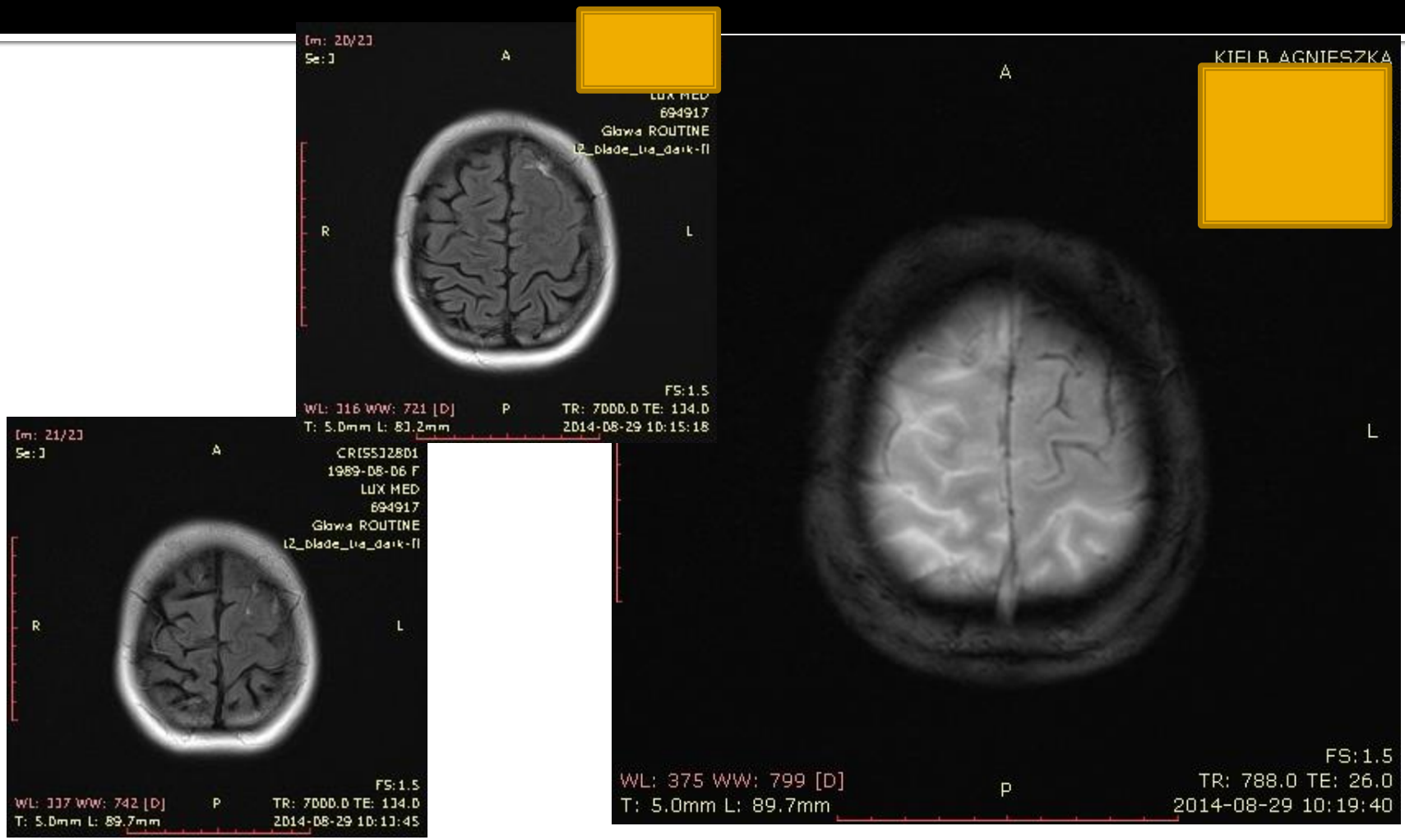
Beata Błażejewska-Hyżorek
II Klinika Neurologii IPiN, Warszawa

Zakrzepica żylna - pułapki diagnostyczne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Se: 3
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694917
Głowa ROUTINE
WL: 316 WW: 721 [D]
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P
FS:1.5
TR: 7000.0 TE: 134.0
2014-08-29 10:15:18
R
L
[m: 21/2]
Se: 3
A
CRISS328D1
1989-08-06 F
LUX MED
694917
Głowa ROUTINE
WL: 337 WW: 742 [D]
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P
FS:1.5
TR: 7000.0 TE: 134.0
2014-08-29 10:13:45
R
L
A
KIELB AGNIESZKA
L
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P
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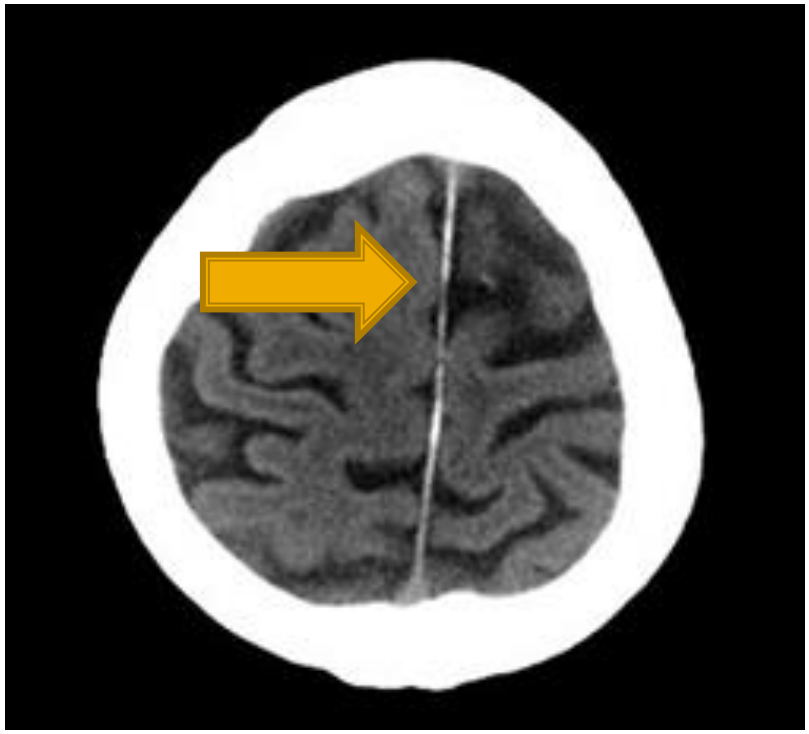
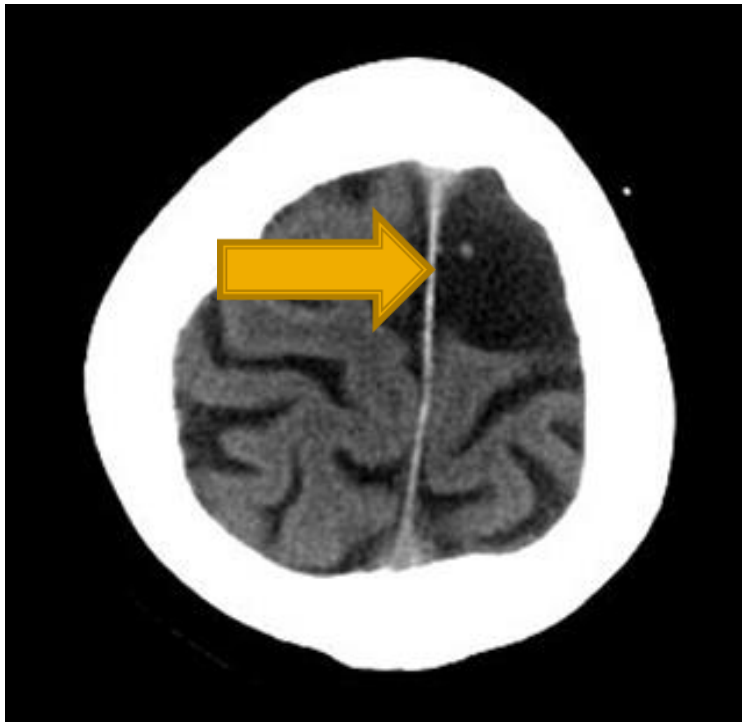




Zakrzepica naczyń żylnych mózgu: epidemiologia

- Choroba rzadka – rocznie 0.22/100 tys.

1,3/100 tys (Countinho, 2012)

- Stanowi 0.5-1.0 % udarów
- Wśród dorosłych szczyt zachorowania: III dekada życia, częściej chorują kobiety – K:M 3:1
- <10% starszych niż 65 lat

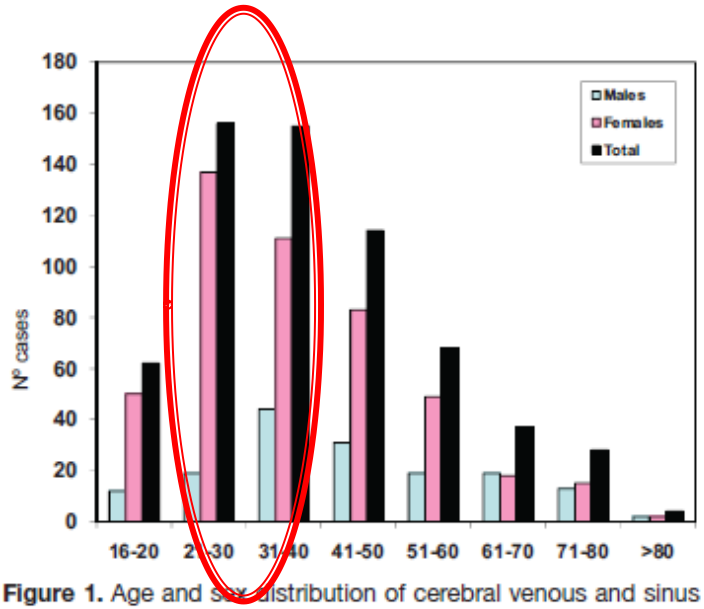


Figure 1. Age and sex distribution of cerebral venous and sinus thrombosis (CVT) in adults. Bars represent the number of patients with CVT for the specific age/sex category. Data provided by Dr Jose Ferro from the International Study on Cerebral Venous and Dural Sinuses Thrombosis.

Ferro i wsp., ICSVT, 2004

Pułapka #1

Choroba rzadka …

ale możliwa…

CVT – rzadka ale możliwa!

- Opóźnienie w postawieniu rozpoznania – 7 dni
- 7% umiera w ostrej fazie…

Continuho, 2014)

CVT – rzadka ale możliwa!

- Brak rozpoznania na skierowaniu

- Nieuwzględnienie istniejących obciążeń

- zatorowość płuca,
- trombofilia w rodzinie,
- nawracające poronienia,
- zakrzepica żył głębokich kończyn dolnych

- W jednym z badań podejrzenie wysunięto tylko u 5% CT, które wykazało CVT i 33% MR

Tang i wsp., 2008

Pułapka #2

Choroba o wielu twarzach klinicznych…

CVT – różnorodna prezentacja kliniczna!

4 główne zespoły objawów klinicznych

1. zespół izolowanego nadciśnienia śródczaszkowego (10-40%)
   - imitujący idiopatyczne nadciśnienie śródczaszkowe
2. zespół objawów ogniskowych (50-80%) – imitujący udar, guz, ropień itp.
3. zespół podostrej encefalopatii (10-20%) – imitujący zapalenie mózgu, zapalenie naczyń
4. Inne:
   zespół zatoki jamistej, nawracające TIA, SAH, pulsujący szum uszny, porażenia nn. czaszkowych

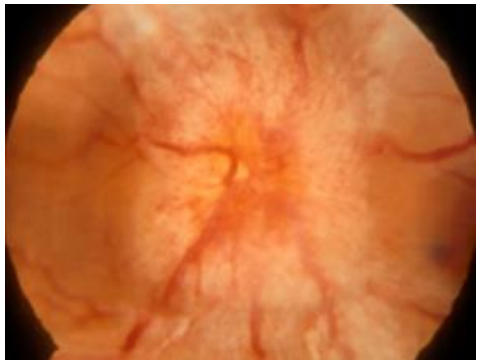
W TYCH SYTUACJACH ZAWSZE NALEŻY ROZWAŻAĆ ZAKRZEPICĘ ŻYLNĄ

Bousser i wsp.2007

Izolowane nadciśnienie śródczaszkowe

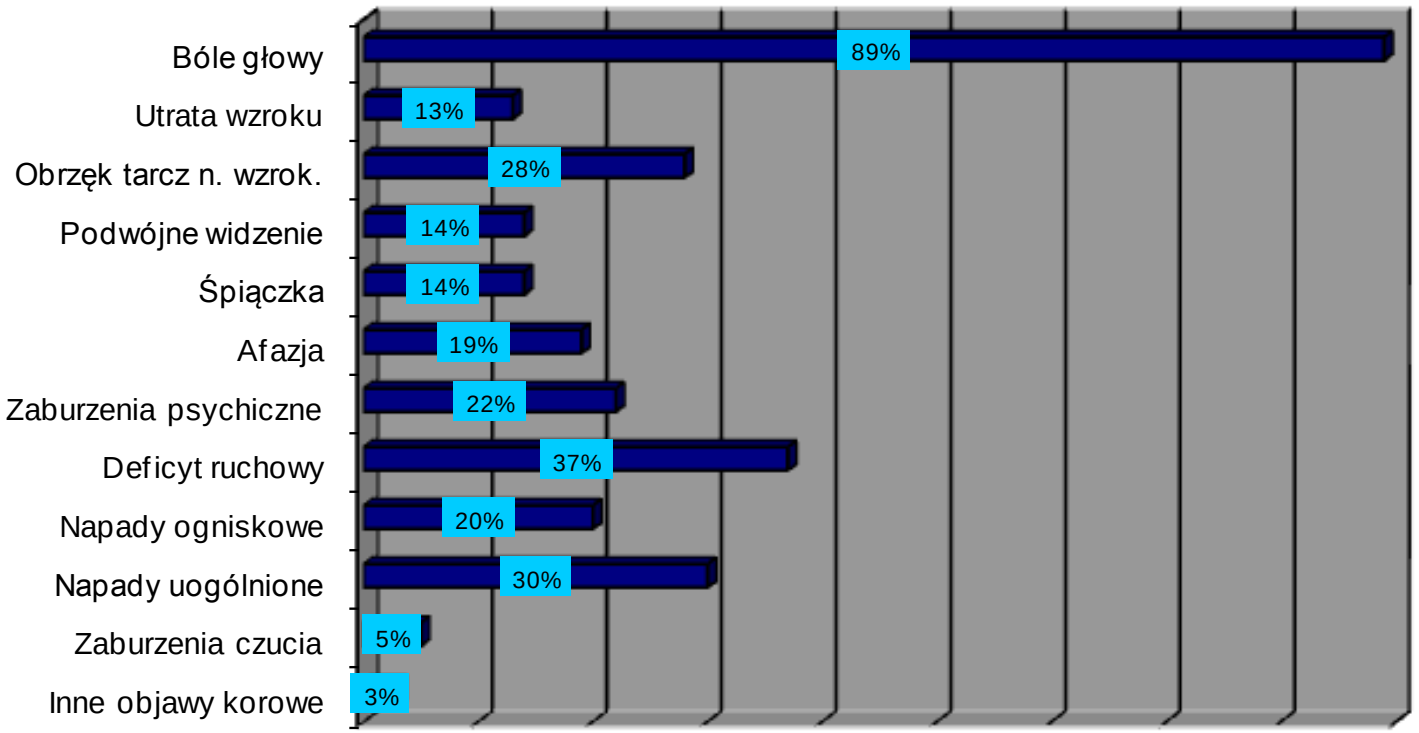
- Izolowane nadciśnienie śródczaszkowe (10-40%)

- rozlany ból głowy, nudności, wymioty, szum w uszach, zaburzenia widzenia, obrzęk tarcz n.wzrokowego (imituje idiopatyczne nadciśnienie śródczaszkowe)



Rozważ CVT!

CVT - różne objawy



Ferro, ICSVT, 2004

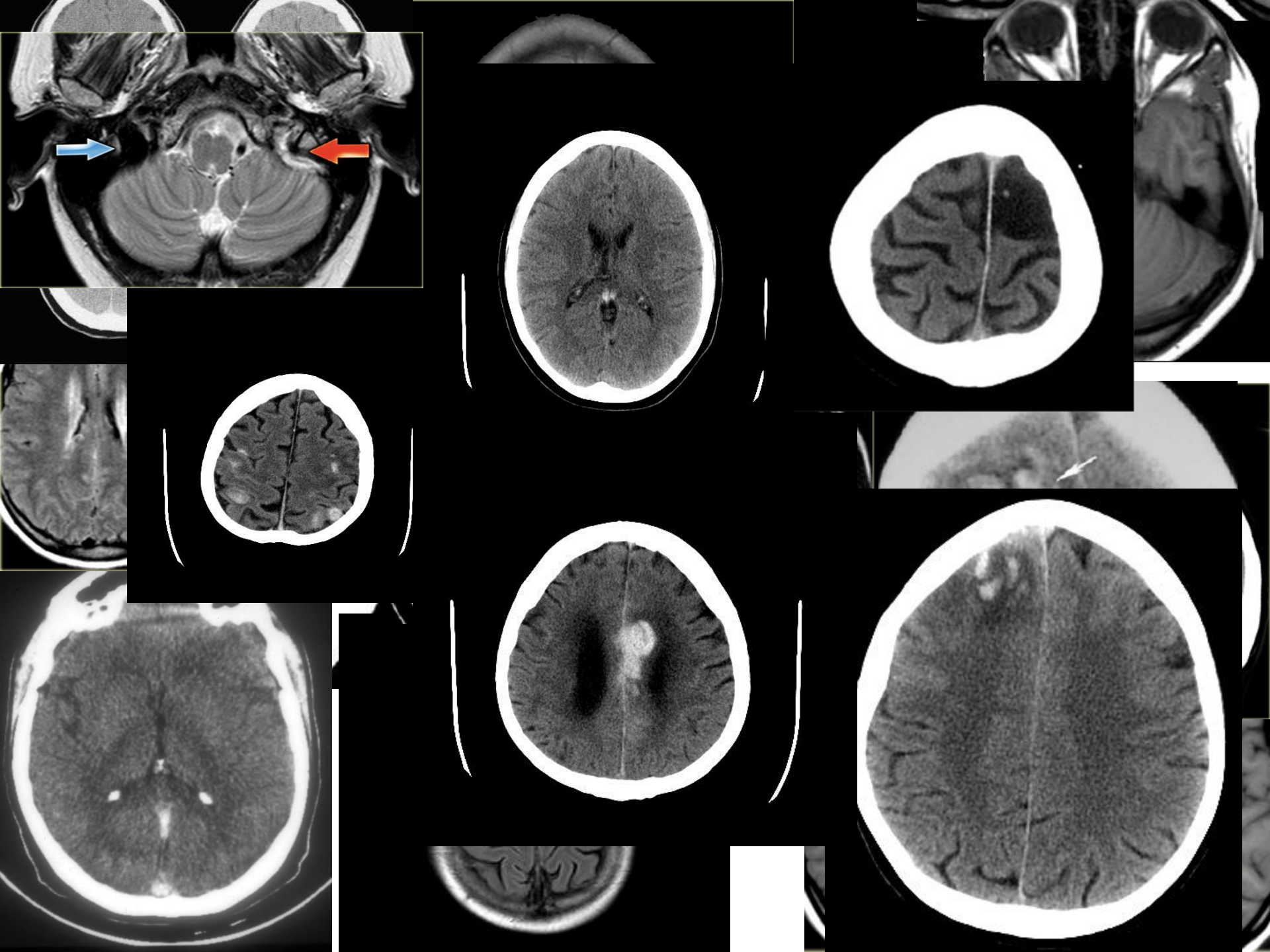
CVT – różne prezentacje kliniczne

- napady padaczkowe (40% CVT)
- obustronne zajęcie struktur mózgu
- obustronne objawy ruchowe (np.paraplegia w przebiegu zakrzepicy zatoki strzałkowej górnej)
- częste bóle głowy (krwotok pochodzenia żylnego),
- zaburzenia świadomości (zajęcie jąder podkorowych w przebiegu zakrzepicy żył głębokich)
- często przebieg powoli postępujący, z okresami pogorszeń

Ferro, ICSVT, 2004

Pułapka #3

Choroba o wielu twarzach radiologicznych …

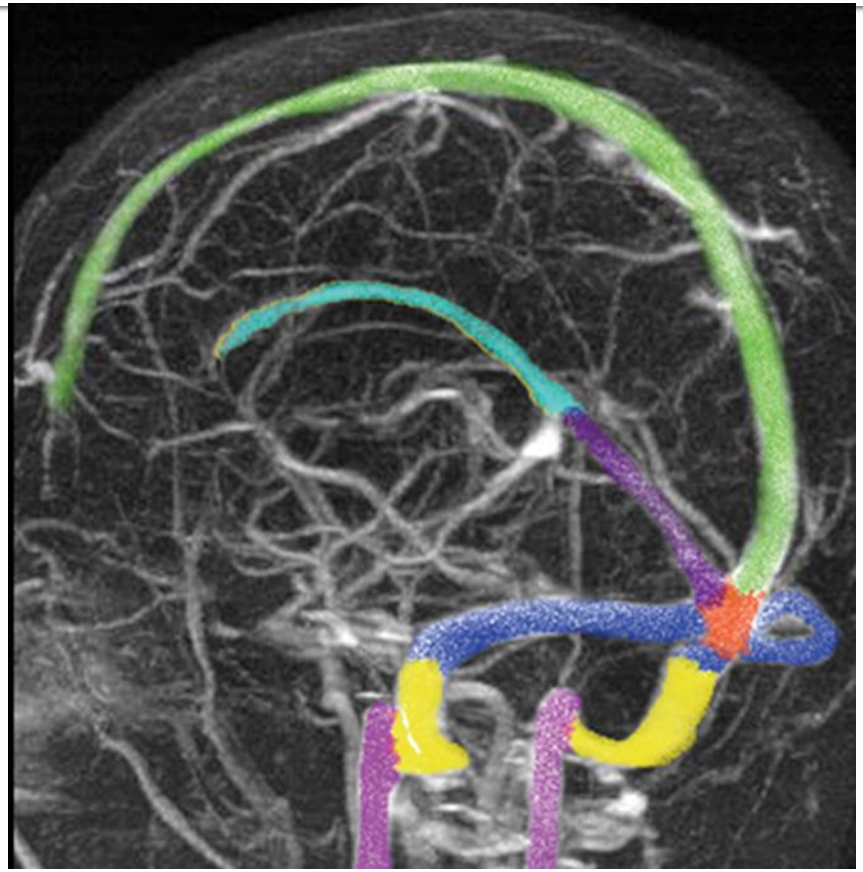


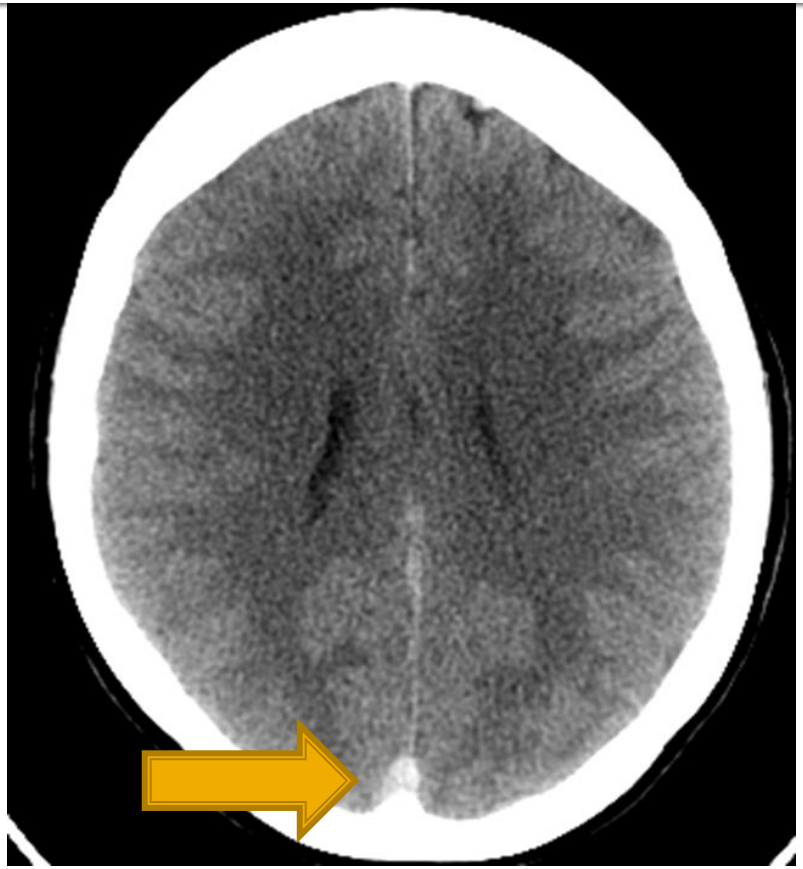
Badanie Nr 1

Tomografia komputerowa głowy

- Objaw delty –”delta sign”
- Objaw struny – „cord sign”
- Objaw pustej delty – badanie TK z kontrastem!
- Venografia TK

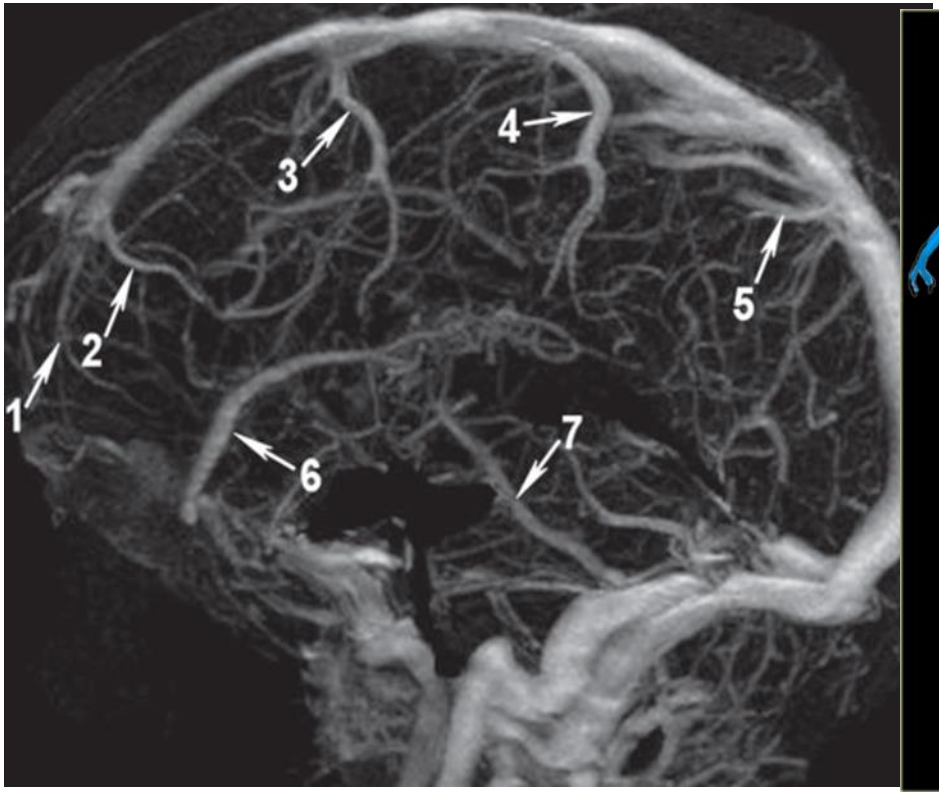
Objaw delty – „delta sign”

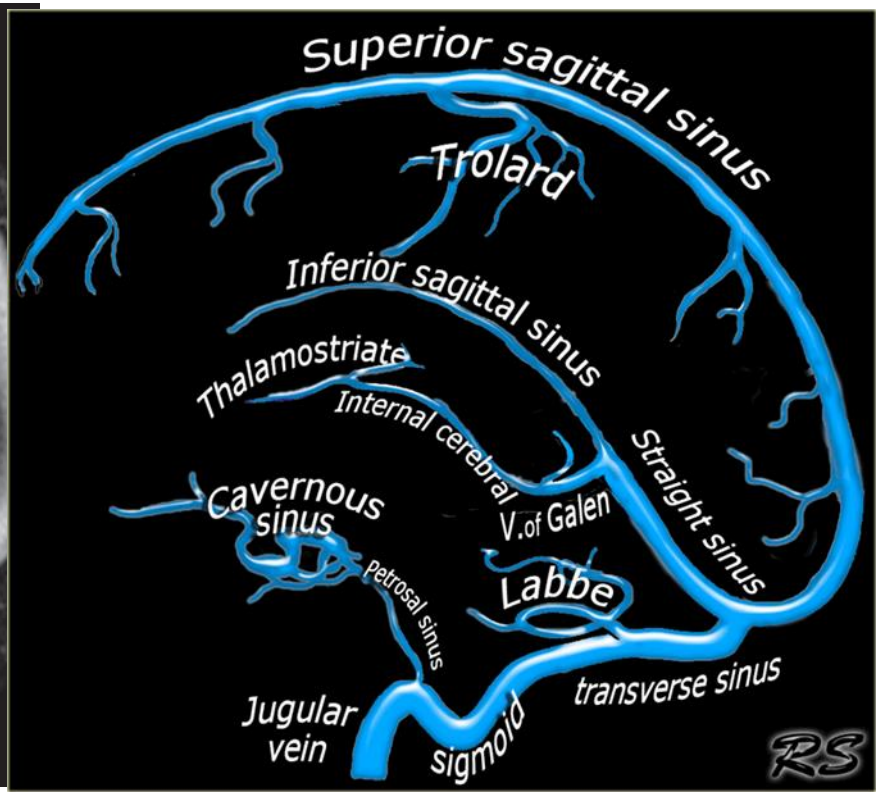




Leach J L et al. Radiographics 2006;26:S19-S41

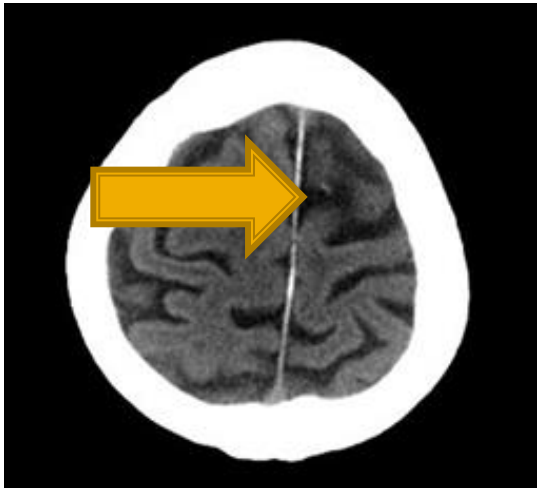
Układ żył powierzchownych

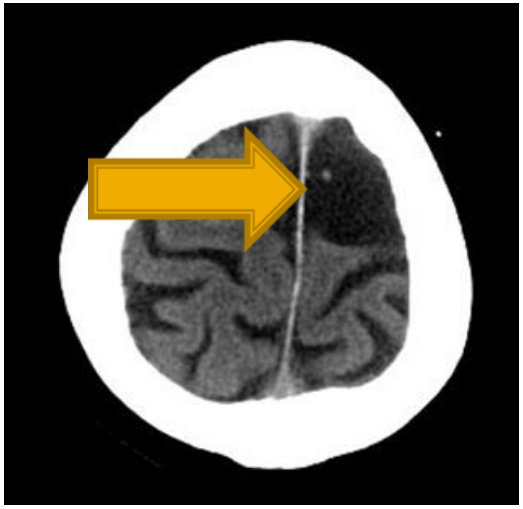


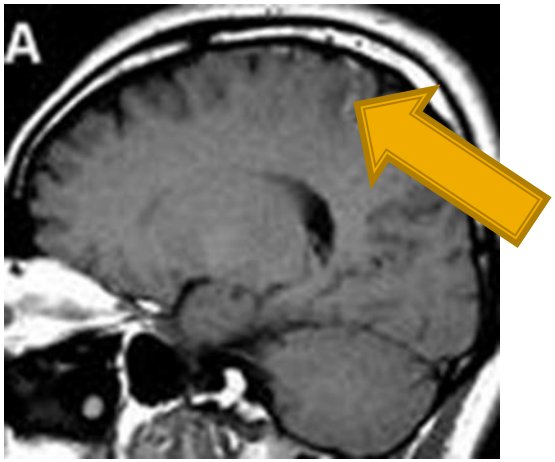


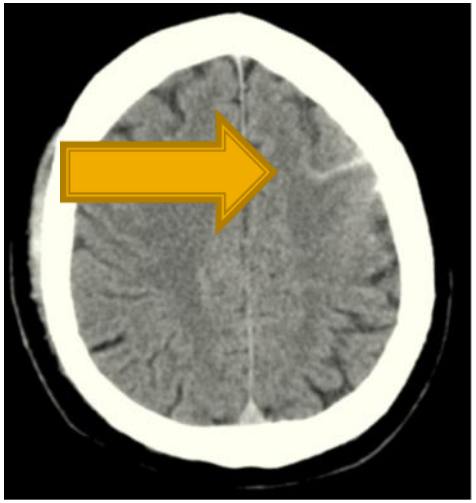
Leach J L et al. Radiographics 2006;26:S19-S41

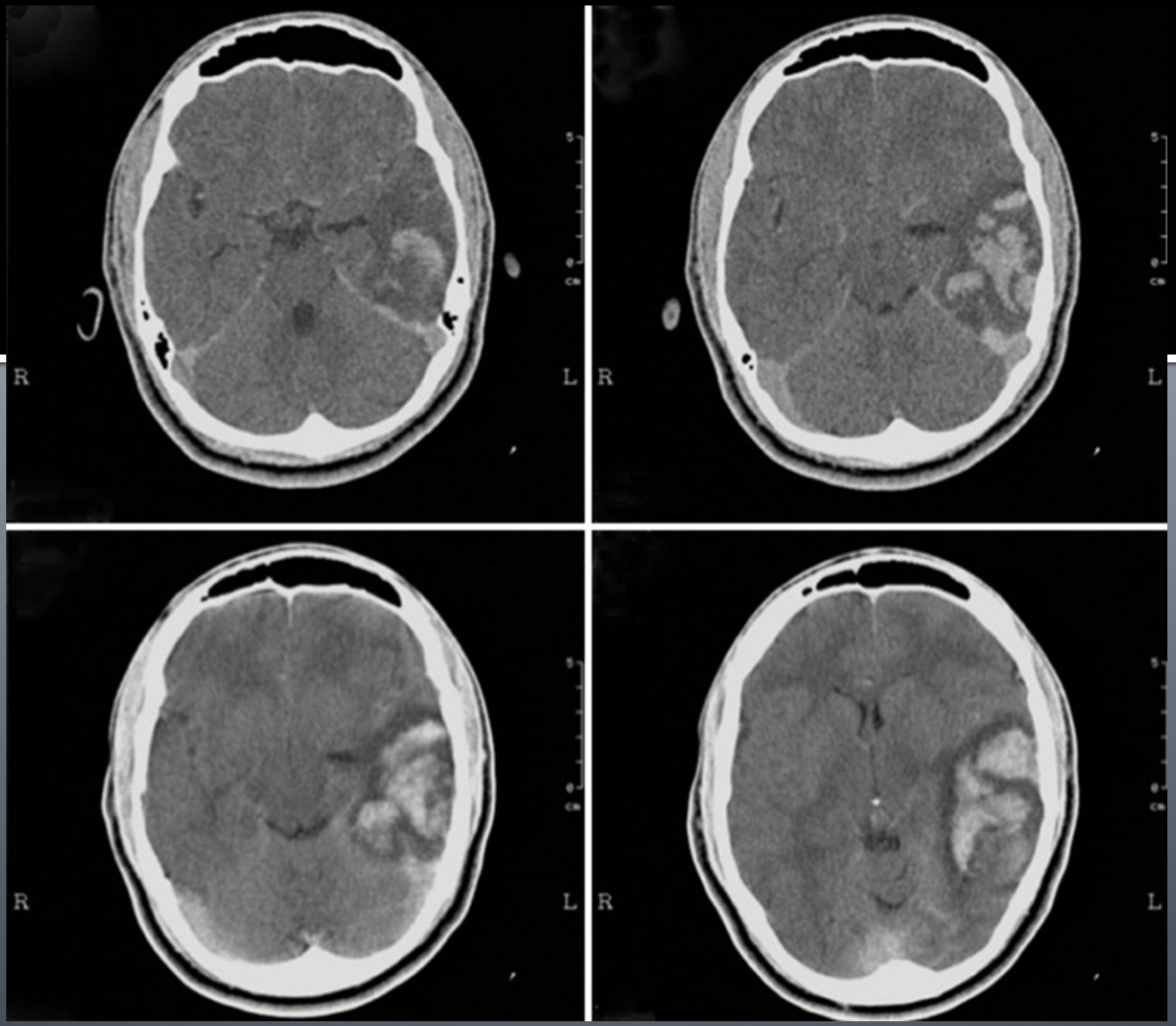
CT bez kontrastu – objaw struny („cord sign”)










