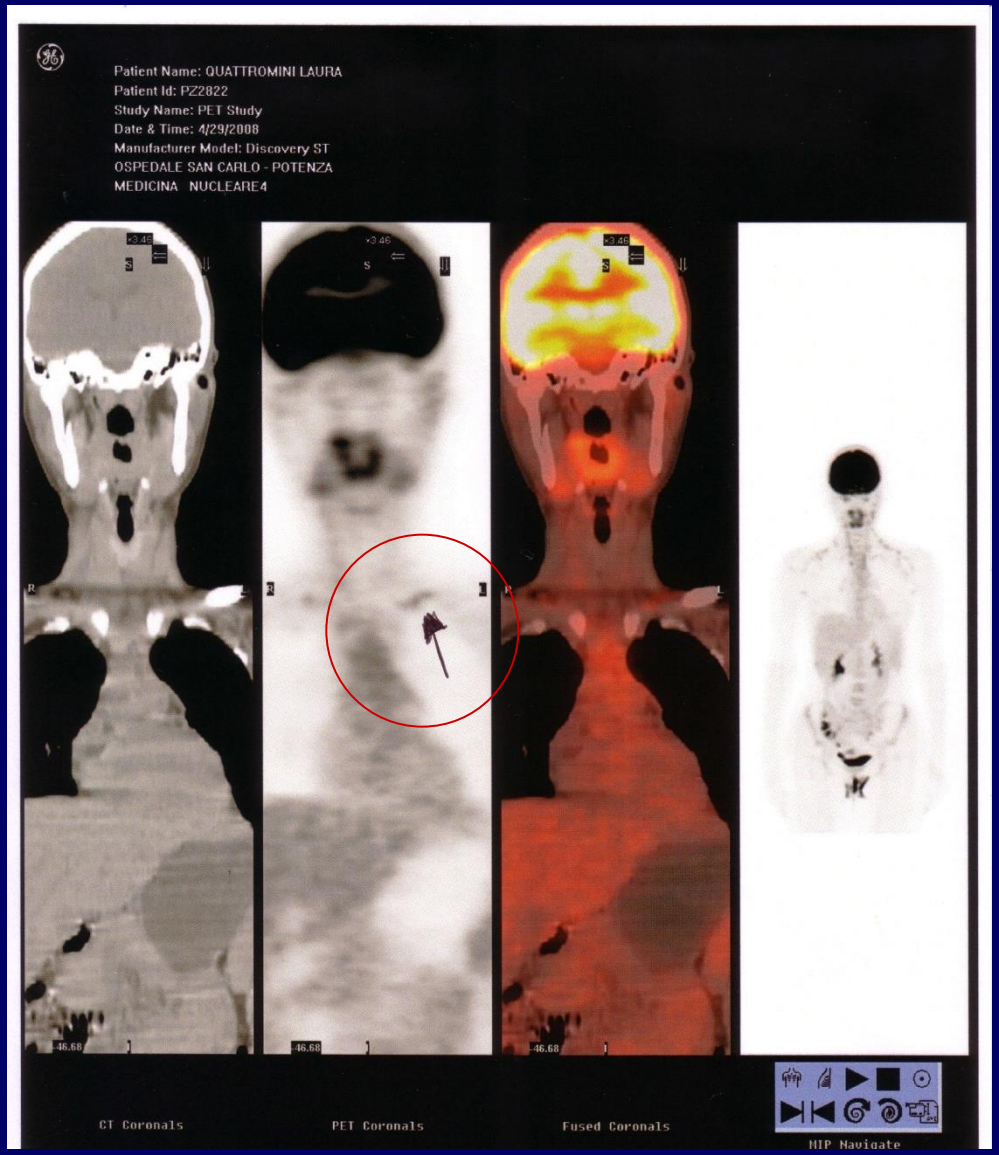
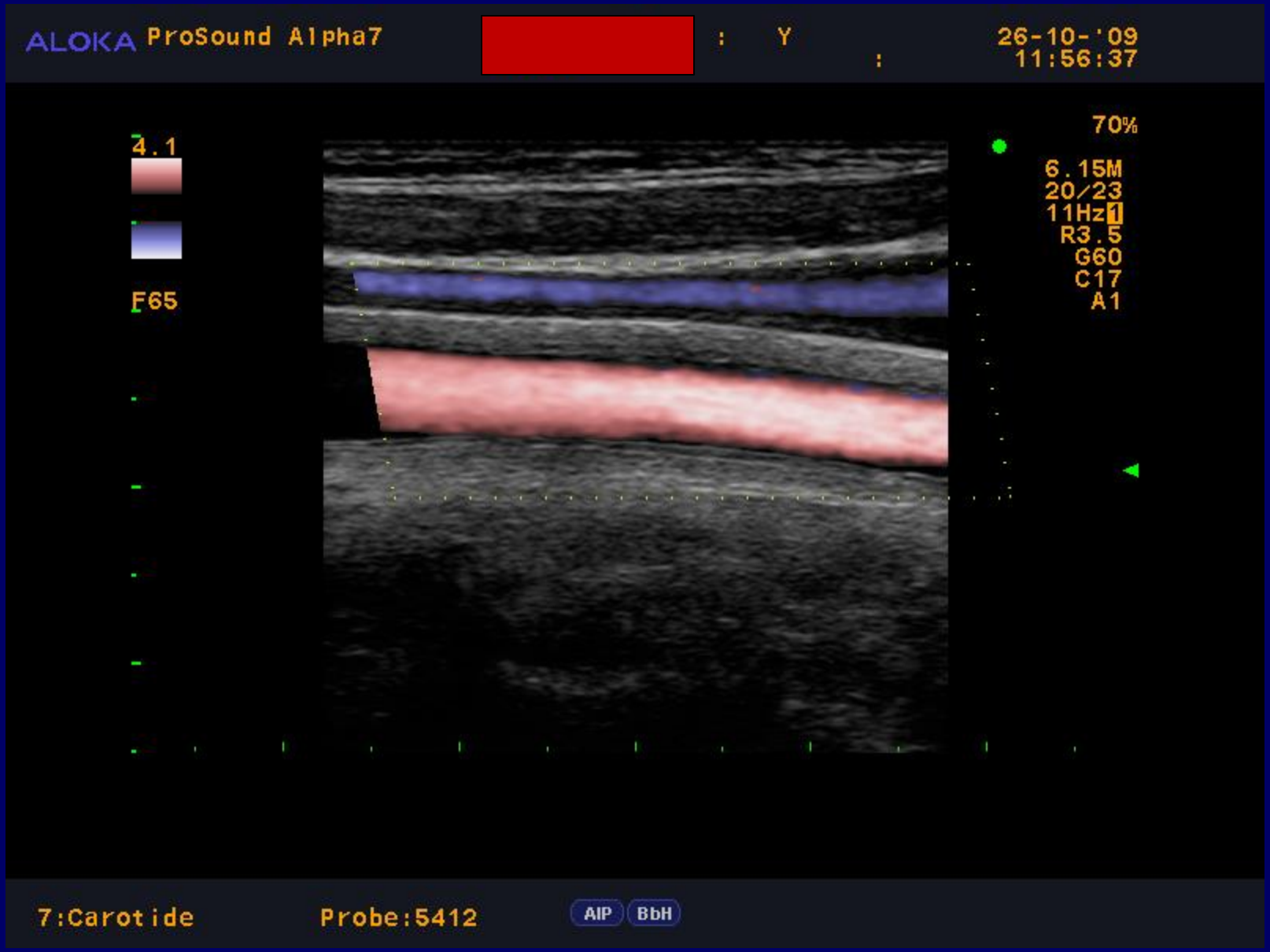
2. Meini S, De Franco V, Astori A, Pieragalli D. Images in cardiovascular medicine. Takayasu's arteritis: the "macaroni sign". Circulation 2006;114:e544.
3. Schmidt WA, Nerenheim A, Seipelt E, Poehls C, Gromnica-Ihle E. Diagnosis of early Takayasu arteritis with sonography. Rheumatology 2002;41:496-502.

