Diagnosi della cefalea secondaria in PS? Solo TC cerebrale

Paola Torelli,
Centro Cefalee
Università di Parma

ANEU, Roma 30 settembre 2022

Disclosures

Novartis
Teva
Allergan – Abbvie
Lilly
Penta

Cefalee secondaria in Pronto Soccorso

Cosa non dobbiamo farci sfuggire?

Patologia intracranica grave e pericolosa per la vita

Strumenti a disposizione:

Anamnesi ***(Accettazione, Rifiuto, Preferenza)***
Esame obiettivo
Es. ematochimici
TAC (Neuroradiologia)
Rachicentesi

Strumenti che spesso mancano:

Il tempo
La tranquillità
L'organizzazione

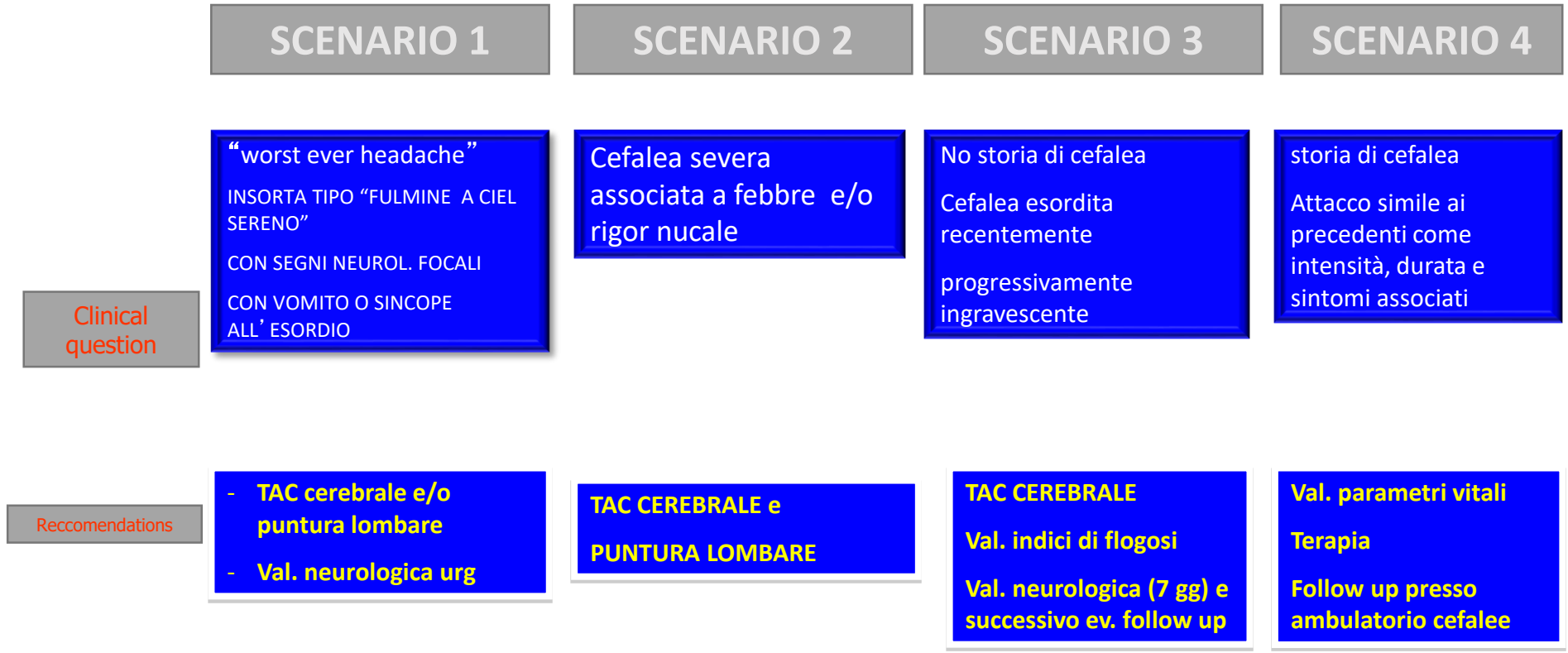
Cosa non può mancare:

Il metodo !