R
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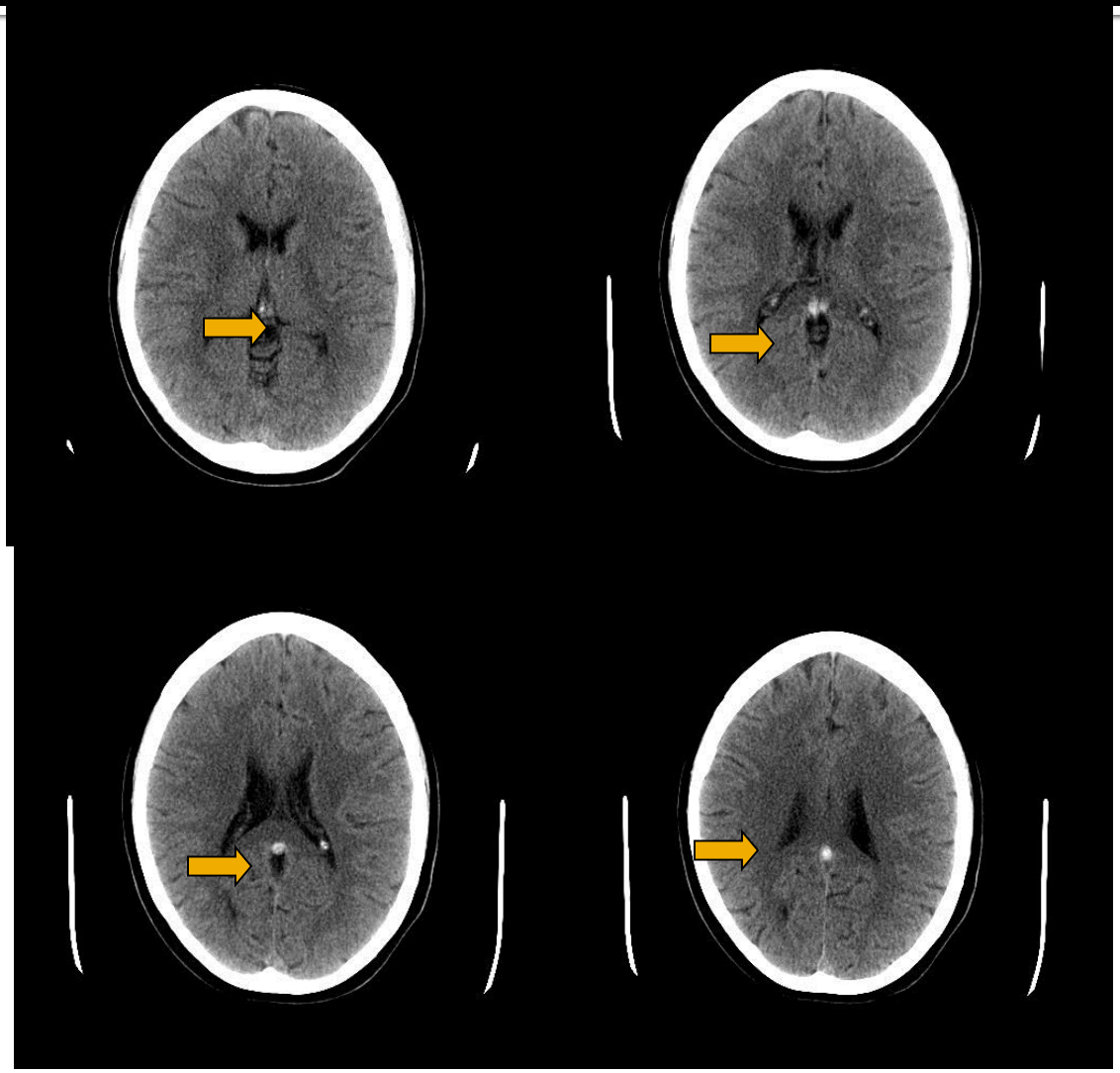
Układ żył głębokich

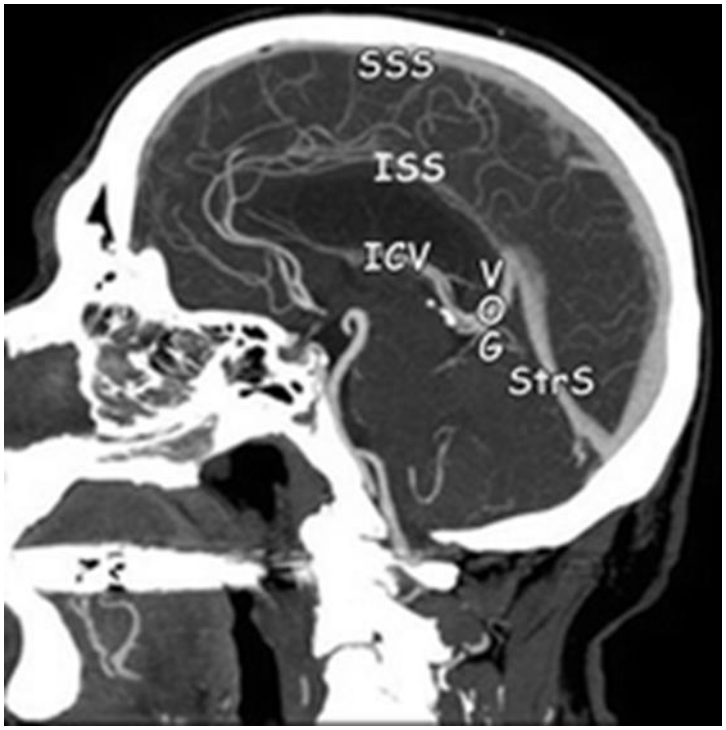
Pułapka?...

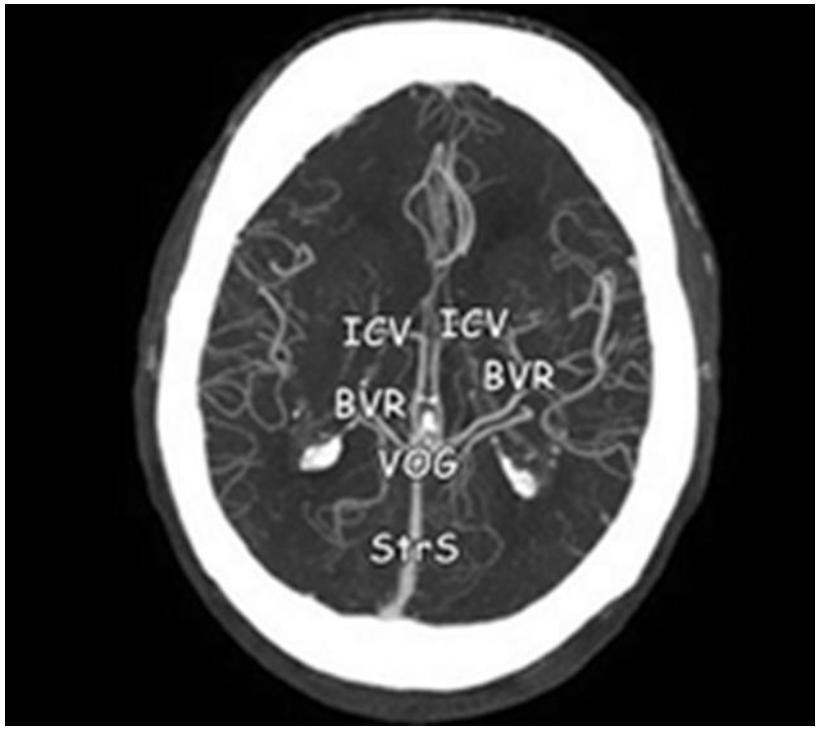
Pacjentka lat 25, bóle głowy od kilku dni ...

Pacjentka, lat 25...



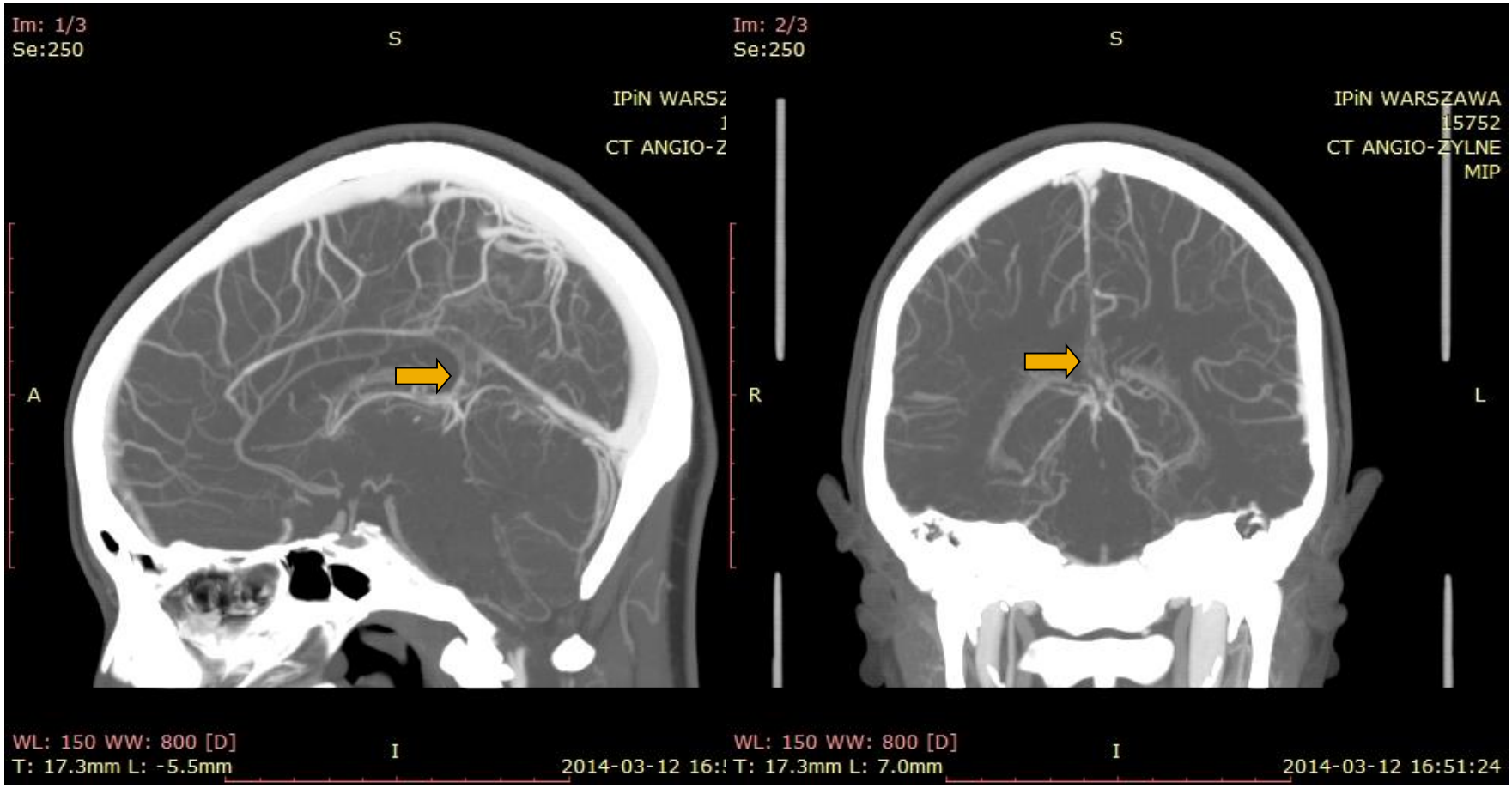
Układ żył głębokich



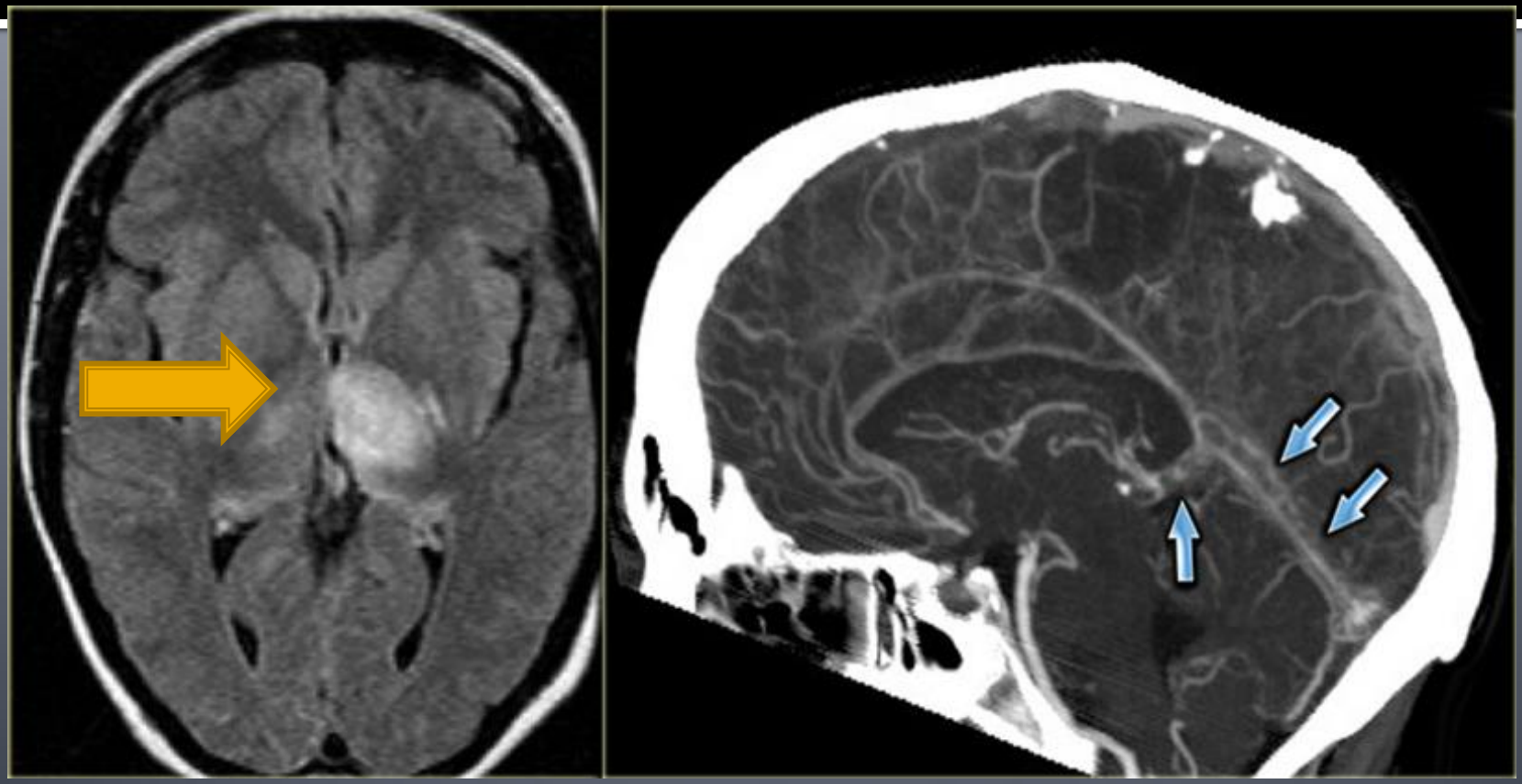


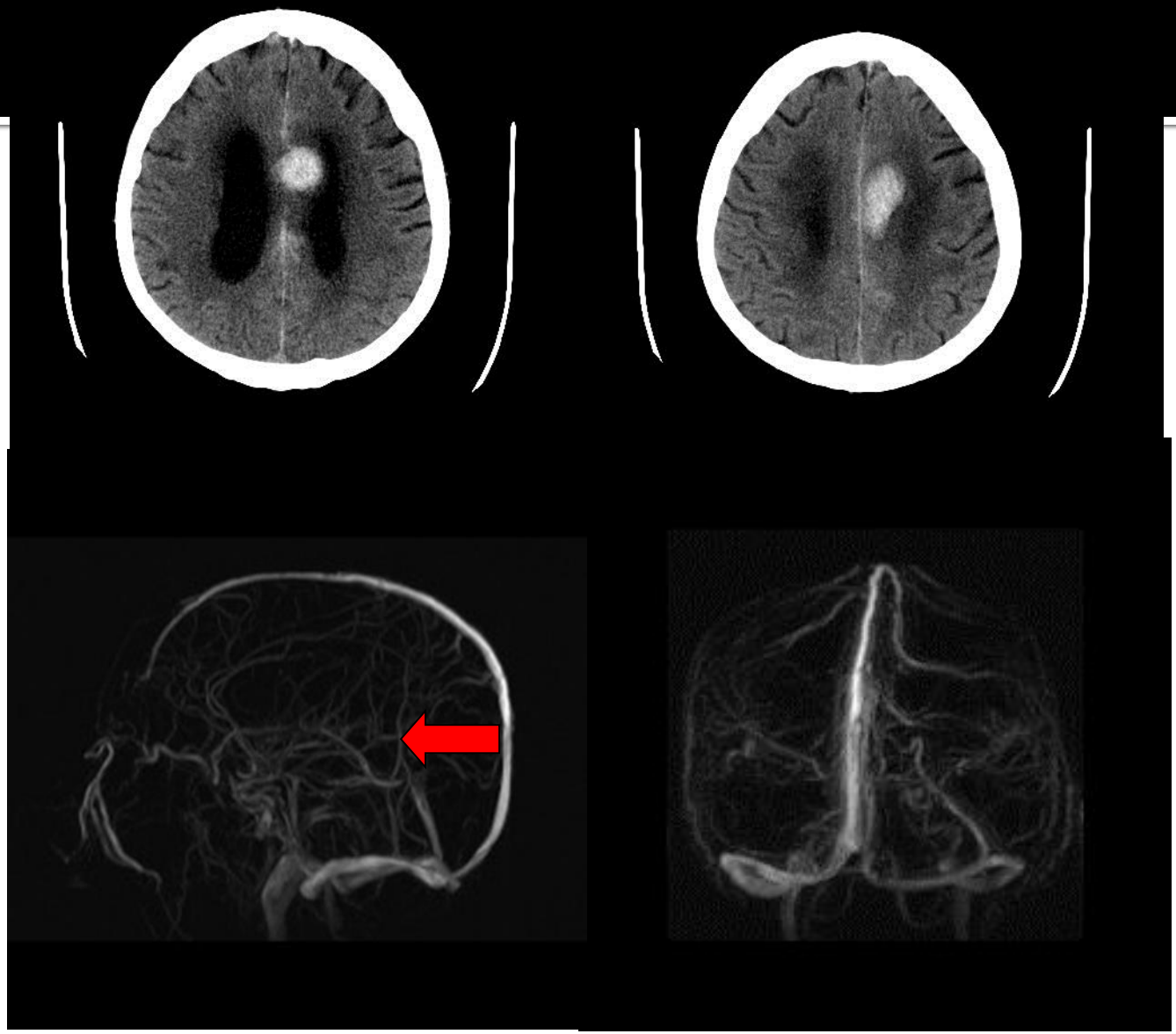
Leach J L et al. Radiographics 2006;26:S19-S41

Pacjentka, lat 25...



CVT w przebiegu zakrzepicy żył głębokich – wzgórze!!!



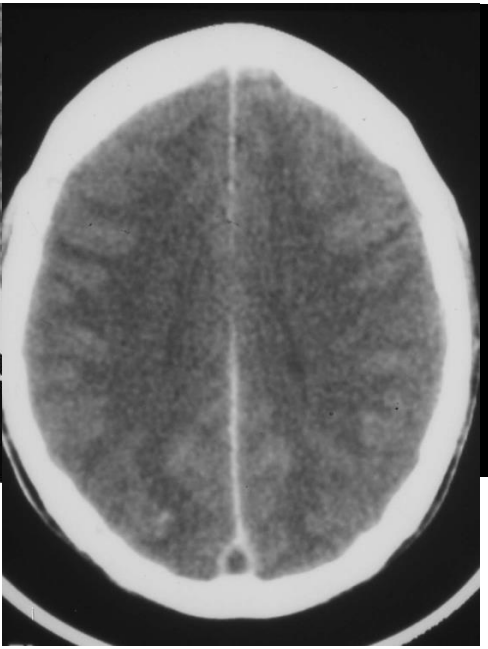


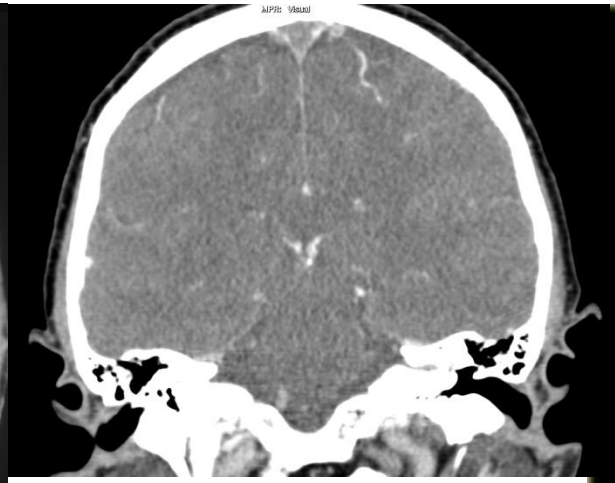
TK z kontrastem

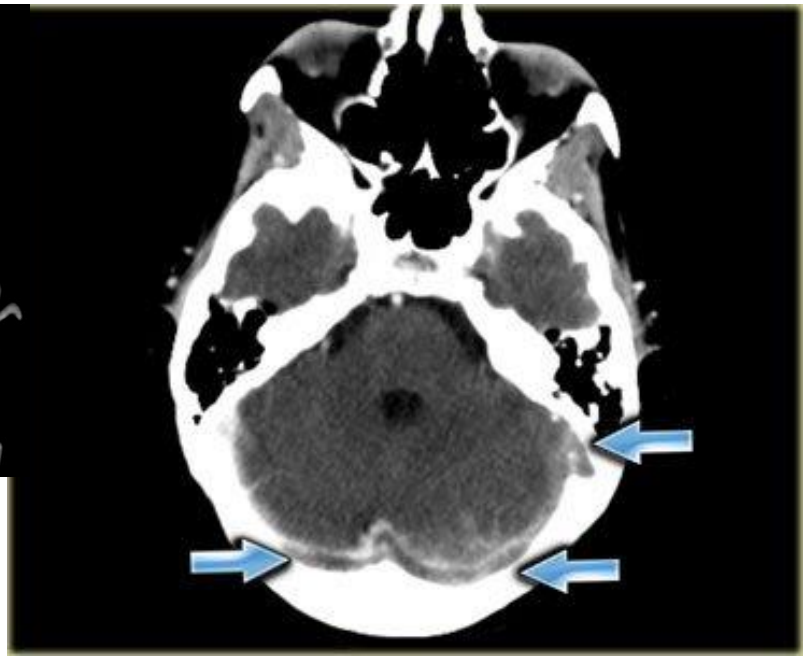
- Objaw pustej delty („empty delta sign”)
- Czułość 70%
- Wykonywane stosunkowo rzadko w ramach podstawowej diagnostyki

Zakrzepica naczyń żylnych mózgu:
diagnostyka radiologiczna

- KT z kontrastem: objaw pustej delty (może być nieobecny w pierwszych dniach choroby ale utrzymuje się kilka tygodni)

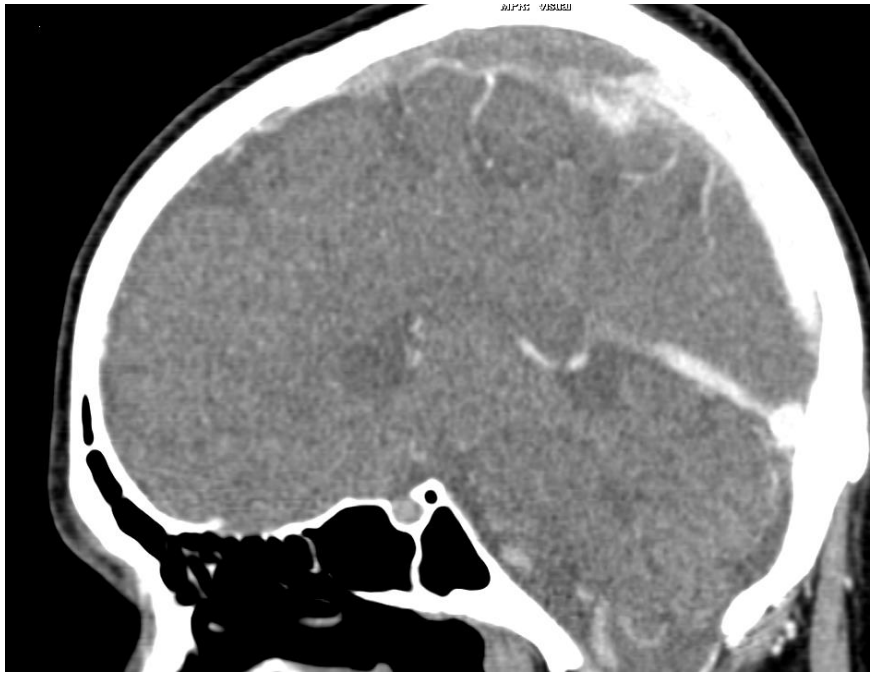


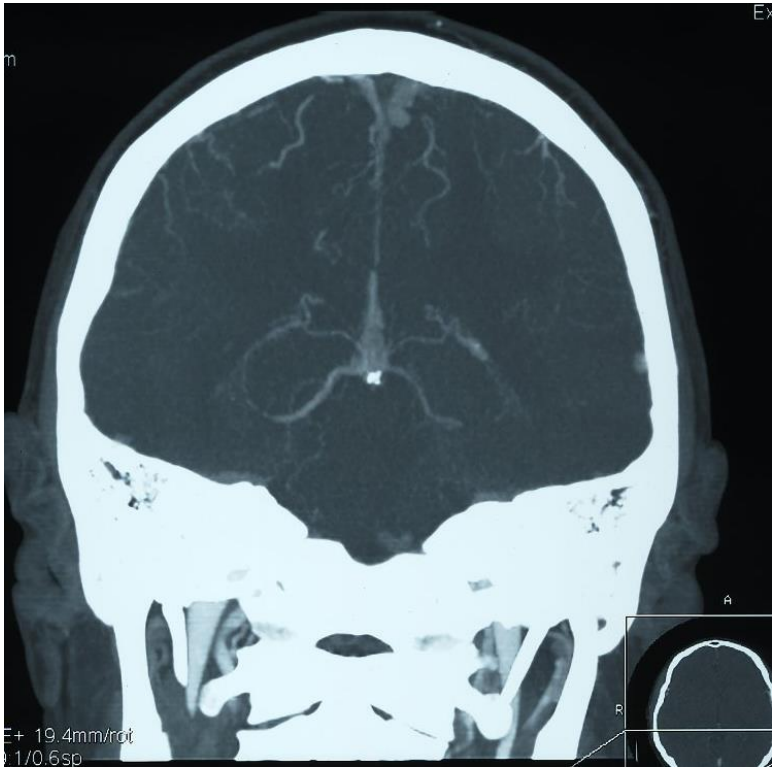




Venografia TK

Brak wypełnienia kontrastem zakrzepniętej zatoki/żyły





„KT – prawidłowy obraz struktur mózgu”

3 scenariusze…

Badanie TK a CVT

Badania mało czułe, nie mogą być podstawą rozpoznania/wykluczenia CVT

- objaw delty -20%,
- objaw struny – 50%,
- objaw pustej delty – 70%

Badanie TK a CVT

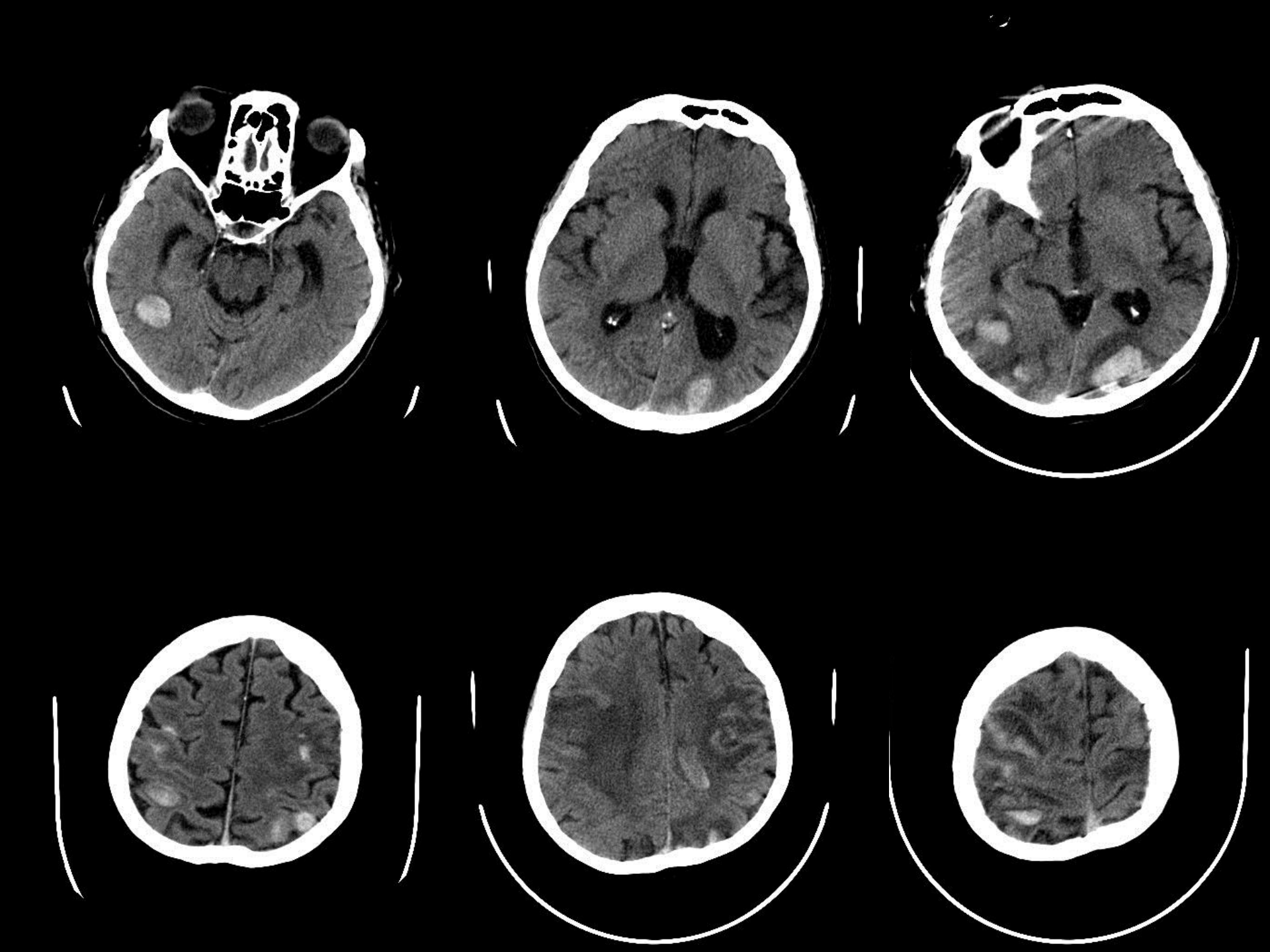
- Brak podejrzenia na rozpoznaniu…

Badanie TK a CVT

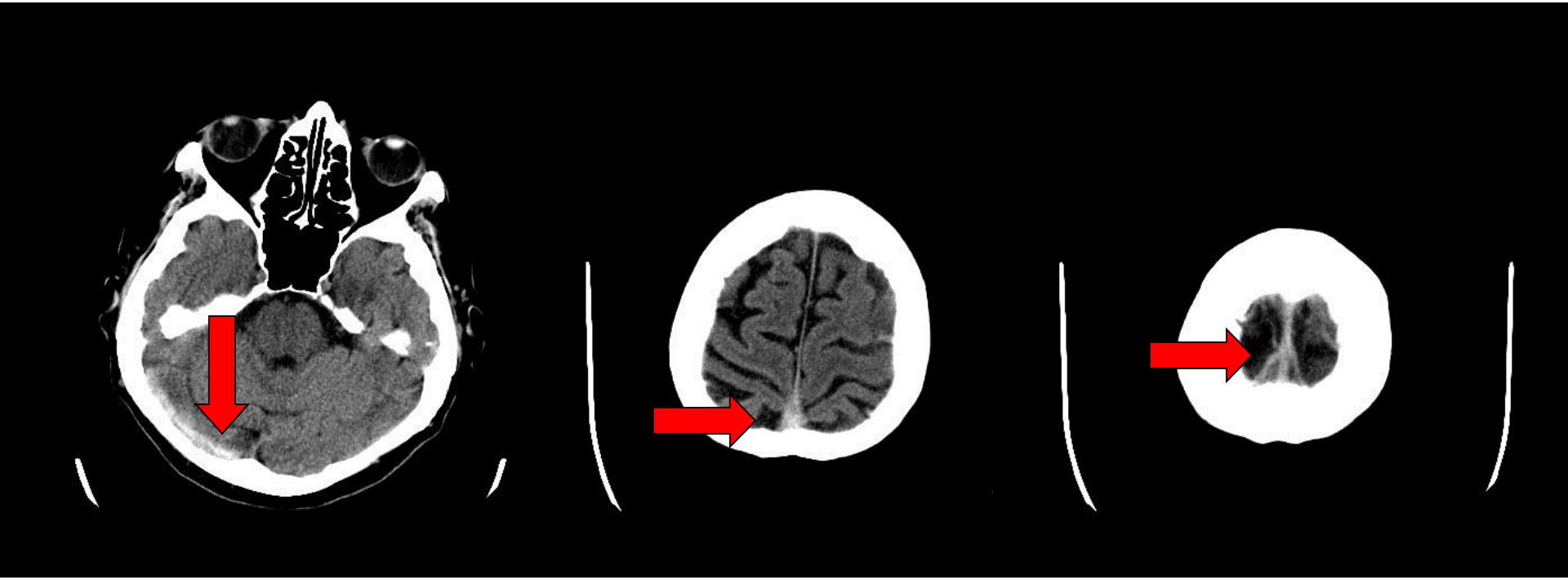
- Pominięte skrajne skany …

Pacjentka, lat 64…

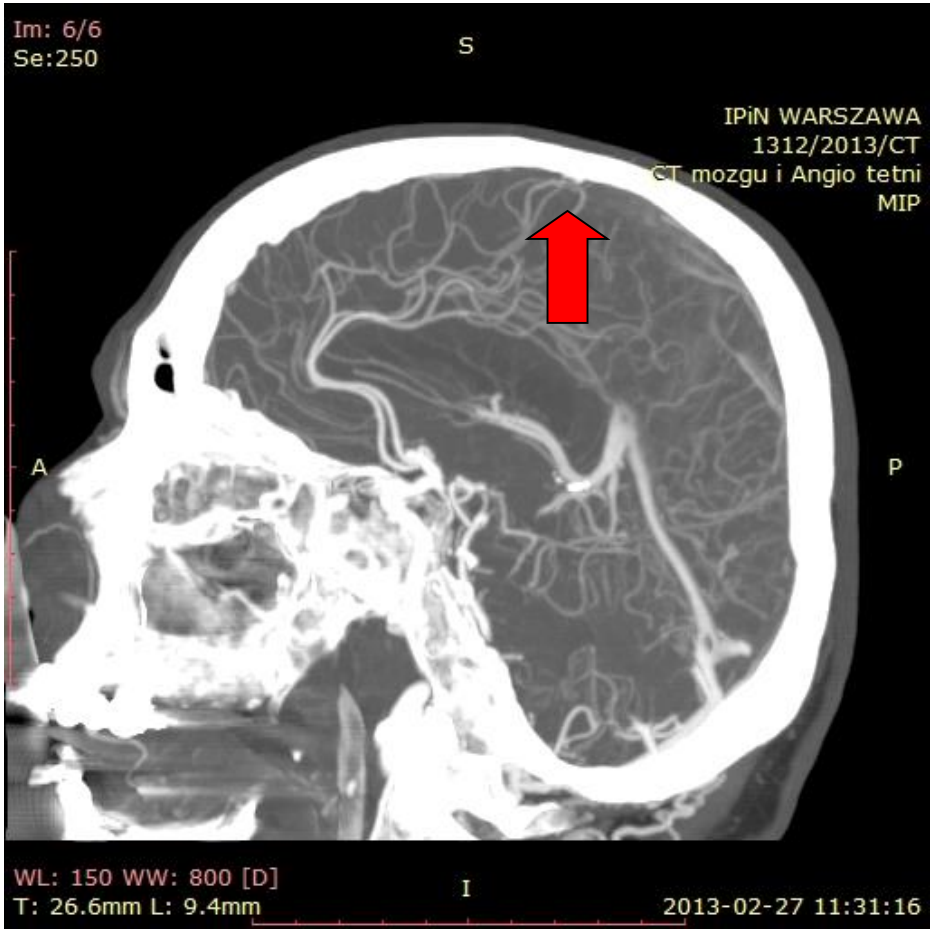
- Pacjentka lat 64, w wywiadzie niedoczynność tarczycy
- Zachorowała nagle, przywieziona na IP w stanie padaczkowym…



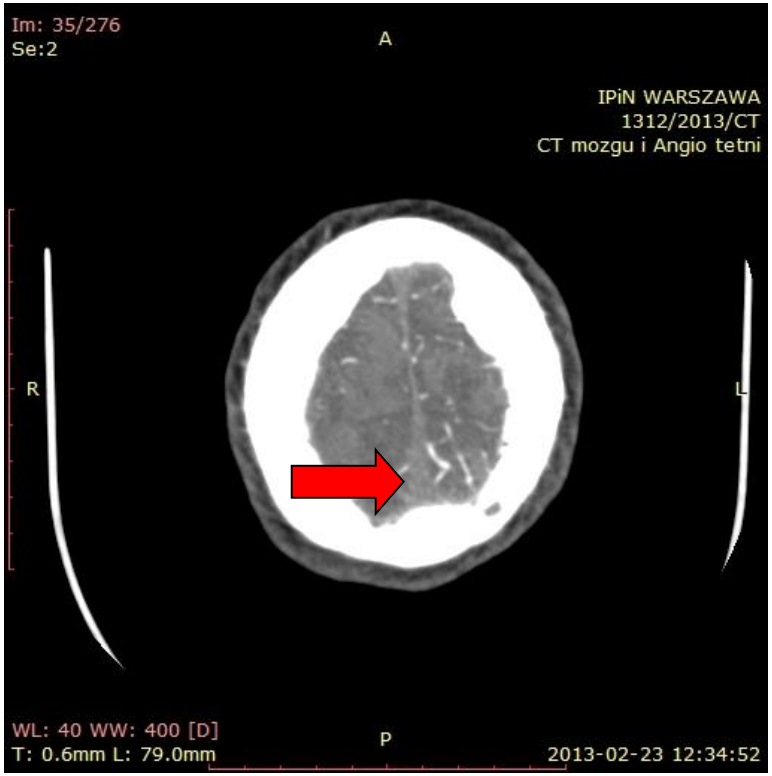
Pacjentka, lat 64...