TAKAYASU'S ARTERITIS

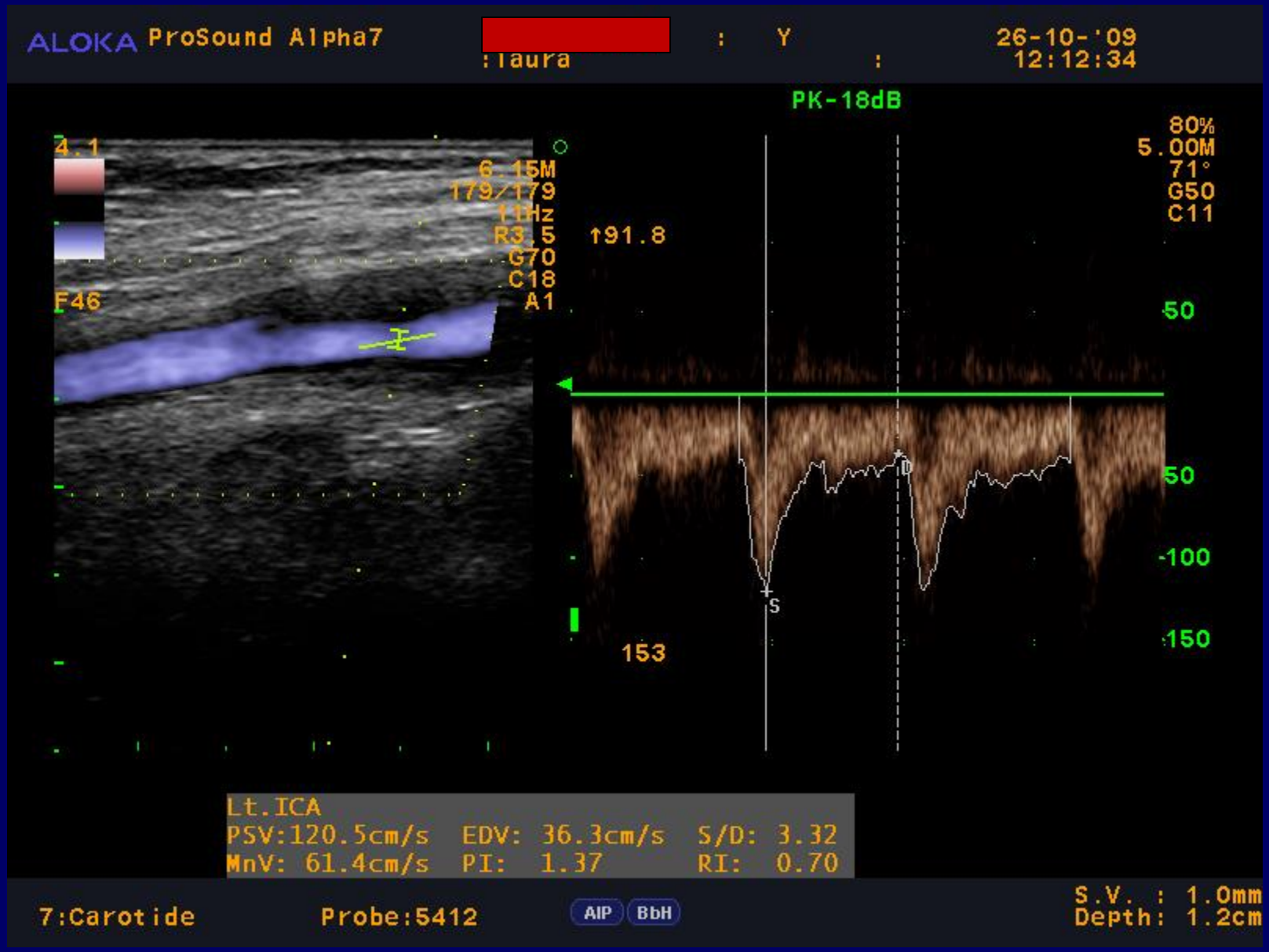
REFERTO: L'esame evidenzia accumulo del radiofarmaco di lieve entità (SUV 4,0) a carico dei 2/3 prossimali dell'arteria succlavia sinistra.
Non evidenti ulteriori obiettività patologiche negli altri distretti esaminati-



