

BIRD BRAIN

**FROM HEADLESS CHICKEN
TO CHICKENLESS HEAD**

HISTORY

22-y female, referred by GP

Acute onset decreased level of consciousness (unsure of exact duration) and 1x seizure

Apparently RVD positive

No history of seizures

Given a stat dose of ceftriaxone by the GP, and referred on to Helen Joseph Hospital

No other history available!

EXAMINATION

BP 127/90

P 108

RR 18

HGT 9.8

Temp 36.7

No cyanosis

Good hydration

No oedema

No lymphadenopathy

No jaundice

EXAMINATION

Neurological exam

GCS 9/15 (E = 2, V = 3, M = 4)

Significant meningism

Right pupil sluggish, left pupil dilated

“Facial asymmetry”

Moving all limbs, normal tone

Chest

Clear

GAEB

EXAMINATION

Abdominal

No organomegaly, no masses

Not distended

Normal bowel sounds

CVS

Normal pulses, good perfusion

Normal heart sounds

No added sounds

Not in heart failure

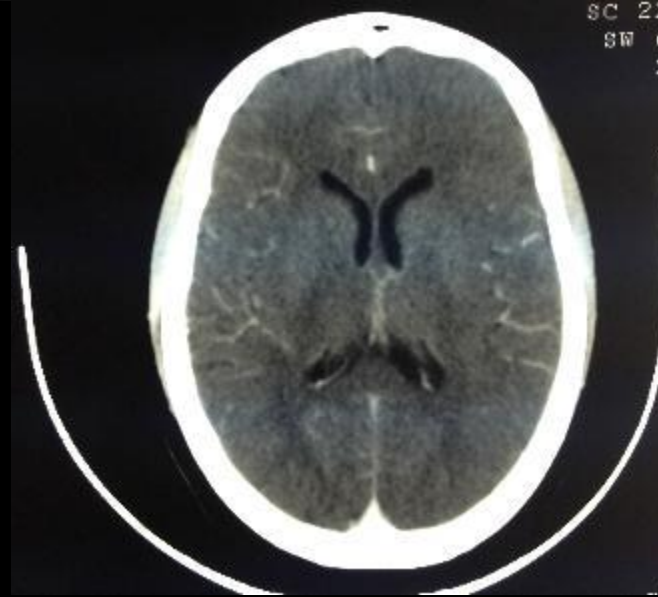
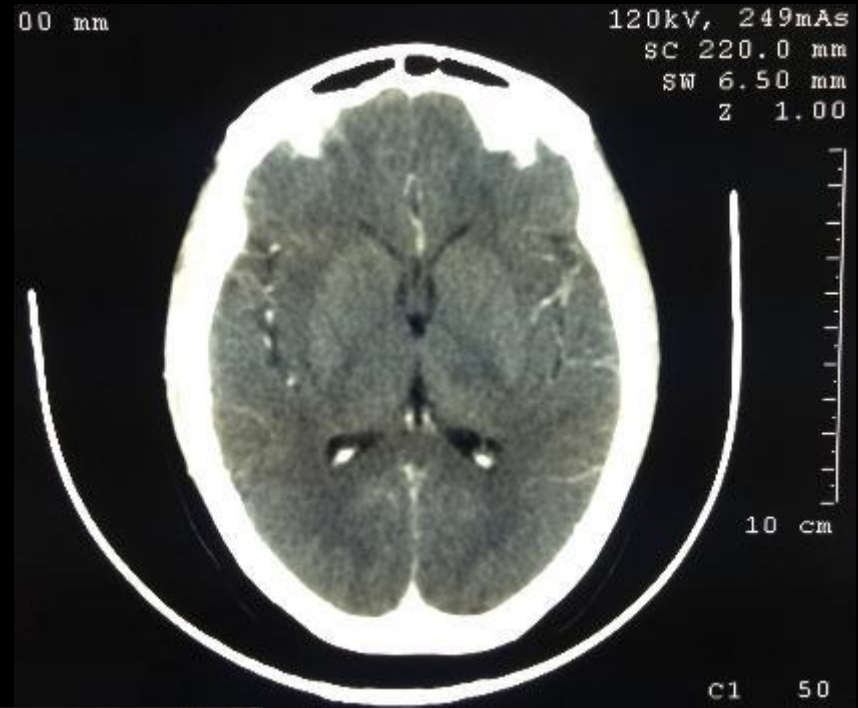
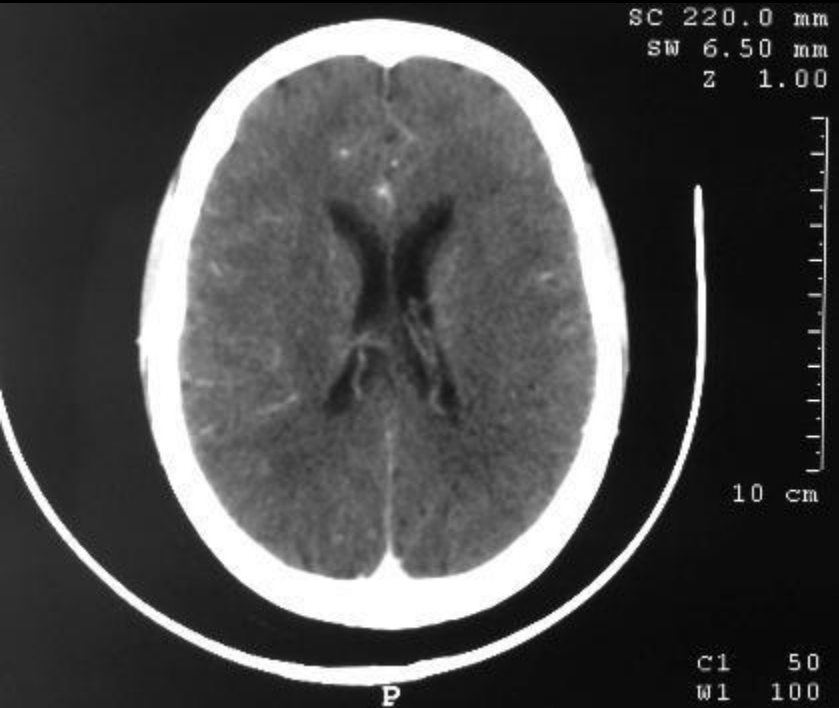
BLOODS

