Expert Opinion

Pseudo-Pseudotumor Cerebri

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Key words: cerebral venous thrombosis, pseudotumor cerebri

Abbreviations: CVT cerebral venous thrombosis, MRV magnetic resonance venography

(*Headache* 2001;41:416-418)

The presentation of cerebral venous thrombosis (CVT) as only severe headache and disc edema in an obese woman with a normal CT scan of the head can easily be misdiagnosed as pseudotumor cerebri.

CLINICAL HISTORY

A 37-year-old woman was seen for evaluation of headaches. Two weeks previously, she had developed an increasingly severe pressure in her cheeks, behind her eyes, and in her right temple associated with nausea, vomiting, and light and noise sensitivity. She was seen in an emergency department, diagnosed with "sinusitis" without any imaging studies, and started on clanthromycin and promethazine. The headache persisted daily. One week later, she saw her internist and was started on cefuroxime, fluticasone propionate, and loratadine for "sinusitis." A CT scan of the brain, with and without contrast, the next day was reported as normal. Two days later, she was seen in an emergency department again where a lumbar puncture was advised, but she declined.

When I first saw her 2 weeks after the onset, she reported a daily, severe, intermittent, generalized aching and throbbing—the worst of her life, increased with Valsalva, and sometimes awakening her from sleep. She had intermittent nausea and occasional vomiting but no fever. She had no visual symptoms. Hydrocodone would dull the headache. There was a prior history of occasional mild, bifrontal, pressure-type headaches without associated symptoms. Past history was otherwise negative.

On examination, she was 5′7″ tall and weighed 318 pounds. The neck was supple. Neurological examination was normal except for blurring of the nasal and temporal sides of both optic discs. I considered pseudotumor cerebri as the most likely diagnosis because of her sex and obesity, but wanted to exclude the possibility of CVT first before performing a lumbar puncture.

An MRI scan of the brain on an open-sided scanner showed right mastoiditis and suggested thrombosis of the right sigmoid and transverse dural sinuses, subsequently confirmed on a magnetic resonance venography (MRV) study. In retrospect, the first CT of the brain did not adequately show the right mastoid because of rotation of the patient's head. The mastoiditis was confirmed on the second CT scan of the mastoids. She was started on heparin and antibiotics. The headache resolved within 2 days of starting the heparin. She subsequently underwent a right mastoidectomy and was then placed on warfarin.

Questions.—How often does CVT present with headache only? If she had a lumbar puncture in the emergency department as recommended, what would be the likely findings, and how might these differ from those present in pseudotumor cerebri? What is the sensitivity of CT versus MRI versus MRV of the brain in diagnosing CVT? What are the other causes of "pseudo-" pseudotumor cerebri?

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EXPERT COMMENTARY

This patient presents an increasingly recognized pitfall in the clinical diagnosis of headache. She is obese, has a normal head CT scan, and a normal neurological examination with the exception of blurring of the optic disc margins. In the not-too-distant past, her only further diagnostic study would have been a lumbar puncture to exclude a chronic inflammatory process and to verify the elevated intracranial pressure that defines the syndrome of idiopathic intracranial hypertension, or pseudotumor cerebri. Her treatment would have consisted of medical or mechanical measures to reduce the papilledema, as visual loss is the sole malignant complication of this otherwise benign syndrome.

But, she did not have pseudotumor cerebri. The outcome in CVT, and specifically dural sinus thrombosis, is unpredictable but can be fatal if untreated. Cerebral venous thrombosis typically presents with a combination of headache and focal deficit, headache and focal seizure, or headache with progressive decline in consciousness and emergence of long-tract findings.[1] In up to 37% of cases, however, it presents only with headache and papilledema.[1-3] Moreover, cerebrospinal fluid studies are negative except for elevated intracranial pressure in 75% of patients with CVT.[2] These facts, as well as this patient's negative head CT scan, should serve as warnings for caregivers seeing a patient with headache and papilledema, that pseudotumor cerebri is CVT until proven otherwise.[4]

Contrast-enhanced head CT can often detect a dural sinus thrombosis by virtue of the *empty delta sign*, due to filling defect of the sinus, but this has a very low sensitivity of 20%. An MRI scan is far better but, even with contrast, is subject to false negative readings due to time-related changes in clot imaging, and false-positive results in the case of slow flow through the sinuses.[5] These errors can usually be compensated for both by high clinical index of suspicion and confirmation of MRV. The obesity of this patient presents an obstacle to MR imaging except for use of an open-sided MRI scanner, which typically has a 500-pound patient weight limit for brain studies. Open-sided MRV is usually done with contrast to enhance resolution, although this technique has not yet been compared to standard MRV in large studies. Thus, cerebral angiography would be an important adjunct in her diagnostic studies if the open-sided MRI were inconclusive. Another option is cerebral CT venography in some institutions, which has a sensitivity at least as great as MRV.[6]

The list of conditions producing intracranial hypertension with a normal head CT is daunting, and should dissuade practitioners from using the word *idiopathic* intracranial hypertension too quickly.[7] Causes include encephalitis and (chronic) meningitis, meningeal infiltration, metabolic disorders such as uremia and hypercapnia, endocrine disorders such as thyrotoxicosis and hypoparathyroidism, as well as side effects of medications such as tetracyclines, cimetidine, cyclosporine, and tamoxifen. For CVT, one must consider factors or cofactors for thrombophilia, such as local inflammation (in this patient's case), dehydration, infection, and puerperal state. Recently, there has been recognition of thrombophilic disorders such as activated protein C resistance[8] which can serve as cofactors for CVT.

Not only the frequency of diagnosis, but the standard of care for CVT has also changed in the last decade, due to the excellent prognosis of patients treated with anticoagulation, and the variable (sometimes dismal) outcome of patients without anticoagulation.[9] Surprisingly, this holds true whether or not there is an associated parenchymal hemorrhage due to the venous thrombosis. This patient's remarkable reversal of symptoms after 2 days of anticoagulation underscores the importance of rapid diagnosis and treatment of CVT.

In summary, CVT is an uncommon condition, although it is probably far more common than previously appreciated. With the advances in imaging technology and in treatment of CVT, our best weapon against it is an appropriately high index of suspicion in the presentation of progressive headache, particularly with papilledema and particularly when we find ourselves asking, "Is this pseudotumor cerebri?"

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