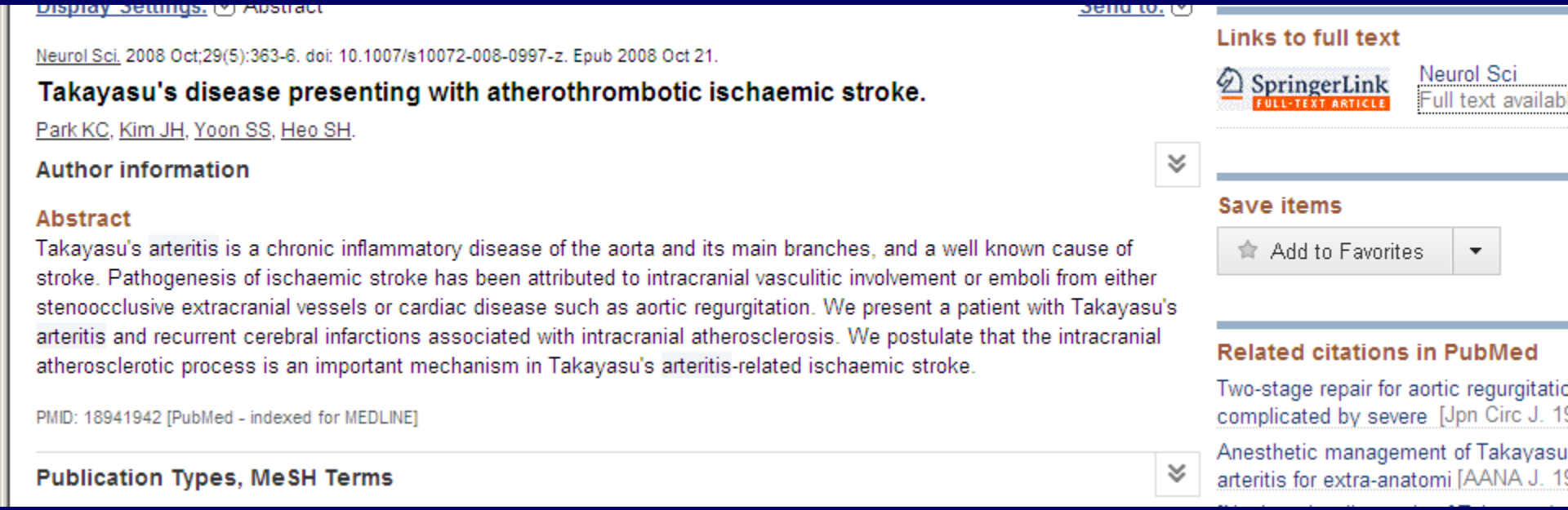
TAKAYASU ARTERITIS



TAKAYASU ARTERITIS



ARTERITI E ULTRASUONI



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Neurol Sci. 2008 Oct;29(5):363-6. doi: 10.1007/s10072-008-0997-z. Epub 2008 Oct 21.

Takayasu's disease presenting with atherothrombotic ischaemic stroke.

Park KC, Kim JH, Yoon SS, Heo SH.

Author information

Abstract

Takayasu's arteritis is a chronic inflammatory disease of the aorta and its main branches, and a well known cause of stroke. Pathogenesis of ischaemic stroke has been attributed to intracranial vasculitic involvement or emboli from either stenoocclusive extracranial vessels or cardiac disease such as aortic regurgitation. We present a patient with Takayasu's arteritis and recurrent cerebral infarctions associated with intracranial atherosclerosis. We postulate that the intracranial atherosclerotic process is an important mechanism in Takayasu's arteritis-related ischaemic stroke.

PMID: 18941942 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms

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Two-stage repair for aortic regurgitatic complicated by severe [Jpn Circ J. 19

Anesthetic management of Takayasu arteritis for extra-anatomi [AANA J. 19

ARTERITI E ULTRASUONI

Noninvasive Cerebrovascular Assessment of Takayasu Arteritis

Carlos Cantú, MD; Carlos Pineda, MD; Fernando Barinagarrementeria, MD; Perla Salgado, MD; Alba Gurza, MD; Paola de Pablo, MD; Rolando Espinosa, MD; Manuel Martínez-Lavín, MD

Background and Purpose—Despite prominent neurological symptoms reported in Takayasu arteritis (TA), a complete evaluation of the cerebral circulation has not been consistently performed. The purpose of this study is to describe MR angiography (MRA), color Doppler flow imaging, and transcranial Doppler (TCD) findings in the extracranial and intracranial cerebral arteries in TA.

Methods—MRA, color Doppler flow imaging, and TCD were performed in 21 patients with TA. Intima-media thickness was measured in the common carotid artery. The correlation between noninvasive studies and panaorto-arteriography was examined for supraortic vessels. Cerebral angiography findings were compared with the noninvasive methods in 7 patients. Intracranial hemodynamic changes detected by TCD were compared with extracranial circulation lesions assessed by panaorto-arteriography.

Results—Noninvasive vascular techniques showed at least 1 abnormality in the extracranial and/or intracranial cerebral arteries in 20 of 21 patients (95%). Both MRA and color Doppler flow imaging showed a substantial correlation in the ability to detect obstructive lesions in supra-aortic vessels compared with panaorto-arteriography. High-resolution ultrasonography displayed common carotid artery wall thickening in 5 vessels that were considered normal by arteriography. In 24% of patients, MRA and TCD showed abnormalities consistent with stenosis of the basal cerebral arteries. In 10 patients with severe extracranial circulation involvement (detected by arteriography), TCD displayed intracranial hemodynamic changes consisting of dampened or blunted waveforms with low pulsatility.

Conclusions—The comprehensive assessment of cerebral circulation in TA patients by noninvasive methods allowed the detection of a high rate of diverse vascular abnormalities in both extracranial and intracranial circulation. (***Stroke.*** **2000;31:2197-2202.)**

Key Words: arteritis ■ cerebrovascular circulation ■ magnetic resonance angiography ■ ultrasonography ■ vasculitis

ARTERITI E ULTRASUONI

Microembolus Detection in Patients With Takayasu's Arteritis

Emre Kumral, MD; Dilek Evyapan, MD; Kenan Aksu, MD; Gökhan Keser, MD;
Yasemin Kabasakal, MD; Kaan Balkir, MD

Background and Purpose—Takayasu's arteritis (TA) is a chronic inflammatory disease of unknown etiology that can affect the aorta and its branches. The cerebral ischemia in TA can be caused by a variety of mechanisms, and the focus of this study is to detect the possible contribution of microembolus in the pathogenesis of stroke.