ANEU, Roma 30 settembre 2022

Evidence-Based Diagnosis of Nontraumatic Headache in the Emergency Department: A Consensus Statement on Four Clinical Scenarios

P. Cortelli, MD; S. Cevoli, MD; F. Nonino, MD; D. Baronciani, MD; N. Magrini, MD; G. Re, MD; G. De Berti, MD; G. C. Manzoni, MD; P. Querzani, MD; A. Vandelli, MD on behalf of the Multidisciplinary Group for Nontraumatic Headache in the Emerg.Department
(Headache 2004;44:1-9)



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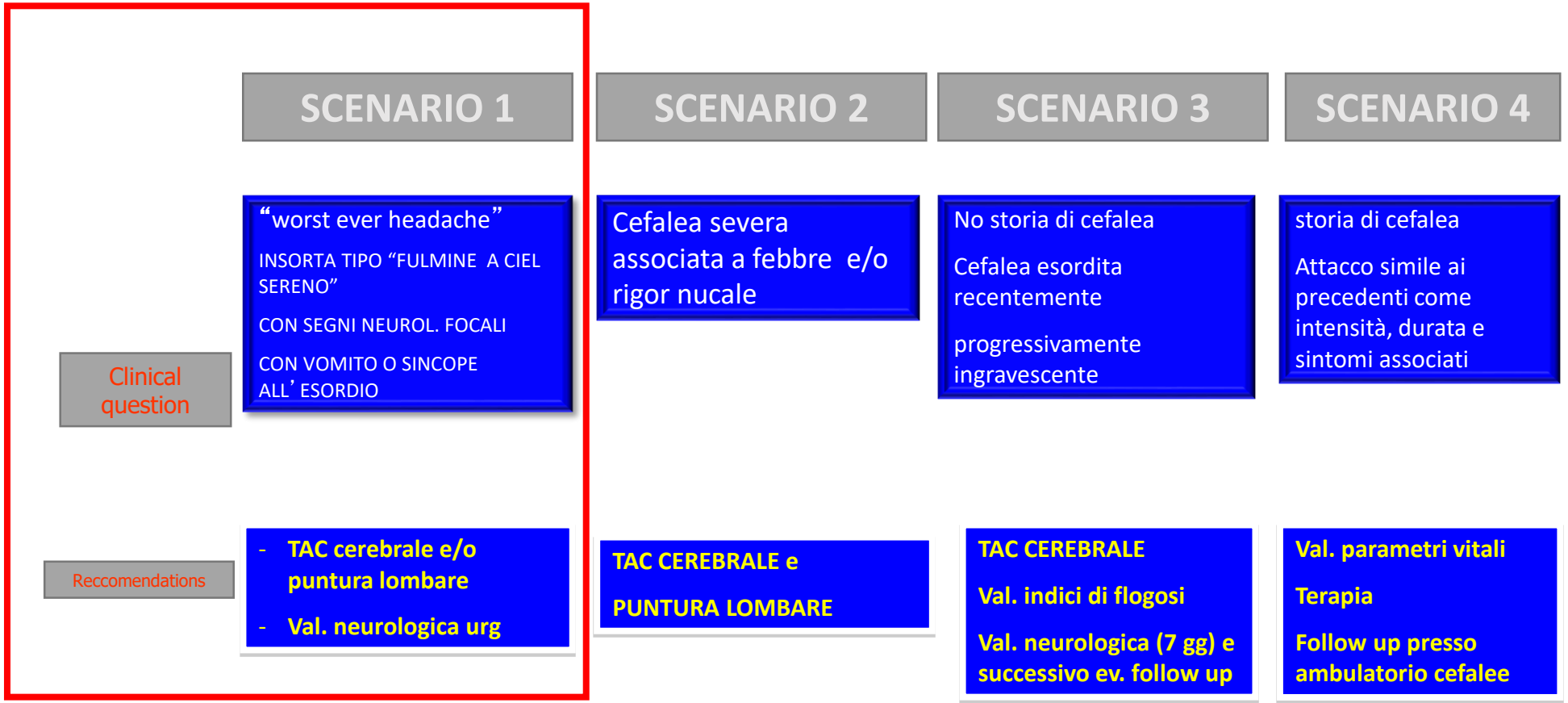