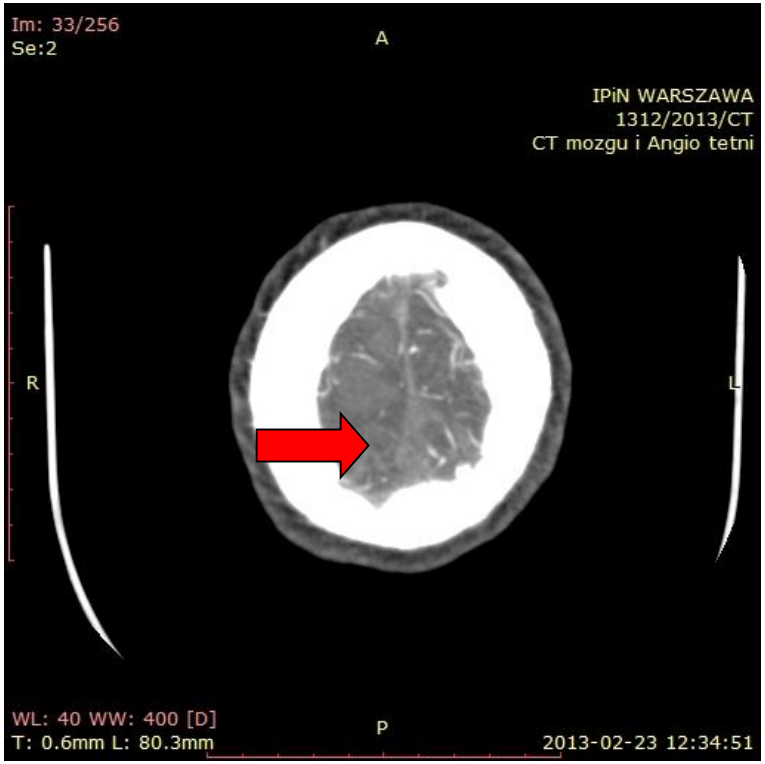


Pacjentka, lat 64...

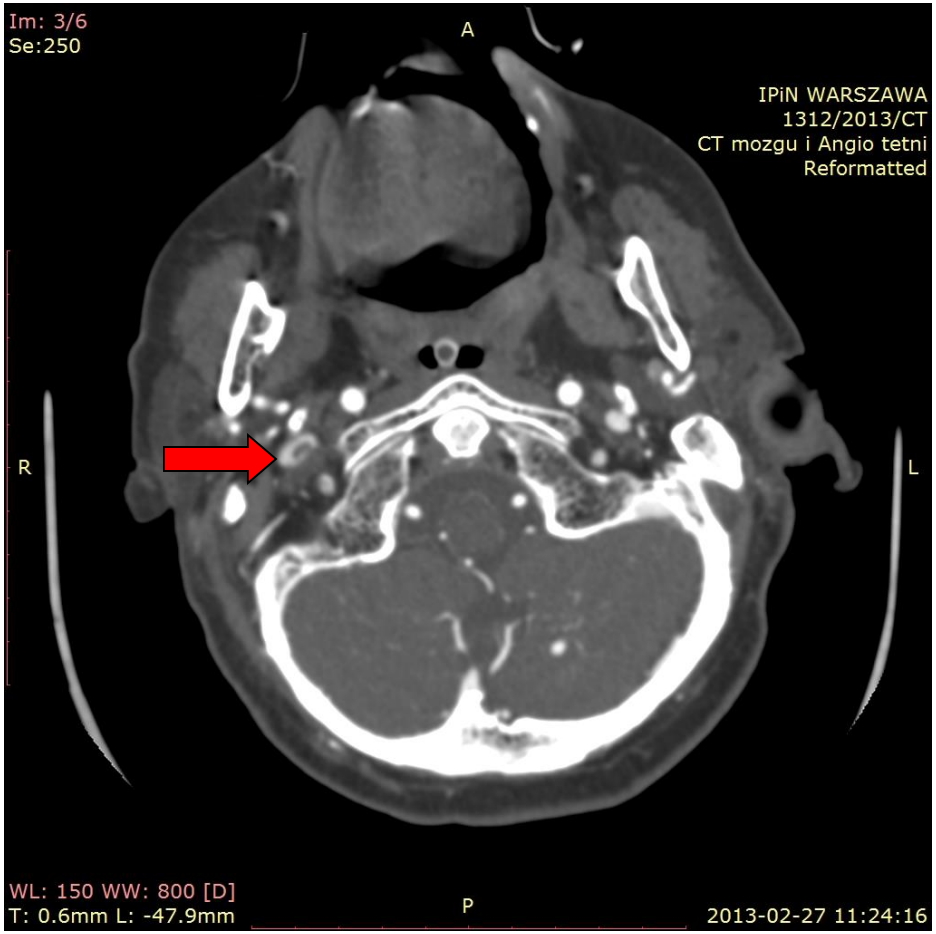


Pacjentka, lat 64...





Pacjentka, lat 64...



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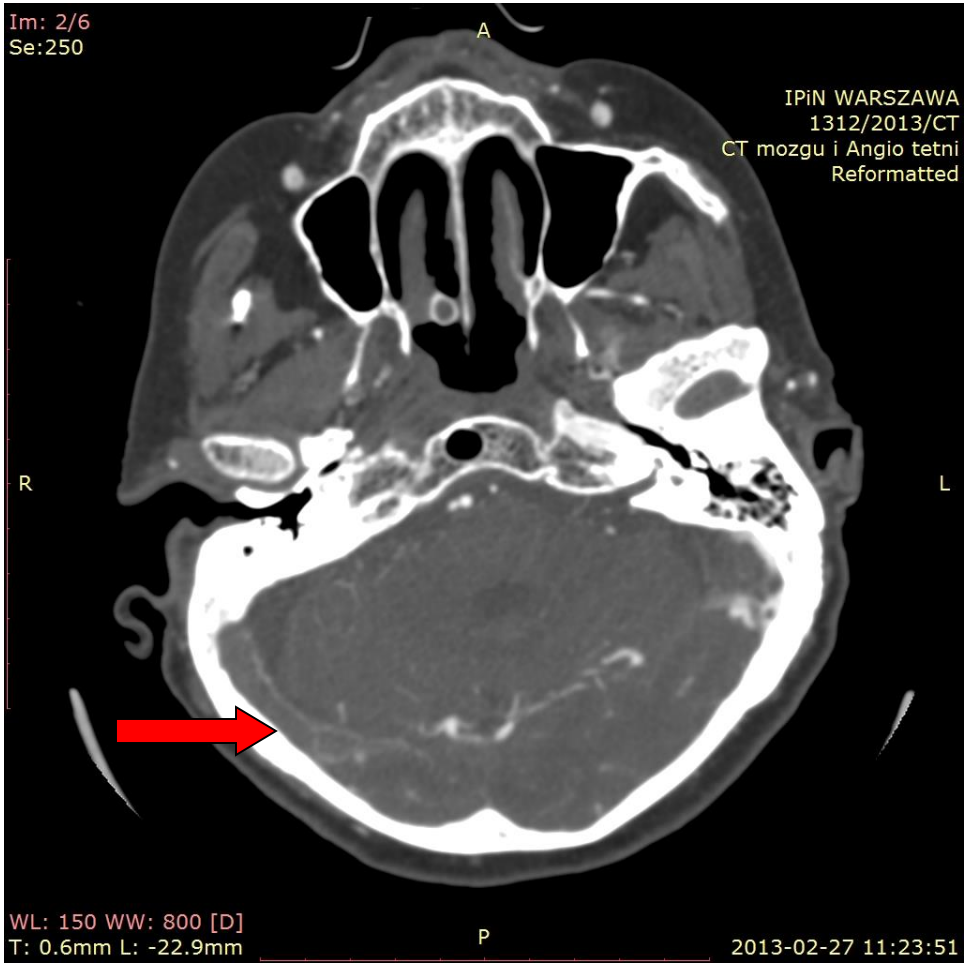

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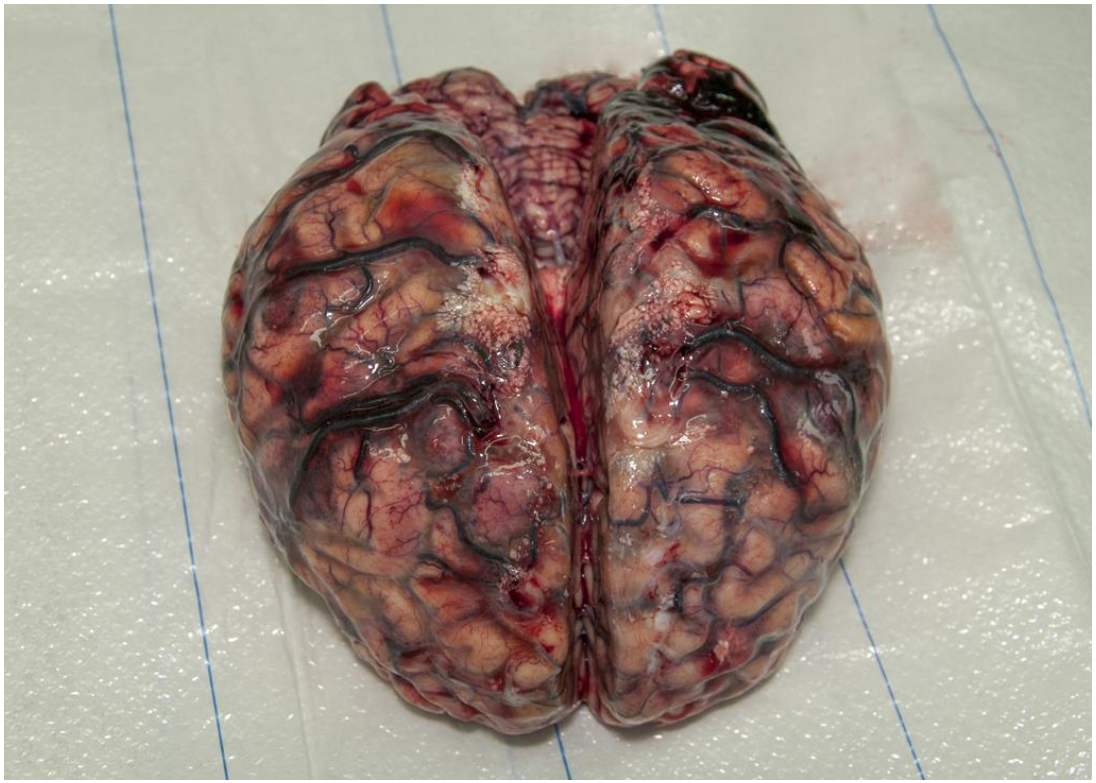
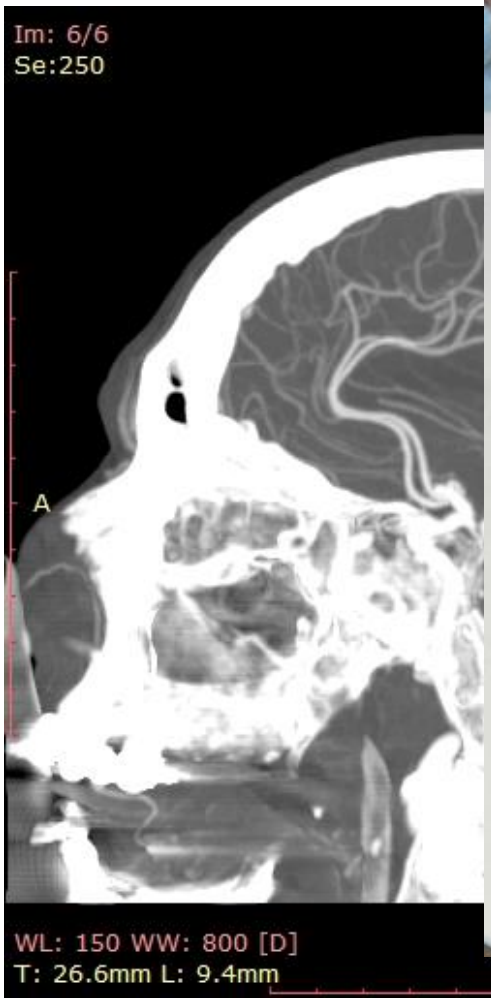
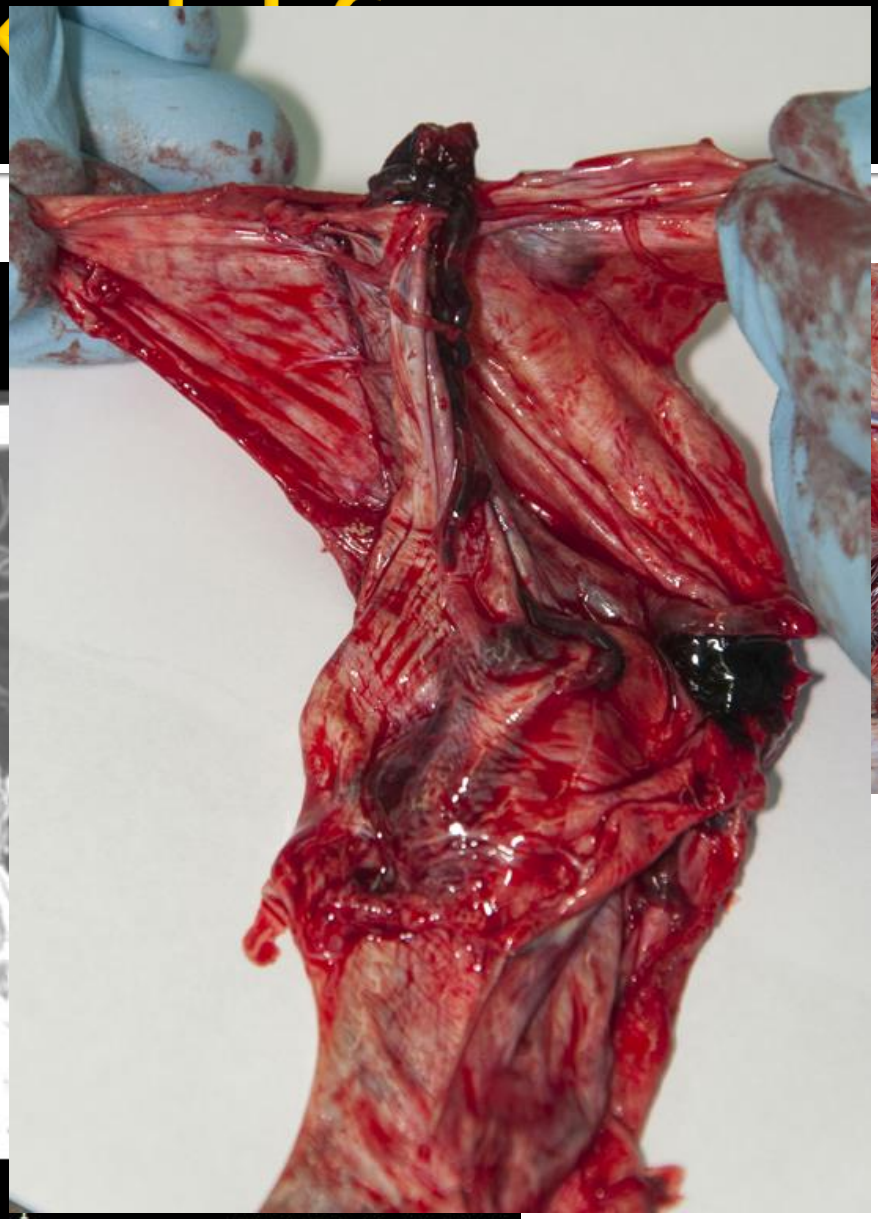
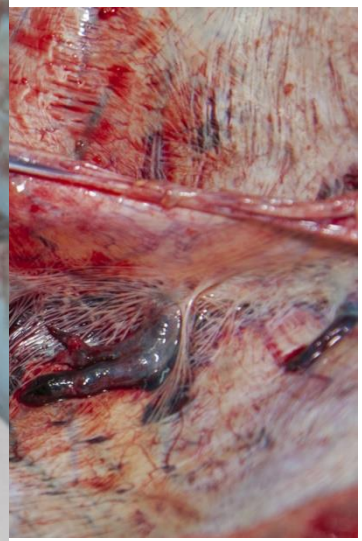


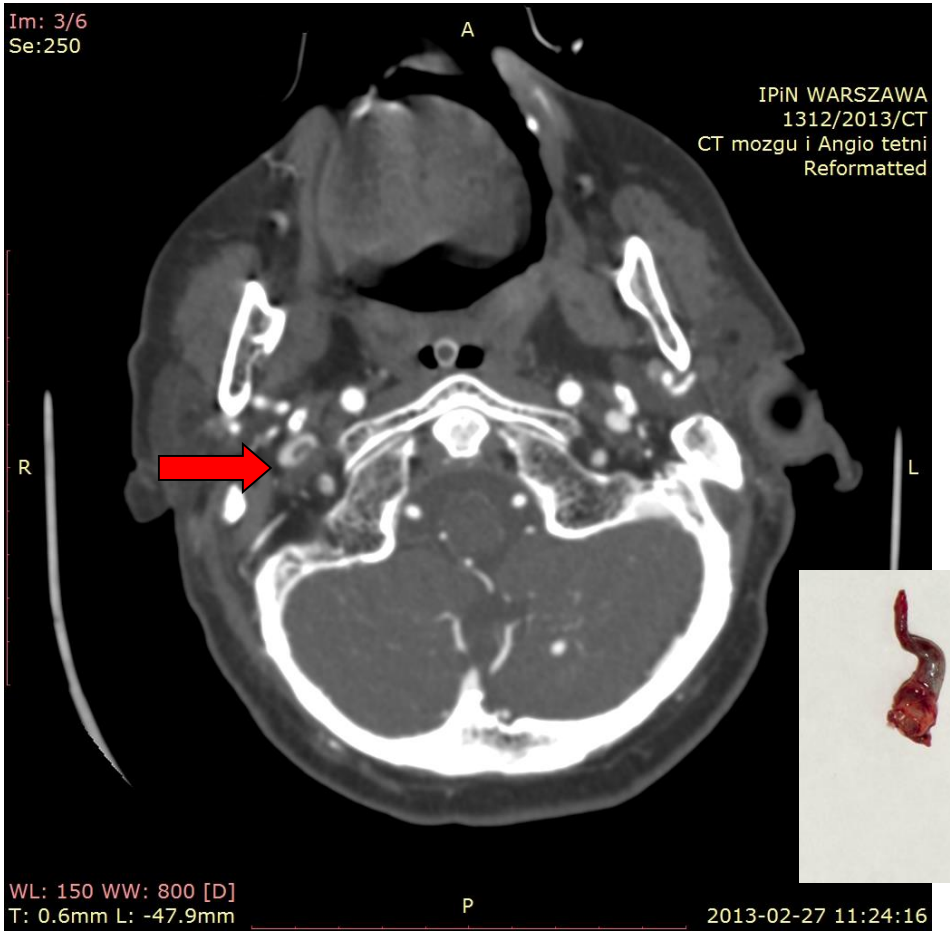
Pacjentk



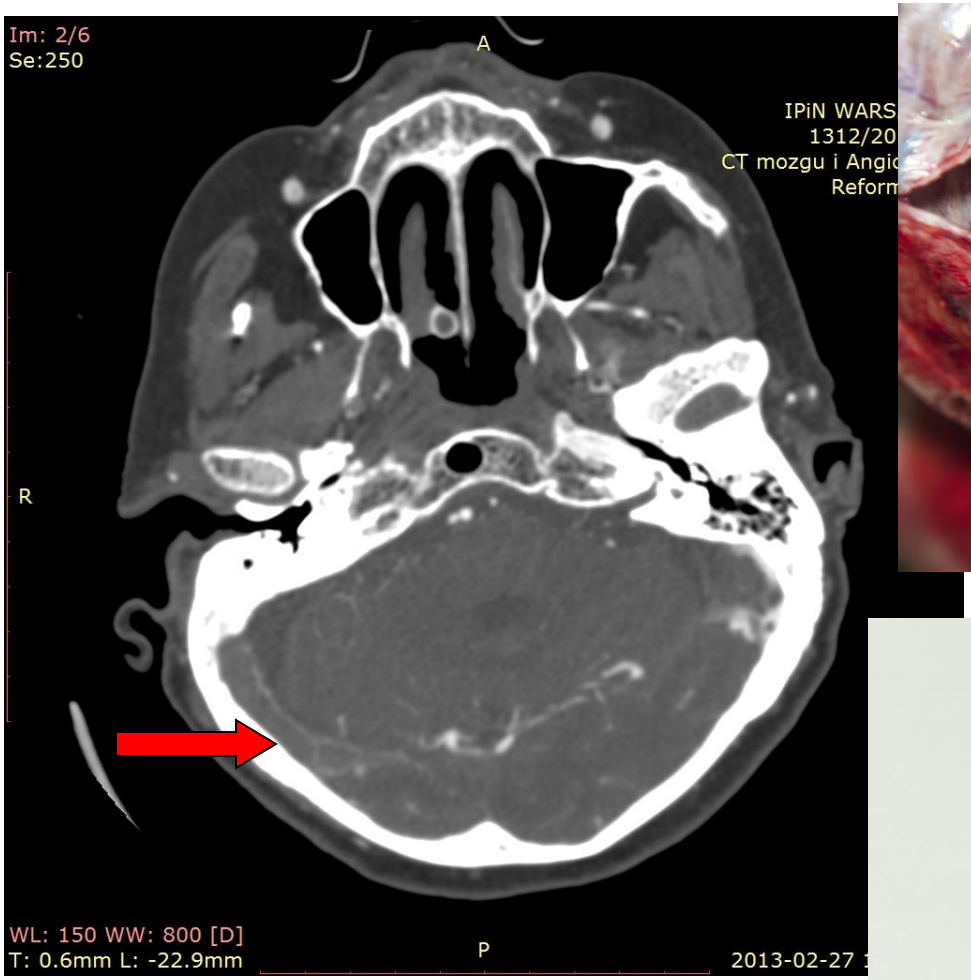


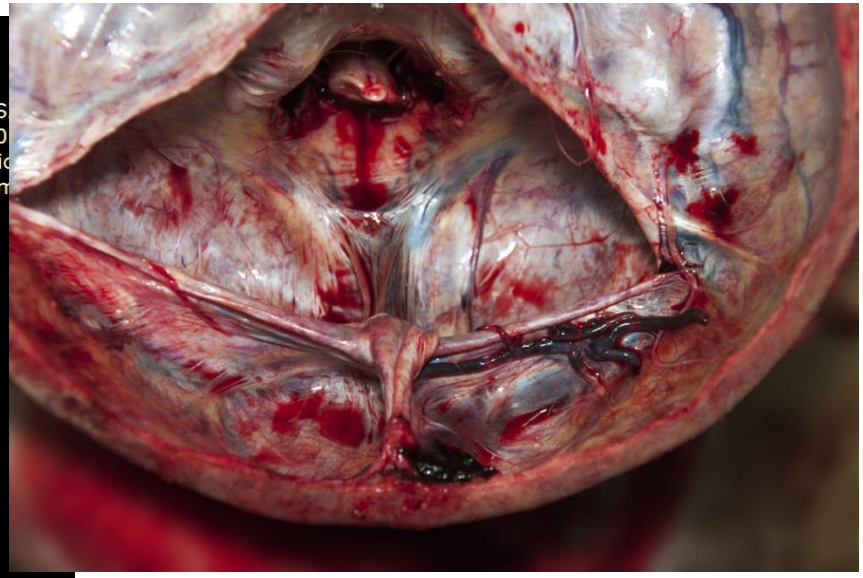


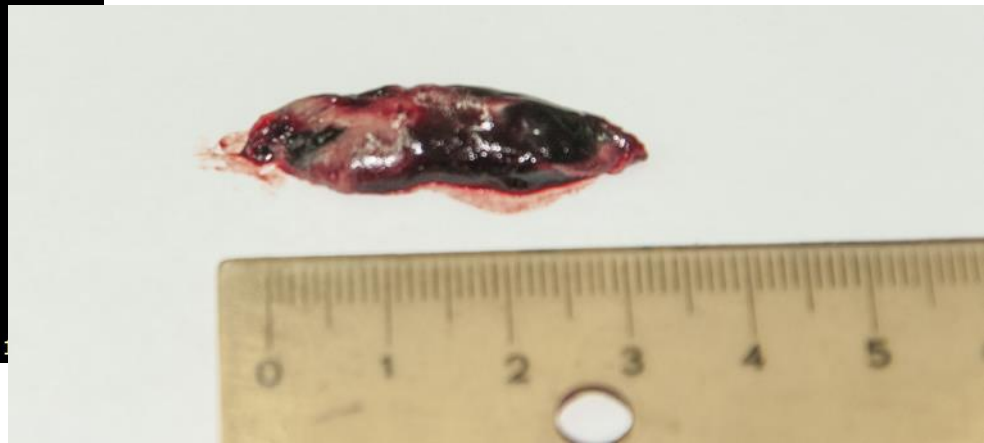
Pacjentka, lat 64...



Pacjentka, lat 64...







„Błędy nie wynikają z niewłaściwej interpretacji lecz są wynikiem braku należytej uwagi poświęconej zatokom mózgowym”…

Provenzale JM, Kranz PG. Dural sinus thrombosis: sources of error in image interpretation. AJR Am J Roentgenol. 2011 .

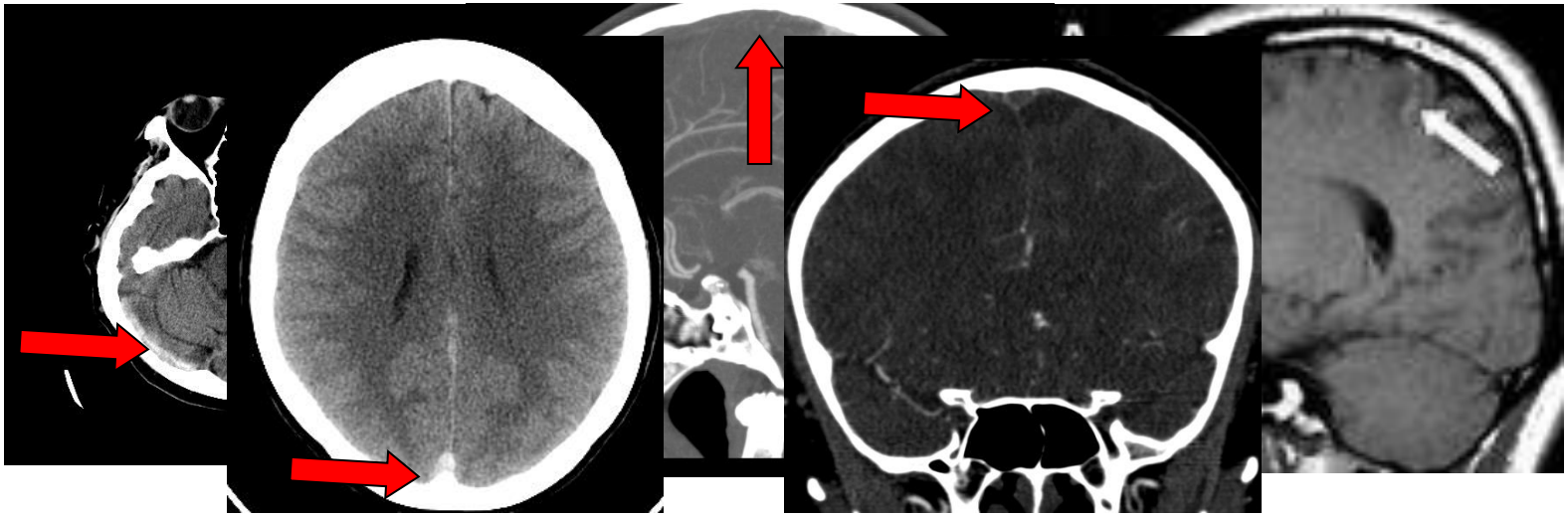
Przyczyny „braku uwagi”

- Patologia zlokalizowana na „krawędziach skanów” a nie w centralnej części
- SSS - na skrajnych skanach (szczyt głowy), „końcówka serii” – co zwykle jest pomijane, gdy nie ma podejrzenia zakrzepicy

Provenzale i wsp., 2011

Zakrzepica żylna – trudności diagnostyczne

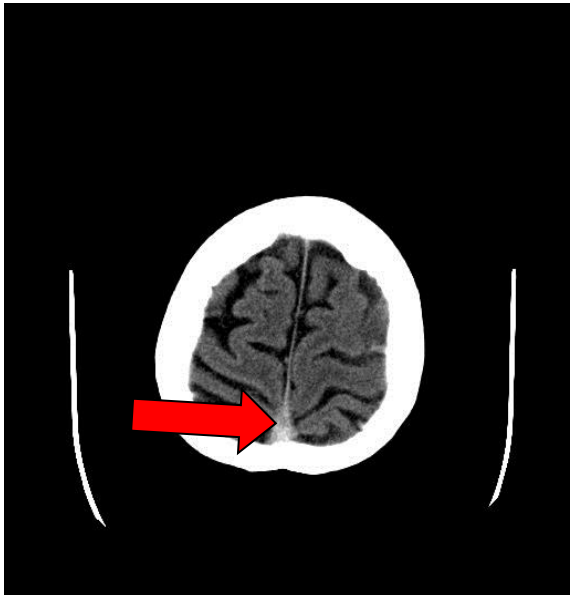
- Patologia zlokalizowana w skrajnych krawędziach skanu, a nie centralnie

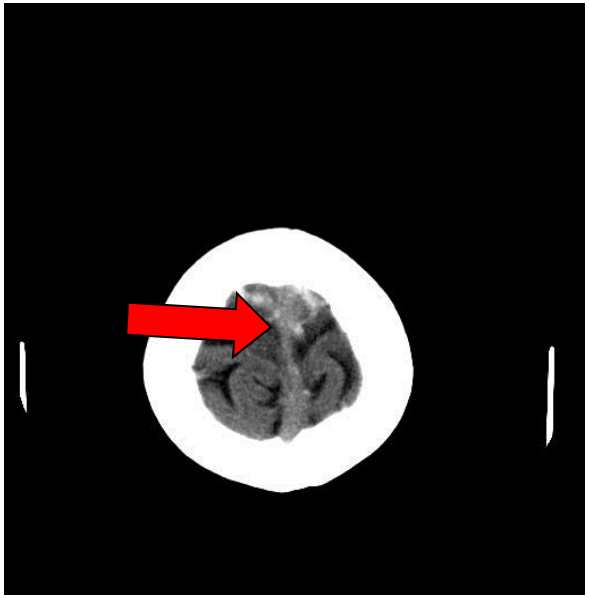


Tang PH, Chai J, Chan YH, Chng SM, Lim CC. Superior sagittal sinus thrombosis: subtle signs on neuroimaging. Ann Acad Med Singapore. 2008 May;37(5):397-401.