Methods—Eighteen patients with TA according to the criteria for the classification of TA of the American College of Rheumatology and 100 age-matched healthy controls were studied. Both middle cerebral arteries were monitored by transcranial Doppler (TCD) ultrasound for at least 30 minutes. All patients with TA were followed up for a mean duration of 2.1 months, and recurrent strokes were registered.

Results—Microembolic signals (MES) were present in 22% of the patients overall, and the intensity of the MES varied between 9 and 30 dB. Moreover, MES were found in 30% of the patients with higher erythrocyte sedimentation rate. Two (67%) of 3 patients who did not receive any treatment had MES, but only 2 (13%) of 15 patients who received immunosuppressive and anticoagulant therapy before the TCD ultrasonography monitoring had MES. During the follow-up period after MES recording, we did not observe any recurrent stroke.

Conclusions—TCD ultrasonography monitoring can be used as an additional noninvasive procedure to detect microembolus in patients with TA during the acute and chronic phase of the disease. The monitoring of MES may also help in choosing better treatment for the long-term prophylaxis of the disease from acute ischemic stroke, but further large studies are required to justify the efficacy of immunosuppressive treatment in these patients. (*Stroke*. 2002;33:712-716.)

Key Words: embolism ■ Takayasu's arteritis ■ ultrasonography, Doppler, transcranial

ARTERITI E ULTRASUONI

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Nat Rev Rheumatol. 2010 Jul;6(7):406-15.

Takayasu arteritis--advances in diagnosis and management.

Mason JC.

Bywaters Centre for Vascular Inflammation, National Heart and Lung Institute, Imperial College London, Hammersmith Hospital, Du Cane Road, London W12 ONN, UK. justin.mason@imperial.ac.uk

Abstract

Takayasu arteritis, a rare granulomatous vasculitis affecting young people, is associated with considerable morbidity and premature mortality. In most patients the diagnosis is delayed until after the development of substantial arterial injury. Studies of noninvasive imaging techniques suggest that these approaches might facilitate earlier diagnosis and have a role in monitoring disease progress; however, they remain limited in their ability to accurately quantify inflammatory disease activity in the arterial wall. A lack of controlled clinical trial data complicates the choice of therapy for Takayasu arteritis, and clinical indices for monitoring disease activity are currently suboptimal. Increasing knowledge of the pathogenesis of the large vessel vasculitides might eventually lead to novel targeted therapies. Preliminary data from open-label trials of anti-tumor necrosis factor therapy are encouraging, but there is an urgent need for controlled clinical trials to establish optimum therapeutic approaches for this disease. These trials should include a prospective assessment of the use of noninvasive imaging modalities in the diagnosis and subsequent management of Takayasu arteritis.

PMID: 20596053 [PubMed - indexed for MEDLINE]

Publication Types, MeSH Terms

LinkOut - more resources

RHEUMATOLOGY

Rheumatology 2013;52:2196–2202
doi:10.1093/rheumatology/ket289
Advance Access publication 6 September 2013

Original article

Development of a colour Doppler ultrasound scoring system in patients of Takayasu's arteritis and its correlation with clinical activity score (ITAS 2010)

Debanjali Sinha[1], Sumantro Mondal[1], Arijit Nag[1] and Alakendu Ghosh[1,2]

Objectives. The objectives of this study were to develop a scoring system with colour Doppler ultrasound (CDUS) in patients with Takayasu's arteritis, to correlate the CDUS score with the Indian Takayasu's Activity Score (ITAS) and to assess the degree of agreement between CDUS and angiogram in the diagnosis of Takayasu's arteritis.

Methods. Nineteen angiographically confirmed Takayasu's arteritis patients fulfilling three or more of the 1990 ACR criteria were evaluated. Their ITASs were recorded. A CDUS scoring system, CDUS-Kolkata (CDUS-K), was devised based on the presence of stenosis and altered flow patterns. It was then correlated with the ITAS. An inter-rater agreement analysis was done between the CDUS-K scores and angiographic scores in selected arterial sites.

Results. We found a significant degree of correlation between the ITAS and the CDUS-K score ($r = 0.7144$, 95% CI 0.3852, 0.8823, $P = 0.0006$). A high degree of correlation was found between the CDUS-K and angiographic scores in the selected arterial sites (κ-value = 0.725 on inter-rater agreement analysis).

Conclusion. CDUS imaging may be used as an objective tool for assessing disease severity in Takayasu's arteritis. Development of a CDUS-K scoring system would be a supplementary tool to clinical scoring and the ITAS. CDUS imaging could be a cost-effective, non-invasive and reliable substitute for angiogram, especially for follow-up in Takayasu's arteritis patients.

Key words: Takayasu's arteritis, Indian Takayasu's Activity Score, colour Doppler ultrasound scoring.

