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CORRESPONDENCE

Rapid identification of *Streptococcus intermedius* by multiplex polymerase chain reaction 1 week before culture positivity in a patient with antibiotic-treated thalamic brain abscess



Dear Editor,

Thalamic abscesses are rare and may mimic brain tumors especially when no culture is performed or it is negative.¹ We herein present the case of a patient with thalamic abscess who received stereotactic aspiration 1 week after treatment with antibiotics. A previously healthy 68-year-old woman had headache for 2 weeks. Two days prior to her presentation, she developed fever, lethargy, and progressive left hemiparesis. She was brought to the emergency room of the only community-based hospital in Kinmen. Kinmen is a remote island located just off the southeastern coast of mainland China. At present, the hospital on the island has no magnetic resonance imaging (MRI) facility. On presentation, she had a fever (body temperature 38.5°C) with stable vital signs. On neurological examination, she was drowsy (E3M5-6V4) with left hemiparesis (3/5) and hyporeflexia over the four limbs. She did not show any meningeal signs. A hemogram revealed left-shifted leukocytosis (13,000 cells/μL) and elevated serum C-reactive protein level (4.38 mg/dL). Urinalysis was clear. Blood culture results were negative. Contrast-enhanced computed tomography (CT) showed one well-defined ring-enhanced cystic lesion at the right thalamus, 3 cm in the largest diameter (Figure 1A). We initiated treatment with empirical ceftriaxone (2 g every 12 hours) and metronidazole (500 mg every 6 hours) under the tentative diagnosis of brain abscess. She also received mannitol. Her neurological status improved gradually in the following 3 days, and she was transferred to the National Taiwan University Hospital, a medical center at the main island of Taiwan on the 4th day after her initial presentation.

MRI with gadolinium enhancement at the medical center delineated one cystic lesion (3.5 cm in the largest diameter) at the right thalamus with diffusion restriction, with its edema involving the upper midbrain (Figure 1B–1E). Magnetic resonance spectroscopy (MRS) showed decreased choline and *N*-acetyl aspartate levels with increased lactate level. Because the abscess was larger than 3 cm and MRI images suggested a possibility of abscess progression, stereotactic aspiration was performed 3 days later (i.e., 1 week after initiating antibiotics treatment). A multiplex PCR was performed directly from the abscess soon after the stereotactic aspiration, which indicated a possible presence of *Streptococcus* species (Figure 2). Further sequencing of 16S ribosomal RNA (rRNA) gene identified *Streptococcus intermedius*. Based on this result, we discontinued metronidazole, and continued treatment with ceftriaxone. Although routine culture did not show any pathogen initially, growth of *S. intermedius* was noted on the 8th postoperative day. Susceptibility testing showed that the pathogen is susceptible to penicillin, ampicillin, and ceftriaxone. We completed 8-week ceftriaxone therapy. Follow-up images showed complete remission of the abscess (Figure 1F) and the patient recovered completely. A lung nodule was noted incidentally in the left lower lobe and she received video-assisted thoracoscopic lobectomy later. The pathology revealed adenocarcinoma (T1aN0M0 lesion).

Solitary thalamic abscesses are rare, and its mortality is reported to be 7% even with prompt and appropriate treatment.² Although CT is a useful tool in the diagnosis of thalamic abscesses, differential diagnosis of cyst lesion at

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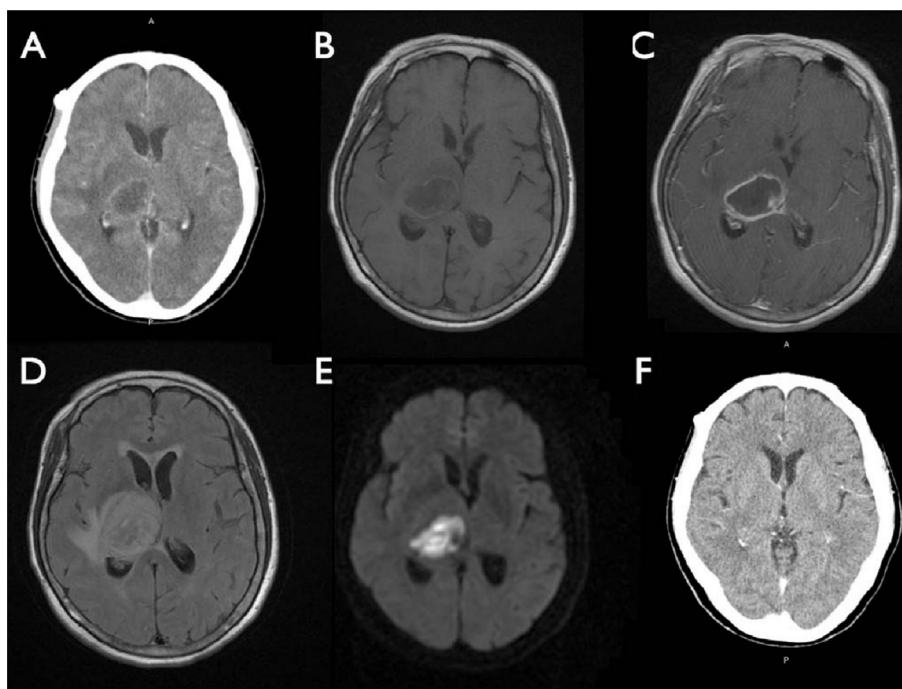