Zakrzepica żylna – trudności diagnostyczne

- Lokalizacja SSS jest jedną z ostatnich w serii oglądanych obrazów – często pomijaną!

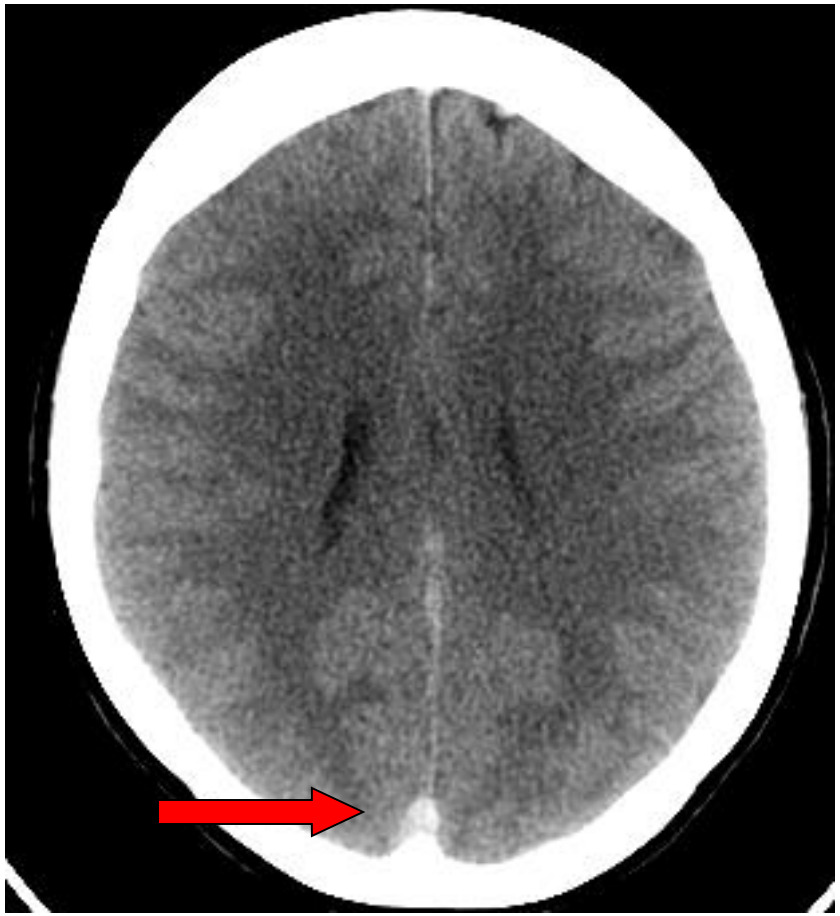


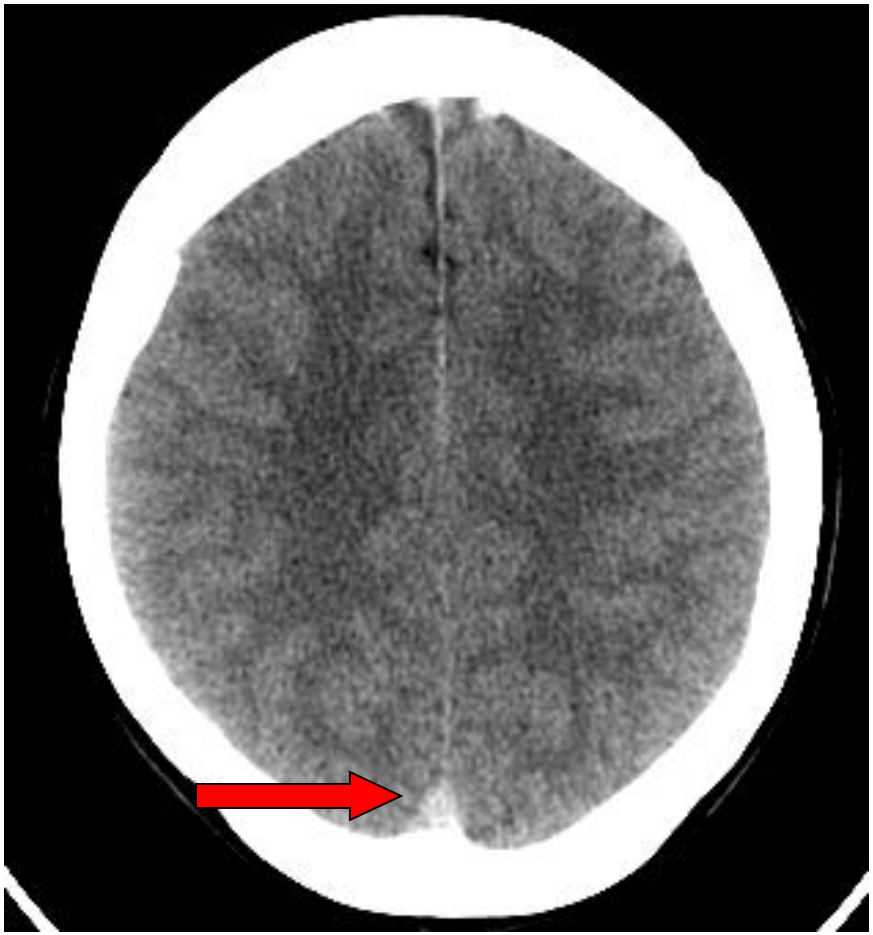


Provenzale JM(1), Kranz PG, AJR Am J Roentgenol. 2011 Jan;196(1):23-31. doi: 10.2214/AJR.10.5323. Dural sinus thrombosis: sources of error in image interpretation.

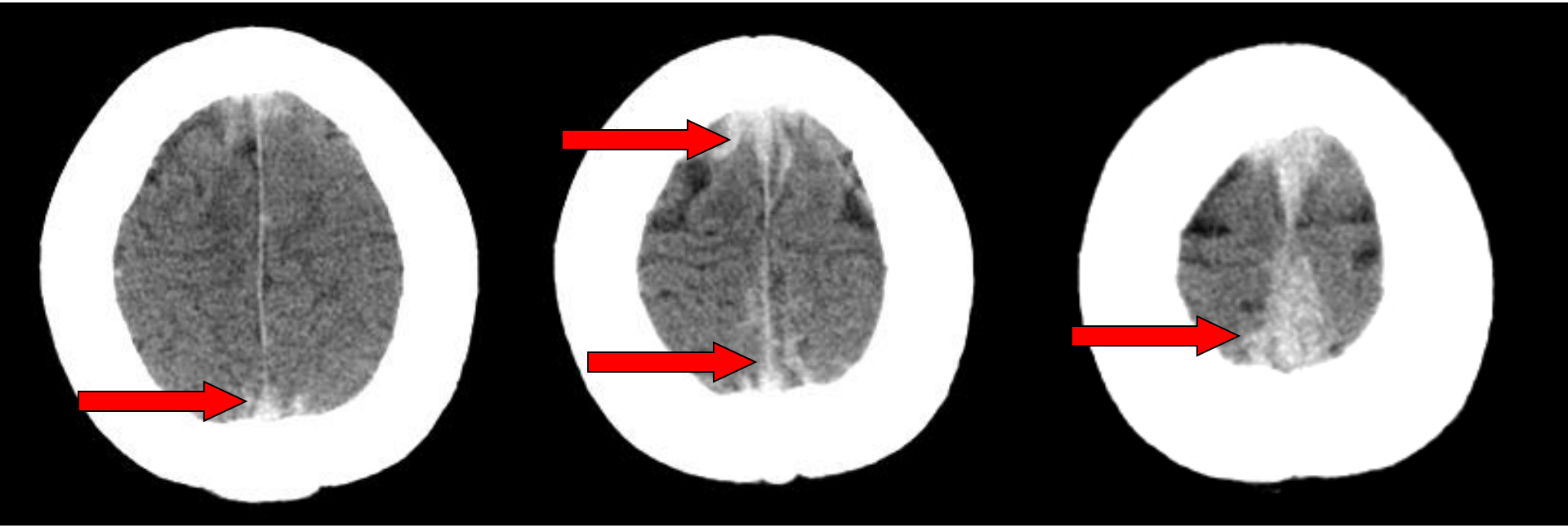
Oglądaj wszystkie zdjęcia/skany!

TK not so bad!





TK not so bad…



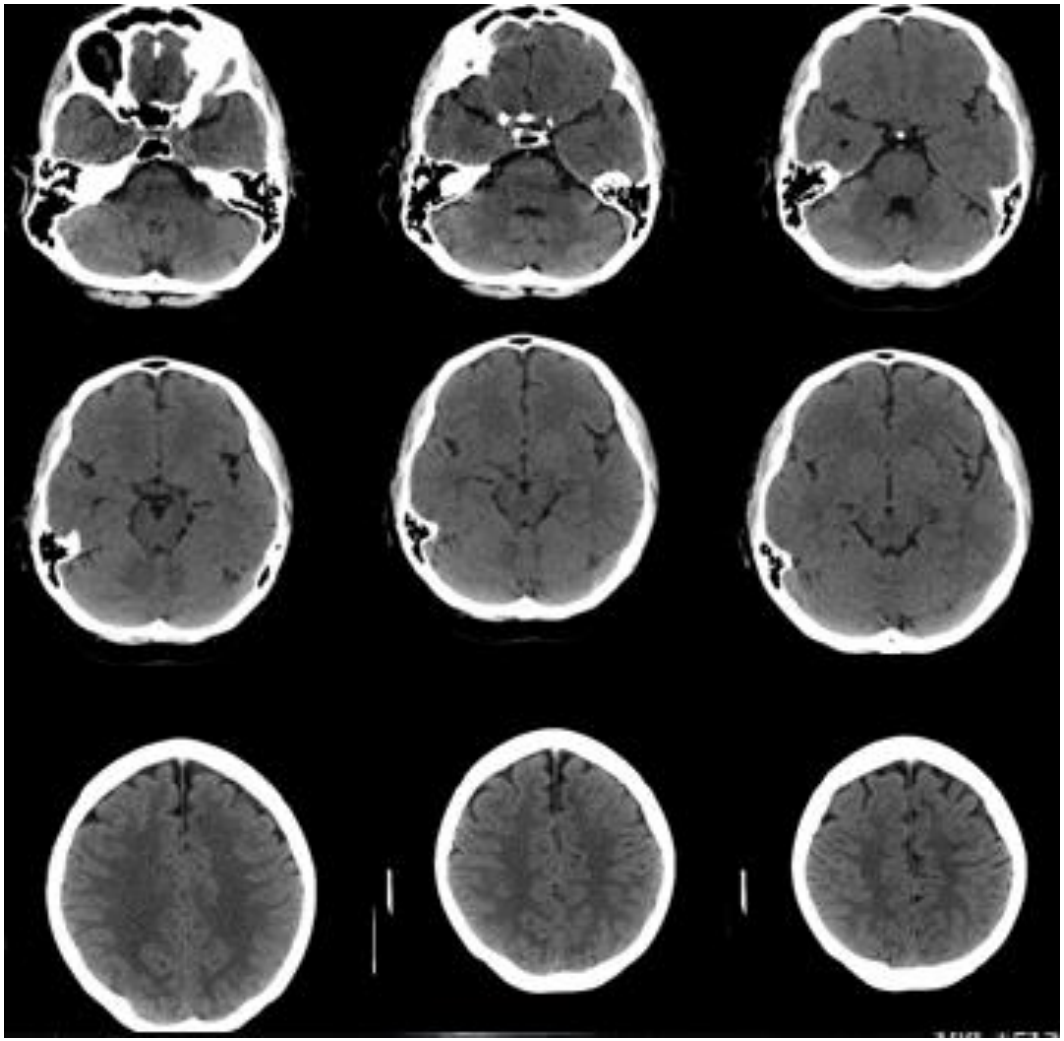
Pacjent lat 28, białaczka w wywiadzie, od kilku dni bóle głowy …

Pacjent lat 28…

- Wynik badania CT mózgu

Nie uwidoczniono zmian ogniskowych w strukturach mózgowia.
Układ komorowy bez przemieszczenia, prawidłowej szerokości.
Obraz przymózgowych przestrzeni płynowych bez nieprawidłowości. Wydano1 kliszę

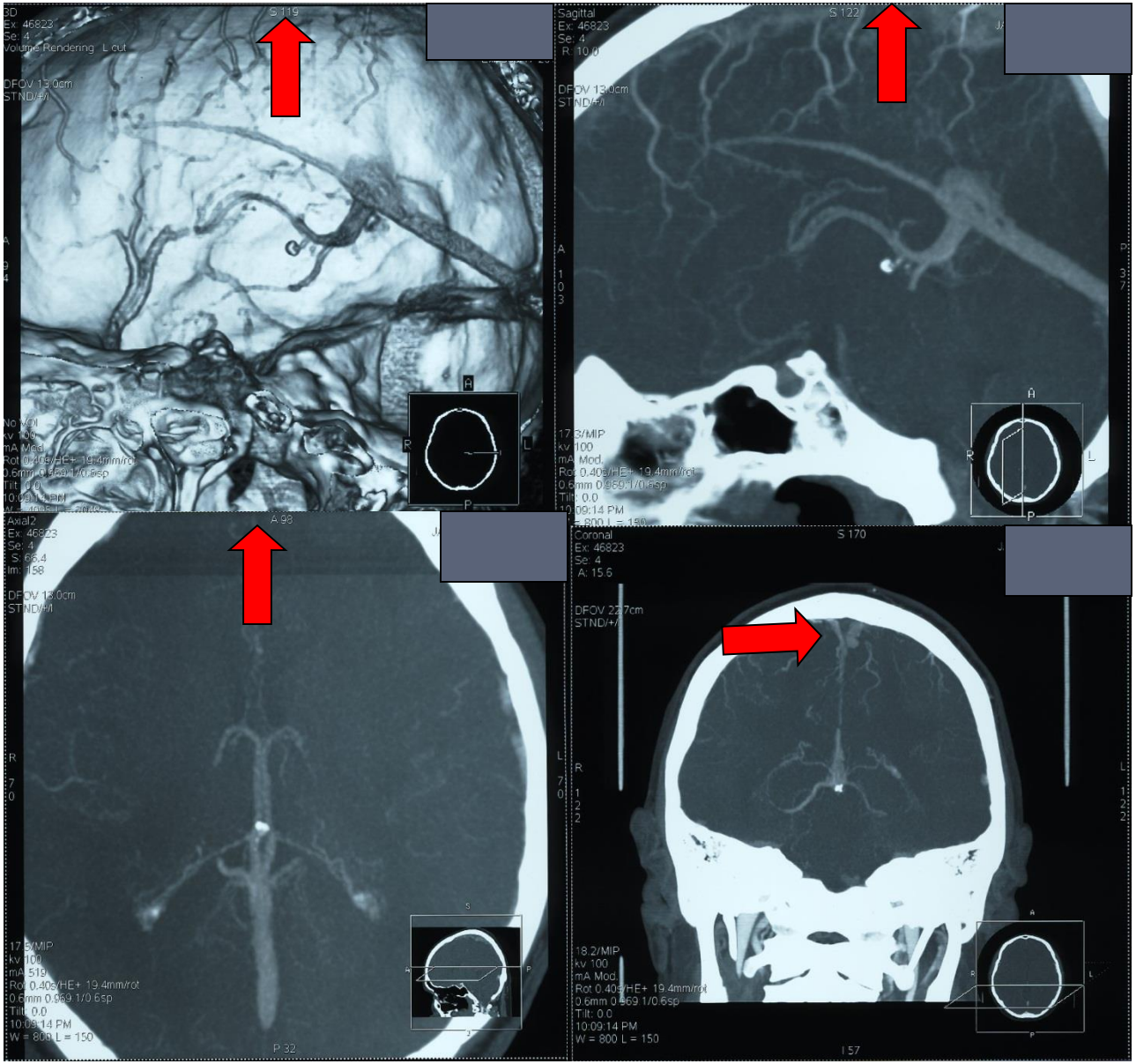
Pacjent lat 28, białaczka w wywiadzie...



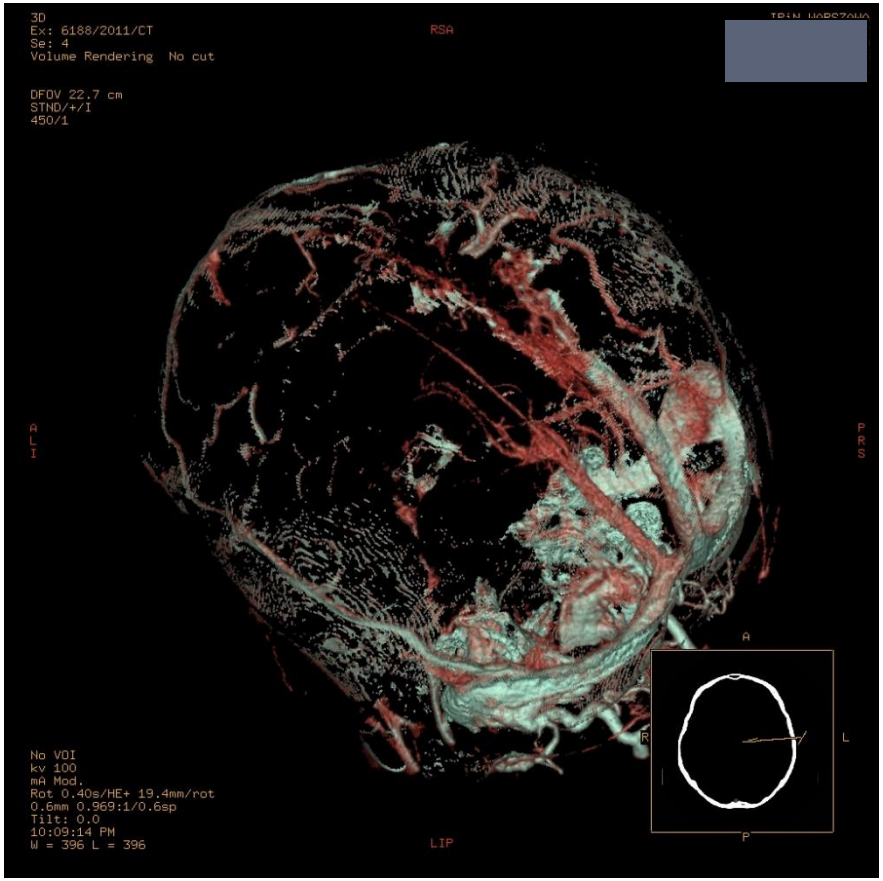
Pacjent lat 28, białaczka w wywiadzie…

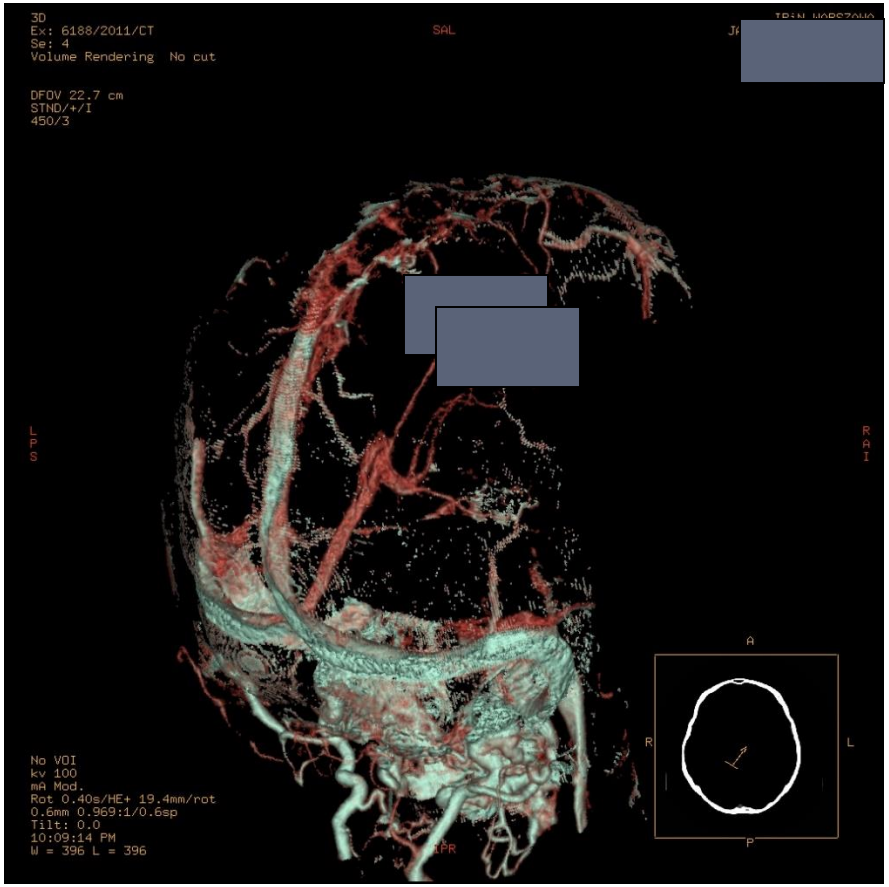
- CT Angio tętnic wewnątrzczaszkowych

- Badanie niediagnostyczne - kontrast obecny w żyłach i w zatokach żylnych mózgu, uwidocznione zatoki żylne (badanie o ograniczonej wartości diagnostycznej)- strzałkowa górna i dolna, prosta, poprzeczne, esowate bez cech niedrożności, żyły wewnętrzne bez cech niedrożności. Wydano 1 kliszę

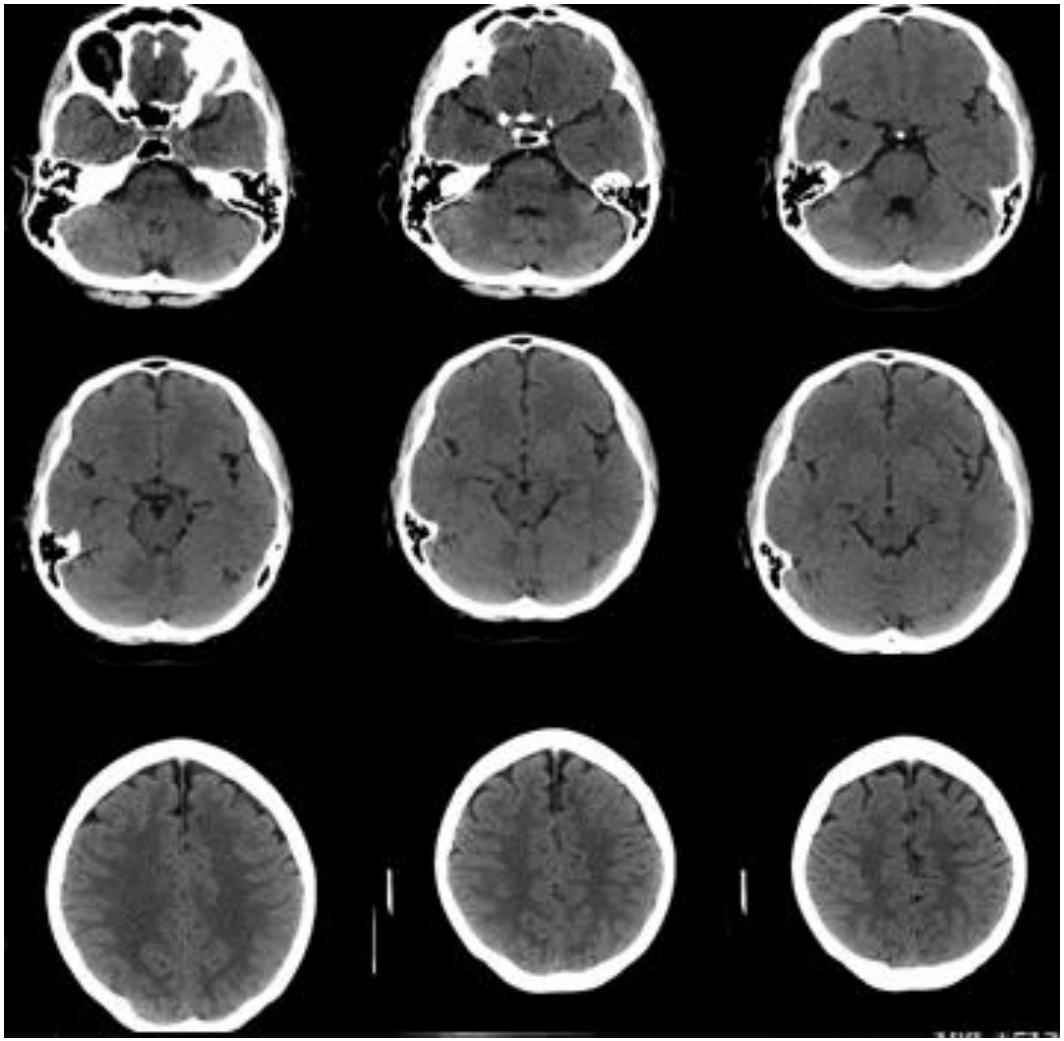

3D
Ex: 46823
Se: 4
Volume Rendering L cut
DFOV 13.0cm
STND/+/
S 119
Sagittal
Ex: 46823
Se: 4
R 10.0
DFOV 13.0cm
STND/+/
S 122
Axial2
Ex: 46823
Se: 4
S: 66.4
Im: 158
DFOV 13.0cm
STND/+/
A 98
P 32
Coronal
Ex: 46823
Se: 4
A: 15.6
DFOV 22.7cm
STND/+/
S 170
I 57
kv 100
mA Mod.
Rot 0.405/HE+ 19.4mm/rot
0.6mm 0.969:1/0.6sp
Tilt: 0.0
10:09:14 PM
W = 800 L = 150

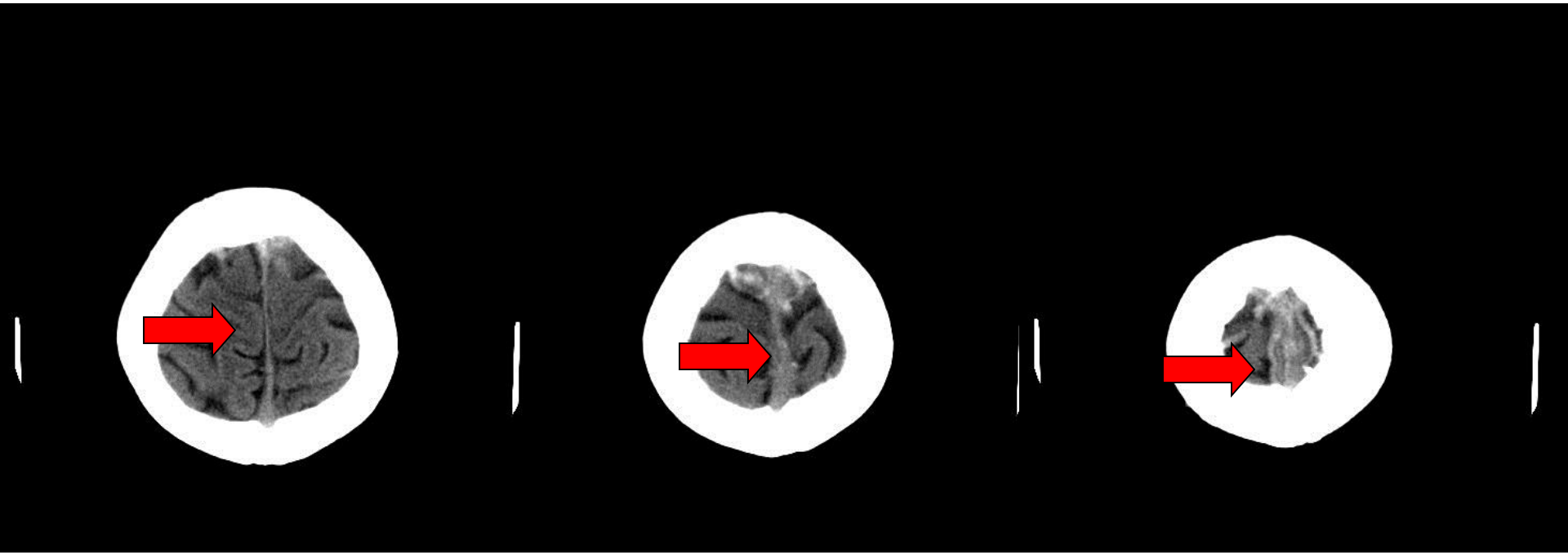
Pacjent lat 28, z białaczką w wywiadzie…





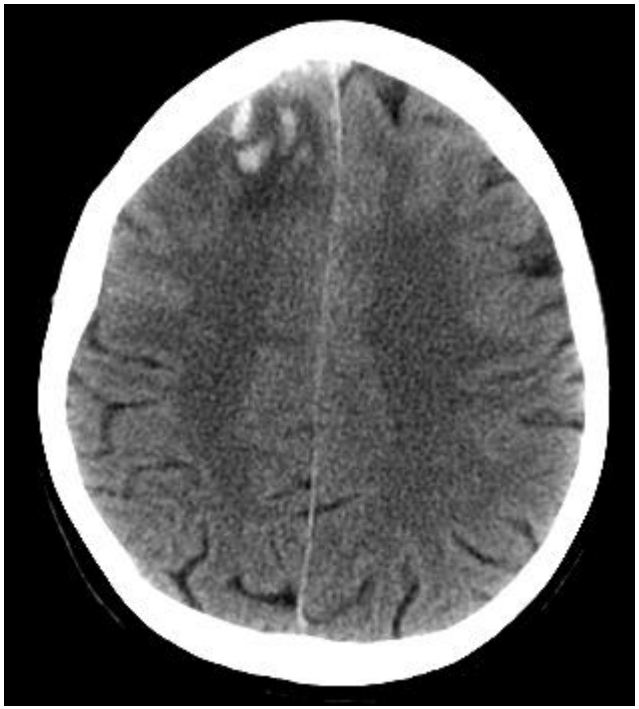
Pacjent lat 28, z białaczką w wywiadzie...



