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Letter to the Editor

Huge brain abscess caused by *Actinomyces israelii* associated with chronic sinusitis: A rare case report



Dear editor,

Actinomycosis is a chronic granulomatous disease commonly caused by *Actinomyces israelii* (*A. israelii*), which is an anaerobic, gram-positive filamentous bacterium that most commonly infects the pelvic, intra-abdominal, and pulmonary organs; however, brain tissue is rarely involved.^{1–3} Clinically, actinomycosis-associated abscesses can be mistaken for malignant tumors, and in most cases, the diagnosis is delayed or missed entirely until surgery. Herein, we report a rare case of a huge brain abscess caused by *A. israelii*, initially presenting with lost memory, disorientation, and unstable gait. The patient was successfully treated with two-stage surgery and a complete 12-week course of antibiotic therapy.

The 54-year-old male patient presented to the emergency department with dizziness, headache, and unstable gait intermittently and progressively for 3 months. He suffered injury after falling today and had a disturbance of consciousness with fever episodes. He is a worker at the construction site of a residential building. Laboratory data showed that the white blood cell count (15380/ μ L), hemoglobin (13.8 mg/dL), platelet (280,000/ μ L), sodium (137/L), potassium (3.8/L), C-reactive protein (0.7 mg/dL), and liver and renal function were within normal limits. The magnetic resonance image (MRI) revealed a mass-like lesion of the frontal and parietal brain tissue, suspected glioblastoma, or brain abscess (Fig. 1A & B). He underwent a two-stage surgical removal of the brain abscess because the abscess was too large and the degree of brain damage needed to be decreased. He also underwent a sinusectomy and surgical debridement of chronic obstructive sinusitis of the maxillary and ethmoid sinuses during the second surgery. The pathologic report

of the sinus and brain lesions revealed a filamentous bacterium in sulfur granule-like material using Gomori's methenamine silver (GMS) stain (Fig. 2). A brain abscess caused by *A. israelii* associated with chronic sinusitis was clinically diagnosed. He received a high-dose ampicillin (2 g) intravenous drip (q4h) for 12 weeks and recovered well, except for sequelae of weakness of the right-side limbs.

Actinomycosis is a rare chronic disease caused by *Actinomyces* spp., anaerobic gram-positive bacteria that normally colonize the human mouth and digestive and genital tracts.^{1,2} *A. israelii* accounts for almost 70% of cases; however, many other species have been described, such as *A. meyeri*, *A. odontolyticus*, *A. naeslundii*, *A. georgiae*, *A. pyogenes*, and *A. viscosus*.^{3,4,6}

Physicians must be aware of typical clinical presentations, such as cervicofacial actinomycosis following dental infection focus, pelvic actinomycosis in women with an intrauterine device, and pulmonary actinomycosis in smokers with poor dental hygiene; however, actinomycosis may also mimic the malignancy, tuberculosis, or norcardiosis process in various anatomical sites.^{3–6} Patients with actinomycosis require prolonged treatment (4–6 months) with high doses of penicillin G, ampicillin, or amoxicillin; however, the duration of antimicrobial therapy could likely be reduced to 3 months (8–12 weeks) for patients on whom optimal surgical resection of infected tissues has been performed.^{1,2,6} Bacterial cultures and pathology are the cornerstones of the diagnosis of actinomycosis and require particular attention to prevent misdiagnosis. Prolonged bacterial cultures under anaerobic conditions are necessary for the identification of the bacterium, and typical microscopic findings include necrosis with yellowish sulfur granules. Furthermore,