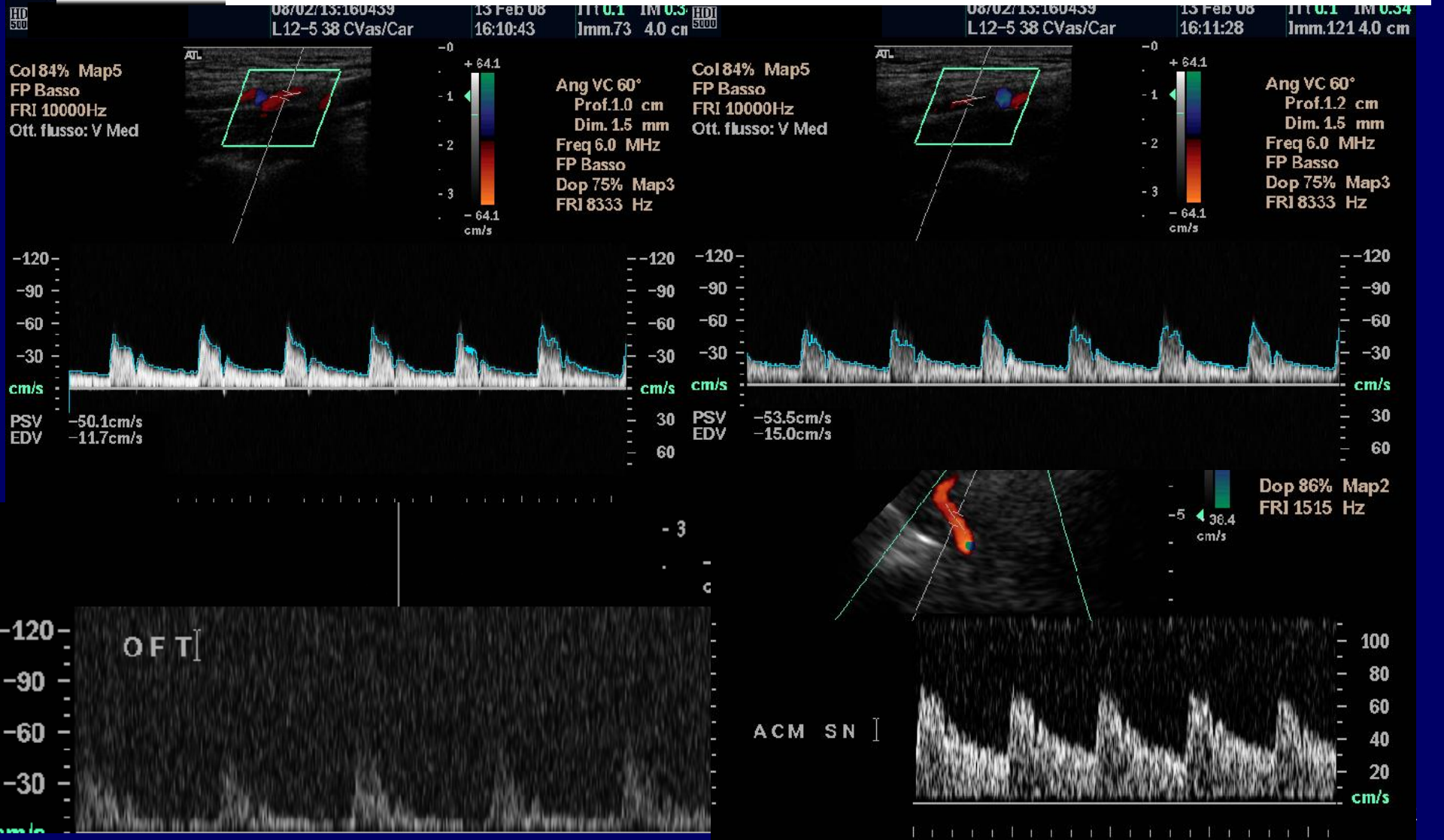
NOTE

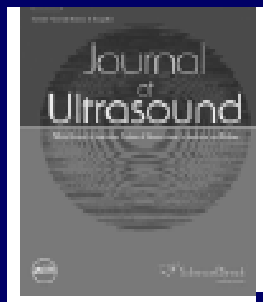
PITFALL: dissecazione , ipoplasia, fibrodisplasia

- flap intimali
- medio intima
- ematomi
- string of beads
- TCCD
- canale carotico

Hypoplasia of the internal carotid artery: collateral circulation and ultrasonographic findings. A case report