WCC	11.24	Sodium	136
Hb	11.7	Potassium	4.7
MCV	82.2	Chloride	95
Platelets	545	Bicarbonate	27
		Urea	2.6
CRP	< 5	Creatinine	65
TSH	0.17		
T4	13.7	B-HCG	Negative

BLOODS

Total bilirubin	6	HIV	Positive
Conj. bilirubin	3	CD4	24
Protein	84		
Albumin	31	CLAT	Positive
Alk. phos	73		
γ-GT	53	Hepatitis B sAg	Negative
ALT	16	TPHA	Negative
AST	22	Malaria	Negative

CONTRAST CT BRAIN



Loss of surface sulci,
Loss of grey-white matter differentiation

Features in keeping with cytotoxic cerebral oedema

LUMBAR PUNCTURE

Polys	0	Protein	2.27
Lymphs	0	Glucose	4.9
Erythrocytes	160		
		India Ink	Negative
		CLAT	Negative

Standard blood cultures and TB blood culture done

FURTHER CONSULTS: NEUROLOGY

Patient rousable, but drowsy ++

Able to obey simple commands

Photophobia (fights to keep eyes shut)

Right INO

No meningism

Possible right-sided CVA:

- **reflexes asymmetrical – Lt < Rt**
- **Upgoing plantars left**

FURTHER CONSULTS: NEUROLOGY

On skin:

“Looks like healing HSV right V1 distribution – healing now”

Suggest:

MRI brain

CSF viral studies

Treat as viral meningitis / encephalitis with acyclovir IVI

Ophthalmology and dermatology consult



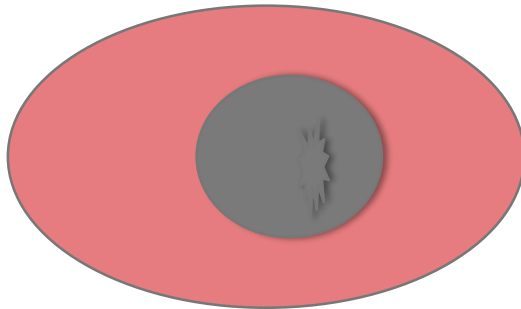


FURTHER CONSULTS: OPHTHALMOLOGY

Old herpes zoster scarring over right eye

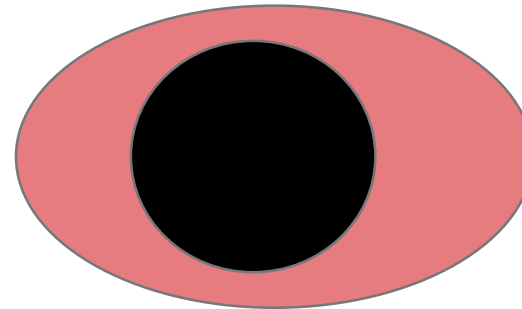
Conjunctival injection bilaterally

Right eye



Opacified cornea
Dendritic ulcer
Severe panuveitis

Left Eye



Dilated pupil
Panuveitis

FURTHER CONSULTS: OPHTHALMOLOGY

Suggest:

Await MRI

Acyclovir drops 5x daily to right eye

Tobramycin drops tds to right eye

FURTHER CONSULTS: DERMATOLOGY

Previous acne folliculitis, now with erosions on right forehead with scalloped edges

? Erythema herpeticum

Suggest:

Continue acyclovir for 1/52

Chloromax ung to open areas

UE as soap

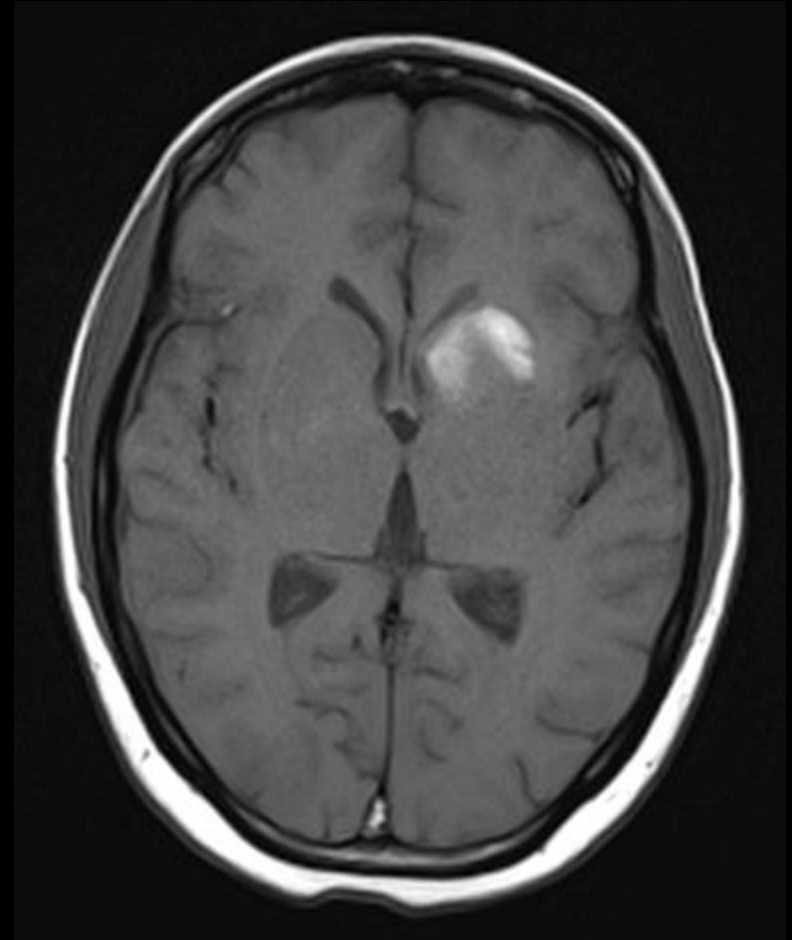
2% sulphur to body

CSF VIRAL STUDIES

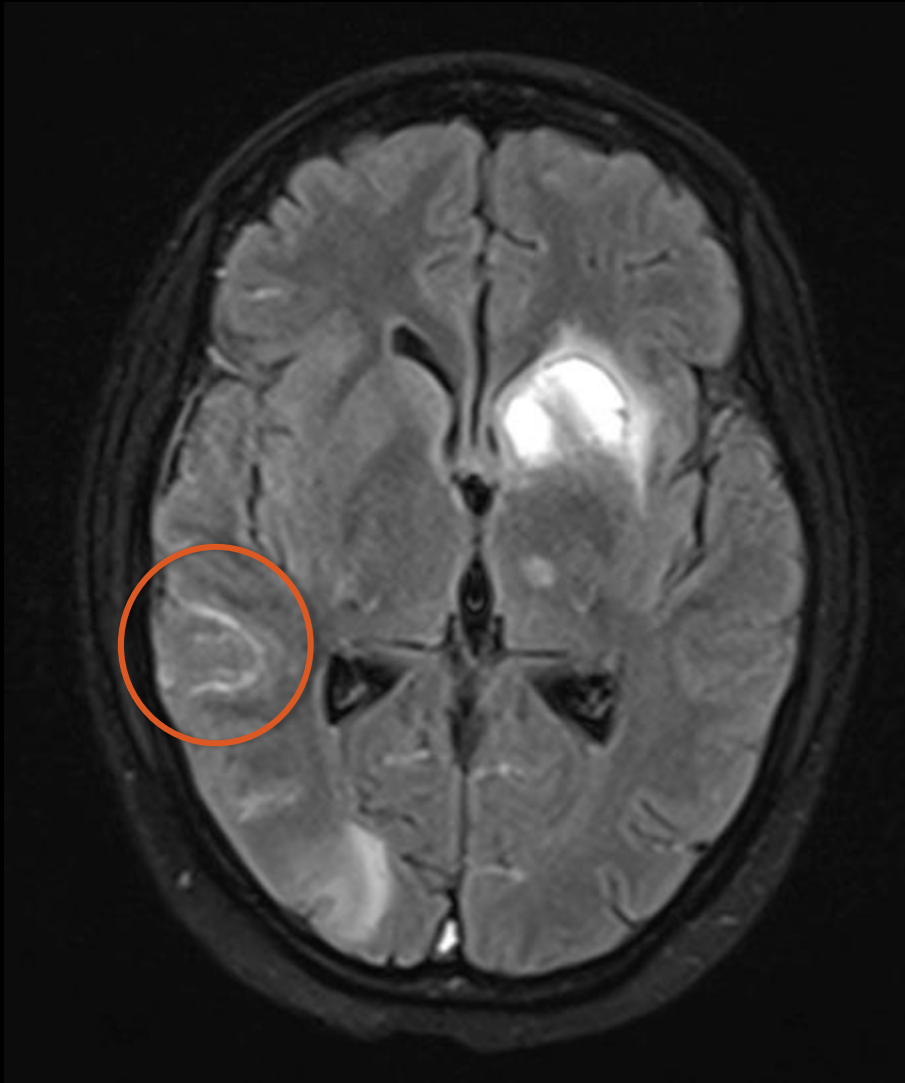
Virus	Result
EBV viral load	Undetectable
HSV-1 DNA	Not detected
HSV-2 DNA	Not detected
VZV DNA	POSITIVE
Enterovirus RNA	Not detected
Mumps virus RNA	Not detected