Thunderclap Headache

Esma Dilli

Table 1 Differential diagnosis of thunderclap headache

Secondary headache
Vascular etiology
Subarachnoid hemorrhage
Sentinel bleed related to unruptured aneurysm
Arterial dissection
Reversible cerebral vasoconstriction syndrome
Cerebral venous sinus thrombosis
Intracranial hemorrhage
Ischemic stroke
Pituitary apoplexy
Reversible posterior leukoencephalopathy
Arterial hypertension
Retroclival hematoma
Nonvascular intracranial disorders
Spontaneous intracranial hypotension
Third ventricle colloid cyst
Intracranial infection

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Curr Neurol Neurosci Rep (2014) 14:437

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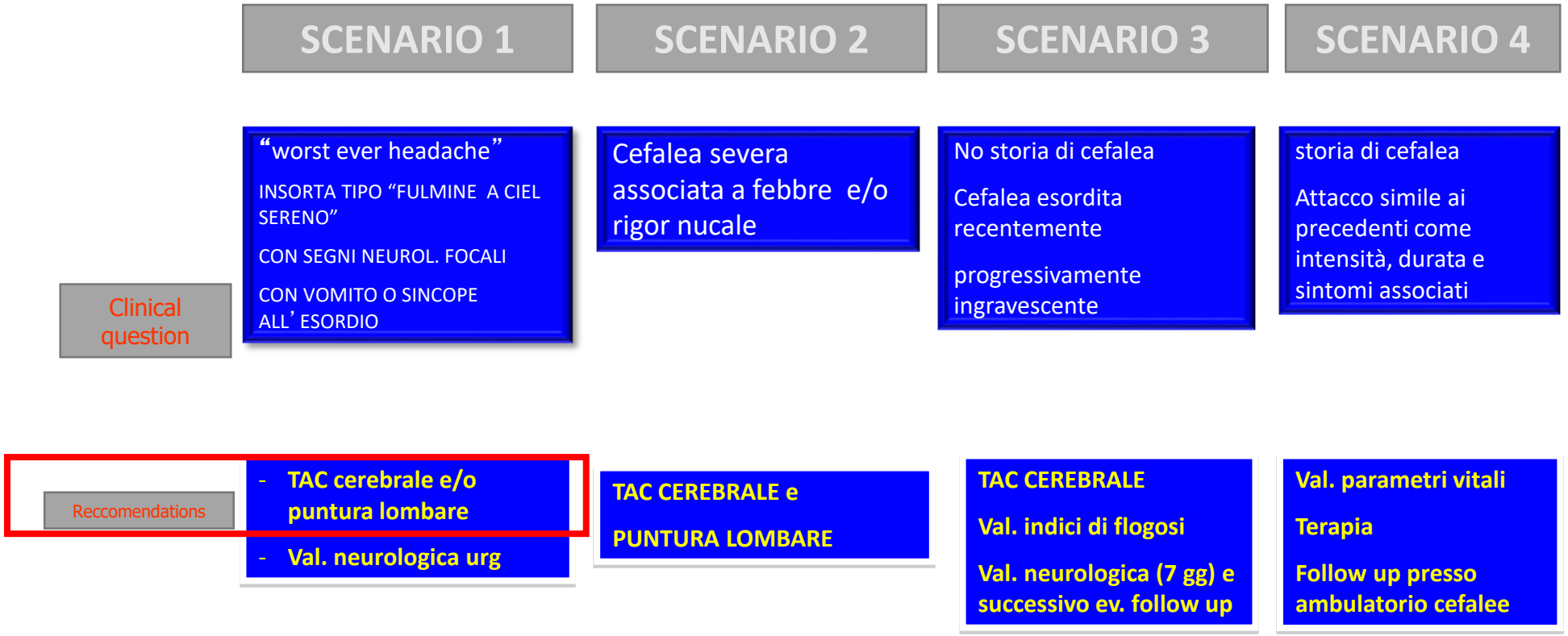

