

Correspondence

Subdural effusion and ischemic stroke complicating meningococcal meningitis in an adult



Dear Editor,

Acute bacterial meningitis (ABM) caused by *Neisseria meningitidis* can result in neurologic complications, among which subdural effusion (SE) is rarely reported in adults. We presented a case of meningococcal meningitis complicated with SE and ischemic stroke.

A 66-year-old female presented with fever and altered level of consciousness for one day. On physical examination, Glasgow Coma Score was E4V1M1, body temperature was 39.7 °C and respiratory rate was 21/min. No skin rashes were noted. Due to impending respiratory failure, she was intubated. Two sets of blood culture were collected and showed the growth of *N. meningitidis*. Cerebrospinal fluid (CSF) analysis revealed opening pressure 220 mmHg, white blood cells 2358/μL (85% neutrophils), glucose 66 mg/dL and total protein 782 mg/dL. Ceftriaxone and ampicillin were given. Brain magnetic resonance imaging (MRI) was

done due to refractory seizures and revealed right fronto-temporo-parietal (F-T-E) SE with mild mass effect, subacute infarction of left basal ganglion, temporal lobe and corona radiata, and increased leptomeningeal enhancement (Fig. 1). Right parietal trephination was performed and 50 ml of xanthochromatic fluid was drained. Post-operatively she was given ceftriaxone, vancomycin and dexamethasone. She was extubated five days later and her condition improved.

SE complicating ABM is more commonly seen in infants and children.¹ Although SE after ventriculoperitoneal shunting procedure in adults with cryptococcal meningitis has been recently reported,² it is unusual in adults with ABM without prior neurosurgery. The pathogenesis of SE complicating ABM may be the result of meningeal inflammatory process and the impairment of CSF circulation. Risk factors for SE complicating ABM include high CSF WBC

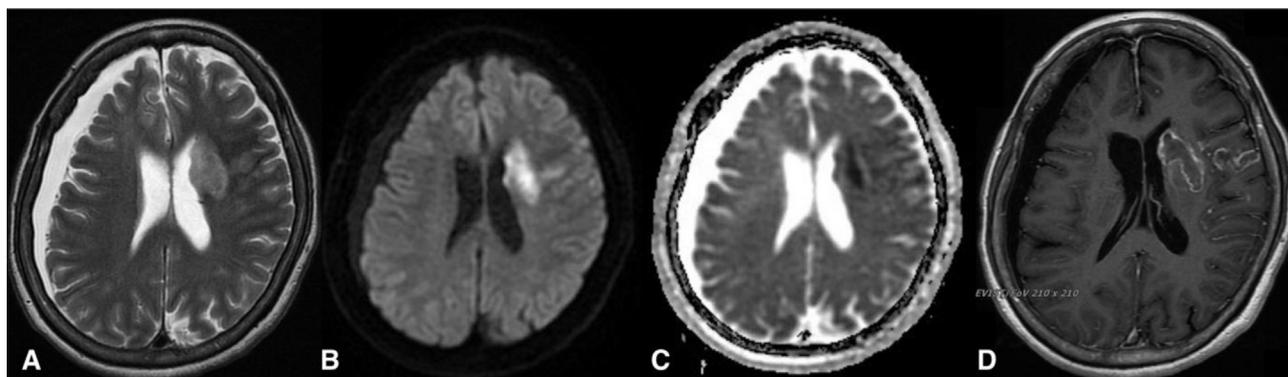


Figure 1. Brain MRI. Right F-T-P subdural effusion has similar signal intensity as CSF in lateral ventricles on T2-weighted imaging (A), is dark on diffusion-weighted imaging (DWI) (B), bright on apparent diffusion coefficient (ADC) (C) and no surrounding ring enhancement on contrast-enhanced T1WI (D). Subacute infarction of left basal ganglion can also be appreciated, as seen bright on DWI and dark on ADC.

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count, high CSF protein and high CSF bacterial concentration. On the other hand, ischemic stroke is a common complication of ABM with a high mortality rate and unfavorable outcomes.³ The mechanism underlying ischemic stroke in ABM includes cerebral arterial narrowing as a result of vasculitis and encroachment by the exudate in subarachnoid space, vasospasm, endocarditis, intraarterial thrombosis and activation of coagulation leading to diffuse cerebral intravascular coagulation. Current guidelines recommend a third-generation cephalosporin, penicillin G or ampicillin as the first-line therapy for meningococcal meningitis.⁴ However, bacteriolytic antibiotics can cause the release of endotoxins and the activation of proinflammatory cytokines such as tumor necrosis factor (TNF), leading to severe inflammation of the CNS and subsequent neurologic sequelae. Recently, an experimental animal study showed that using nonbacteriolytic antibiotic therapy was associated with significantly lower CNS TNF- α level in rabbits with pneumococcal meningitis.⁵ Whether this result can be applied to human adults with meningococcal meningitis requires further investigation.

To the best of our knowledge, this is the first case of SE secondary to meningococcal meningitis in an adult. Although previous studies suggested SE usually resolve spontaneously without increased morbidities and mortality in pediatric patients with ABM, literature regarding this issue in adults is limited. The need of trephination should be judged based on the patient clinical symptoms and should not be delayed once indicated. Early detection and timely treatment may improve the outcomes.

Disclosure of conflicts of interest

This case report is based on an abstract posted on 30th International Congress of Chemotherapy and Infection 2017. The abstract is also published on *International Journal of Antimicrobial Agents*. (Chang CY, Wang LS, Chiu TL, Chang PY, Hu CM, Wang CCJ. Meningococcal infection complicated with ischemic stroke and subdural effusion in an adult. *International Journal of Antimicrobial Agents*. 2017; 50:5195).

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jmii.2018.09.011>.

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