MRI BRAIN

Left lentiform nucleus bleed

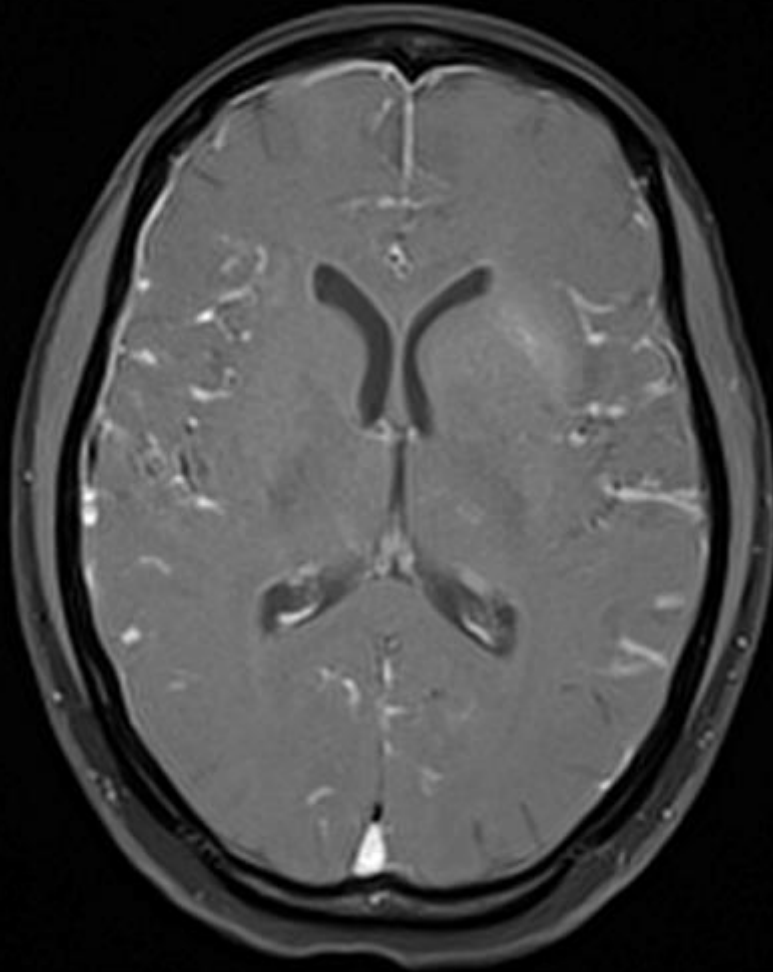


MRI BRAIN



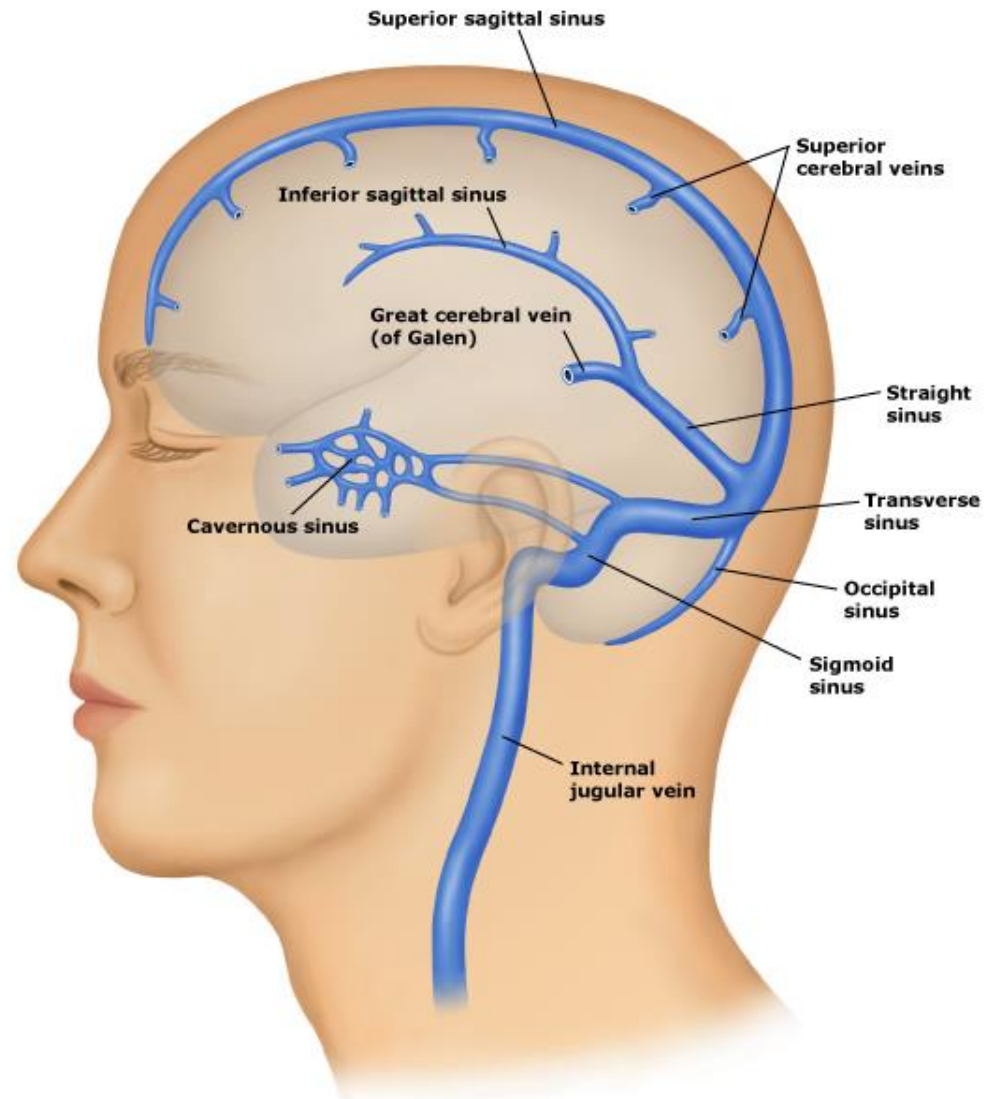
Subarachnoid
haemorrhage

MRI BRAIN



Meningeal
enhancement
(reactive due to SAH)

DURAL VENOUS SINUSES



MRI BRAIN

Extensive venous
sinus thrombosis

A

P



MRI BRAIN

Diffuse arterial
vasculitis



Left internal carotid

MRI BRAIN

Patchy white matter
demyelination
? ADEM
? Vasculitis



FURTHER COURSE

Very slow to respond.

Completed 3 weeks of acyclovir 10 mg/kg 8 hourly.

Commenced on ARVs – FTC/TDF/EFV.

On last day of acyclovir, patient showed marked improvement, woke up and asked, “Where am I?”

Residual decreased visual acuity on right eye

Residual right hemiplegia – power 4/5

VARICELLA VASCULOPATHY

- **VZV causes chickenpox (varicella), after which the virus becomes latent in nervous system ganglia.**
- **With a decline in immunity (old age, HIV, etc.), the virus reactivates to cause shingles (herpes zoster).**
- **Zoster may also be complicated by VZV vasculopathy due to viral infection of cerebral arteries.**
- **VZV vasculopathy probably accounts for the majority of what is often thought to be VZV encephalitis.**

EPIDEMIOLOGY

Frequency unknown

- But, since > 95% of the world population is latently infected with VZV, and 50% will experience reactivation (zoster) by age 85, frequency must be rare!

Stroke risk following zoster is well-described

- For instance, after 1st-ever diagnosis of zoster:
**Risk of Stroke Following Herpes Zoster:
A Self-Controlled Case-Series Study**

Sinéad M. Langan,^a Caroline Minassian,^a Liam Smeeth, and Sara L. Thomas