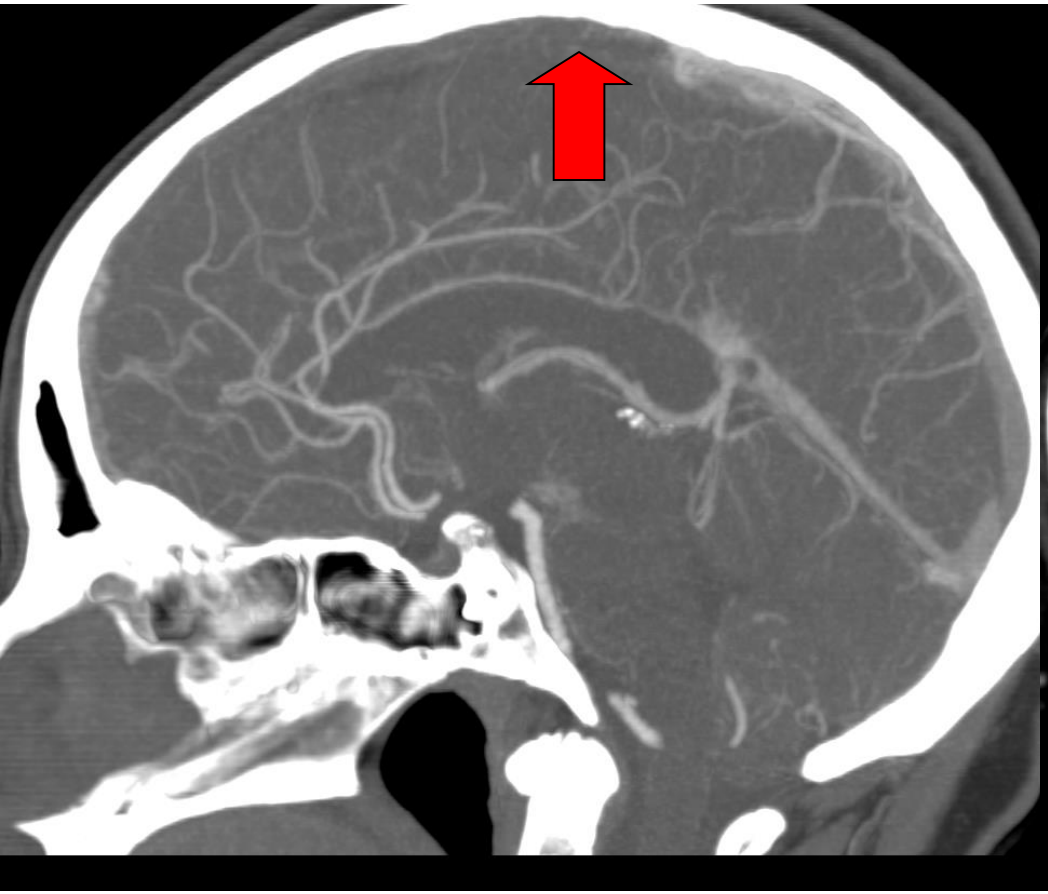


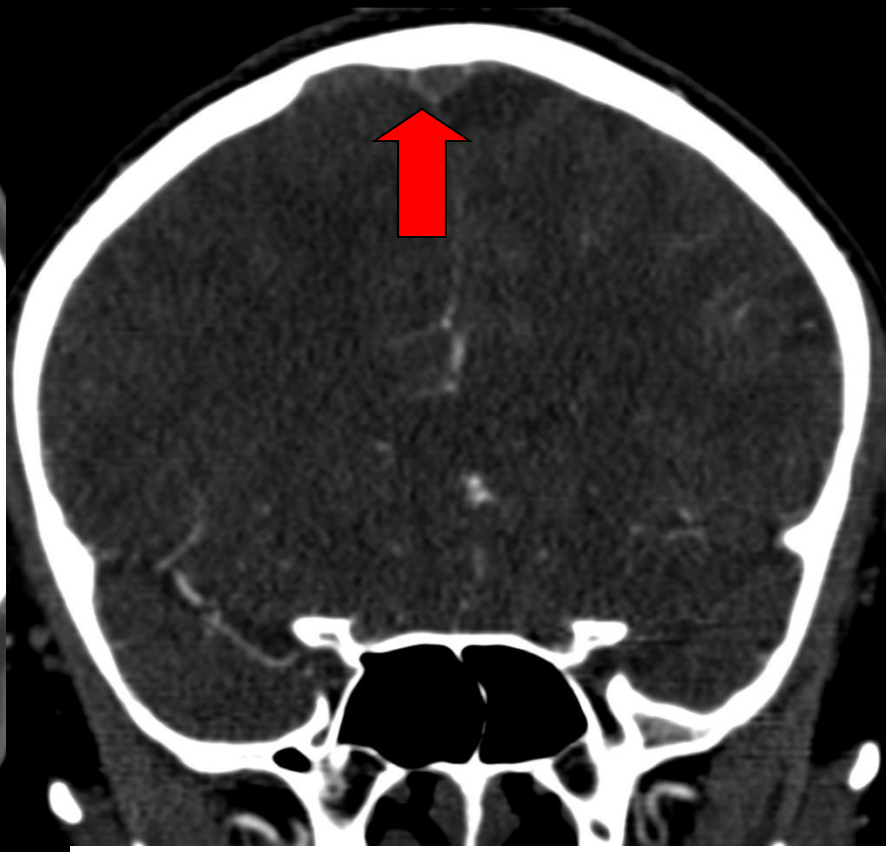
Przypadek z ogniskiem krwotocznym

kobieta, lat 23, przyjęta w stanie padaczkowym

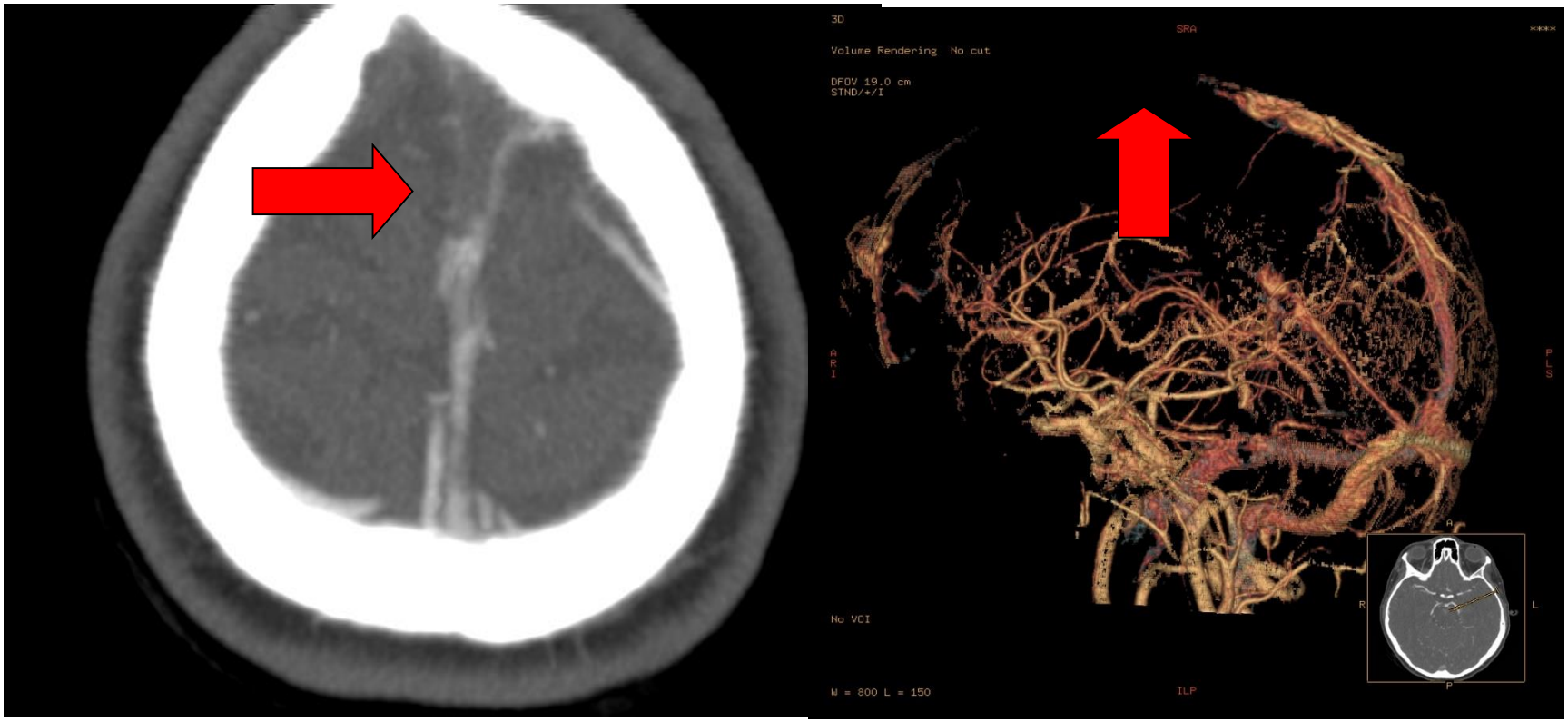


kobieta, lat 23, przyjęta w stanie padaczkowym





kobieta, lat 23, przyjęta w stanie padaczkowym



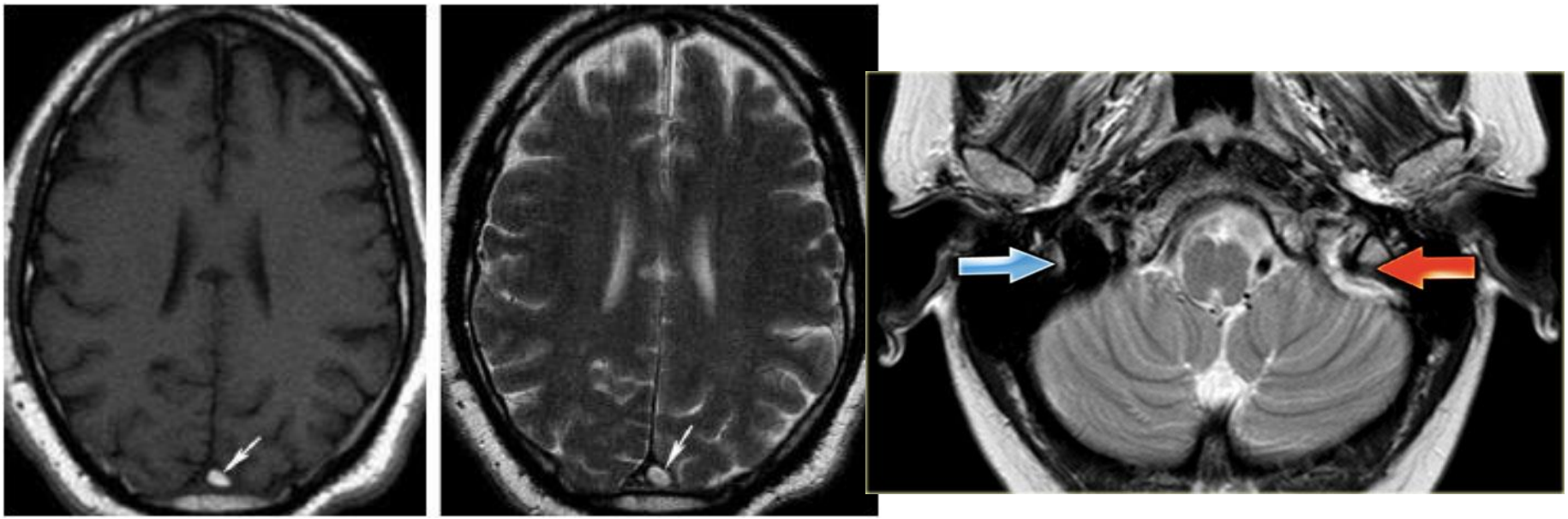
Pułapka #4

Mamy przecież MRI!

Ale…

Zakrzepica naczyń żylnych mózgu:
diagnostyka radiologiczna

- MR – badanie bardziej czułe niż TK w każdej z faz trwania choroby
- Diagnostyka trudna w pierwszych dniach, bo świeży zakrzep jest hipointensywny w T2 i isointensywny w T1 .
- Po 4 dniach staje się hiperintensywny w T1 i w T2

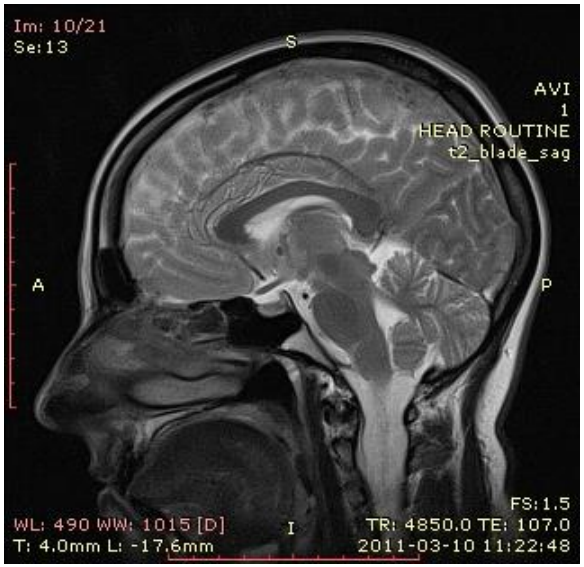


Connor i wsp., 2002

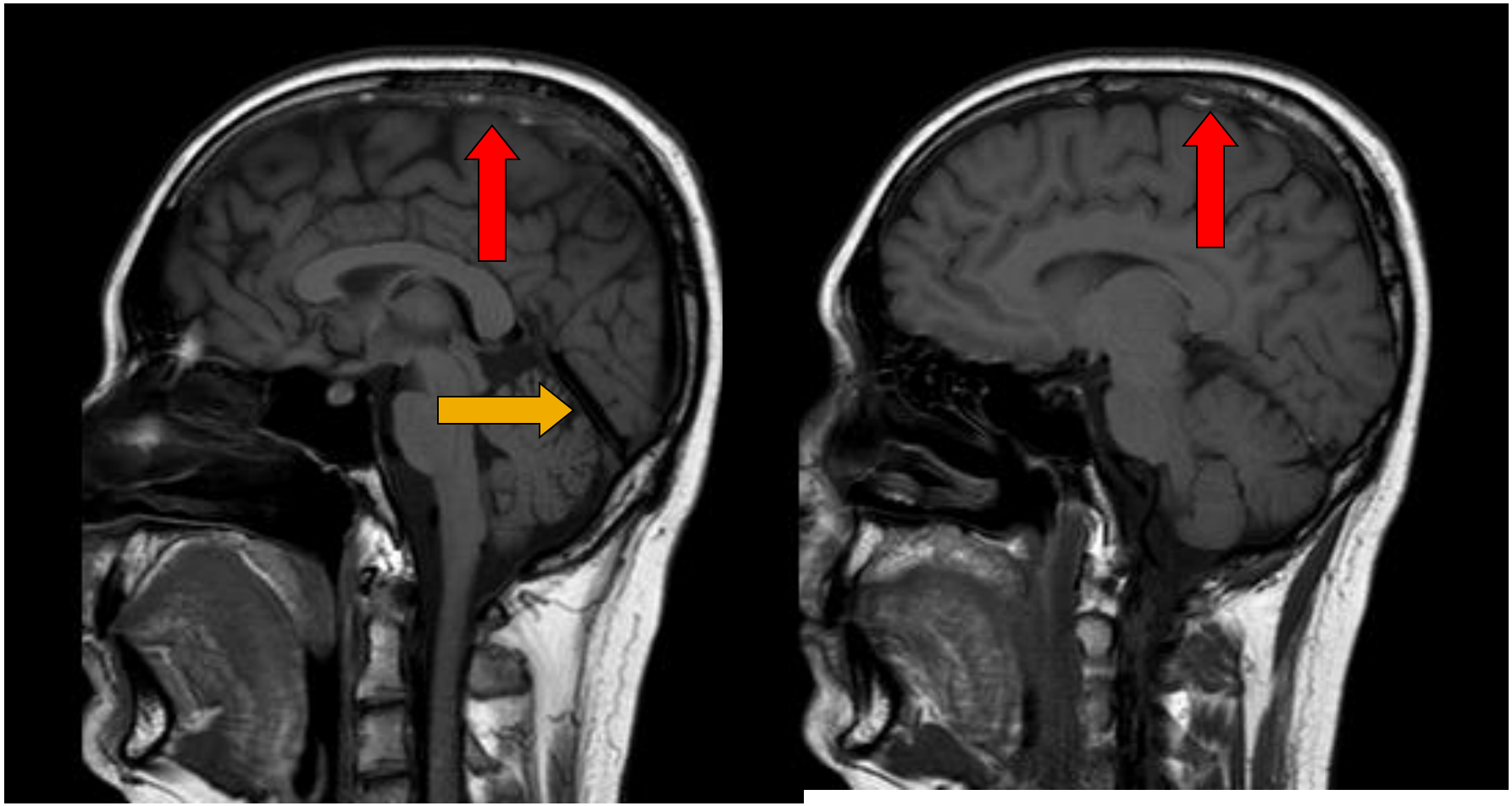
Pułapka #4 – MRI a CVT

- Zmienny obraz densyjności niedrożnej żyły/zatoki w obrazie MRI w zależności od czasu jaki mija od początku zachorowania

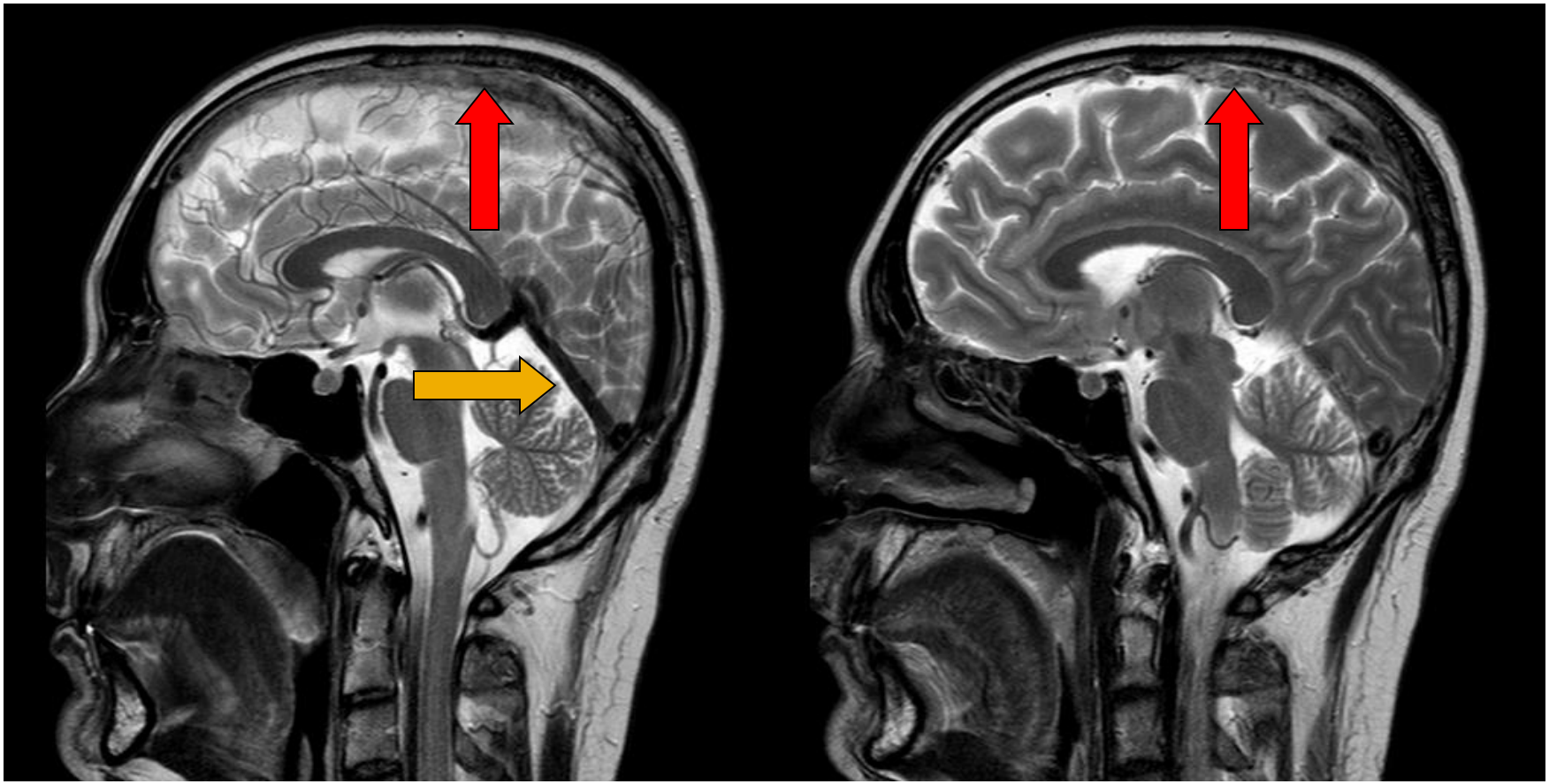
	T1	T2
0-5 d	⟷	↓
6-15 d	↑	↑
Powyżej 2 tyg	⟷	⟷ ↑



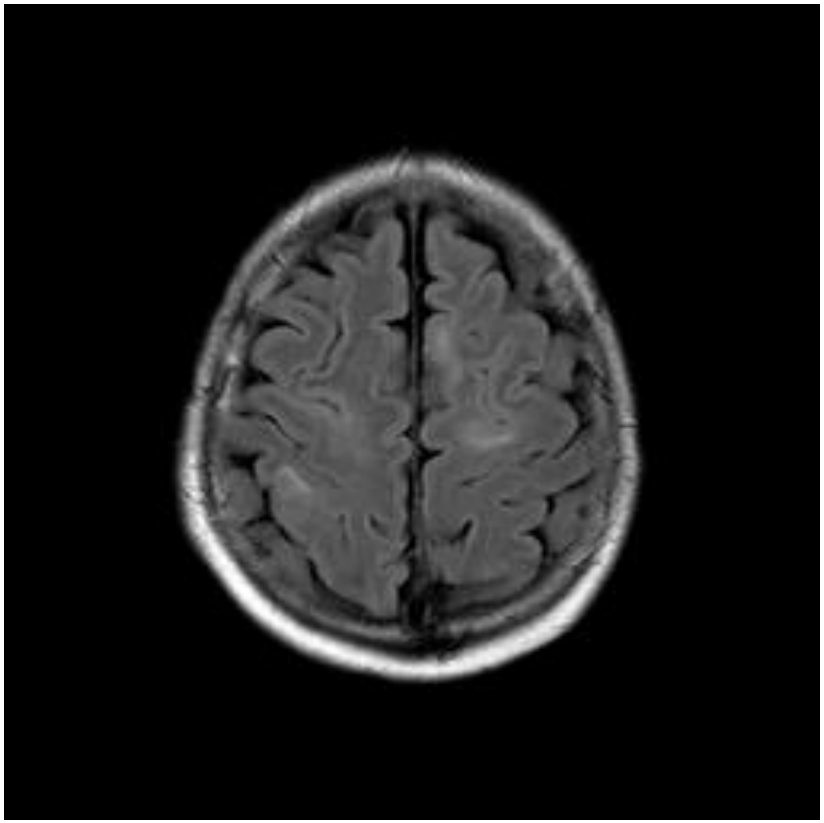
MRI T1

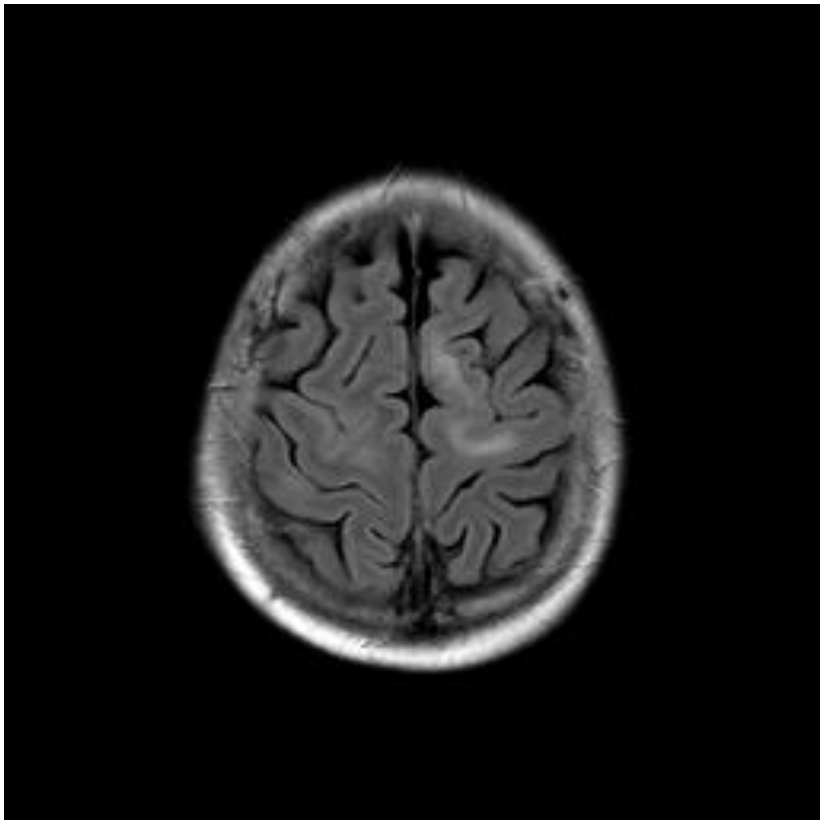


MR T2

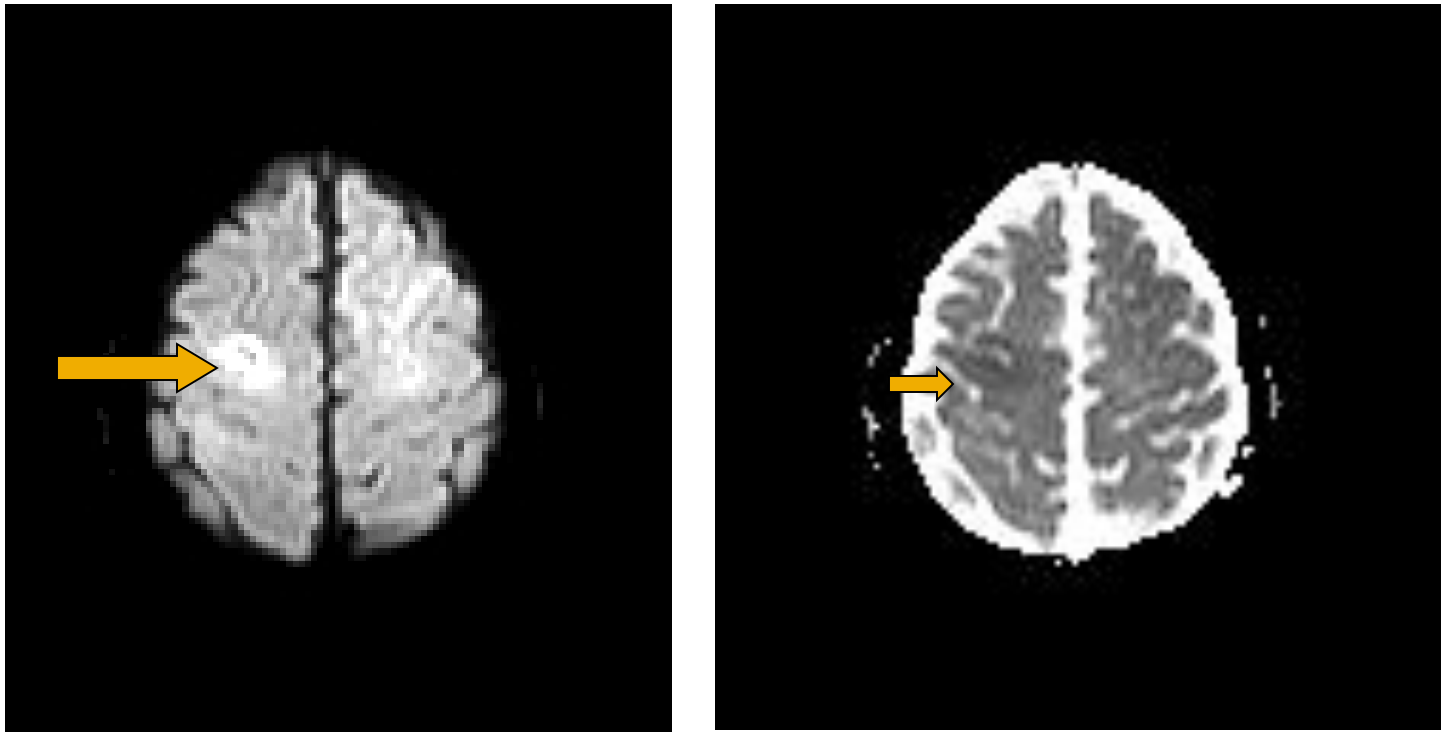


MRI-FLAIR



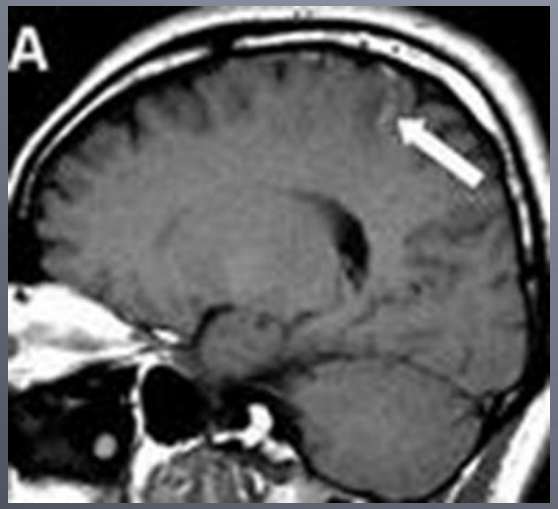


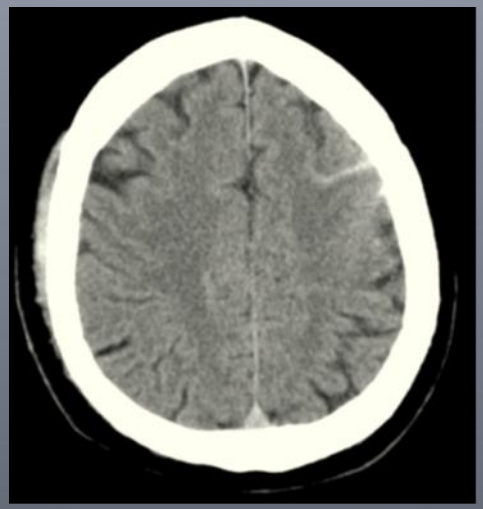
DWI-ADC



Izolowana zakrzepica żył korowych

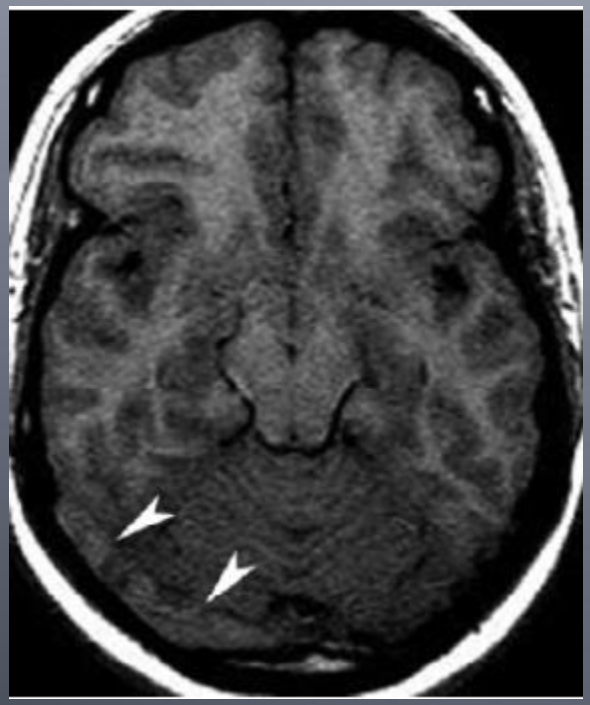
Znowu pułapka !



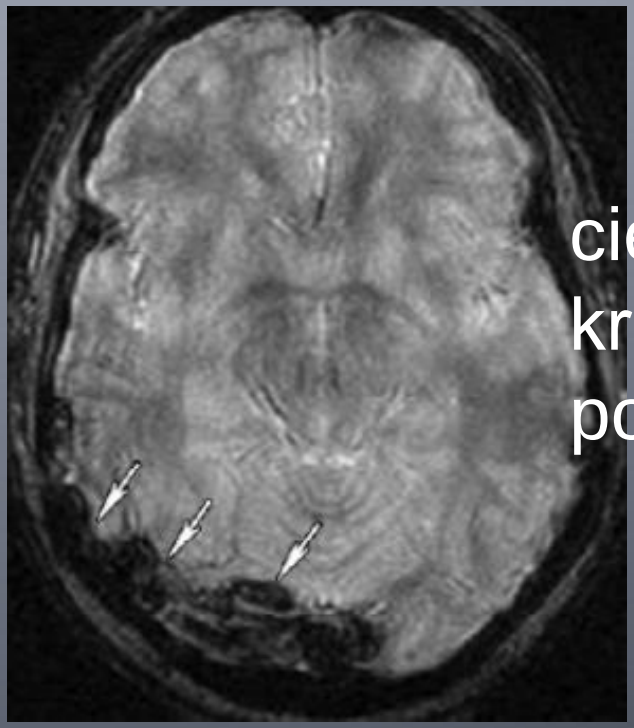


Niejednoznaczny obraz zatoki

T2*, GE - Magnetic susceptibility effect



T1 MR

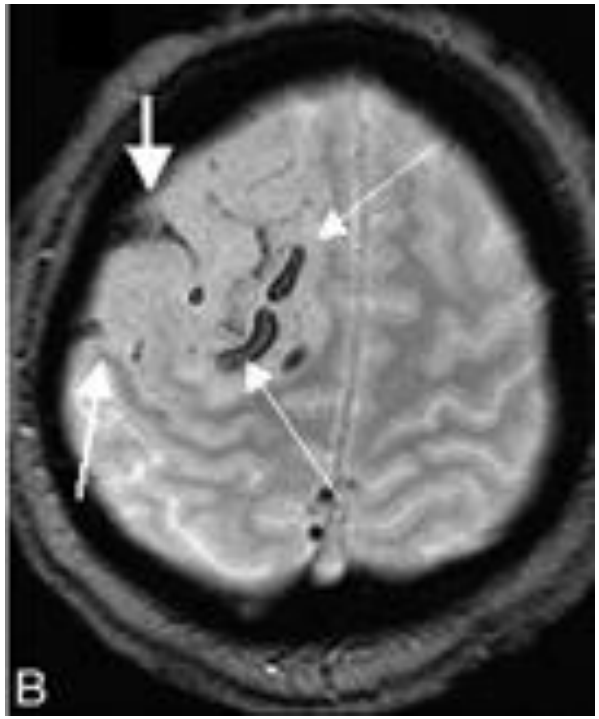


T2* MR

ciemne,
kręte,
poszerzone

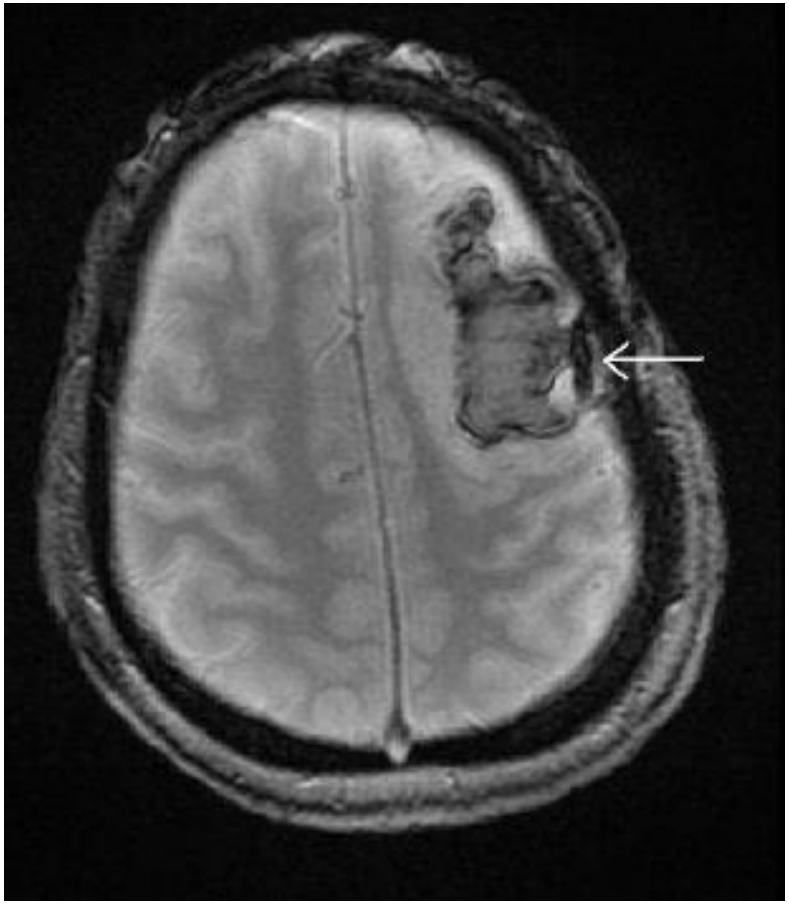
Niejednoznaczny obraz zatoki

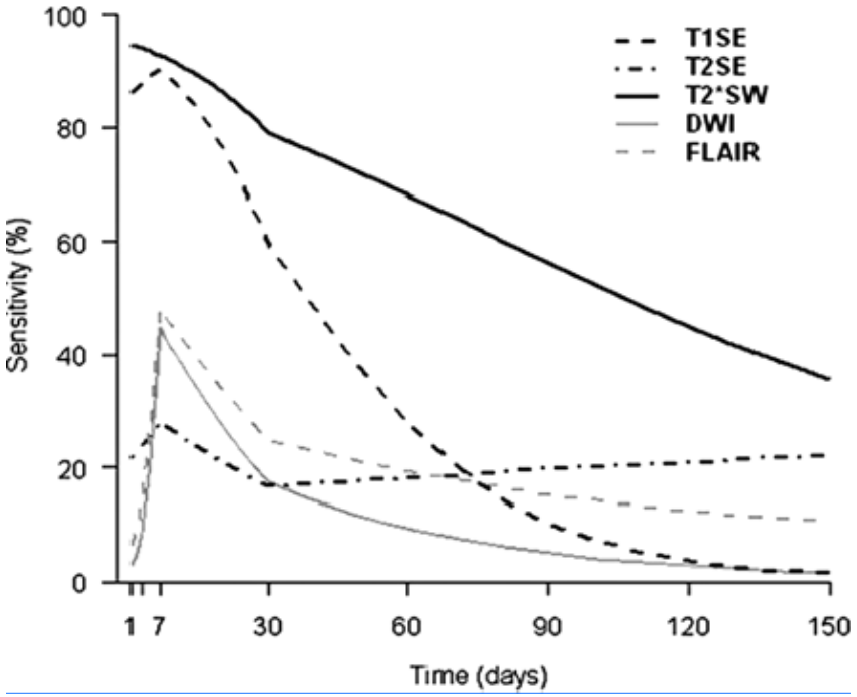
- MR T2 * - metoda bardziej czuła



Idbaih i wsp., 2006

T2*MR– najczulsze w diagnostyce



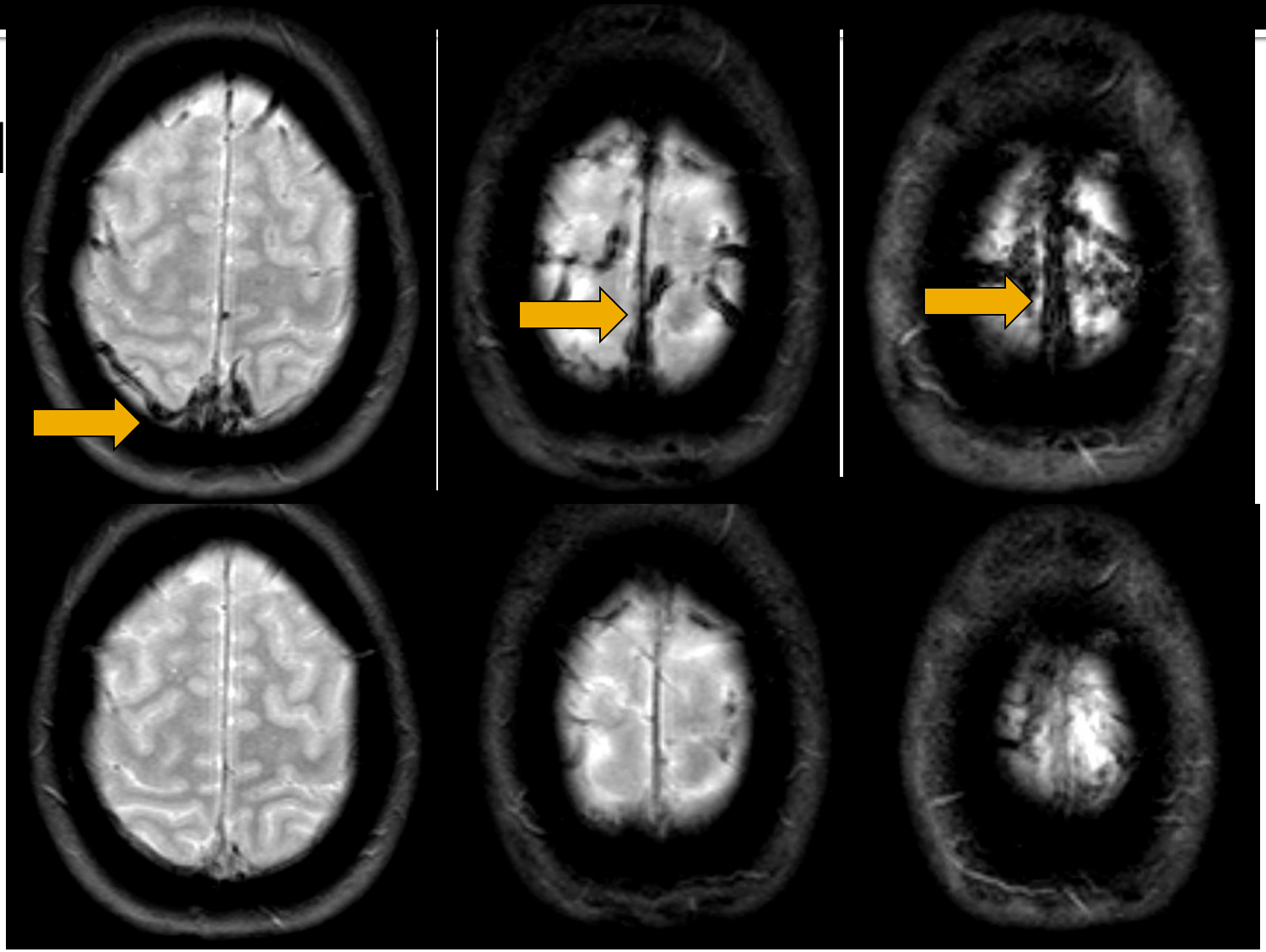


Idbaih A et al Stroke 2006

Magnetic susceptibility effect

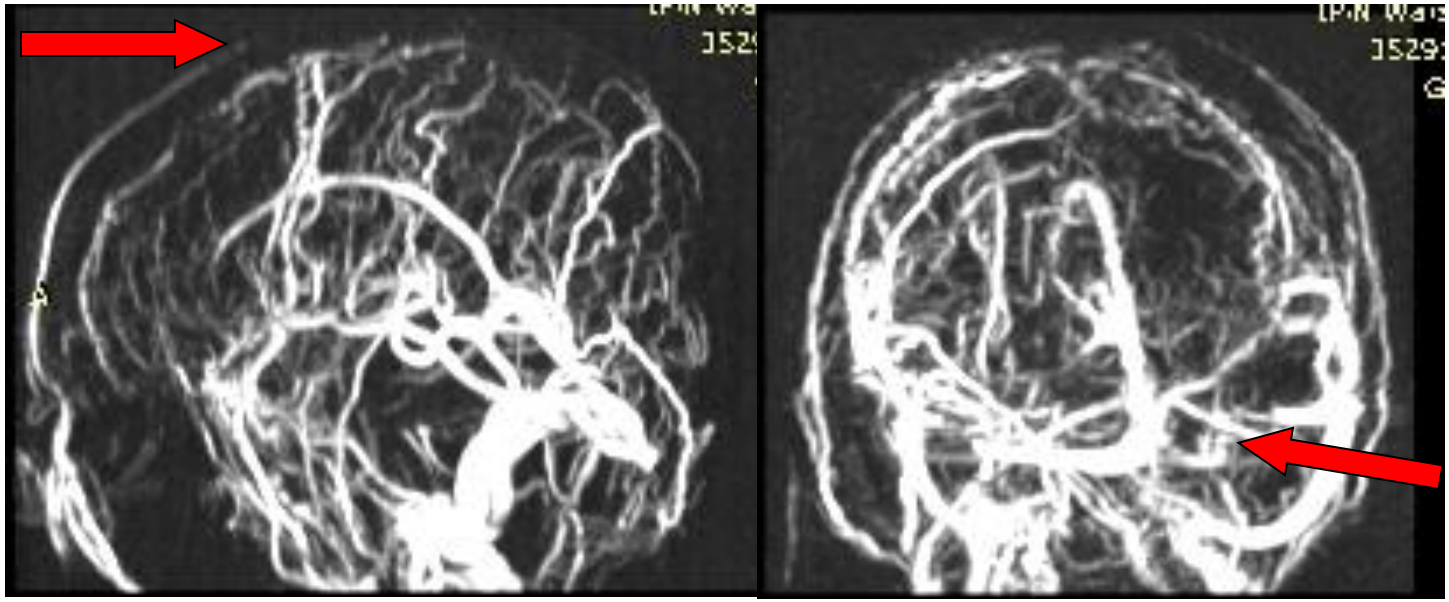
- Przed

Po:



