Teaching NeuroImages: Tuberculous meningitis

Remembering the Rich focus

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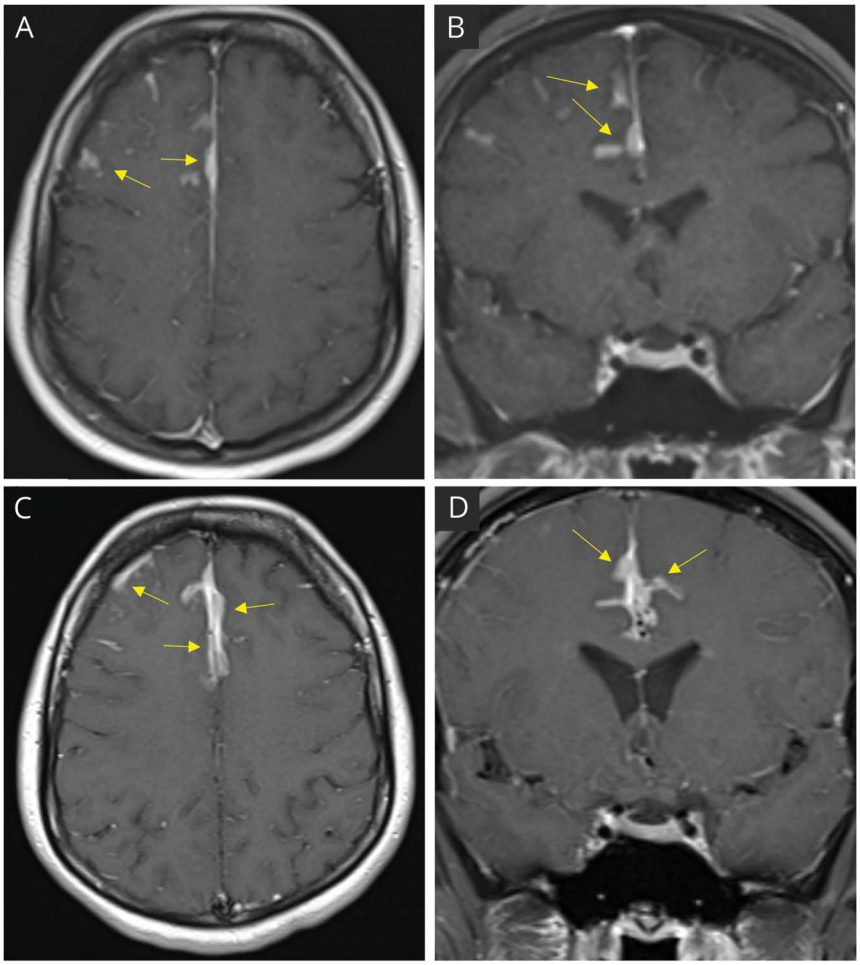
Figure Evolution of leptomeningeal abnormality over 3 years leading up to the clinical presentation with tuberculous meningitis



Images from the MRI brain acquired 3 years before presentation with meningitis (A: axial T1 postcontrast and B: sagittal T1 postcontrast) and on the day of presentation with meningitis (C: axial T1 postcontrast, D: sagittal T1 postcontrast). Arrows indicate the areas of nodular leptomeningeal enhancement that expanded over the 3-year interval.

Tuberculosis (TB) infection can seed in the meninges or cortex as silent caseous foci. TB meningitis occurs when one of these foci—the Rich focus[1]—ruptures and releases *Mycobacterium tuberculosis* bacilli into the subarachnoid space.[2] This natural history has rarely been confirmed in vivo.

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Table Results of CSF studies and other relevant investigations

	3 years before meningitis	At presentation with meningitis
CSF white cell count (tube 4)	1 per mm^3	213 per mm^3
Lymphocytes	100%	56%
Neutrophils	0%	42%
CSF red cell count (tube 4)	0 per mm^3	8 per mm^3
CSF protein (normal 15.0–45.0)	47.7 mg/dL	114.5 mg/dL
CSF glucose	57 mg/dL	38 mg/dL
CSF oligoclonal bands	Not tested	Negative
CSF IgG index (normal 0.2–0.8)	Not tested	0.52
Serum glucose	91 mg/dL	105 mg/dL
Glucose CSF:serum ratio	0.63	0.36
CSF bacterial, mycobacterial, and fungal cultures	No growth	Positive for mycobacterium tuberculosis
CT chest, abdomen, and pelvis	A single 0.4 cm calcified granuloma in the right lung and a few small calcified lymph nodes in the mediastinum	No change to previous findings
FDG-PET body	No areas of abnormal metabolic activity. No evidence of sarcoidosis or malignancy.	—

FDG = fluorodeoxyglucose.

A 40-year-old woman with a history of latent TB infection treated in childhood presented with acute fever and headache and was diagnosed with TB meningitis. Three years before, an incidental leptomeningeal abnormality was identified during evaluation for concussion (figure), but investigations yielded no etiology (table). In retrospect, we concluded that it represented a longstanding Rich focus.

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Disclosure

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Appendix Authors

Name	Location	Contribution
Olwen C. Murphy, MBBCh, MRCPI	Johns Hopkins Hospital and Johns Hopkins School of Medicine, Baltimore, MD	Analyzed the data and drafted the manuscript for intellectual content
Carlos A. Pardo, MD	Johns Hopkins Hospital and Johns Hopkins School of Medicine, Baltimore, MD	Design and conceptualized the study, analyzed the data, and reviewed the report for intellectual content

References

1. Rich AR, McCordock HA. The pathogenesis of tuberculous meningitis. Bull Johns Hopkins Hosp 1933:2–37.
2. Donald PR, Schaaf HS, Schoeman JF. Tuberculous meningitis and miliary tuberculosis: the rich focus revisited. J Infect 2005;50:193–195.

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