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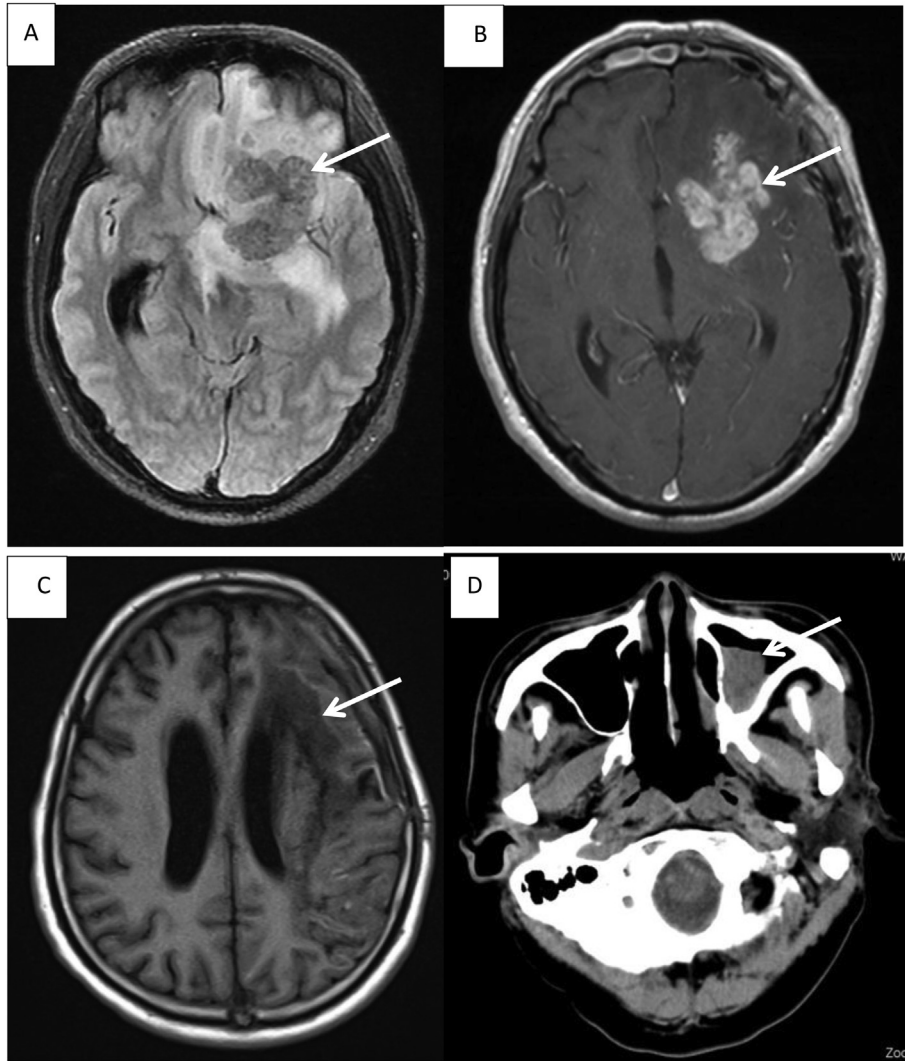


Figure 1. (A) & (B) The MRI revealed a mass-like lesion of the left frontal and parietal brain tissue with edematous change (white arrow). (C) The image revealed only mild edematous change of brain-tissue status following surgical debridement and antibiotic therapy. (D) The image showed chronic sinusitis of the ethmoid and maxillary sinus (white arrow).

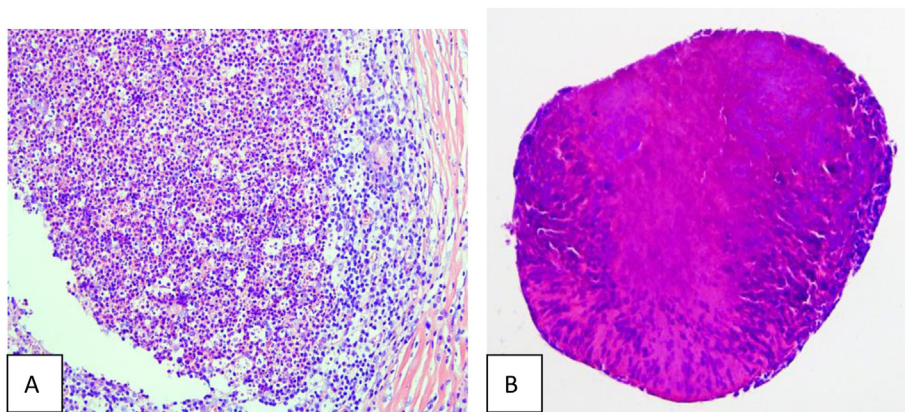


Figure 2. (A) Microscopy revealed dense fibrous tissue with focal aggregation of neutrophils, macrophages, and lymphocytes. (B) The section revealed scanty sulfur granule-like material, in which the presence of filamentous bacteria was confirmed using Gomori's methenamine silver (GMS) stain.

confirmation of filamentous, gram-positive fungal-like pathogens using GMS stain is crucial.

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Lien-Hsuan Chou
*Department of Family Medicine, Wan Fang Medical Center,
Taipei Medical University, Taipei, Taiwan*

Ying-Shih Su
Fu-Lun Chen
Wen-Sen Lee*

*Division of Infectious Disease, Department of Internal
Medicine, Wan Fang Medical Center, Taipei Medical
University, Taipei, Taiwan*
*Department of Internal Medicine, School of Medicine,
College of Medicine, Taipei Medical University, Taipei,
Taiwan*

Wei-Hao Li
*Department of Emergency Medicine, Wan Fang Medical
Center, Taipei Medical University, Taipei, Taiwan*

*Corresponding author. Division of Infectious Diseases,
Department of Internal Medicine, Wan Fang Medical Center,
Taipei Medical University, Number 111, Section 3, Hsing
Long Road, Taipei 116, Taiwan.
E-mail address: 89425@w.tmu.edu.tw (W.-S. Lee)

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