Zakrzepica naczyń żylnych mózgu:
diagnostyka radiologiczna

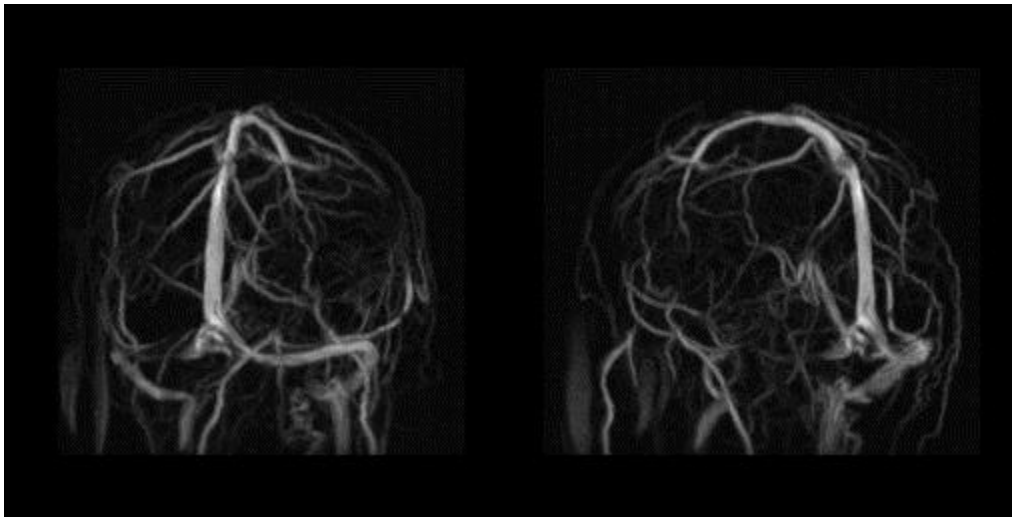
- Angiografia RM



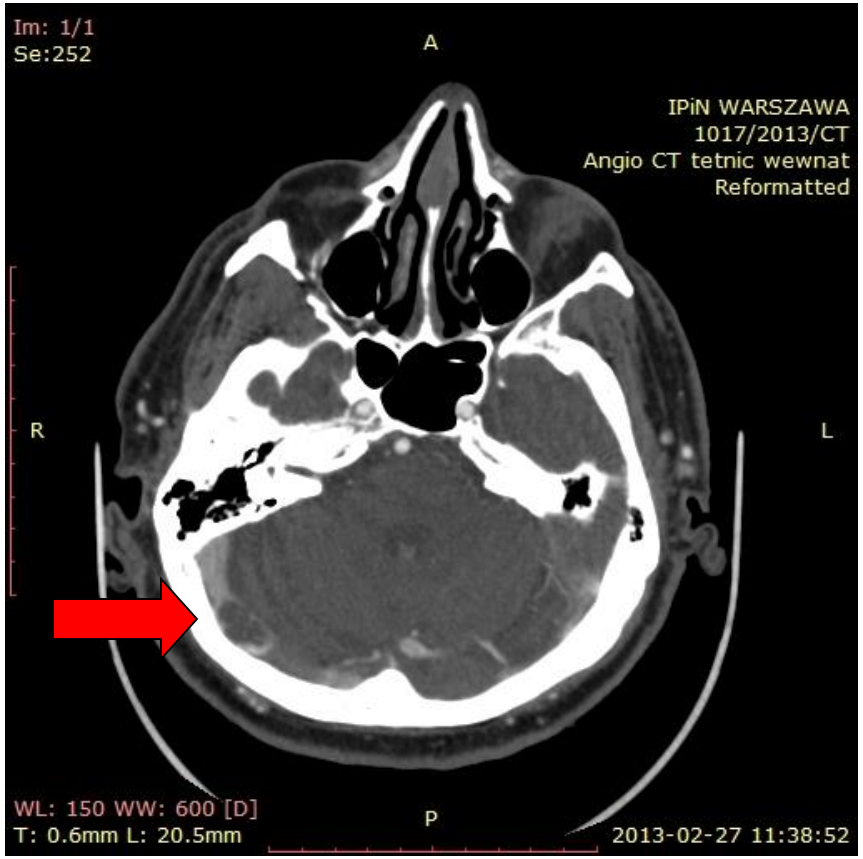
Pułapki kolejne...

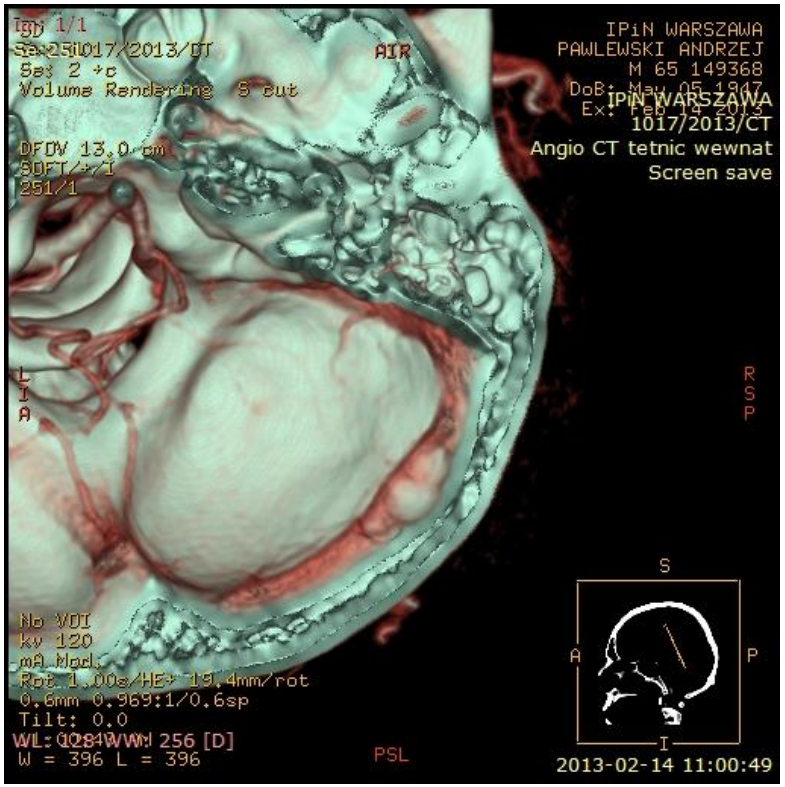
Hipoplazja zatok poprzecznych

- Hipoplazja zatok poprzecznych (ok.50% w badaniu z użyciem klasycznej angiografii),
- brak lub ubytek zatoki poprzecznej w 20%, szersza po stronie prawej - ok.30%
- Odcinkowy brak sygnału przepływu w zatoce poprzecznej (flow gap)



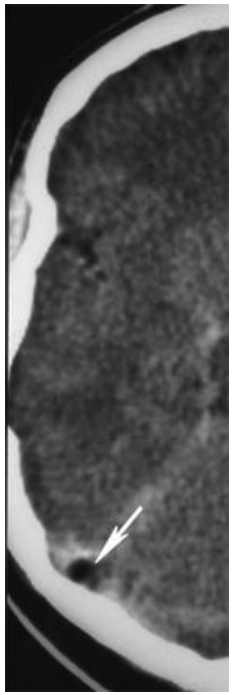
Ziarnistości pajęczynówki

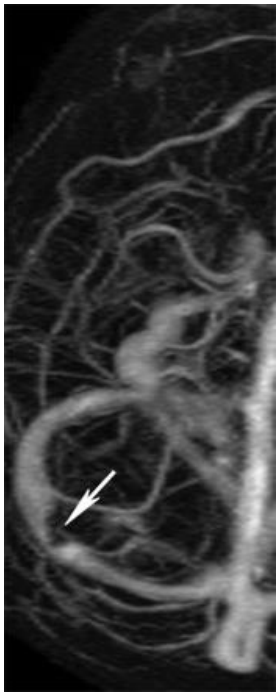




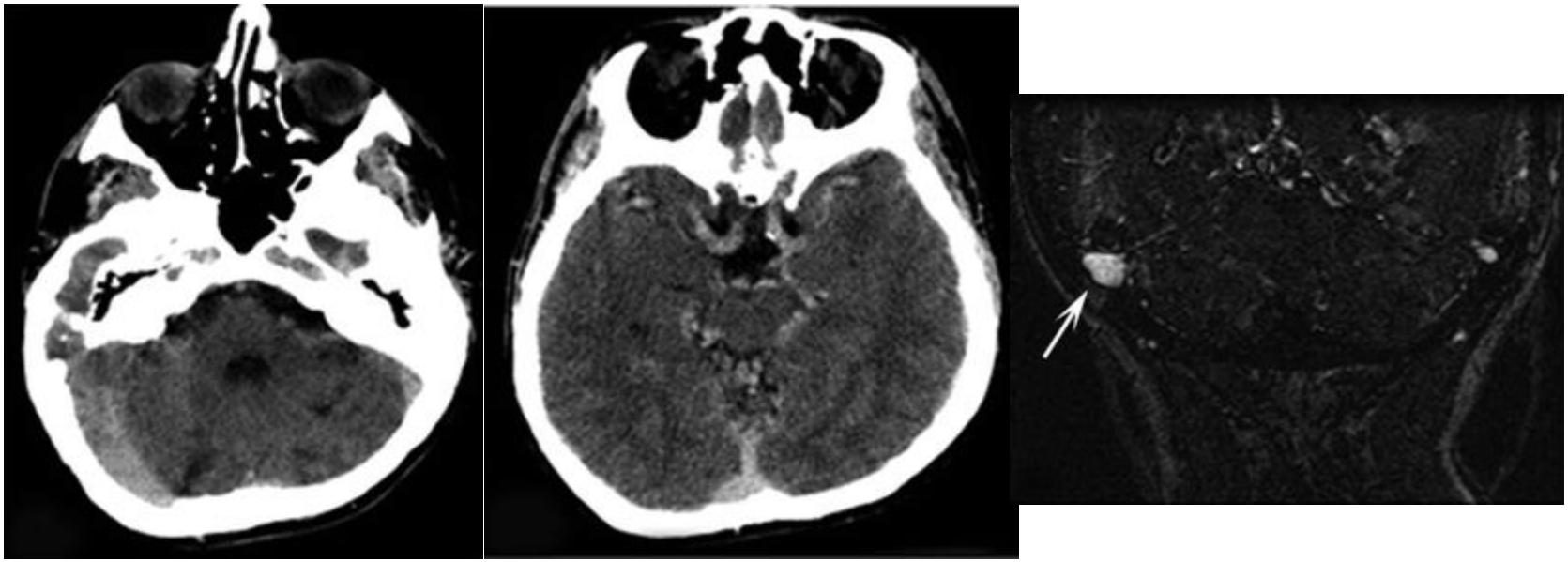
Ziarnistości pajęczynówki

- Obecność ziarnistości pajęczynówki (najczęściej boczna cz. zatoki poprzecznej) – wyniki fałszywie dodatnie





- Fałszywie dodatni obraz zatoki poprzecznej lewej u chorego z czerwienicą prawdziwą, lat 55



I jeszcze...

Risk Factors for Cerebral Venous Thrombosis

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Suzanne C. Cannegieter, MD, PhD[3] Jonathan M. Coutinho, MD, PhD[1]

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Semin Thromb Hemost

Abstract

Cerebral venous thrombosis (CVT) is a rare thrombotic disorder involving the cerebral veins and dural sinuses. In contrast to more common sites of venous thromboembolism (VTE), such as the legs and lungs, CVT mainly affects young adults and children, and women are affected three times more often than men. Although presenting symptoms are variable, headache is usually the first symptom, often in combination with focal neurologic deficits and epileptic seizures. The primary therapy for CVT consists of heparin followed by oral anticoagulation for at least 3 to 6 months. The mortality in the acute phase is 5 to 10% and a substantial proportion of survivors suffer from long-term disabilities. A large number of risk factors have been linked to CVT, although the scientific evidence for an association varies considerably between risk factors. Some risk factors, such as hereditary thrombophilia, correspond with risk factors for more common sites of VTE, whereas others, such as head trauma, are specific to CVT. In most patients, at least one risk factor can be identified. In this review, we provide an overview of the risk factors for CVT.

Keywords

- cerebral venous thrombosis
- sinus thrombosis
- risk factors

Silvis i wsp, Semin Thromb Hemost, 2016

Risk factor	Prevalence[a]	Risk factor for DVT/PE?
Sex-specific risk factors		
Oral contraceptives	54 to 71%[b]	Yes
Pregnancy and puerperium	11 to 59%b	Yes
Hormone replacement therapy	4%[b]	Yes
Hereditary thrombophilia	34 to 41%	
Infections	8 to 11%	No
Obesity	23%	Yes

Silvis i wsp, Semin Thromb Hemost, 2016

Czynniki ryzyka CVT

Najczęstsze przyczyny:

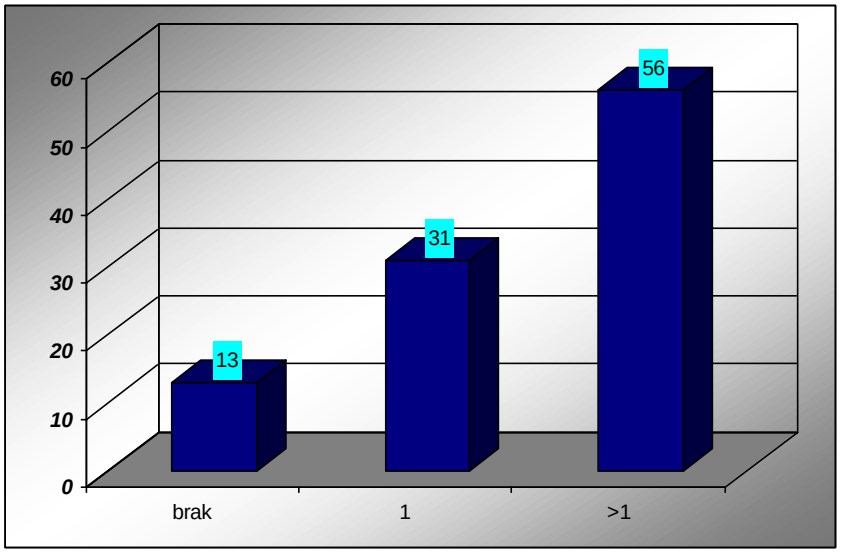
- doustna antykoncepcja,
- okres ciąży/ połogu,
- urazy, zabiegi OUN,
- infekcje

Doustna antykoncepcja ≈22-razy większe ryzyko CVT
(Ryzyko jest wyższe przy współistnieniu wrodzonej trombofilii).

Stosowanie pierścieni dopochwowych - **6.5-↑ryzyka CVT.**

Ferro, ICSVT, 2004, Lidegaard,2012

Czynniki ryzyka CVT

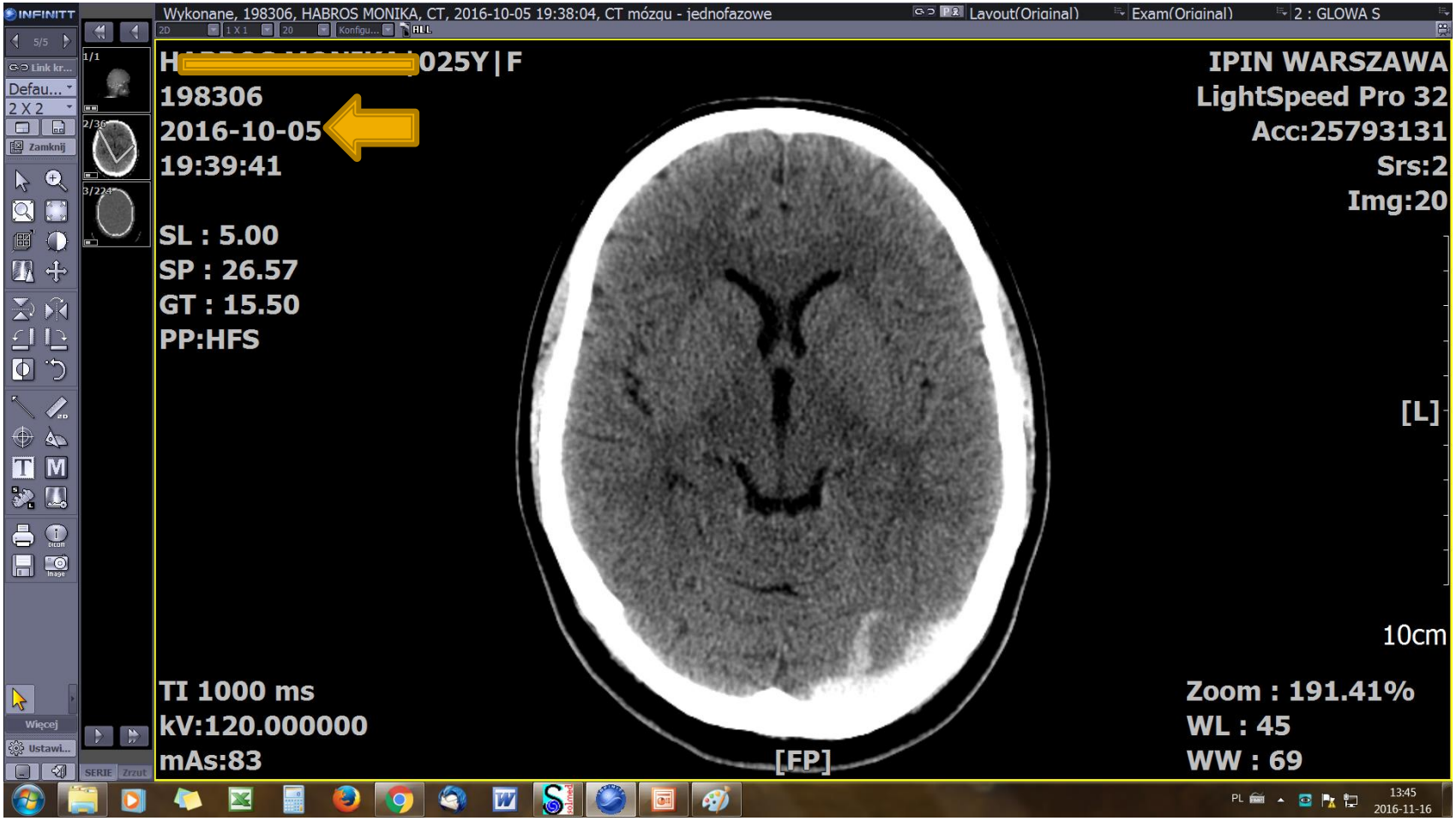


CVT może mieć etiologię wieloczynnikową! – każdy pacjent wymaga wnikliwej diagnostyki i badania w kierunku trombofilii wrodzonych!

Ferro, 2004

Przy podejrzeniu zakrzepicy konieczna jest diagnostyka w kierunku trombofilii

D-dimery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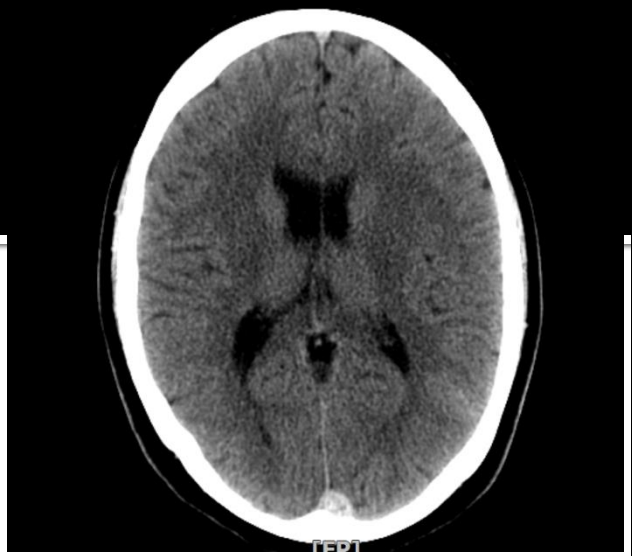

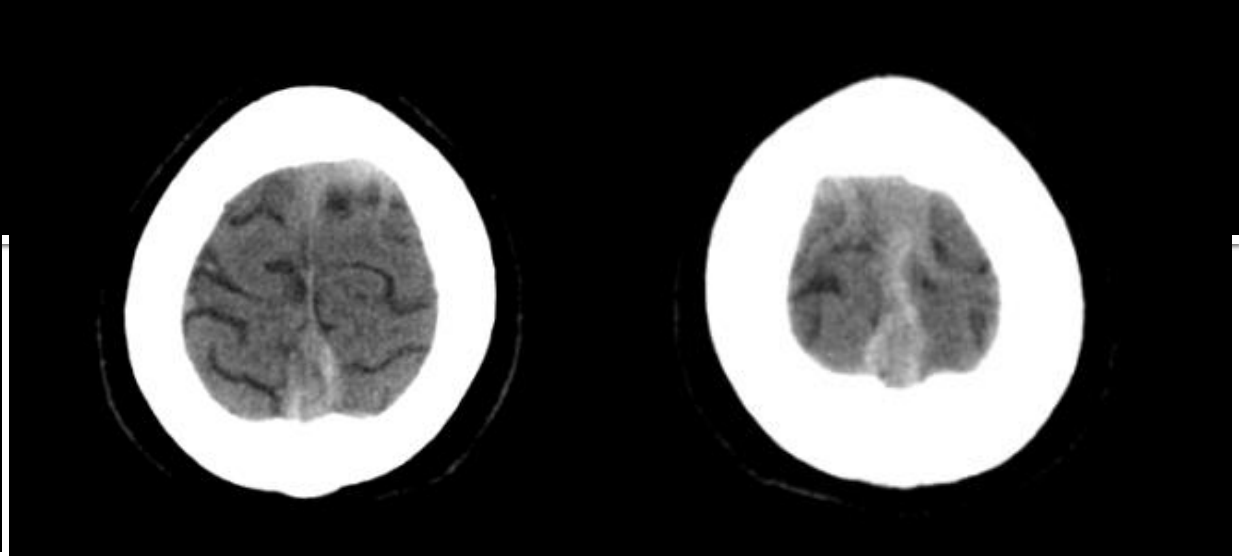

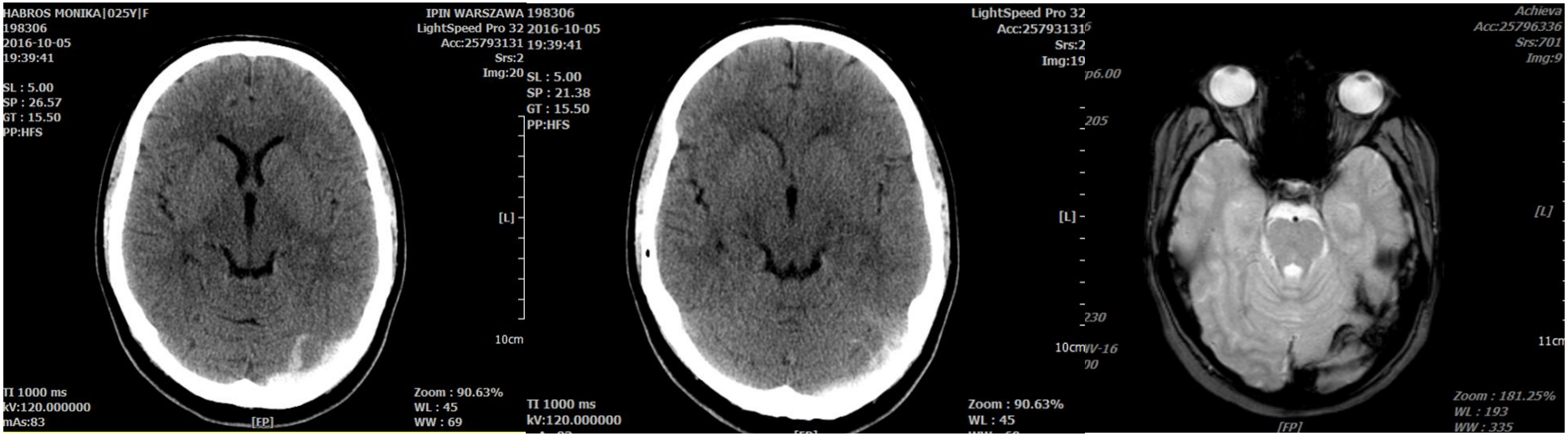
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WL : 45
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Zoom : 181.25%
WL : 193
WW : 335

Dziękuję za uwagę!

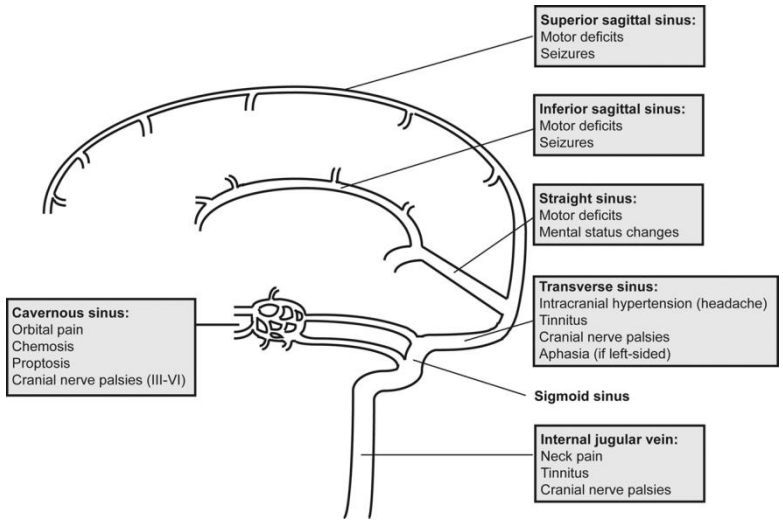
Pułapka 1

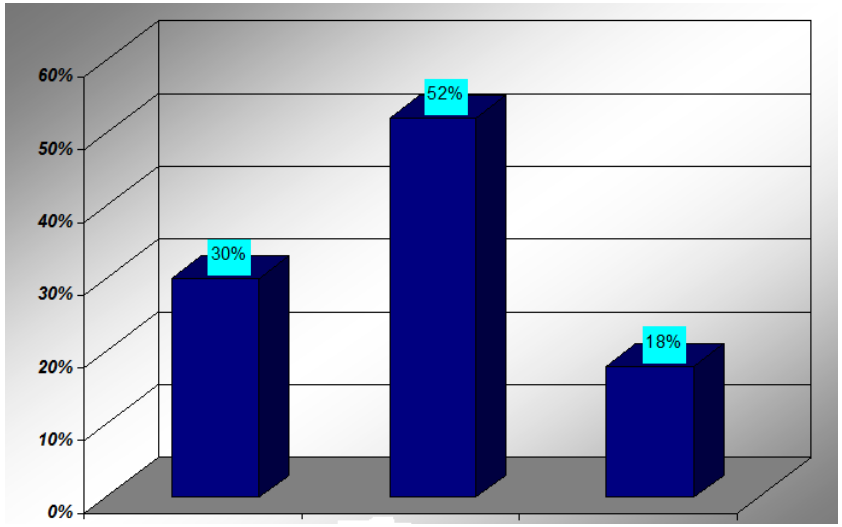
- Pierwsza pacjentka, mutacja w genie protrombiny

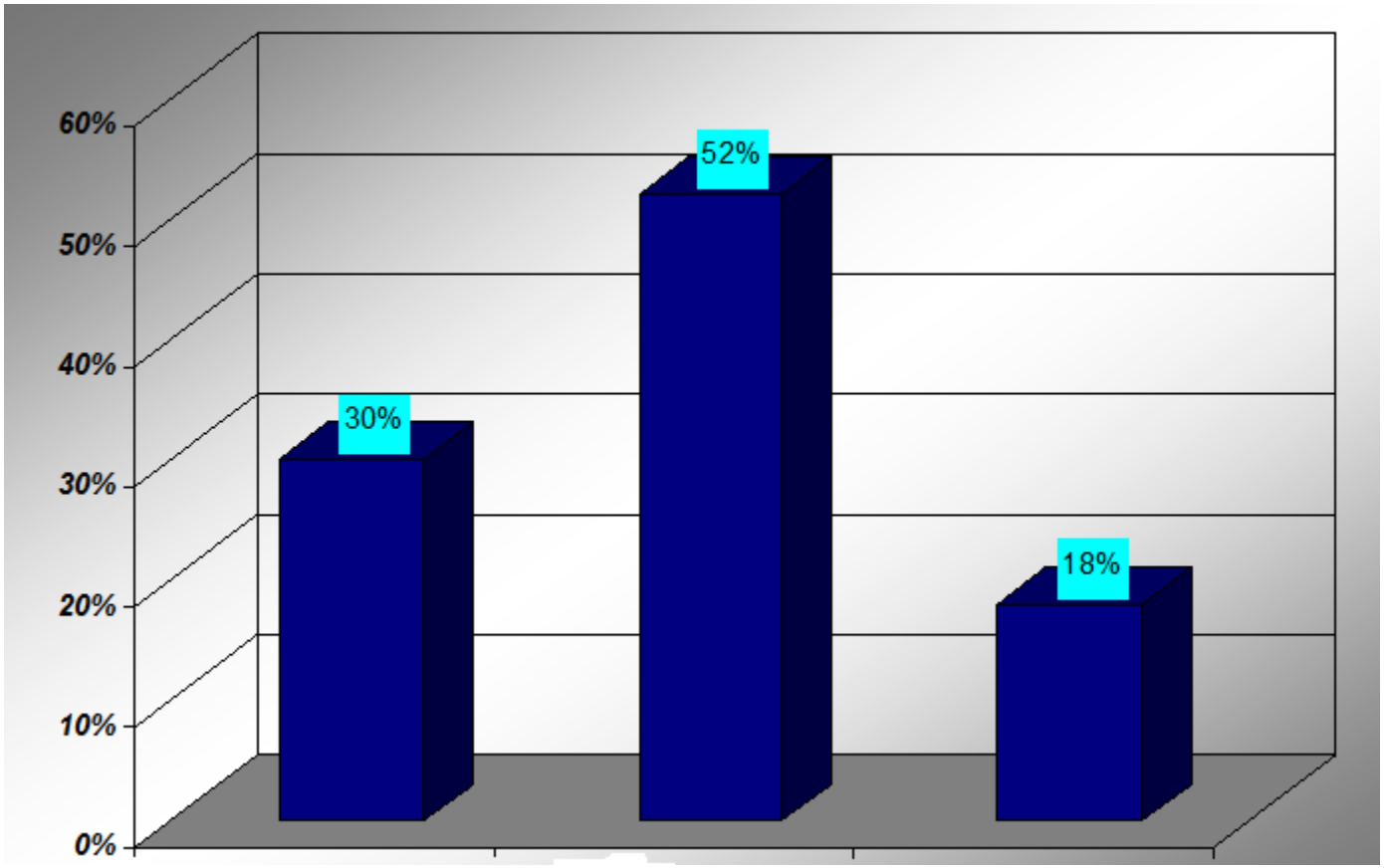
CVT Clinical symptoms

Clinical presentation depends on several factors

- location of the thrombosis,
- the presence of venous infarction or hemorrhage,
- patient's age,
- and duration of CVT (acute versus chronic).