G. Nicoletti [a,*], S. Sanguigni[b], F. Bruno[a], S. Tardi[a], G. Malferrari [c]

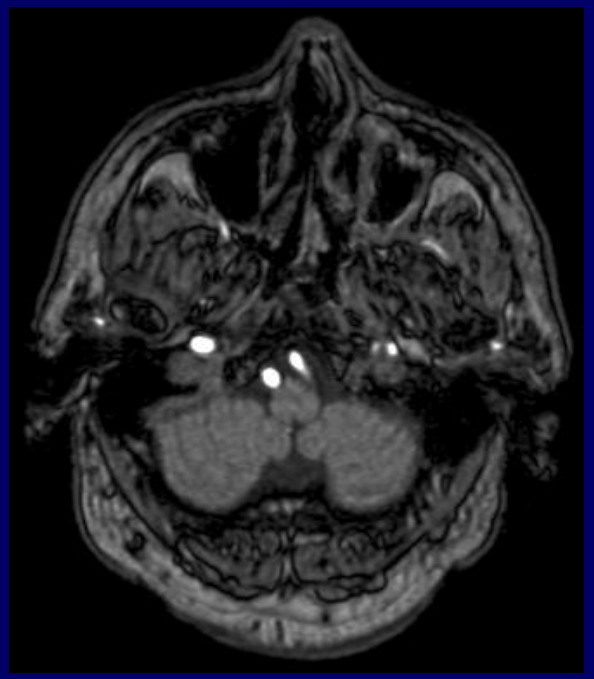


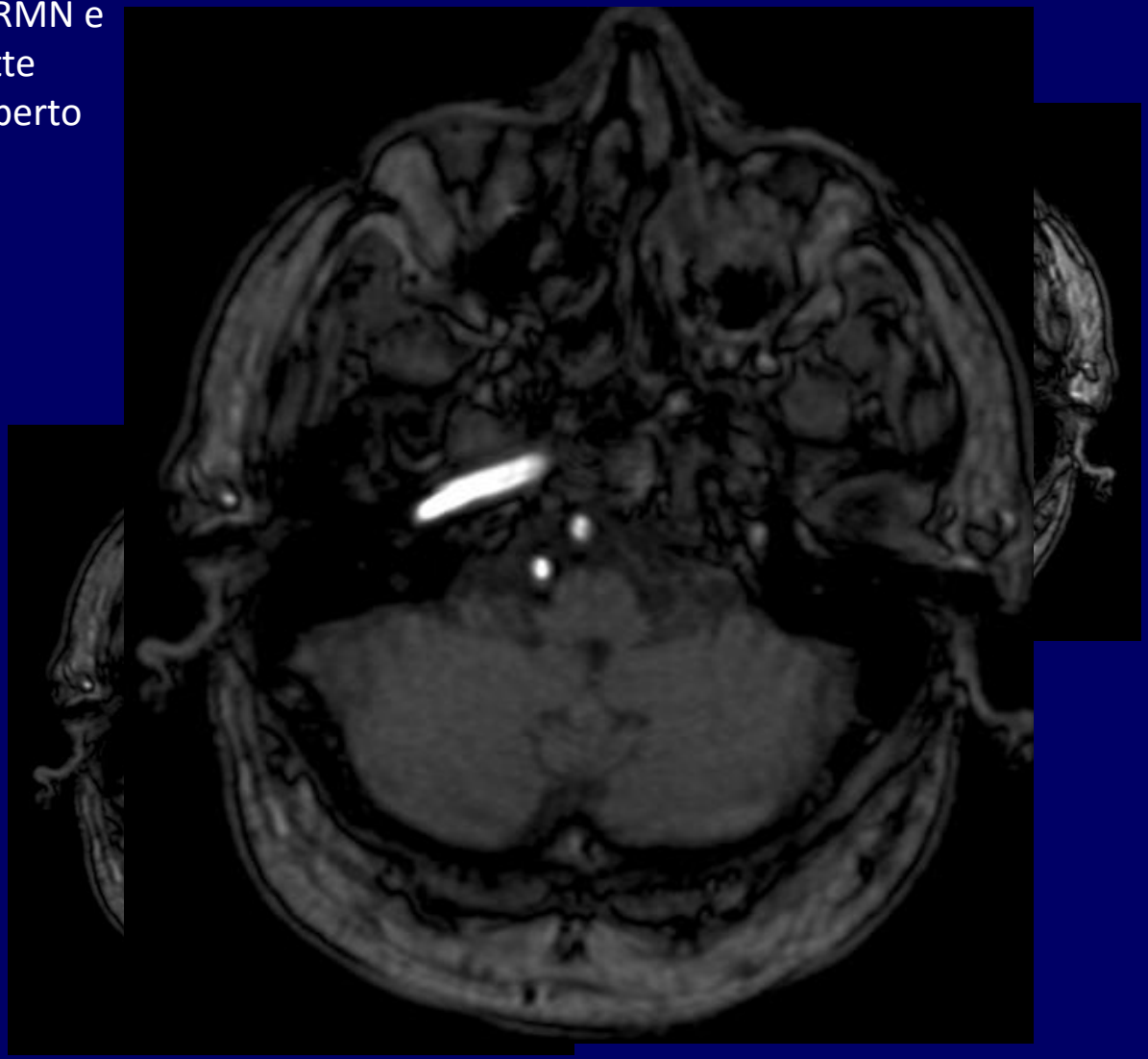


Hypoplasia of the internal carotid artery: collateral circulation and ultrasonographic findings. A case report

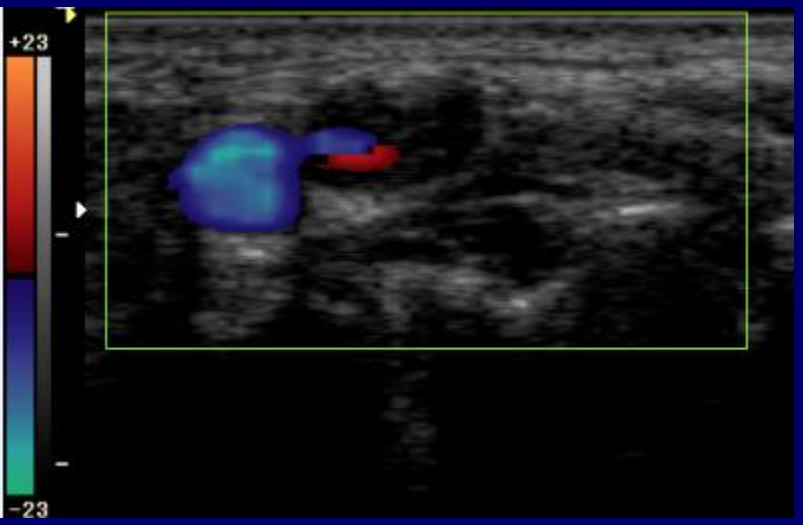
G. Nicoletti [a,*], S. Sanguigni[b], F. Bruno[a], S. Tardi[a], G. Malferrari [c]

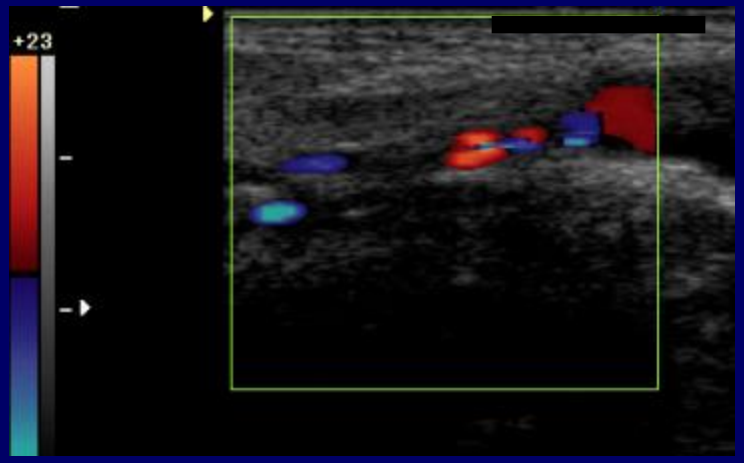
Diagnosi differenziale: ANGIO RMN e TC (canale carotico di ridotte dimensioni) confermano il reperto ecodoppler