Time-Dependent Test Characteristics of Head Computed Tomography in Patients Suspected of Nontraumatic Subarachnoid Hemorrhage

Daan Backes, MSc; Gabriel J.E. Rinkel, MD; Hans Kemperman, PhD; Francisca H.H. Linn, MD, PhD; Mervyn D.I. Vergouwen, MD, PhD

Table 3. Test Characteristics of Head Computed Tomography in Patients Presenting With a Clinical Suspicion of Subarachnoid Hemorrhage and Acute Headache Stratified by Timing of Scan

Time From Onset of Symptoms to Head CT	N of Patients	% Sensitivity (95% CI)	% Specificity (95% CI)	Likelihood Ratio (95% CI)		% Predictive Value (95% CI)	
				Positive	Negative	Positive	Negative
All patients	247	97.2 (91.9–99.4)	100 (97.4–100)	Infinity	0.03 (0.01–0.09)	100 (96.5–100)	97.9 (94.0–99.6)
≤6 hours	135	100 (94.6–100)	100 (94.8–100)	Infinity	0.00 (0.00–0.04)	100 (94.6–100)	100 (94.8–100)
>6 hours	112	92.3 (79.1–98.4)	100 (95.1–100)	Infinity	0.08 (0.03–0.23)	100 (90.3–100)	96.1 (88.9–99.2)

Conclusions: In patients presenting with acute headache and a normal head CT ≤6 hours after ictus, as interpreted by experienced neuroradiologists, there is no added value of CSF analysis. In patients with an atypical presentation without headache and in patients presenting >6 hours after ictus, CSF analysis is still indicated.

Stroke. 2012;43:2115-2119

Sensitivity of computed tomography performed within six hours of onset of headache for diagnosis of subarachnoid haemorrhage: prospective cohort study

Jeffrey J Perry

BMJ 2011;343:d4277

Table 3| **Sensitivity of computed tomography for subarachnoid haemorrhage in patients with acute headache stratified by timing of scan**

Time from headache onset to scan	No of patients	% Sensitivity (95% CI)	% Specificity (95% CI)	Likelihood ratio (95% CI)		Predictive value (95% CI)	
				Positive	Negative	Positive	Negative
All patients	3132	92.9 (89.0 to 95.5)	100 (99.9 to 100)	Infinity	0.07 (0.05 to 0.11)	100 (98.3 to 100)	99.4 (99.1 to 99.6)
≤6 hours	953	100 (97.0 to 100.0)	100 (99.5 to 100)	Infinity	0.00 (0.00 to 0.02)	100 (96.9 to 100)	100 (99.5 to 100)
>6 hours	2179	85.7 (78.3 to 90.9)	100 (99.8 to 100)	Infinity	0.14 (0.14 to 0.17)	100 (96.3 to 100)	99.2 (98.7 to 99.5)

Conclusion Modern third generation computed tomography is extremely sensitive in identifying subarachnoid haemorrhage when it is carried out within six hours of headache onset and interpreted by a qualified radiologist.

Diagnosis of Subarachnoid Hemorrhage

Time to Change the Guidelines?