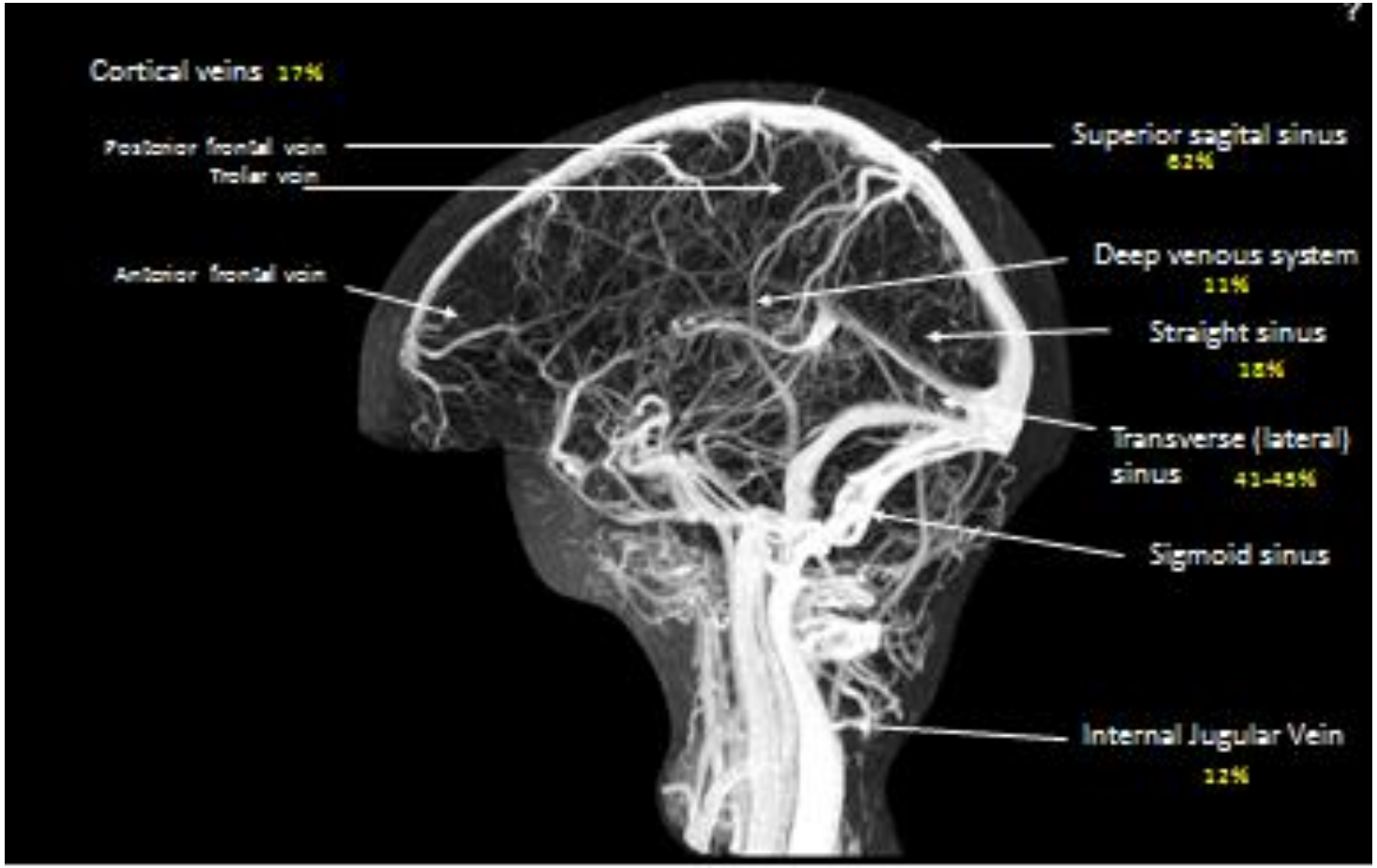




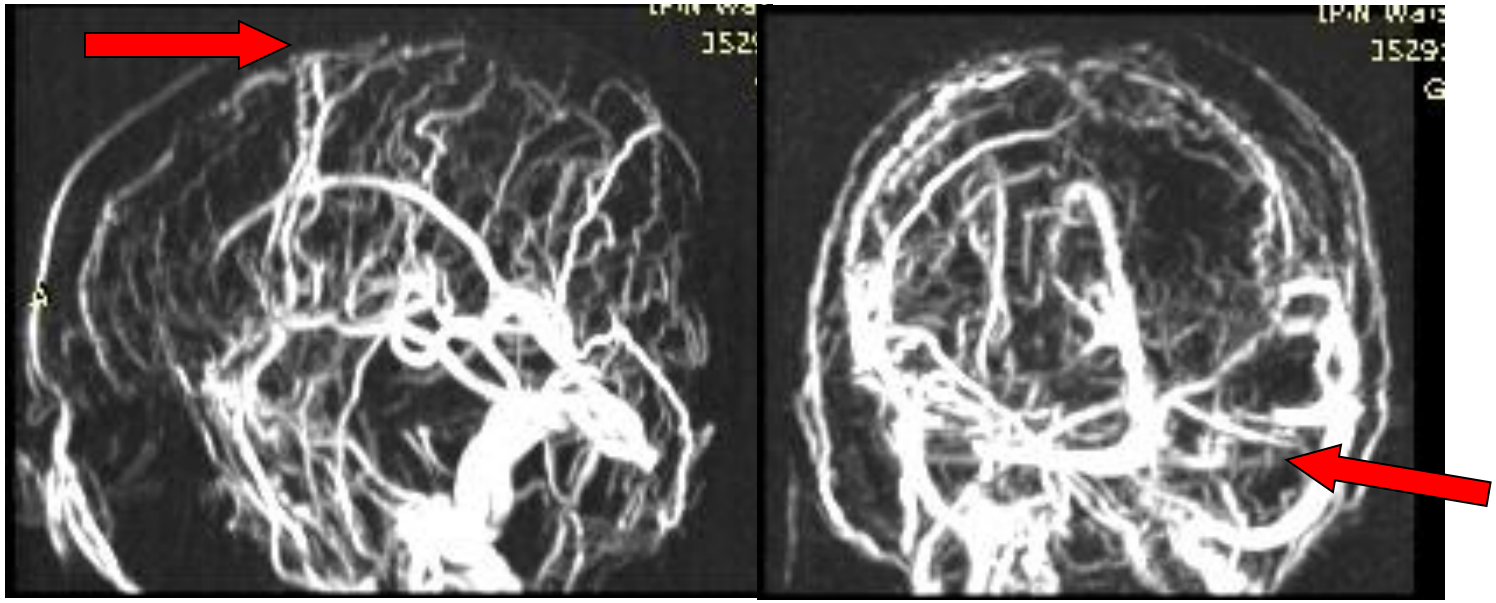


Acute (<48h) Subacute (<1Mth) Chronic (>1Mth)

Most frequent (%) location of CVT as reported by in the ISCVT (n=624).

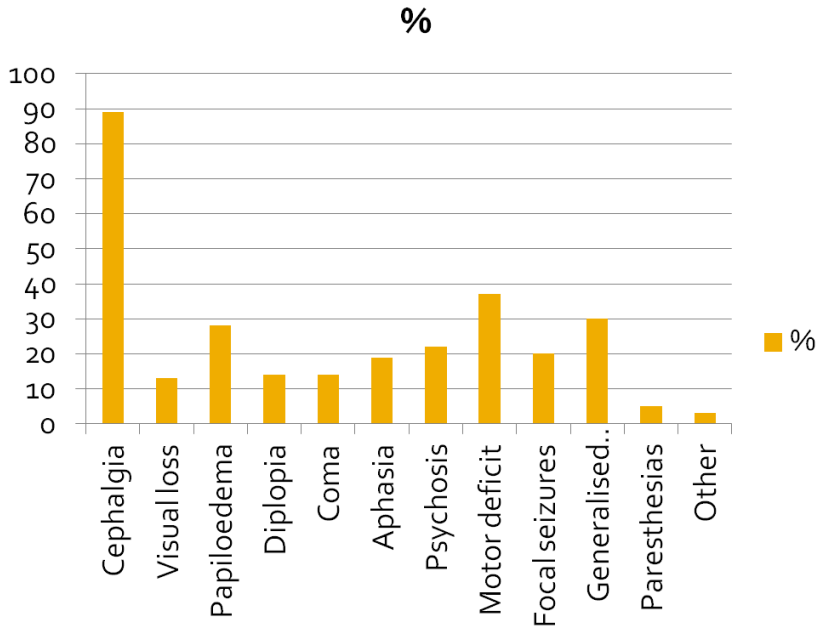


Multiple sinuses and veins 50-60%



CVT - Clinical symptoms

- secondary to increased intracranial pressure
- or focal brain injury from venous infarction or hemorrhage.

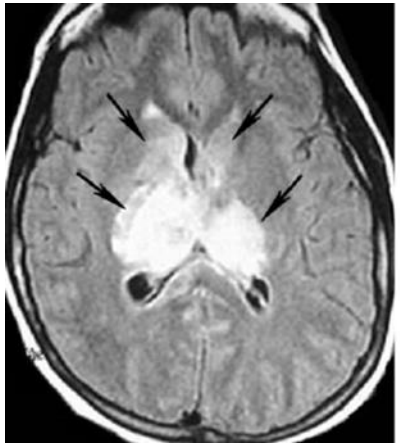


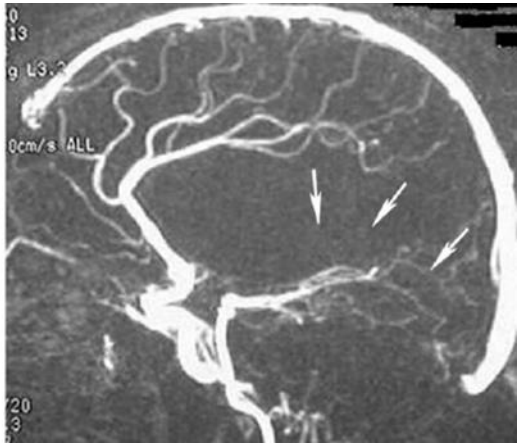
- Isolated headache without focal neurological findings or papilledema occurs in 25% of patients with CVT and poses a significant diagnostic challenge.

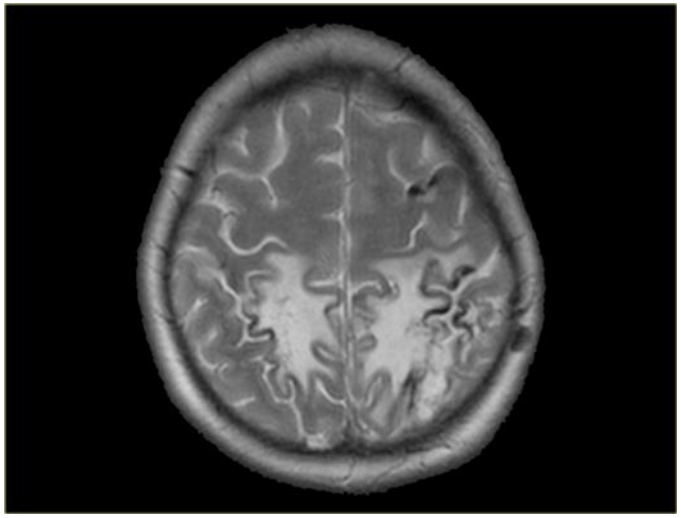
Clinical features suggesting CVT

- Headache, disturbances of consciousness
- focal or generalized seizures are quite frequent, occurring in about 40% of patients
- bilateral brain involvement
- bilateral motor signs
- slowly progressive symptoms

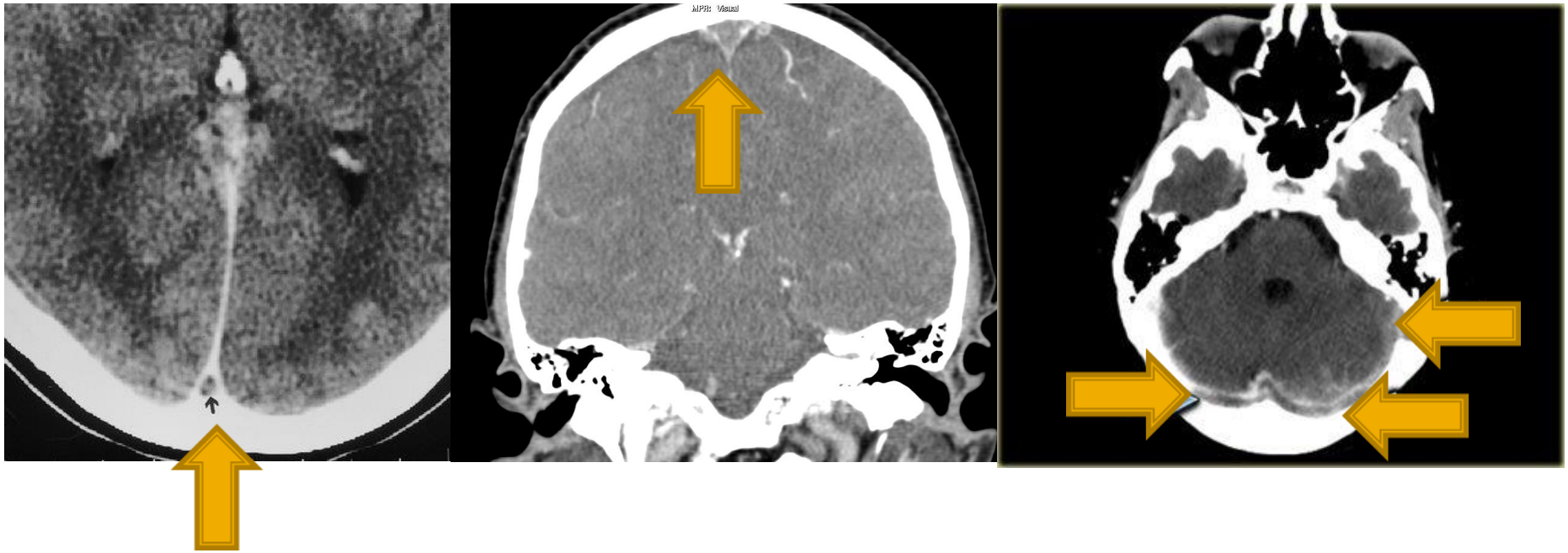
- Atypical CT/MR pictures :
- „glioma like”
- vanishing stroke







CT with contrast – 'empty delta sign'



MRI –

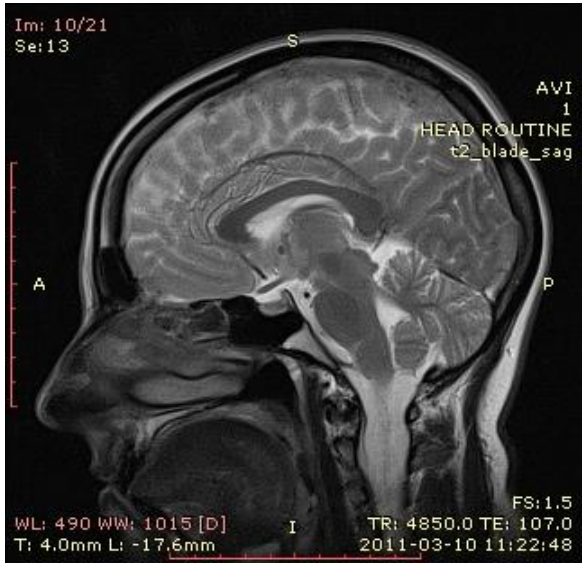
- Depends

Table 2
Predominant Signal Intensity in Intraluminal Thrombi according to MR Imaging Technique and Time after Symptom Onset

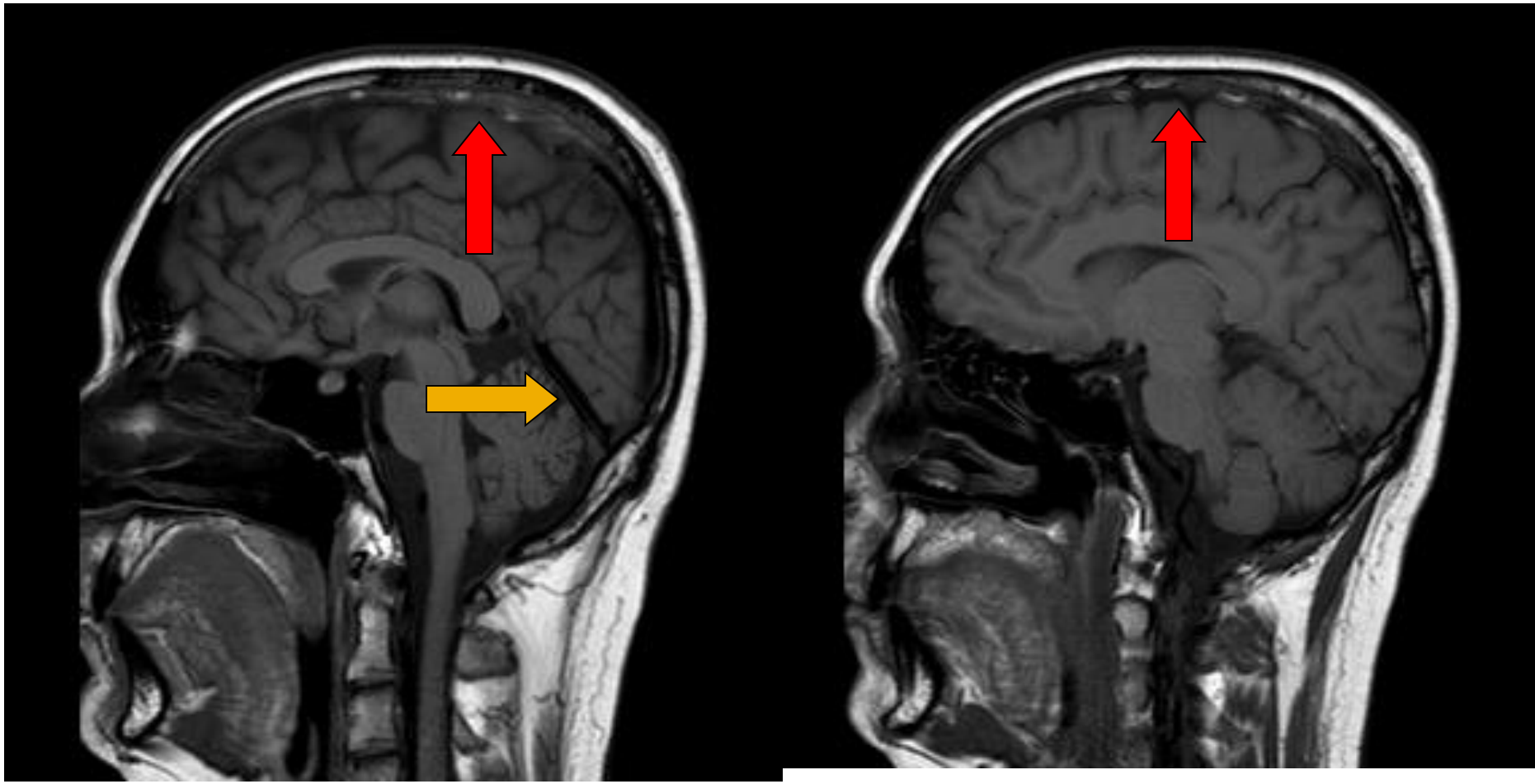
Imaging Technique and Signal Characteristic*	0–5 Days	6–15 Days	>15 Days
T1-weighted sequence			
Hyperintensity	30 (17/57)	71 (57/80)	39 (23/59)
Isointensity	68 (39/57)	29 (23/80)	54 (32/59)
Hypointensity	2 (1/57)	0 (0/80)	7 (4/59)
T2-weighted sequence			
Hyperintensity	25 (14/57)	52 (40/77)	43 (33/76)
Isointensity	11 (6/57)	32 (25/77)	45 (34/76)
Hypointensity	65 (37/57)	16 (12/77)	12 (9/76)

Sources.—References 3, 9, 10, 29, 30.
Note.—Data are the percentage of thrombi with the specified signal characteristic at the given time after symptom onset. The numbers in parentheses are the number of segments with the specified signal intensity among the number of segments reported within the given time interval after symptom onset. A total of 80 thrombosed venous segments were reported. Not all studies included cases for each time interval (thrombus stage) and each pulse sequence.
*The signal characteristic is the signal intensity of thrombi in relation to that of gray matter.

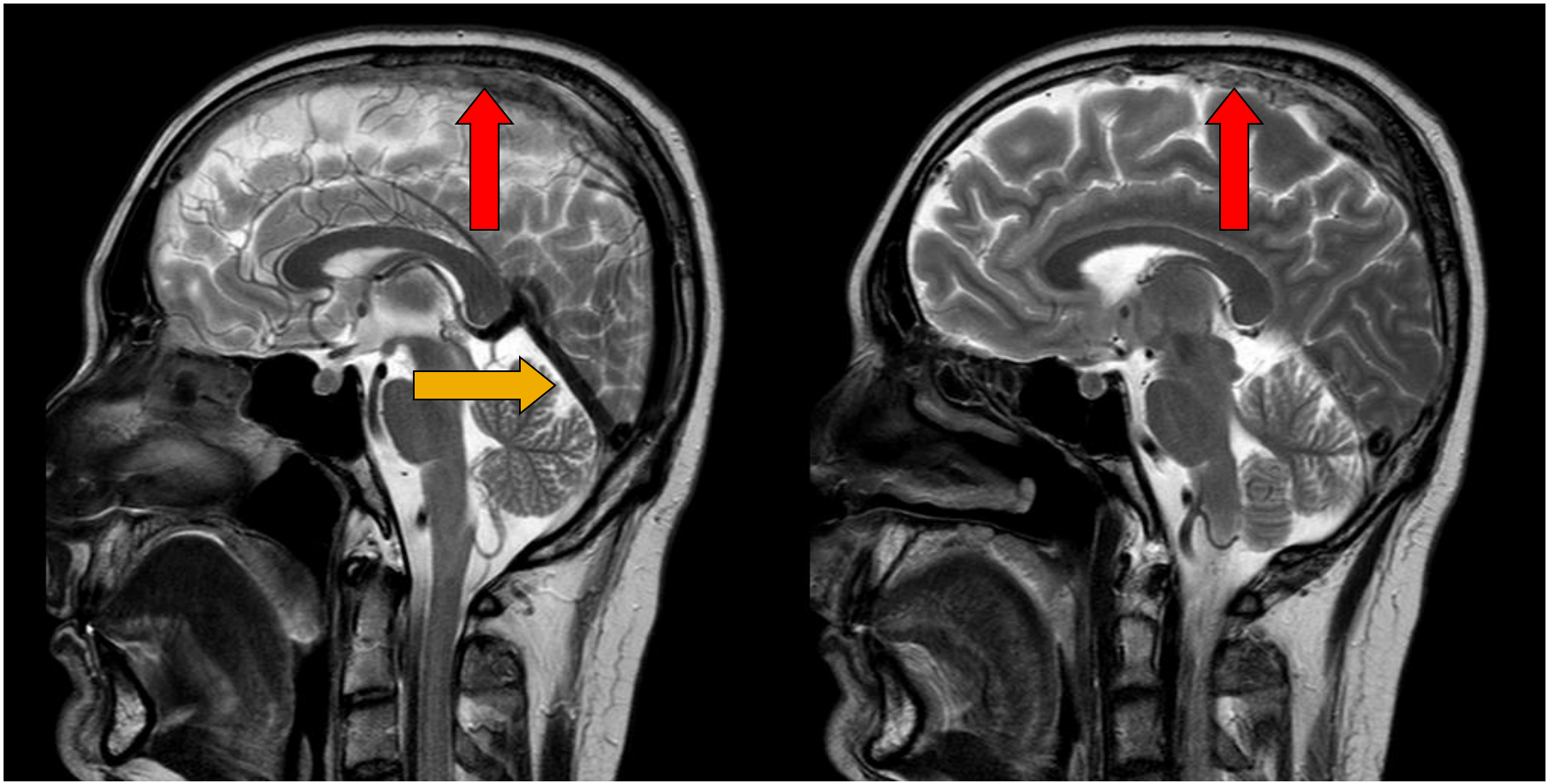
Time from onset of symptoms	T1	T2
0-5 d	⇔	↓
6-15 d	↑	↑
↑ 2 weeks	⇔	⇔ ↑

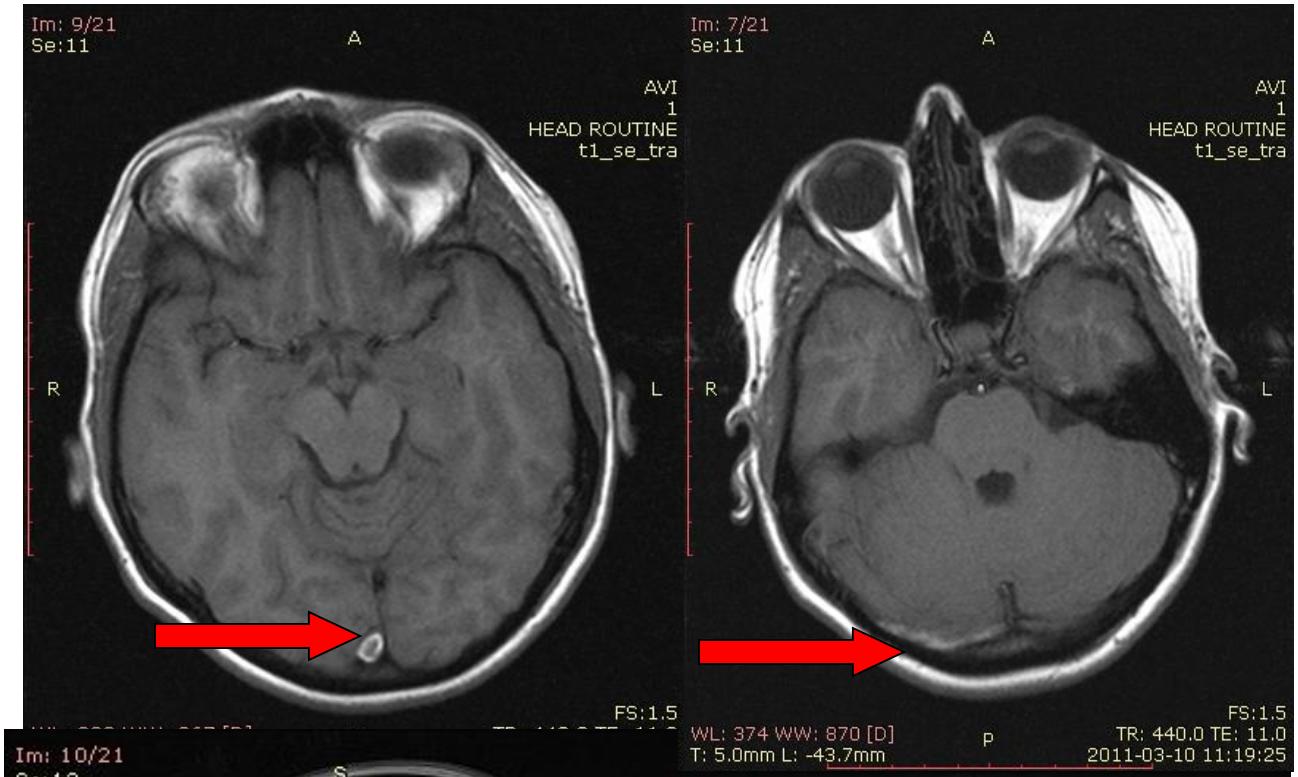


MRI T1



MR T2

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T: 4.0mm L: -17.6mm
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WL: 455 WW: 956 [D]
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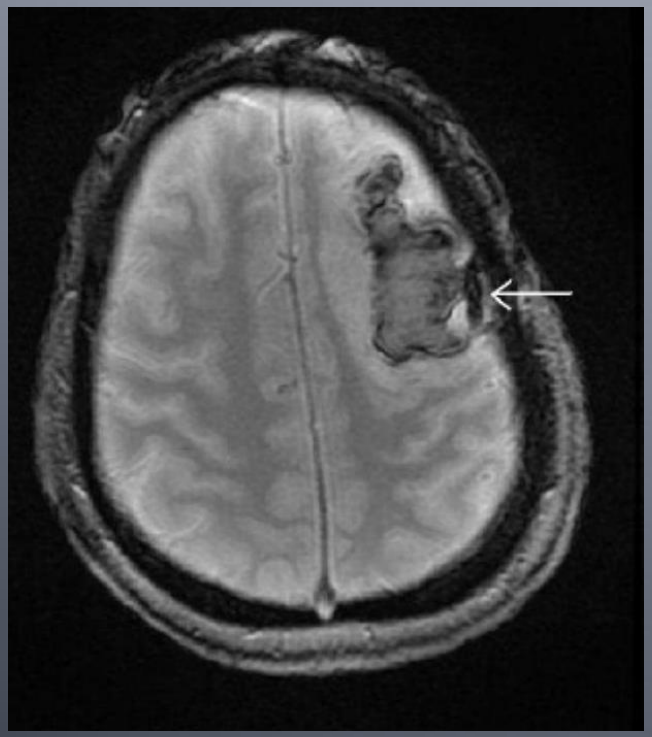
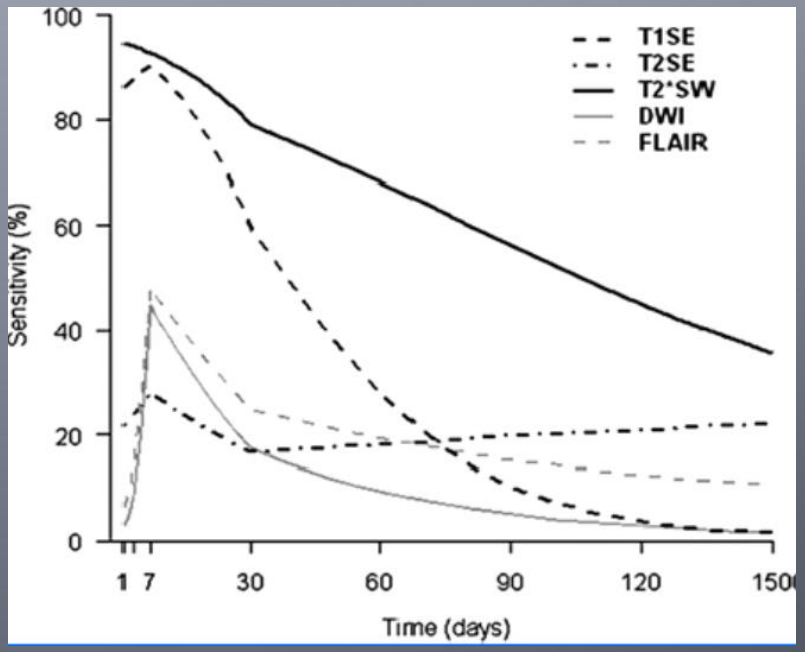
MR T2* - Magnetic susceptibility effect

