

Diagnostic Utility of Cerebral Biopsy Following Suggestive Cerebral Angiogram in the Workup of CNS Vasculitis

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Introduction

The gold standard for diagnosis of CNS vasculitis (CNSV) is cerebral biopsy. Cerebral angiography, however, has become a common diagnostic tool for workup of this disease with characteristic radiographic findings. Few analyses have been performed which examine the value of angiography as a stand-alone diagnostic entity or the value of cerebral biopsy in the setting of positive angiography.

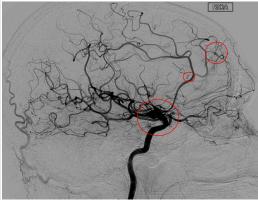
Methods

A retrospective review of a prospectively collected angiography database was performed for all patients who underwent both cerebral angiography and cerebral biopsy for the workup of a presumptive diagnosis of CNSV at a single center from 2005 to 2016. The results were then subjected to statistical analyses.

Results

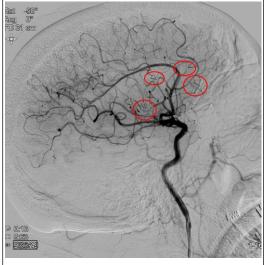
A total of 57 patients over the period of 2005-2016 underwent angiography for workup of presumed CNSV. Twenty patients exhibited angiograms suggestive of vasculitis and 28 patients underwent cerebral biopsy. Only one was positive. The negative predictive value (NPV) for angiography was 94.11% (CI: 71.31-99.85). Specificity was 59.26%. Positive predictive value (PPV) was unable to be calculated based on these data, given that angiography did not accurately predict biopsy diagnosis. Of note, the patient with biopsy-proven vasculitis exhibited negative angiography. Only 3.7% of biopsies were positive for vasculitis. Pathology from biopsies included a range of findings from multifocal neocrotizing leukoencephalopathy to lymphoma.

Right Internal Carotid Artery



RICA Injection showing multiple fusiform dilatations suggestive of vasculitis.

Right Internal Carotid Artery



RICA injection showing areas of focal stenosis

Right Internal Carotid Artery



RICA injection showing fusiform dilatation of M1 segment

Left Vertebral Artery



Left vertebral artery injection showing fusiform dilatations of the P1 and P2 segments.

Conclusions

Cerebral angiography shows high NPV for CNSV. Angiography, however, did not accurately predict diagnosis in a single case in this series. The prevalence of disease is too low to accurately ascertain PPV. Pathology from biopsy is positive in a minority of cases, regardless of angiographic findings. Even in the face of negative radiography and pathology, a large percentage of patients still received an empiric steroid regimen. Given the influence of clinical suspicion on subsequent management, cerebral biopsy may be uneccessary in cases of positive angiography given the low likelihood of the disease, and the overwhelming tendecy to treat for vasculitis based on a presumptive clinical diagnosis. Angiography may also serve as an effective screening tool given the high NPV. Given this data, cerebral biopsy and the concomitant surgical risks can likely be avoided without significantly altering the course of treatment for many of these patients.

References

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