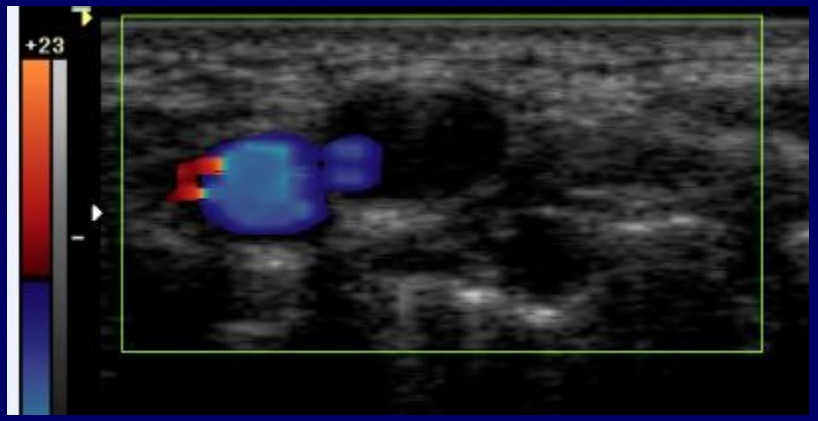


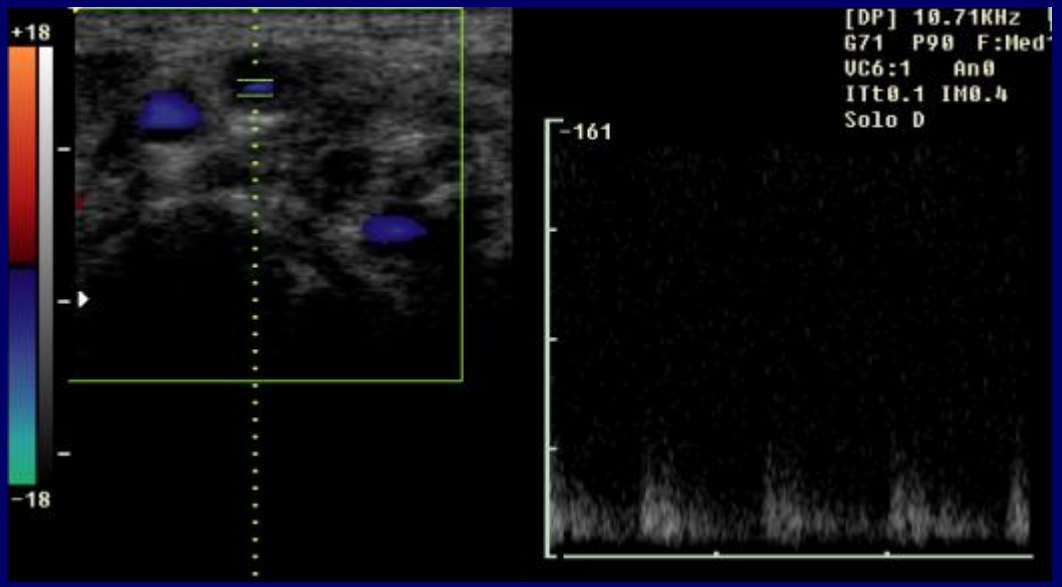


DISSECAZIONE INVETERATA DELLA CAROTIDE INTERNA





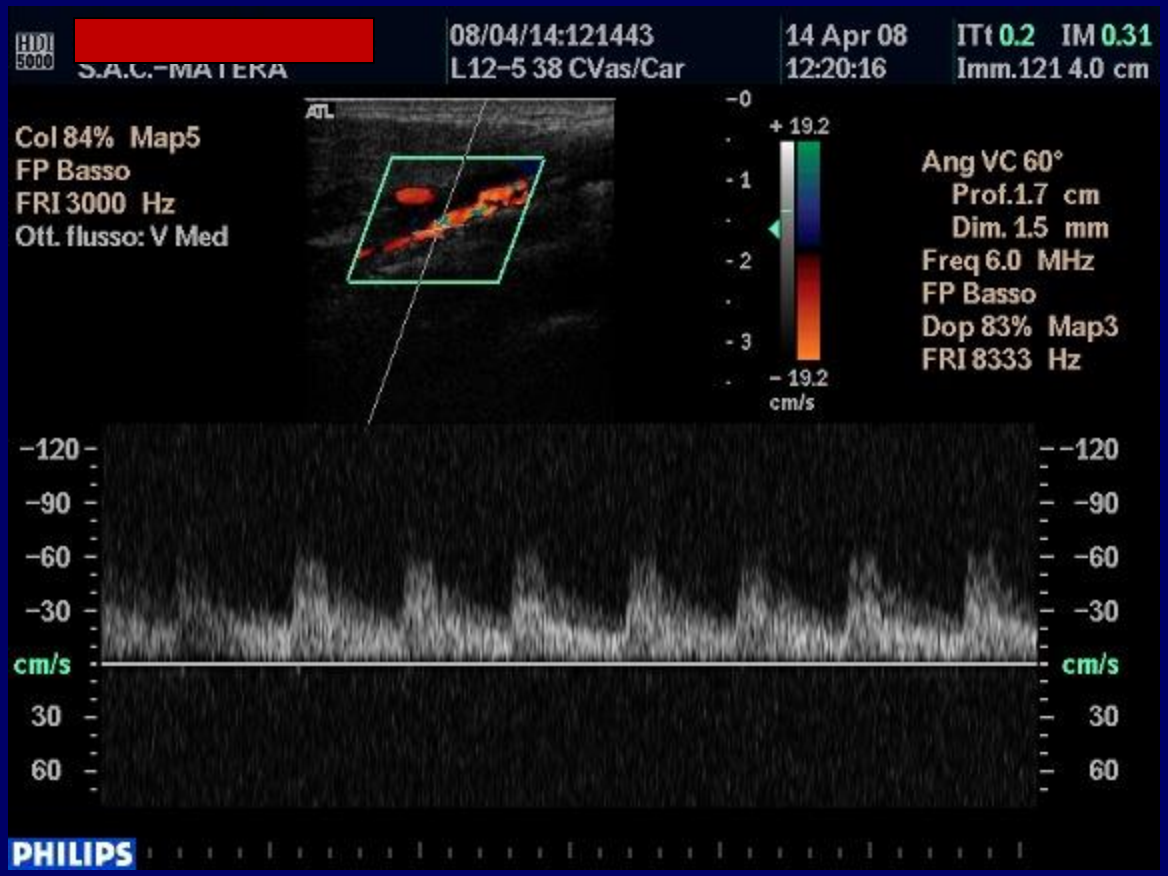




DISSECAZIONE CAROTIDEA IN DONNA DI 42 ANNI:

REPERTO ECODOPPLER A DISTANZA (1 ANNO)

