Chloe's Complications

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Chloe's Case

Chloe, 19, presents to the ED complaining of a week long headache. The headache had a gradual onset affecting mainly the right side of the forehead, eye, ear and neck (6/10). It is associated with nausea, vomiting and photophobia and may have had a short febrile period.

Chloe has a history of ulcerative colitis, iron deficiency anemia and asthma.

Chloe's medications include:

- Prednisone
- Mesalamine
- Fluticasone
- Salbutamol
- OC pill

A lumbar puncture rules out meningitis. The lumbar puncture is normal.

She is treated for migraine with metoclopramide 10 mg IV and has near complete resolution of her headache. She is discharged home and advised to follow-up with her FP.

Three days later she presents with slurred speech and left-sided tingling. Chloe has a seizure in the ER and is intubated. A CT scan of Chloe's head is performed.

Read on for more on Chloe.

Questions & Answers

1. What dangerous headaches must be ruled out?

Based on history and physical, dangerous headaches must be ruled out (Table 1).[1]

2. What is the diagnosis?

Chloe's worsening headache despite treatment, negative lumbar puncture and focal neurologic deficits point towards an uncommon secondary headache, cerebral venous thrombosis (CVT). This is a difficult diagnosis to make and presents infrequently, even in large centers. Clinical presentation varies with the location and extent of thrombus. The most common signs and symptoms are headache (90%), focal motor or sensory deficits (40% to 60%), seizures (40%) and papilledema (20% to 40%). Headache can be of sudden onset and mimic a subarachnoid hemorrhage. A syndrome of isolated intracranial hypertension with headache, vomiting and blurred vision secondary to papilledema accounts for 20% to 40% of CVT presentations. Stupor and coma are found in 15% to 19% and coma is a predictor of poor outcome.[2]

Etiologies are both infectious and non-infectious:

- malignancies,
- red cell and platelet disorders,
- inflammatory disease and
- connective tissue disease.

Other causes include:

- pregnancy,
- the puerperium,
- OCs,

Table 1

Dangerous headaches to rule out

Secondary headache	Signs/symptoms	Best initial test
Subarachnoid hemorrhage	Sudden onset (seconds, worst headache ever)	Lumbar puncture with or without CT
Meningitis/encephalitis	Headache, fever, stiff neck, systemic infection, rash	Lumbar puncture if increased intracranial pressure not present
Tumours/abscesses	Persistent, progressive, late focal findings, valsalva worsens	CT
Temporal arteritis	New headache, > 50-years-old, scalp/jaw pain	Erythrocyte sedimentation rate

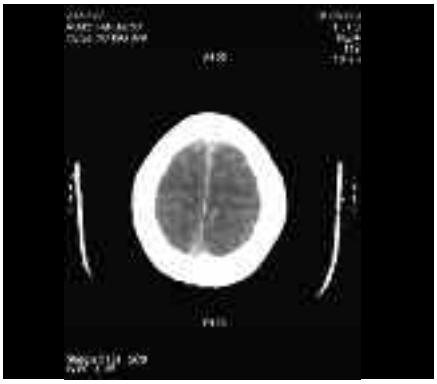

Figure 1a. Contrast CT head showing "empty delta" sign.

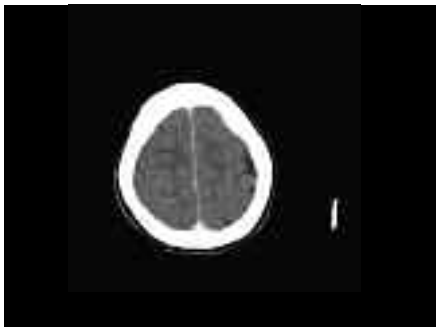

Figure 1b. Normal contrast CT head.

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- coagulopathies,
- head injury and
- severe dehydration.[3]

CVT affects all ages, but is most likely in those < 45-years-of-age and in children. It has an increased incidence in women (5:1.5), possibly due to OC use and pregnancy.

In patients with focal deficits together with headache, seizures or an altered consciousness, CVT should always be considered.[2]

3. *How is the diagnosis confirmed?*

Imaging is necessary and although a CT scan with contrast (angiography) is capable, magnetic resonance angiography (MRA) is the gold standard for diagnosis and follow-up. Imaging of the brain may show an empty delta sign, a triangular filling defect in the superior sagittal sinus. Care should also be taken to rule out secondary intracranial hemorrhage. Figure 1a shows a CT scan with contrast with an empty delta sign. Figure 1b is a normal contrast head with contrast. Figure 2a shows an MRA positive for CVT. Figure 2b is a normal MRA.

4. *What are the complications?*

The course of CVT varies. It can lead to benign intracranial hypertension or it can result in further bleeding with conversion to a hemorrhagic infarct. A large cerebral vein thrombosis may extend in a retrograde fashion, worsening the symptoms. Pulmonary embolus (PE) can occur if CVT is not diagnosed and treated promptly. A review of 203 cases of CVT found 23 cases of PE with a mortality rate of 95.6%. Excellent recovery from CVT is possible with early diagnosis and treatment.[4]

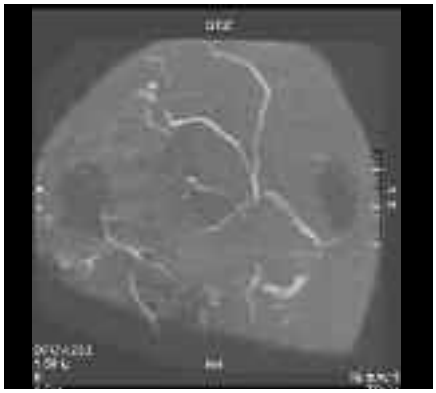

Figure 2a. Magnetic resonance angiography (MRA) showing no contrast in the sagittal sinus.

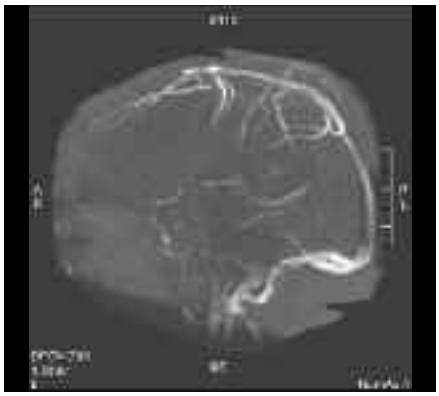

Figure 2b. Normal MRA showing contrast in the sagittal sinus.

5. *What is the treatment?*

Treatment has been controversial as there is a concern of worsening a hemorrhagic infarct with anticoagulant therapy. A recent Cochrane Review of two randomized control trials (79 patients) comparing anticoagulant therapy with placebo or control was associated with a pooled relative risk of death of 0.33 or dependency of 0.46. No new symptomatic intracerebral hemorrhages were observed, though one patient experienced a major GI hemorrhage.[5] Thrombolytic therapy remains more controversial because of greater hemorrhagic risk. In cases of progressive neurological dysfunction despite systemic anticoagulation, local thrombolysis has improved outcomes.[3]

Chloe was admitted to the ICU. CT scan of the head was suspicious for CVT with empty delta sign. MRA confirmed sagittal sinus thrombosis. She was treated with anticoagulation including heparin but not thrombolysis. She was subsequently extubated and transferred to the Neurology service. She recovered fully after several weeks in hospital. Dx

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