Faculty of Epidemiology and Population Health, London School of Hygiene and Tropical Medicine, United Kingdom

For further information, please contact the corresponding author.

SPECTRUM OF DISEASE

- **Spectrum of VZV:**
 - Ischaemic/haemorrhagic stroke
 - Temporal arteritis (mimicking GCA)
 - Cerebral aneurysm and subarachnoid / IC haemorrhage
 - Arterial dissection
 - Cranial neuropathies
 - Venous sinus thrombosis
 - Spinal cord infarction
 - Peripheral thrombotic disease

PATHOGENESIS

After reactivation, VZV travels transaxonally to arteries.

- So, for VZV vasculopathy to cause a stroke, needs to reactivate in the trigeminal or cranial nerve ganglia. Etc.

Infection established within arteries.

- VZV antigen detectable within adventitia early on in infection.

Vascular remodelling and either ischaemia or bleeding follow.

- Altered arterial caliber: thickened intima
- Disruption of vessel wall: abundant neutrophils within adventitia, etc.

STROKE

- **Suspect in a patient with recent zoster or varicella who presents with a TIA, stroke, altered mental status, or headache.**
- **Also suspect if vasculopathy of unknown origin – esp. if immunocompromised.**
 - 1/3 of patients with VZV have no preceding rash.
 - 1/3 have normal CSF findings
 - Average 4.2 month delay from zoster to neurological symptoms

Diagnosis hard: PCR positive in only 30% (but 93% have anti-VZV IgG in CSF, with reduced serum:CSF ratio)

ANEURYSM & HAEMORRHAGE

Spectrum:

- Cerebral aneurysm
 - Subarachnoid aneurysm
- } ± bleeds

Only a handful of case reports so far.