Figure 1. (A) Computed tomography (CT) with contrast at presentation shows one ring-enhanced cystic lesion at the right thalamus, 3 cm in the largest diameter; (B) magnetic resonance imaging (MRI) T1 without contrast; (C) MRI T1 with contrast; (D) MRI T2 fluid attenuation inversion recovery; (E) MRI diffusion-weighted imaging taken 6 days after antibiotics treatment shows one ring-enhanced cystic lesion at the right thalamus with diffusion restriction, 3.5 cm in the largest diameter, and its edema involving the upper midbrain, indicating possible failure of antibiotics treatment or abscess growth; (F) CT with contrast after 8-week antibiotics treatment shows complete remission of the abscess.

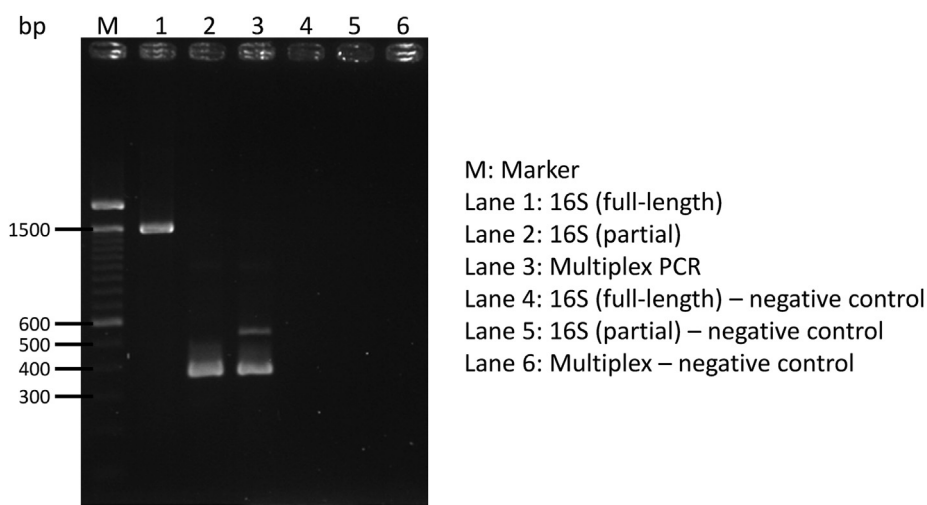


Figure 2. Polymerase chain reaction (PCR) for bacterial detection. Lane 1: full-length PCR of 16S ribosomal RNA (rRNA) gene. Lane 2: partial-length PCR of 16S rRNA gene. Lane 3: multiplex PCR of partial 16S rRNA gene and *Streptococcus*-specific *groESL* genes. The multiplex PCR performed directly from the brain abscess sample of the patient indicated the presence of *Streptococcus* DNA. Lanes 4–6 are negative controls for the aforementioned PCRs.

this location is still difficult, including glioblastoma, metastasis, infarction, and resolving hematoma. The diagnosis is particularly difficult if the patient does not have any signs of infection, which is not uncommon in patients with brain abscess. Even if the patient has fever or leukocytosis,

stereotactic procedure is still necessary for definitive diagnosis and identification of pathogens. Among the various methods available, MRI better delineates the thalamic cystic lesion. Moreover, the fluid restriction on diffusion-weighted imaging and high lactate level on MRS

are characteristic features and make MRI a useful tool to diagnose brain abscess.

Thalamic abscesses may rupture into the ventricles, causing acute ventriculitis and poor prognosis.² Prompt control and reduction of the abscess size is one of the important strategies in management.³ Treatment with empirical antibiotics can be initiated immediately when brain abscess is diagnosed.⁴ Direct sequencing of bacterial 16S rRNA gene from specimens may provide rapid diagnosis in such a situation as is shown in this case.⁵ In the presented case, CT, MRI, and molecular detection of pathogen all contributed to the successful diagnosis and treatment of the patient.

Conflicts of interest

All contributing authors declare no conflicts of interest.

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