

Images and educational vignettes in vasculitis

A headache and a mass lesion: Vasculitis or CNS sarcoid?

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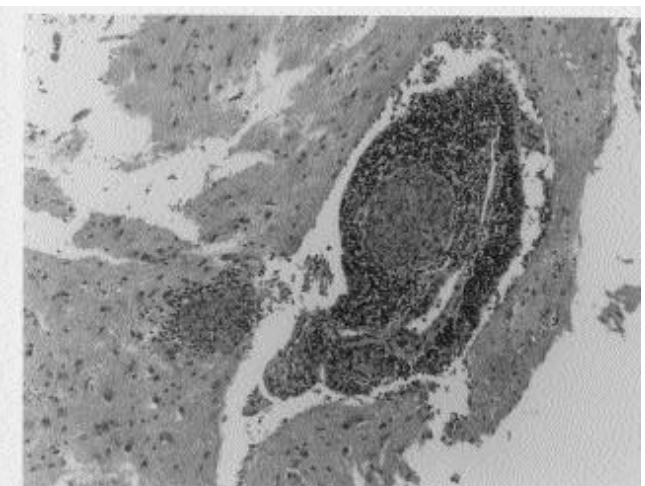
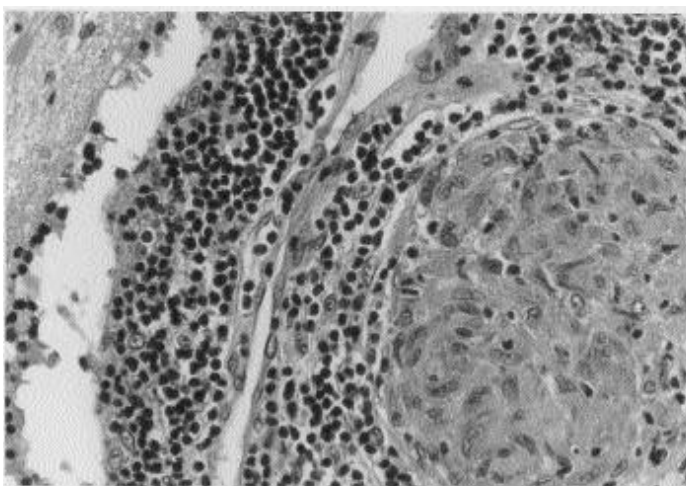
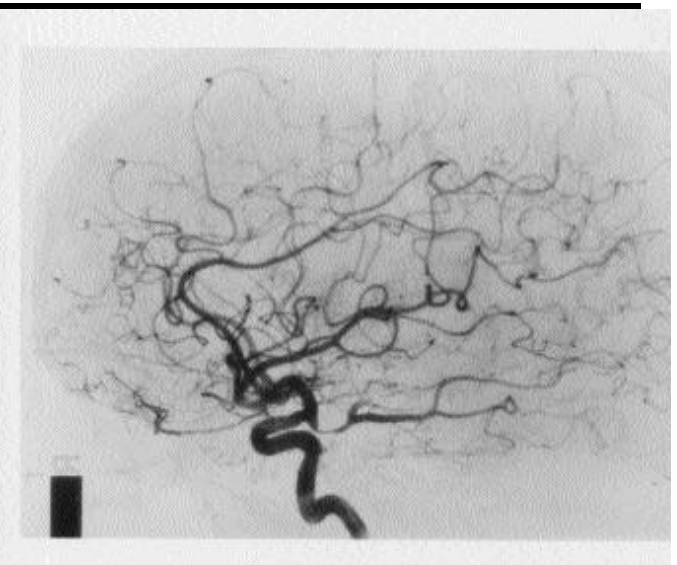
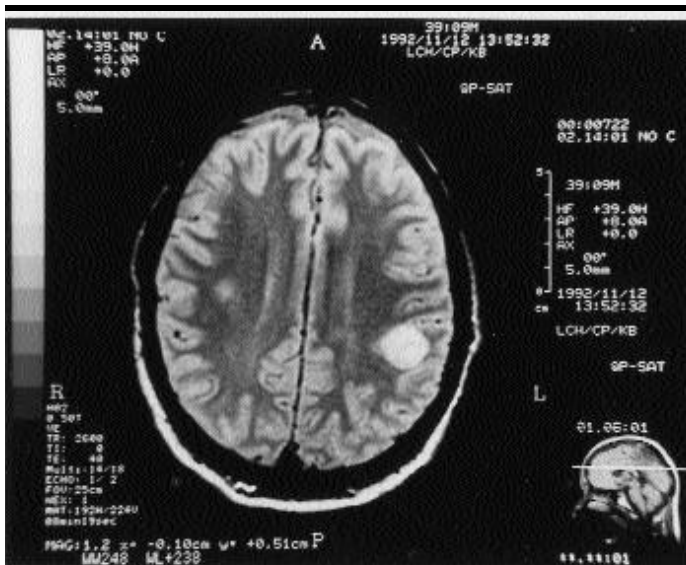
A headache and a mass lesion: Granulomatous angiitis of the central nervous system (GACNS) or neurosarcoidosis

A 40-year-old man presents with a new onset generalized seizure in the setting of increasing headaches and undergoes a magnetic resonance imaging scan (MRI) of his head that reveals a mass-like lesion in the right parietal-occipital area (Figure, upper left). The patient had no significant past medical history and no other signs or symptoms except for his severe headache. A biopsy of the lesion revealed a granulomatous arteritis with well formed, non-caseating granulomas exclusively distributed in a perivascular pattern (lower right and left). A lumbar puncture revealed no significant abnormalities. An angiogram was performed to further evaluate

the cerebral vasculature and was normal (upper right). A further work-up for any evidence of a systemic granulomatous process (chest abdomen and pelvic computed tomography (CT), gallium scan, ophthalmologic evaluation, axillary lymph node biopsy, serum angiotensin-converting enzyme (ACE) level, multiple cultures) was negative.

