Cavernous sinus thrombophlebitis masquerading as ischaemic stroke: a catastrophic pitfall in any emergency department

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Cavernous sinus thrombophlebitis is a clinically rare but fatal disease that progresses rapidly. Its initial presentation is always neglected by emergency physicians, until typical symptoms and signs are noted or thin-slice brain CT results obtained, by which time it is already too late. A case of cavernous sinus thrombophlebitis caused by sinusitis, which initially masqueraded as ischaemic stroke, is reported. Blindness of the left eye was the outcome. High suspicion, accurate diagnosis and aggressive antibiotic treatment are emphasised.

A 66-year-old woman with diabetes presented to the emergency room with a 1-day history of left facial numbness, which occasionally radiated to the left side of her neck. No fever, ptosis, proptosis, chemosis, periorbital swelling, decreased visual acuity, neck stiffness, diplopia, seizure or hemiparesis was noted. She had had sinusitis about 10 days previously. A history of minor stroke without obvious sequelae about 5 years ago was reported.

She was conscious on admission to hospital. Vital signs were stable: blood pressure 160/50 mm Hg, pulse rate 80 bpm, respiratory rate 16 breaths/min and body temperature 36.9°C. Neurological examination showed no obvious cranial nerve palsy or other focal neurological signs except for left facial numbness. The pupils were 3 mm and reactive to both direct and consensual stimuli. Visual acuity was normal. A blood test showed slight leucocytosis (white blood cells (WBCs) 11 600/ μ l). Thick-slice (5 mm) brain CT was carried out, with no obvious findings. A neurologist advised emergency room observation with a possible diagnosis of ischaemic stroke.

Four hours after her admission, left eye ptosis was noted. She had decreased visual acuity and complained of pain in the left eye. Neurological examination showed obvious ophthalmoplegia. The pupils were 3 mm (right) and 5 mm (left). Corneal reflex was absent in the left eye. Meanwhile, the fever increased to 38°C. Cavernous sinus lesion was suspected and thin-slice brain CT was performed. It disclosed a bulging of the cavernous sinus area in coronal view (fig 1). Additionally, lumbar puncture showed marked leucocytosis (white blood cell count 27 per high power field) with a predominant neutrophil count. She was diagnosed as having fulminant cavernous sinus thrombophlebitis caused by sinusitis. Despite broad spectrum antibiotics followed by adequate drainage, the patient survived with total blindness in her left eye.

DISCUSSION

Cavernous sinus thrombophlebitis is a lethal disease that may be ignored by emergency physicians, especially without typical presentation or a high index of suspicion. Before the availability of antibiotics, septic inflammation or thrombosis of the cavernous sinus was uniformly fatal. Grove¹ reviewed about 400 cases with an estimated 100% mortality in 1936. In the post-antibiotic era, cavernous sinus thrombophlebitis is still associated with high rates of morbidity and mortality, typically between 10% and 34%.² This is possibly due to delayed diagnosis without prompt surgical drainage and aggressive use of antibiotics. Permanent neurological morbidity such as visual field deficit, blindness or persistent cranial nerve palsy will accompany the patients for the rest of their lives. Thus, immediate diagnosis and prompt broad-spectrum antibiotic treatment is crucial.

Two catastrophic pitfalls delayed prompt diagnosis in this patient. First, the patient presented to the emergency room without typical presentations of cavernous sinus thrombophlebitis. According to Southwick *et al*,³ 80–100% of patients with cavernous sinus thrombophlebitis presented to hospital with symptoms of fever, ptosis, proptosis, chemosis or cranial nerve palsy. Meanwhile, 50–80% of patients reported lethargy, headache, periorbital swelling or papilloedema. However, none of these symptoms or signs appeared initially in this

patient. The major concern of this patient was numbness of half of her face. This will easily distract the diagnosis away from the possible lethal cavernous sinus thrombophlebitis. When ptosis and visual deficit appeared in this patient, it became easy to detect but difficult to cure.

Second, thick-slice brain CT always shows a negative finding of this entity. Schuknecht *et al*⁴ showed that high-resolution CT with a slice thickness of ≤ 3 mm has remarkably improved our ability to establish the diagnosis of cavernous sinus thrombophlebitis. Several direct signs of cavernous sinus thrombophlebitis were observed at high-resolution CT, including expansion or bulging of the cavernous sinus with lateral wall flattening or convexity rather than normal concavity. It is best visualised in coronal images. Unless there is a high suspicion of cavernous sinus thrombophlebitis, thick-slice brain CT is usually performed in the emergency room rather than thin-slice brain CT.

In conclusion, cavernous sinus thrombophlebitis is a rare but dangerous entity that may progress fulminantly. It can be easily neglected by emergency physicians initially, when no typical symptoms or signs have presented. Furthermore, thick-slice brain CT will always show a negative finding of this entity. Because prompt diagnosis and aggressive treatment are crucial, emergency physicians should always include it as a differential diagnosis when dealing with patients who complain of numbness in half of the face. Any delay in treatment can be catastrophic.

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Figure 1 Bulging of the cavernous sinus area in coronal view.