One case report: development of 9 anterior circulation aneurysms 2 months after herpes zoster. Antiviral treatment resulted in regression or reduction in all aneurysms.

Neurology. 2014 Jun 10;82(23):2139-41. doi: 10.1212/WNL.0000000000000503. Epub 2014 May 14.

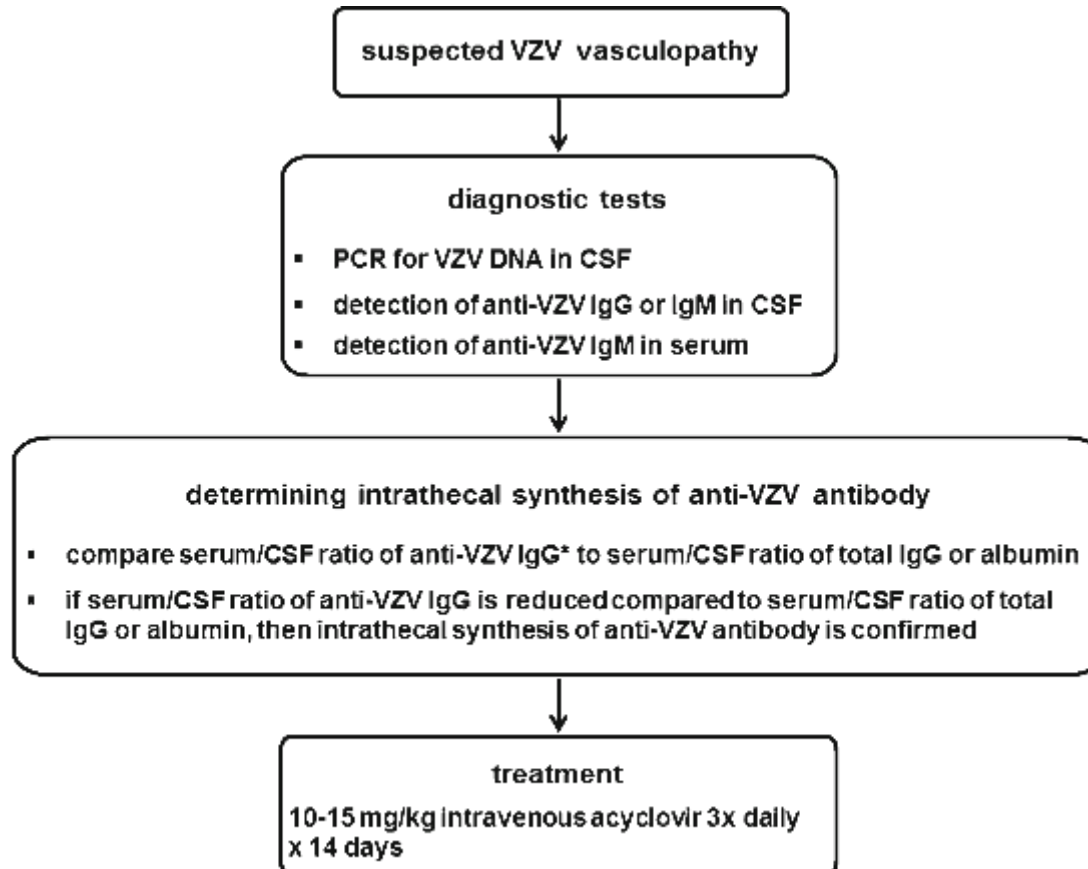
Rapid development of 9 cerebral aneurysms in varicella-zoster virus vasculopathy.

Liberman AL¹, Nagel MA¹, Hurley MC¹, Caprio FZ¹, Bernstein RA¹, Gilden D².

VENOUS SINUS THROMBOSIS

- **Only 3 cases described.**
 - 55-year-old woman
 - 15-year-old boy
 - 20-year-old man
- **All patients improved on treatment with acyclovir and anticoagulation.**

DIAGNOSIS & TREATMENT



[^] the same calculation is used to determine intrathecal synthesis of anti-VZV IgM antibody