Does the patient have vasculitis and can vasculitis present with a mass lesion such as this?

There is little doubt that this patient has vasculitis. The pathology was exclusively limited to the vasculature with no evidence of parenchymal granuloma formation away from the vascular tissues. Even with this dramatic histologic picture,



however, special stains for infectious etiologies (i.e., mycobacteria, fungi, etc.) are essential, as well as cultures of cerebrospinal fluid (CSF) and biopsy material. These studies were all performed and were negative.

Mass lesions are not traditionally suspected as manifestations of central nervous system (CNS) vasculitis; however, in our series nearly 15% of cases presented with a mass effect on CT or MRI imaging (1). Upon biopsy these lesions may or may not demonstrate granulomatous features and the response to therapy is variable. As always, any such lesions must be approached as a neoplasm or infection until proven otherwise.

Does this patient have granulomatous angiitis of the CNS (GACNS) or neurosarcoidosis ?

In general these disorders are readily separated. GACNS is primarily a leptomeningeal and cortical vasculitis process involving the small and medium sized leptomeningeal cortical arteries and less frequently the veins and venules (2). Both Langerhan's and foreign body type giant cells may be seen within the intima, along the internal elastic lamella, or within or outside the media. Skip lesions do occur. Early pathologic descriptions of GACNS emphasized extensive vascular necrosis which served to differentiate GACNS from sarcoidosis in which vascular necrosis is highly uncommon (2). Subsequent reports have clearly demonstrated a far wider spectrum of vascular changes in both GACNS and sarcoidosis with descriptions of necrotic and non-necrotic vascular lesions in both conditions, thus compromising the ability of this pathologic feature to differentiate between them (3-6). The presence of well-formed granulomas, as in the current case, is distinctly uncommon in PACNS, being absent in the largest pathologic series reported to date (3) as well as in our own experience.

Involvement of the CNS in sarcoidosis occurs in about 5% of patients and generally is found in the setting of readily detectable manifestations of systemic disease which are primarily intra-thoracic (6). A diligent search in the present case revealed no evidence of granulomatous disease outside of the CNS. The pathologic features of CNS sarcoid have been well described. Constant features of neurosarcoid include the presence of non-caseating granulomas with or without giant cells of the Langerhan's type, accompanied by lymphocytic infiltrates (6). The distribution of the granulomas within the leptomeninges and parenchyma may be rather circumscribed, leading to mass-like presentations (6). Cases demonstrating frank vascular involvement similar to this case have rarely been reported (5), but occasional examples have even been associated with angiographic changes within the CNS (8).

Securing the diagnosis of neurosarcoidosis (or sarcoid of any isolated end organ in the absence of pulmonary disease) requires a compatible clinical or radiographic picture of sarcoidosis and the presence of a histologic picture of non-caseating granulomas (6). The absence of one or the other of these findings may lead to misdiagnosis, for non-caseating granulomas themselves are not specific, being found in a wide variety of inflammatory infectious and autoimmune states. Differentiating GACNS from neurosarcoidosis is generally not difficult (8), but the nosology of the current case is problematic. It lacks the relatively common clinical and CSF findings typical of GACNS (2), but clearly is a vasculitic disorder clinically confined to the CNS and thus represents a form of PACNS. Alternatively, if this patient had clinical or radiographic evidence outside the nervous system the neuropathologic findings would be readily interpreted as consistent with neurosarcoidosis with a mass-like and vasculitic presentation. Urich has proposed a classification scheme for granulomatous vascular lesions within the CNS (5) and according to these the present case would be classified as GACNS, and our case was tentatively diagnosed as such, but with a high degree of scientific uncertainty.

Perhaps the most important clinical point is that a diligent search for pathogens was undertaken both within the CNS and systemically, and none was found. In the absence of infection, therapy was then instituted for either GACNS or neurosarcoidosis by placing the patient on high dose oral glucocorticoid therapy. After a brief period of observation without improvement, cyclophosphamide was added with slow resolution of the neuroradiographic lesions.

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References

- DUNA GF, GEORGE T, RYBICKI L, CALABRESE LH: Primary angiitis of the central nervous system (PACNS): An analysis of unusual presentations. *Arthritis Rheum* 1995; 38: S340.
- CALABRESE LH, DUNA GF, LIE JT: Vasculitis in the central nervous system. *Arthritis Rheum* 1997; 40: 1189-201.
- LIE JT: Primary (granulomatous) angiitis of the CNS: A clinicopathologic analysis of 15 cases and a review of the literature. *Hum Path* 1992; 23: 164-71.
- FERNANDEZ SRM, SINGSEN BH, HOFFMAN GS: Sarcoidosis and systemic vasculitis. 2000; 30: 33-46.
- URICH H: Neurosarcoidosis or granulomatous angiitis: A problem with definition. *Mt Siani J Med* 1977; 44: 1718-25.
- HERRING AM, ULRICH H: Sarcoidosis of the CNS. *J Neuro Sci* 1969; 9: 405-22.
- CHAPELON C, ZIZA JM, PIETTE JC *et al.*: Neurosarcoidosis: Signs, course and treatment in 35 confirmed cases. *Medicine* 1990; 69: 261-76.
- LAWRENCE WP, GAMMAL T, POOL WH *et al.*: Radiographic manifestations of neurosarcoidosis. *Clin Radiol* 1974; 25: 343-8.