Jonathan A. Edlow, MD; Jonathan Fisher, MD, MPH

Given this analysis, we believe that practice should change.
Neurologically intact patients who present with thunderclap headache and undergo CT scan **within** 6 hours of symptom onset ***no longer need an LP*** to exclude SAH if the CT scan is negative.

It does not apply:

- In patients with abnormal neurological examinations
- if the history and physical examination suggest other diagnoses beyond SAH (cerebral venous sinus thrombosis, arterial dissections, etc)
- to patients presenting with isolated neck pain

Physicians and hospitals must ensure the expertise of the individuals who are interpreting these scans

Stroke. 2012;43:2115-2119

Prospective Implementation of the Ottawa Subarachnoid Hemorrhage Rule and 6-Hour Computed Tomography Rule

Jeffrey J. Perry, MD, MSc, Marco L.A. Sivilotti, MD, MSc, Marcel Émond, MD, MSc, Corinne M. Hohl, MD, MHSc, Maryam Khan, MSc, Howard Lesiuk, MD, Kasim Abdulaziz, MSc, George A. Wells, PhD, and Ian G. Stiell, MD, MSc

Stroke

Volume 51, Issue 2, February 2020; Pages 424-430

validate the 6-hour-CT rule for SAH when applied prospectively in a new cohort of patients.

Table 4. Ottawa SAH and 6-Hours CT Rules With Sensitivity and Specificity (Table view)

	SAH	
	Yes	No
6-h CT rule (N=1204)		
Positive	106	0
Negative	5	1093
Sensitivity (95% CI)	95.5 (89.8–98.5)	
Specificity (95% CI)	100.0 (99.7–100.0)	

Five patients with early CT had SAH with CT reported as normal: 2 unruptured aneurysms on CTA and presumed traumatic LP (as deemed by the treating neurosurgeon); 1 missed by the radiologist on the initial interpretation; 1 dural vein fistula (ie, nonaneurysmal); and 1 patient with sickle cell anemia with profound anemia (Hgb, 63 g/L) with a 3 mm aneurysm. The sensitivity of the Ottawa SAH rule was 100% (95% CI, 98.1%–100%).

Factors influencing time to computed tomography in emergency department patients with suspected subarachnoid haemorrhage

Maryam Khan,[1] Marco L A Sivilotti,[2] Michael J Bullard,[3] Marcel Émond,[4] Jane Sutherland,[5] Andrew Worster,[6] Corinne M Hohl,[7] Jacques S Lee,[8] Mary Eisenhauer,[9] Merril Pauls,[10] Howard Lesiuk,[11] George A Wells,[12] Ian G Stiell, Jeffrey J Perry[1]

Khan M, *et al. Emerg Med J* 2017;**34**:20–26. doi:10.1136/emermed-2016-205785

What is already known on this subject?

- In patients with rapid onset, severe headache, cranial CT performed within 6 hours of headache onset and deemed negative by a qualified radiologist essentially excludes the diagnosis of subarachnoid haemorrhage (SAH), challenging traditional teaching to nevertheless perform LP.
- It is unclear whether this higher sensitivity associated with earlier CT may in part be attributed to a spectrum effect in which patients with readily identifiable SAH on CT are more likely to present and be imaged earlier, thus questioning the merits of processes aimed at accelerating the time to imaging in all patients with headache.

What this study adds?

- Time from headache onset to CT imaging is moderately associated with positive imaging for SAH and the largest fraction of time to imaging is the delay to hospital presentation, especially in those without SAH.
- These findings suggest limited opportunity to reduce lumbar puncture rates simply by accelerating in-hospital processes when door-to-imaging intervals are under 2 hours, as diagnostic yield of imaging decreases markedly beyond the 6-hour imaging window from headache onset.

Internal and Emergency Medicine (2019) 14:451–457
https://doi.org/10.1007/s11739-018-1982-z

EM - ORIGINAL

Is there a role for lumbar puncture in early detection of subarachnoid hemorrhage after negative head CT?