Very sensitive in acute and subacute phase

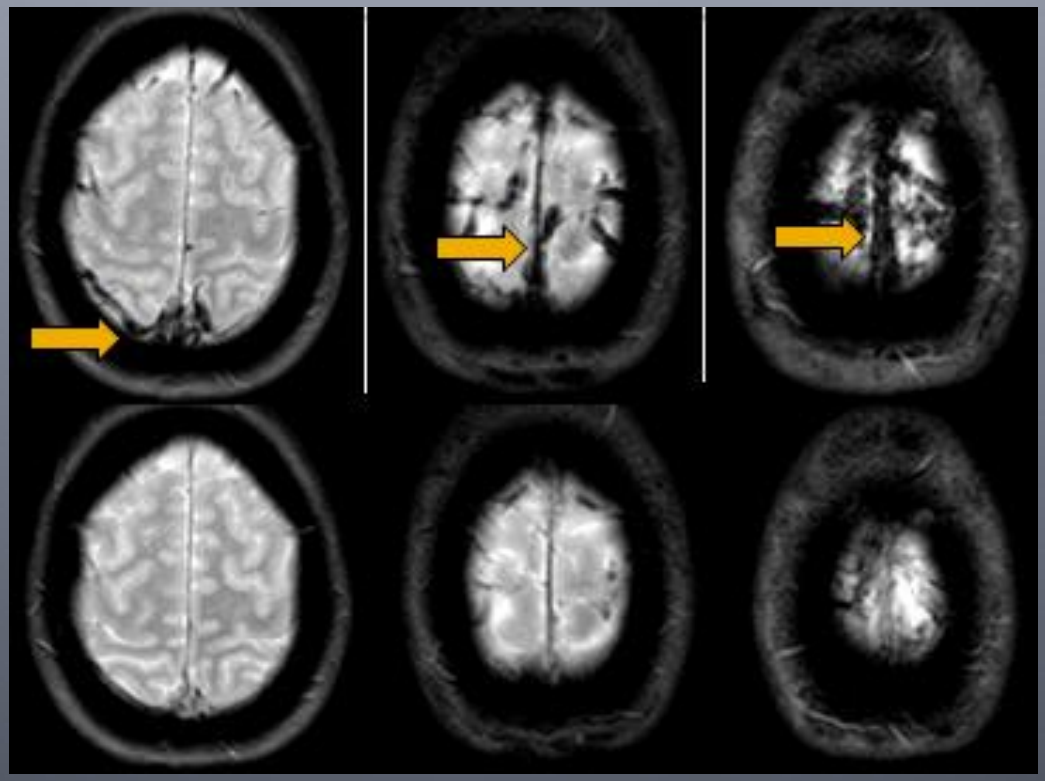




Idbaih A et al Stroke 2006

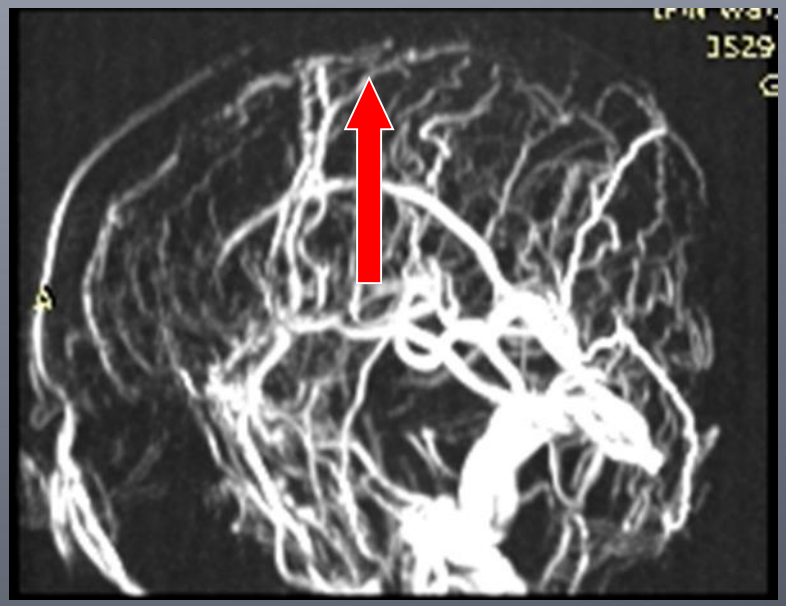
MRI – T2*

Magnetic Susceptibility Effect

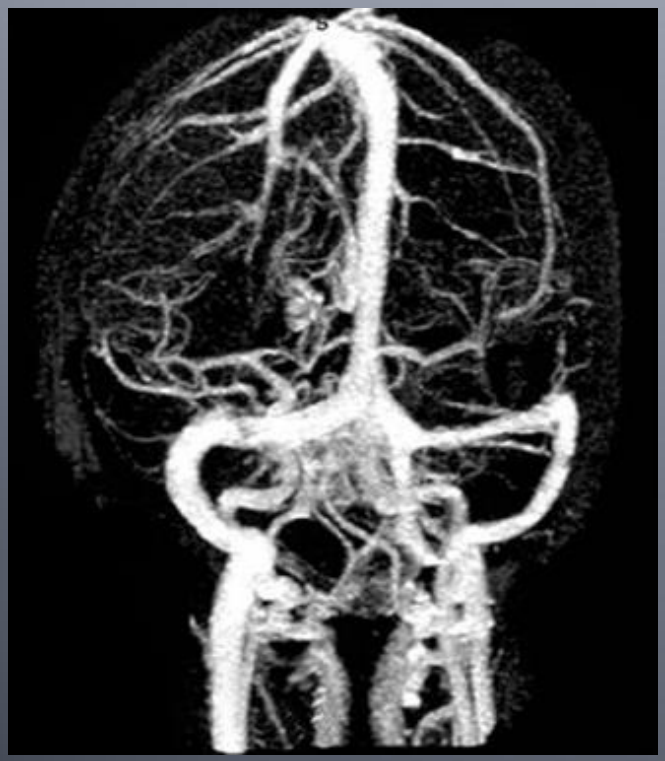


MR Venography

Normal



MR venography



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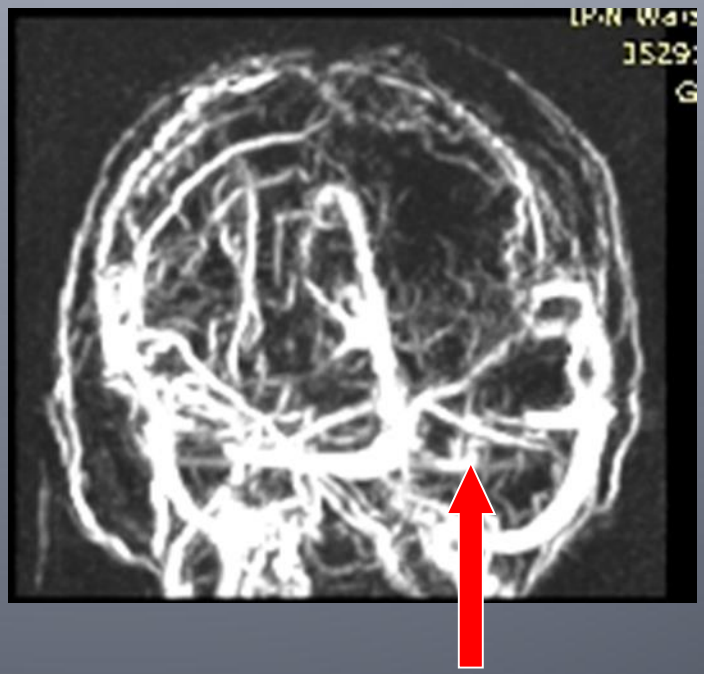
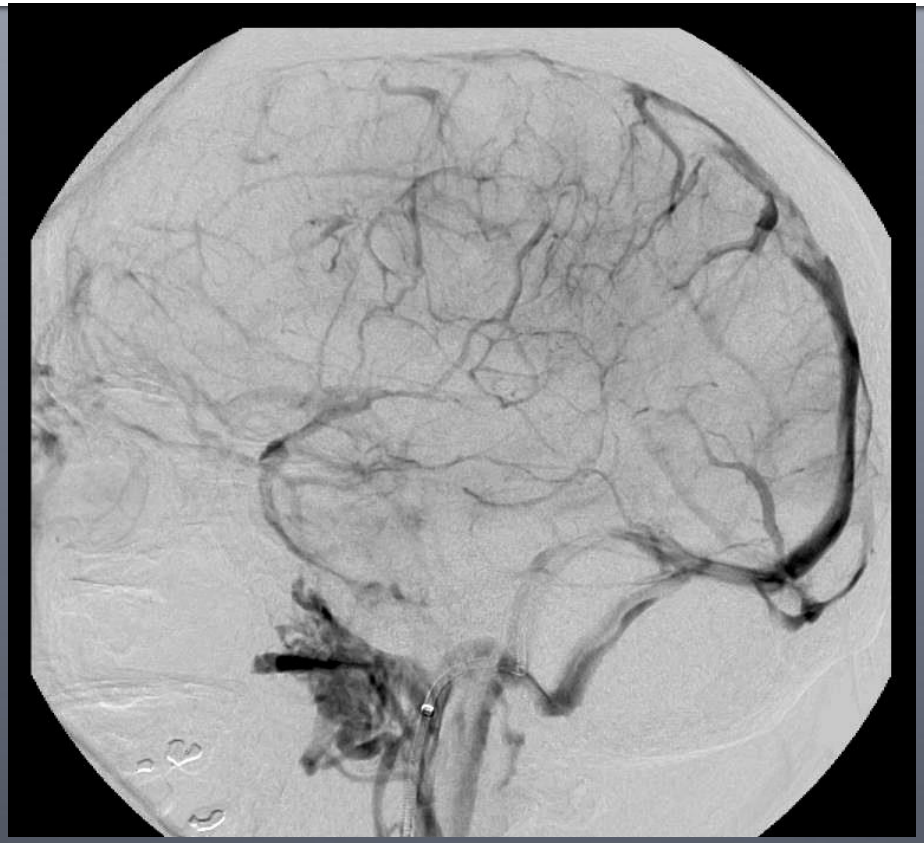


Catheter cerebral angiography can be useful in patients with inconclusive CTV or MRV in whom a clinical suspicion for CVT remains high



Management and Treatment

Stroke
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association | American Stroke Association

J Thromb
DOI 10.1(

Cerebral Venous Thrombosis: Diagnosis and Management
Deepak Gulati, Daniel Strbian and Sophia Sundararajan

Stroke. 2014;45:e16-e18; originally published online December 19, 2013;
doi: 10.1161/STROKEAHA.113.003964
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Guid
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Brett Cucchiara, MD, FAHA; Mary Cushman, MD, MSc, FAHA; Gabrielle deVeber, MD; Jose M. Ferro, MD, PhD; Fong Y. Tsai, MD; on behalf of the American Heart Association Stroke Council and the Council on Epidemiology and Prevention

Curr Cardiol Rep (2014) 16:523
DOI 10.1007/s11886-014-0523-2

STROKE (AB SINGHAL, SECTION EDITOR)

Cerebral Venous Sinus Thrombosis: Update on Diagnosis and Management

José M. Ferro · Patrícia Canhão

Stroke
JOURNAL OF THE AMERICAN HEART ASSOCIATION

American Heart Association | American Stroke Association

Anticoagulants for Cerebral Venous Thrombosis: Harmful to Patients?

David K. Cundiff

Stroke. 2014;45:298-304; originally published online November 14, 2013;
doi: 10.1161/STROKEAHA.113.003519
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Print ISSN: 0039-2499. Online ISSN: 1524-4628

Symptomatic treatment

- In patients with CVT and a single **seizure** without parenchymal lesions, early initiation of anti-epileptic drugs for a **defined duration** is probably recommended to prevent further seizures
-
- In patients with CVT and **increased intracranial pressure**, it is reasonable to initiate treatment with acetazolamide.
- Other therapies (lumbar puncture, optic nerve decompression or shunts) can be effective if there is progressive visual loss

Class II Recommendations

Symptomatic treatment

- Class I Recommendations
  - In patients with CVT and increased intracranial pressure, monitoring for progressive visual loss is recommended, and when this is observed, increased intracranial pressure should be urgently treated
  - In patients with a past history of CVT who complain of new, persisting or severe headache, evaluation for CVT recurrence and intracranial hypertension should be considered

Symptomatic treatment

For patients with CVT, **steroid** medications **are** not recommended, even in the presence of parenchymal brain lesions on CT/MRI, unless needed for another underlying disease

In the absence of seizures, the **routine use of anti-epileptic drugs in patients with CVT is not recommended**

Antithrombotic treatment

- For patients with CVT, initial anticoagulation with adjusted-dose unfractionated heparin or weight-based low molecular weight heparin in full anticoagulant doses is reasonable, followed by vitamin K antagonists, **regardless of the presence of intracerebral hemorrhage**

- Admission to a stroke unit is reasonable for treatment and for prevention of clinical complications of patients with CVT

Antithrombotic treatment 1

Concomitant intracerebral bleeding at the time of CVT diagnosis should not contraindicate the use of anticoagulant treatment. Anticoagulants with a shorter half-life (UFH or LMWH) should be administered over the first days of therapy and the introduction of oral anticoagulants should be postponed until the patient is clinically stable and the neuro-radiological picture improves.

Antithrombotic treatment 2

- *LMWH and UFH appear to be similarly effective and safe for the acute phase treatment. The use of LMWH may be preferred over UFH for the majority of patients due to the practical advantages. The short half-life of UFH may be preferred over LMWH for clinically unstable patients or for patients requiring invasive procedures.*

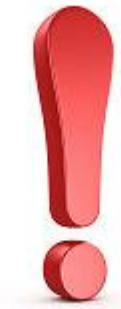
Antithrombotic treatment 3

- *The introduction of oral anticoagulants should be considered when - the patient is clinically stable; that is, in the presence of normalized level of consciousness or a remission of mental confusion, improvement in headache and focal neurological deficits and improvement in the neuro-radiological picture*.

Is there a role for thrombolysis?

Thrombolytic treatment

- *The use of either systemic or local thrombolytic therapy should be restricted to very selected high-risk patients only, such as in patients who deteriorate despite adequate anticoagulant therapy in whom other causes of deterioration have been ruled-out*.



TOACT Study

- There are little data from controlled trials to support endovascular thrombolysis, and the American Heart Association recommends it be restricted to patients with a poor prognosis who have not responded to anticoagulation.3 The Thrombolysis or Anticoagultion for Cerebral Venous Thrombosis (TO ACT) study is an ongoing multicenter, prospective, randomized, open-label, blinded end point trial of standard anticoagulation versus endovascular therapy in patients with CVT and a high probability of poor outcome

inho JM, Ferro JM, et al. Thrombolysis or anticoagulation for cerebral venous thrombosis: rationale and design of the TO-ACT trial. Int J Stroke. 2013;8:135–140.

What is the optimal duration of anticoagulant therapy after a first episode of CVT and what are the main factors driving treatment duration?

AC Treatment duration

- *Anticoagulant treatment for a minimum of 3 months should be considered in patients with transient risk factors.*
- *Patients without known risk factors should be considered for 6–12 months of anticoagulation. It appears safe to discontinue anticoagulant treatment in the presence of transient risk factors such as oral contraceptive use,*
- *indefinite treatment duration should be considered for patients with recurrent CVT and in patients with permanent major risk factors including severe thrombophilia (antithrombin, protein C or protein S deficiency; antiphospholipid antibodies syndrome; homozygous factor V Leiden or prothrombin gene mutation or combined heterozygous mutation)*.

Class II Recommendations

In patients with provoked CVT (associated with a transient risk factor), vitamin K antagonists with a target INR of 2.0-3.0 may be continued for 3 to 6 months

In patients with unprovoked CVT, vitamin K antagonists with a target INR of 2.0-3.0 may be continued for 6 to 12 months

Class II Recommendations

For patients with recurrent CVT, VTE after CVT, or first CVT with severe thrombophilia (i.e. homozygous prothrombin G20210A, homozygous Factor V Leiden, deficiencies of protein C, protein S or antithrombin, combined thrombophilia defects or antiphospholipid syndrome), indefinite anticoagulation may be considered with a target INR of 2.0-3.0

Consultation with a physician with expertise in thrombosis may be considered to assist in the prothrombotic testing and care of patients with cerebral venous sinus thrombosis

Is there a role for the direct oral anticoagulants?

Guidance Statement - NOAC

- *Given the absence of clinical experience with the use of the direct oral anticoagulants in this setting, there is no evidence for or against their use in clinical practice until additional data from clinical studies will become available. If a decision to use these agents is made, their use should be considered off-label and careful patient counselling and clinical monitoring should follow. Ideally, patients receiving direct oral anticoagulants should be included in prospective cohort studies aimed to fill this knowledge gap*.

Ageno 2016, Guidance for management of venous thrombosis in unusual sites. J Thromb Thrombolysis

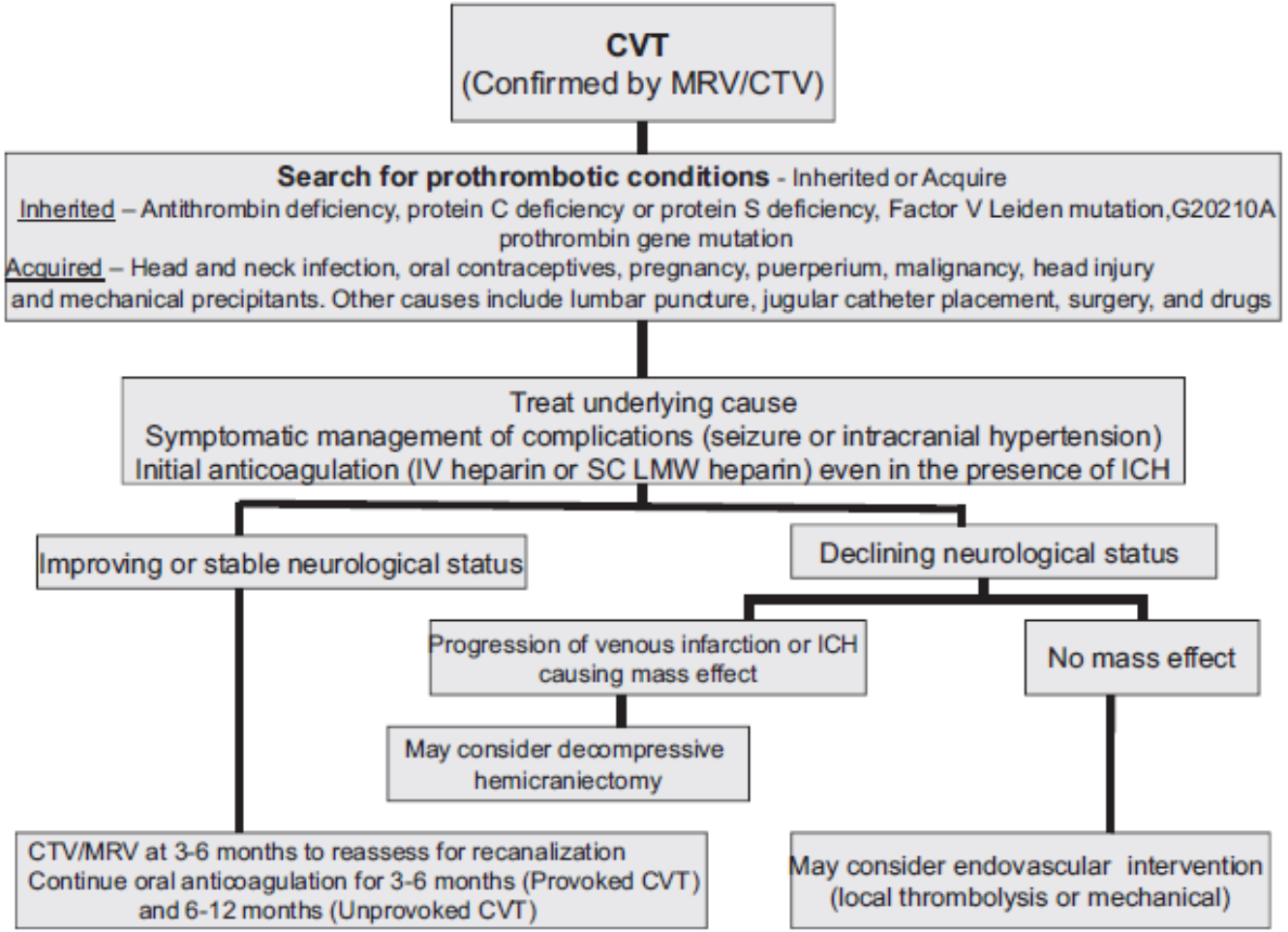
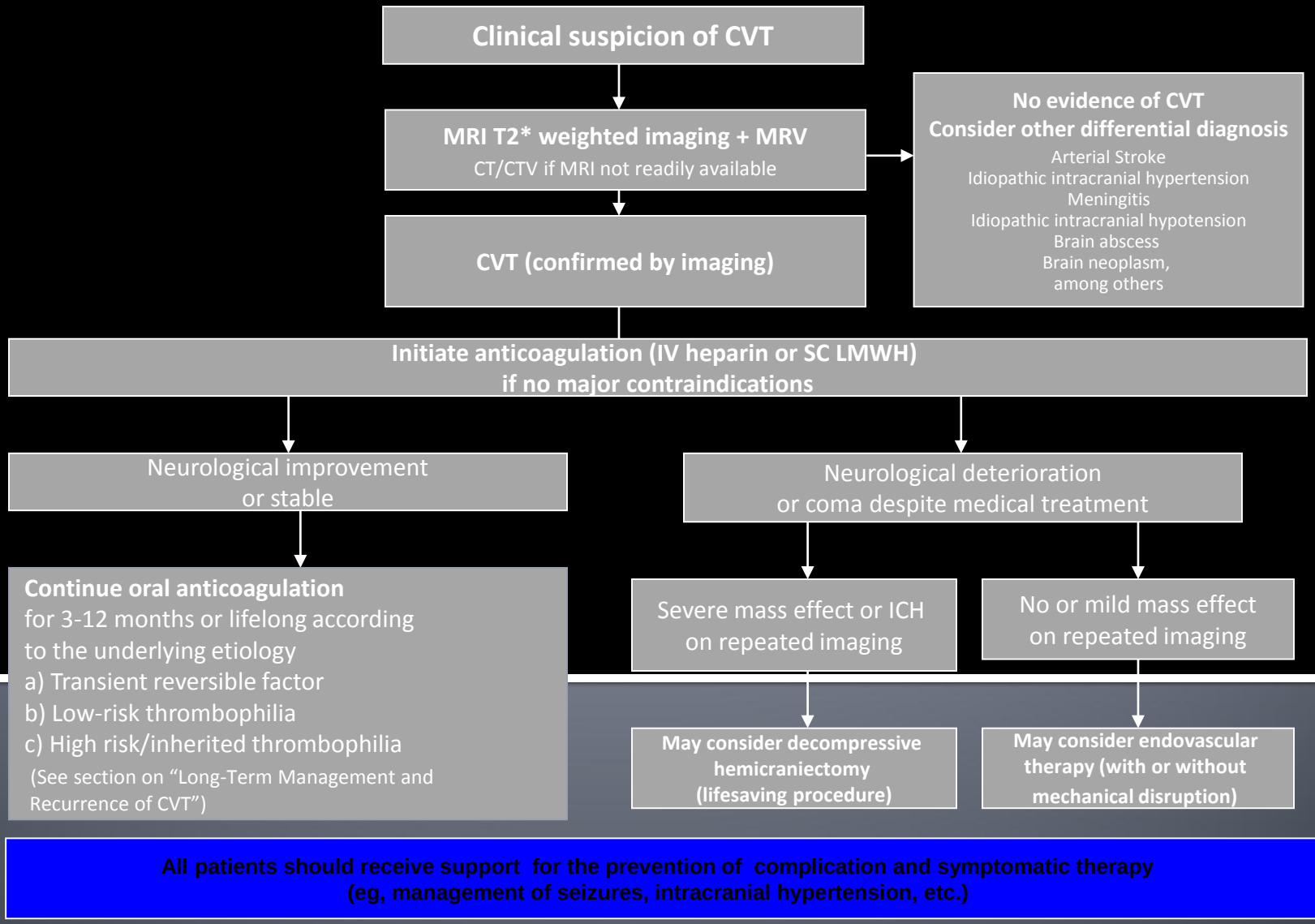


Figure. Cerebral venous thrombosis (CVT). CTV indicates CT venography; ICH, intracranial hemorrhage; IV, intravenous; MRV, magnetic resonance venography; and SC, subcutaneous.

Gulati, Stroke, 2014

Proposed Algorithm for the Management of CVT

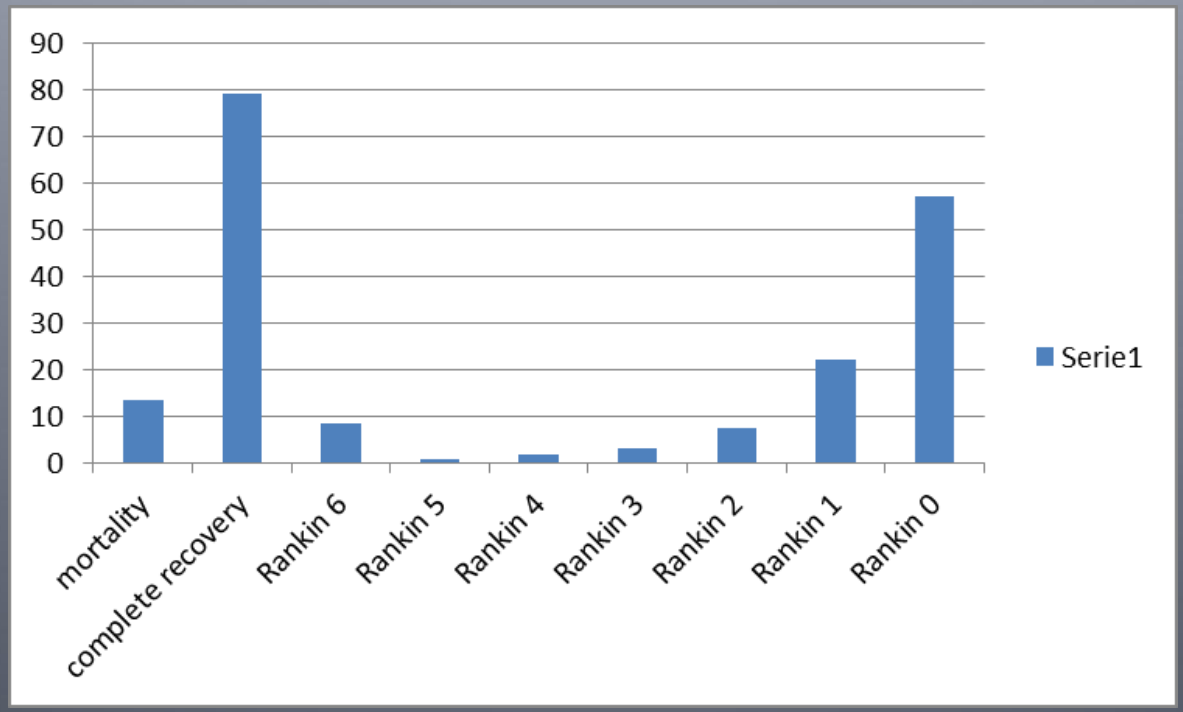


Prognosis

- Despite the effect of anticoagulant treatment, approximately 20% of the patients does not completely recover; (Rankin score of 2 or worse).
- ISCVT - 21% had a poor outcome (death 8%, Rankin 2 or worse: 13%) after an average follow-up of 16 months (3).
- In a logistic regression analysis the following factors were associated with a poor outcome:

• age
• male gender
• mental status disorder
• coma
• thrombosis of the deep cerebral venous system
• intracranial hemorrhage
• infection of the central nervous system and malignancy

Outcome


90
80
70
60
50
40
30
20
10
0
mortality
complete recovery
Rankin 6
Rankin 5
Rankin 4
Rankin 3
Rankin 2
Rankin 1
Rankin 0
Serie1

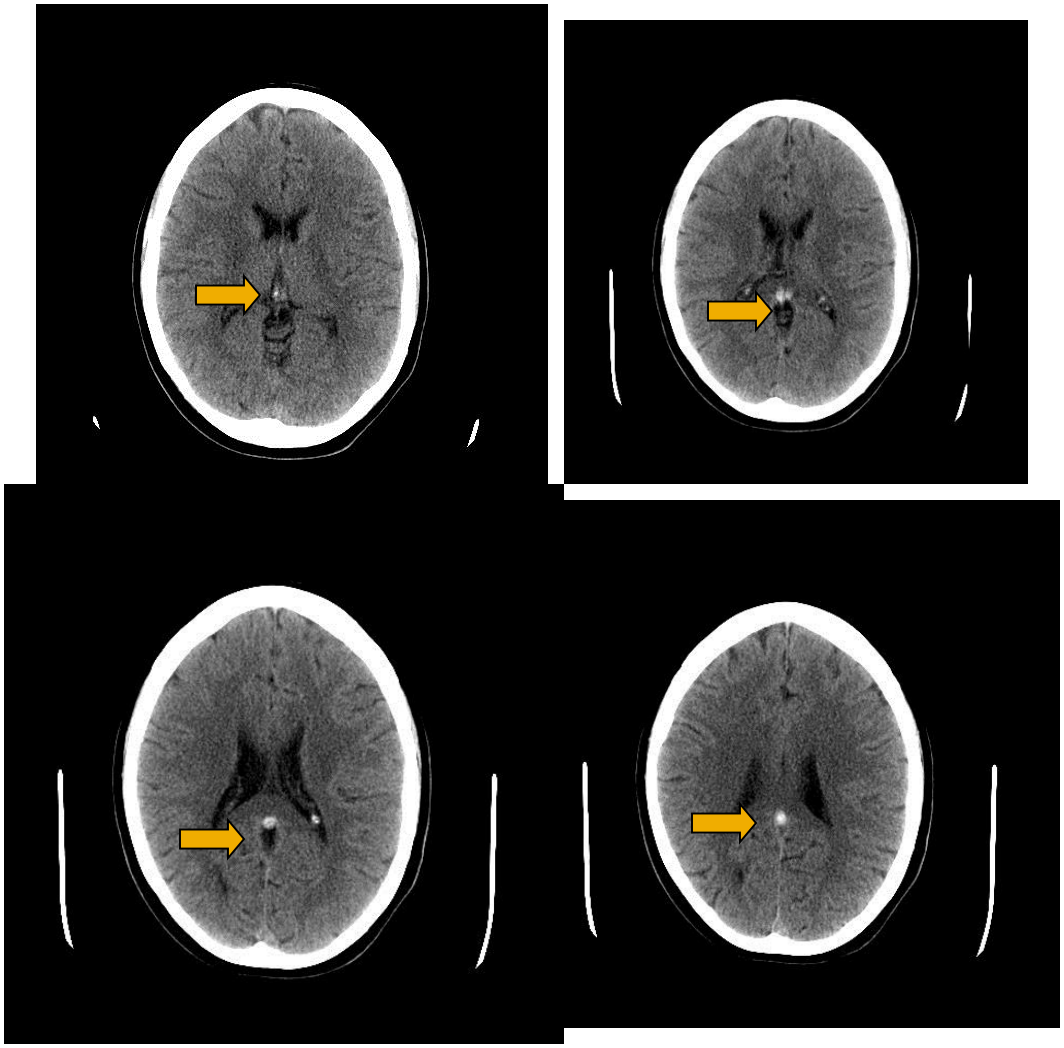
Rekanalizacja

- 40-90% chorych (zależność od zajetej zatoki)
- Do 4 miesięcy od zachorowania
- Bez związku ze stosowaniem OA
- Nie ma wpływu na ostateczne rokowanie

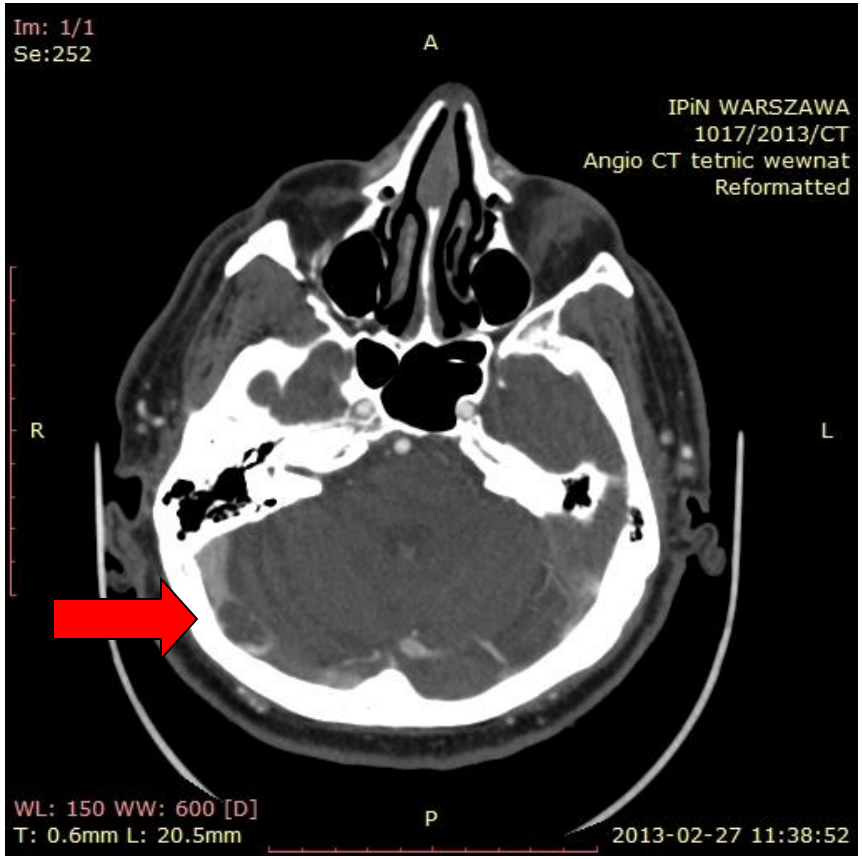
- Baumgather i wsp., JNNP 2003

TYFYA

Przypadek 7



Przypadek 6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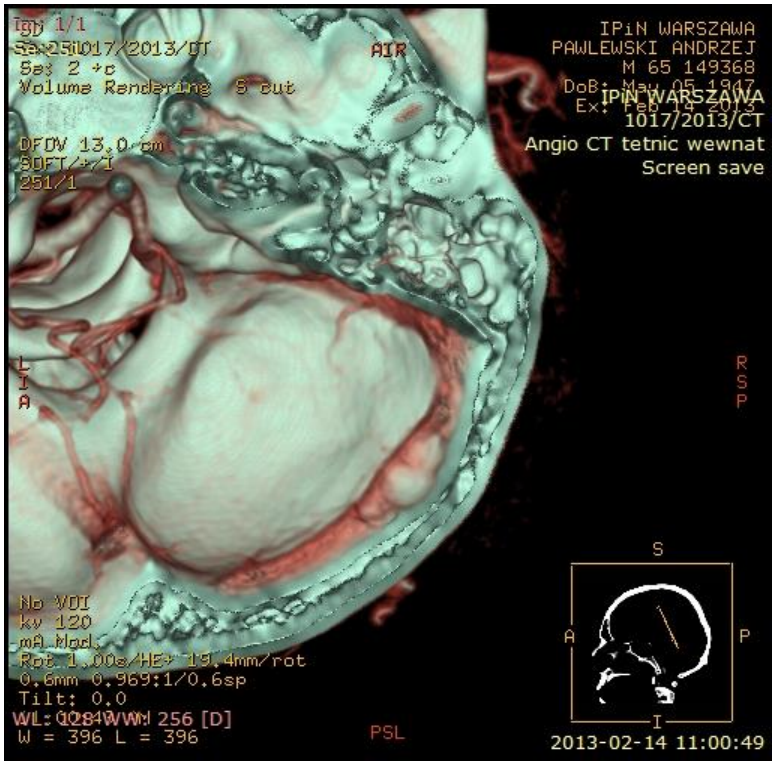
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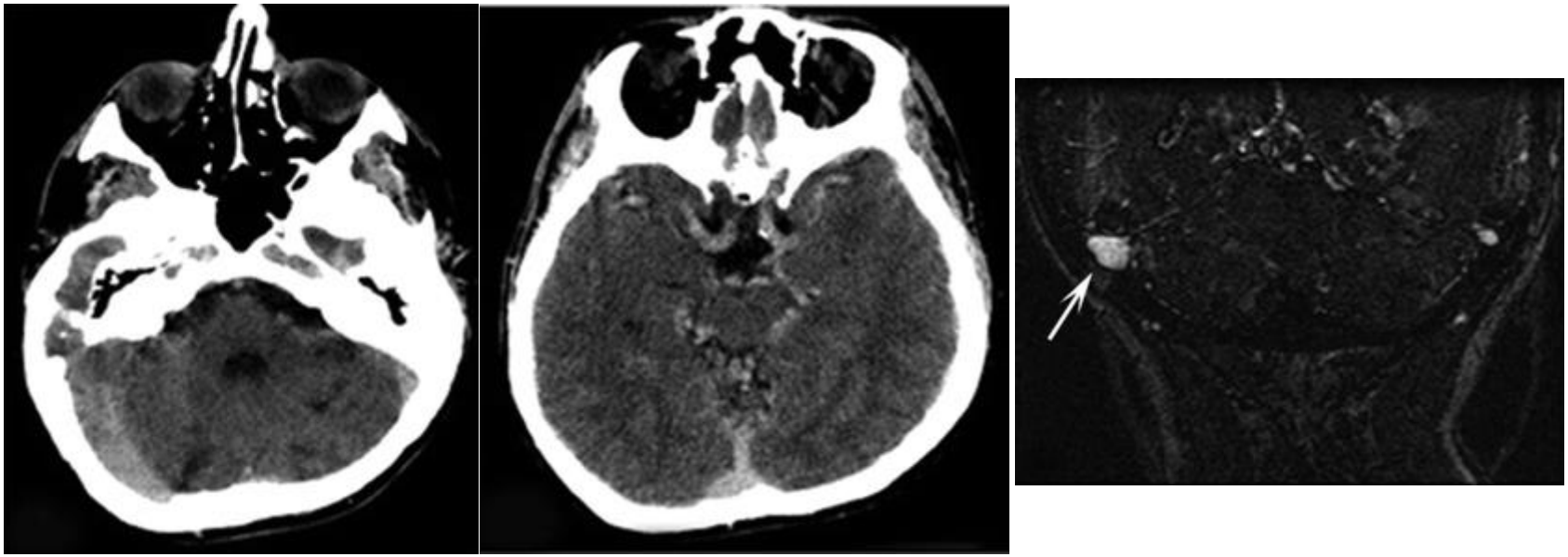
Trudności diagnostyczne

- Fałszywie dodatni obraz zatoki poprzecznej lewej z czerwienicą prawdziwą lat 55



CVT – Pregnancy - Treatment

Class I Recommendation

For women with CVT during pregnancy, LMWH in full anticoagulant doses should be continued throughout pregnancy, and LMWH or vitamin K antagonist with a target INR 2.0-3.0 should be continued for at least 6 weeks postpartum (for a total minimum duration of therapy of 6 months)

CVT - Pregnancy

Class II Recommendations

It is reasonable to advise women with a past history of CVT that future pregnancy is not contraindicated. Further investigations regarding the underlying etiology and a formal consult with a hematologist and/or maternal fetal medicine specialist is reasonable

CVT - Pregnancy

Class II Recommendations

It is reasonable to treat acute CVT during pregnancy with full dose LMWH over unfractionated heparin (UFH)

For women with a past history of CVT, prophylaxis with LMWH during future pregnancies and the post-partum period is probably recommended

CVT - Future pregnancies

Future Pregnancies and Recurrence

Patients with previous VTE are at increased risk of further venous thrombotic events when compared to healthy individuals

Based on the available evidence, CVT is not a contraindication for future pregnancies

Considering the additional risk that pregnancy adds to women with previous history of CVT, prophylaxis with LMWH during future pregnancies and the postpartum period can be beneficial

- Vitamin K antagonists, including warfarin, are associated with fetal embryopathy and bleeding in fetus and neonate and thus are generally contraindicated in pregnancy
- Anticoagulation for CVT during pregnancy and early in the puerperium consists of LMWH in the majority of women
- As in nonpregnant women, fibrinolytic therapy is reserved for patients with deterioration despite systemic anticoagulation and has been reported during pregnancy