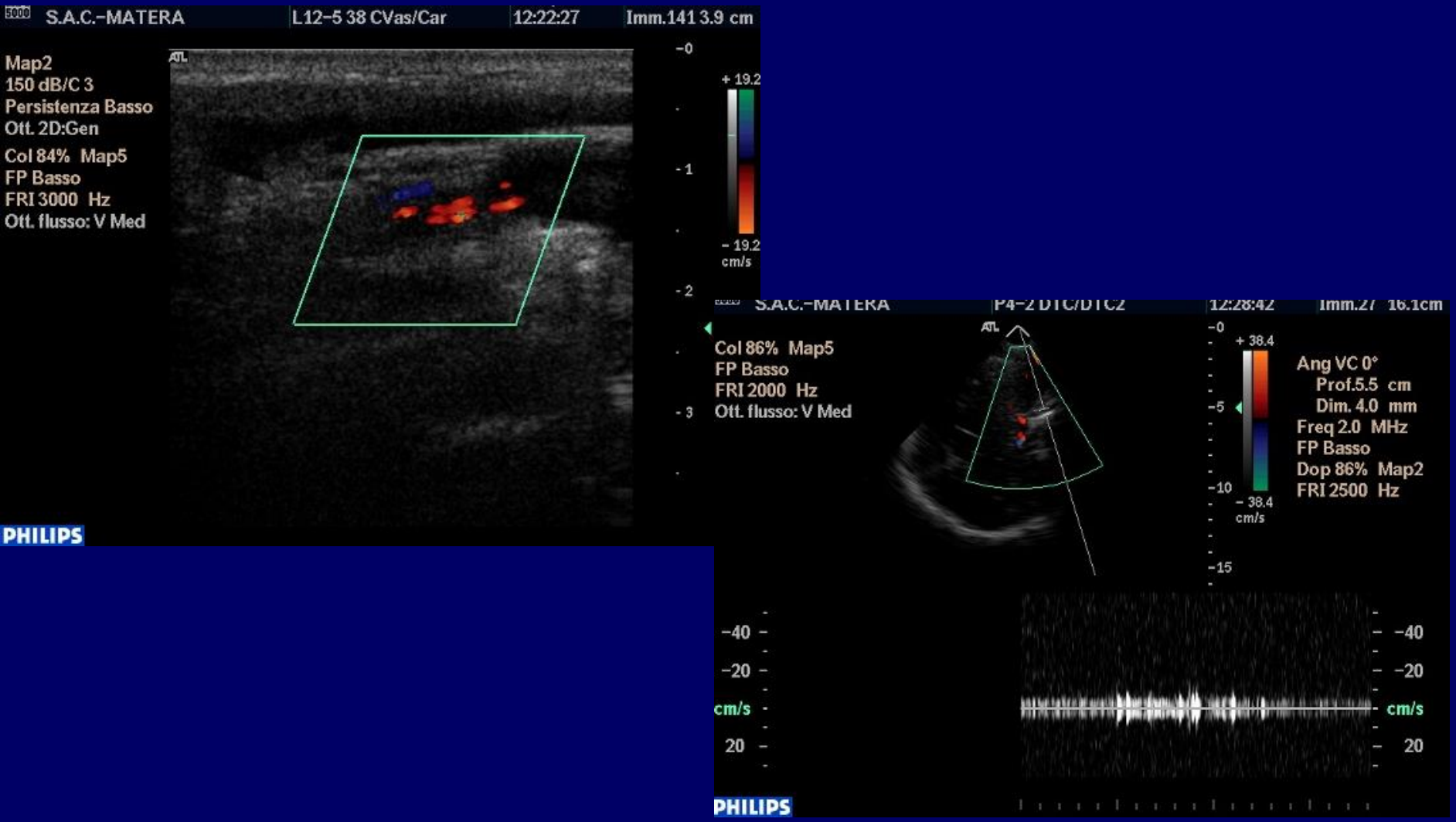
DISSECAZIONE INVETERATA DELLA CAROTIDE INTERNA



DISSECAZIONE CAROTIDEA IN DONNA DI 42 ANNI:

REPERTO ECODOPPLER A DISTANZA (1 ANNO)

DISSECAZIONE INVETERATA DELLA CAROTIDE INTERNA



DISSECAZIONE CAROTIDEA IN DONNA DI 42 ANNI:

REPERTO ECODOPPLER A DISTANZA (1 ANNO)

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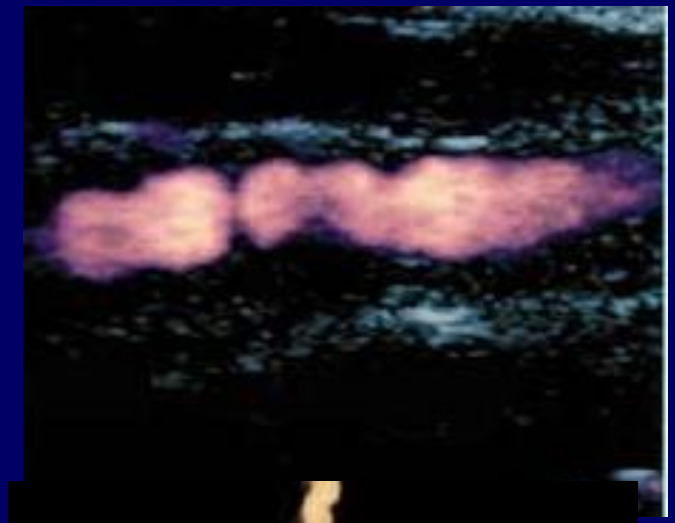

ARTERITI E ULTRASUONI

L'ecocolordoppler

- Non espone a radiazioni
- Basso costo
- Il follow up è facilmente effettuabile
- La risoluzione è eccellente
- Informa sulle caratteristiche del flusso
- superiore alla PET (nella Takayasu iniziale)

L'ecodoppler è una eccellente metodica per la diagnosi e il follow up della malattia di Takayasu e nell'arterite temporale (GCA) che si integra con le altre metodiche di imaging

ARTERITI E ULTRASUONI

. Cosa Fare

Utilizzare ultrasuoni in casi di sospetta arterite temporale
In casi di polimialgia reumatica
In casi di febbre di origine sconosciuta

ARTERITI E ULTRASUONI

. Cosa non Fare

Non utilizzare ultrasuoni in casi in cui la clinica non depone per patologie arteritiche

In sostituzione di altre metodiche