Matti Tulla[1] · Tessa Tillgren[1] · Kalle Mattila[2]

To investigate the role of lumbar puncture (LP) after a negative head computed tomography (CT) when ruling out subarachnoid hemorrhage (SAH) within 24 h of symptom onset. In a single-center, retrospective cohort study, we studied a consecutive series of patients from 2011 to 2015. All patients underwent CT or CT following LP to rule out SAH. Patients were categorized into four groups depending on the time of symptom onset to initial head CT: 0–6 h, 6–12 h, 12–24 h, and over 24 h. Experienced radiologists interpreted all CT scans. We investigated the sensitivity, specificity, and negative predictive value (NPV) of noncontrast CT in detecting SAH. Of 539 patients with suspected SAH and negative CT, 280 (51.9%) had their CT performed within 24 h of symptom onset. None of these patients had SAH. Five (1.9%) out of 259 patients with CT performed after 24 h of symptom onset had SAH diagnosed, and two turned out to be aneurysmal. When CT was performed within 24 h of symptom onset it had a sensitivity of 100% (95% CI 95–100%), specificity of 98% (95% CI 96–99.7%), and NPV of 100% (95% CI 98–100%) in detecting SAH. Modern CT scanners seem to have high sensitivity and specificity in the diagnosis of SAH when performed within 24 h of symptom onset. Beyond this point, CT seems to lack sensitivity and further investigation with LP is required.

ANEU, Roma 30 settembre 2022

CONTINUING EDUCATION PROGRAM: FOCUS...

Subarachnoid hemorrhage in ten questions

M. Edjlali[a,b,*], C. Rodriguez-Régent[a], J. Hodel[b], R. Aboukais[c], D. Trystram[a], J.-P. Pruvo[b], J.-F. Meder[a], C. Oppenheim[a], J.-P. Lejeune[c], X. Leclerc[b], O. Naggara[a]

Diagnostic and Interventional Imaging (2015) 96, 657—666

When a patient presents with a sudden-onset headache, is CT an appropriate investigation?

When it is performed during the first 24 hours, CT has a sensitivity of 95%

After 7 days, therefore, CT is positive in only 50% of cases in SAH

CONTINUING EDUCATION PROGRAM: FOCUS...

Subarachnoid hemorrhage in ten questions

M. Edjlali[a,b,*], C. Rodriguez-Régent[a], J. Hodel[b], R. Aboukais[c], D. Trystram[a], J.-P. Pruvo[b], J.-F. Meder[a], C. Oppenheim[a], J.-P. Lejeune[c], X. Leclerc[b], O. Naggara[a]

Diagnostic and Interventional Imaging (2015) 96, 657—666

Does a negative lumbar puncture always exclude a subarachnoid hemorrhage?

The sensitivity of CT to detect SAH ranges 93% and 95% in the first 24 hours. A patient presenting with severe headaches and clinical features suspected of being a sub-arachnoid hemorrhage and who has **a normal CT or FLAIR MRI *should have a lumbar puncture***

On the other hand, ***a minimum of 12 hours should be left*** between the onset of symptoms and performing the lumbar puncture in order to be able to detect any xanthochromia

LP remains the gold standard for detecting SAH if it is performed between 12 hours and 15 days after the initial symptoms.

If it is performed too early the LP however may be falsely negative

Subarachnoid hemorrhage in ten questions

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Is MRI useful if a CT is negative?

Diagnostic and Interventional Imaging (2015) 96, 657—666

Cerebral CT is the technique of choice for a suspected SAH.

If the clinical index of suspicion for an SAH is high when a CT is negative, it is recommended that:
- a CT angiogram of the circle of Willis be performed
- a LP be performed;
- a MRI may be indicated. FLAIR imaging is more sensitive than CT to detect an SAH, particularly if it is small and carried out immediately after the onset of headache, but particularly within the first 48 hours (sensitivity of 99%, 33% beyond 5 days; FLAIR with T2*-weighted imaging can achieve a sensitivity of 99% in the first 15 days after the onset of symptoms)

EMERGENCY DIAGNOSIS OF SUBARACHNOID HEMORRHAGE: AN EVIDENCE-BASED DEBATE

Ali Farzad, MD,* Bethany Radin, DO,* Jason S. Oh, MD,* Heidi M. Teague, MD,† Brian D. Euerle, MD
J. V. Nable, MD,† Aisha T. Liferidge, MD,† T. Andrew Windsor, MD,* and Michael D. Witting, MD†

The Journal of Emergency Medicine, Vol 44,No 5, 2013

What is the best diagnostic strategy for ED patients in whom SAH is suspected ?

CT/LP

CT alone limits

Sensitivity
-93-95% within 24 h
-85% after 3 days
-50% after a week

LP limits

-Diagnosis unruptured aneurysm
-Arterial dissection
-CVT

MRI/MRA

MRI/MRA is advantageous over CT/LP in its ability to identify a culprit aneurysm.

High sensitivity for diagnosing aneurysms:
-91% in general
-95% sensitive for aneurysms >3 mm

CT/CTA

CTA is used in the evaluation of SAH, when (after a negative CT scan) LP is indeterminate (15% to 20% of cases) or cannot be performed.

CTA has the added advantage of being able to accurately identify other potentially catastrophic causes of headache, such as AVM, vasospasm, arterial dissection and cerebral venous thrombosis

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The Journal of Emergency Medicine, Vol 44,No 5, 2013

What is the best diagnostic strategy for ED patients in whom SAH is suspected ?

CT/LP

CT/LP has been a successful standard for years and has the highest sensitivity of the three protocols for diagnosing SAH

MRI/MRA

CT/CTA

MRI/MRA and CT/CTA are reasonable alternatives when:

-LP is contraindicated or difficult to perform

-*history and physical examination* suggest other diagnoses beyond SAH (cerebral venous sinus thrombosis, arterial dissections, RCVS, etc)

Thunderclap headache: Diagnostic considerations and neuroimaging features

A.M. Mortimer*, M.D. Bradley, N.G. Stoodley, S.A. Renowden

SAH is often and rightfully the primary consideration,

but it should be borne in mind that this accounts for approximately

11% of acute severe headache

Thunderclap Headache

CT and Lumbar Puncture But Occasionally More!

Stephen M. Davis, MD, FRACP; Geoffrey A. Donnan, MD, FRACP

Stroke
JOURNAL OF THE AMERICAN HEART ASSOCIATION

Stroke, 2008

Is the combination of CT and lumbar puncture enough for all patients with thunderclap headache? Here, we believe that the art of medicine should not be lost. There are a number of situations in which the clinician may suspect rarer alternative diagnoses based on a careful history and examination. From our perspective, extracranial or intracranial arterial dissection is the most important of these alternatives, because specific management would be indicated. Other diagnoses include cerebral venous thrombosis and vasculitis. In these settings, we would generally use MRI/MR angiography/MR venography, but CT angiography techniques may be a reasonable alternative.

SESSIONE III

CONTROVERSIE IN CEFALEE PS

moderatori: **A. Russo**, Bologna – **P. Torelli,** Parma

11:10 Terapia delle cefalee primarie in PS? Triptani SI

P. Querzani, Ravenna

11:20 Terapia delle cefalee primarie in PS? Triptani NO

Di Lorenzo, Roma

11:30 Discussione

11:35 Diagnosi della cefalea secondaria in PS? Solo TC cerebrale

P. Torelli, Napoli

11:45 Diagnosi della cefalea secondaria in PS? Non solo TC cerebrale

S. Cevoli, Bologna

11:55 Discussione

Grazie per l'attenzione

ANEU, Roma 30 settembre 2022