ScientificScholar®
Knowledge is power
Publisher of Scientific Journals

https://anmrp.com/

Annals of Medical Research and Practice

*Case Report*

# Conservative management of multiple pyogenic brain abscess from a rare hematogenous spread

Jerne Kaz Niels B. Paber

Department of Neurology, Jose R. Reyes Memorial Medical Center, Manila, Philippines.

***Corresponding author:**
Jerne Kaz Niels B. Paber, Department of Neurology, Jose R. Reyes Memorial Medical Center, Manila, Philippines.

jernepaber@gmail.com

Received : 20 March 2022
Accepted : 11 June 2022
Published : 11 July 2022

**DOI**
10.25259/ANMRP_5_2022

**Quick Response Code:**

## ABSTRACT

This is a rare case of hematogenous spread of brain abscess in a young immunocompetent adult, who presented with an acute onset of symptoms of 1-week duration of headache and sudden onset of seizure. With the patient's refusal for neurosurgical intervention, the choice for conservative management with aggressive antibiotics and close monitoring proved to be a viable alternative treatment.

**Keywords:** Brain abscess, Hematogenous, Antimicrobials, Management, Multiple

## INTRODUCTION

Surgical drainage is the gold standard for treating brain abscess. Abscesses that have been drained have better clinical results, according to studies. For the optimal outcomes in treating brain abscess, medical therapy alone is not encouraged. There has never been a thorough investigation on the efficacy, if any, of oral antibiotic therapy after the completion of a typical course of parenteral therapy.

## CASE REPORT

A 34-year-old male, plywood vendor, Roman Catholic from Zone 8 Zambowood Zamboanga City, came to the emergency room with a chief complaint of seizure of acute onset. The patient denied fever, headache, vomiting, weakness, ear/nasal discharge, chronic fever, or trauma to the head. The patient presented with no history of diabetes or hypertension.

### Physical Findings

On examination, his vitals were found to be normal except for his respiratory rate which was at 34/min. The patient had no altered sensorium and meningeal signs were absent. No limb movement abnormalities were noted. There was a chest lag on the right with decreased tactile and vocal fremitus, crackles from mid to base lung field. The cardiovascular system was normal. The ear, nose, and throat (ENT) findings were normal. There was no cranial nerve or sensory deficits. There were no lateralizing signs or primitive reflexes noted. The clinical suspicion was Generalized Tonic-Clonic seizure, etiology to be determined.

### Laboratory Workup

The blood investigations revealed a total white cell count of 13,400 cells/ml$^3$ with neutrophilic predominance, a platelet count of 380,000 cells/mm$^3$, and a hemoglobin of 11.4 g/dL. The random blood glucose was 165 mg/dL, while the serum electrolytes were within the normal range. HIV screening was negative. Chest X-ray revealed pleural effusion on the right. Further, the investigation revealed a 2-week cough with increasing purulence with an undocumented fever. An unenhanced cranial computed tomography (CT) scan showed space-occupying lesions in the left parietal and right frontal areas with perilesional edema. A provisional diagnosis of multiple brain masses with probable bacterial meningitis was made. Ultrasound of the right hemithorax on the 3$^{rd}$ hospital day revealed lobular pneumonia with a pleural effusion estimated at 300 cc. There were no new neurologic deficits or seizure recurrence noted. The sputum examination for acid-fast bacilli was negative and no growth was noted on blood cultures. The repeat complete blood count revealed normalization of white blood cell count. On the 5$^{th}$ day, the patient underwent diagnostic thoracentesis. Serous fluid was aspirated with an elevated cell count of 1683 with neutrophilic predominance. There was no growth seen on the pleural fluid analysis, Gram stain, and culture. The completion contrast-enhanced CT scan of the brain in [Figure 1] revealed rim-enhancing lesions in the right frontal and left parietal lobes associated with significant surrounding edema.

### Treatment

Empiric treatment for Community-Acquired Pneumonia was started with Cefuroxime IV 1.5 q8 hours and azithromycin 500 mg 1 cap OD. The antibiotic therapy was shifted from cefuroxime to Ceftriaxone 2 g every 12 h. Anti-seizure medications of phenytoin were started at 100 mg TID. The patient was then referred to neurosurgery for definitive management of aspiration of abscess. However, the patient refused neurosurgical intervention due to cultural reasons and was left with aggressive medical management as the only alternative to treatment. Dexamethasone 4 mg IV and Metronidazole 500 mg IV both given every 6 h were then added. The patient decided to go home with medications including dexamethasone 4 mg BID for 1 week, cefixime 200 mg BID for 8 weeks, metronidazole 500 mg TID for 8 weeks, and phenytoin 100 mg TID. The final diagnosis was General Tonic-Clonic seizure sec to multiple brain abscesses left the parietal area and right frontal lobe; community-acquired pneumonia moderate risk with pleural effusion right; and s/p ultrasound-guided thoracentesis right.

### Outcome

The patient had no further seizure episodes and was able to resume activities of daily living. He was advised to repeat the CT scan after completion of antibiotic treatment. After 2 months of antibiotic therapy, his repeat cranial CT scan seen in [Figure 2] showed complete resolution of the brain abscesses. He was maintained on ASM indefinitely.

## DISCUSSION

The gold standard for management of brain abscess is surgical intervention. Studies have shown that abscesses that have been drained have improved clinical outcomes. Medical therapy alone is not optimal for the treatment of brain abscess.[1] The role, if any, of supplemental oral antibiotic therapy following completion of a standard course of parenteral therapy has never been adequately studied. In a review by Helweg-Larsen (2012), case reports of pyogenic brain abscess in a 15-year survey, overall, the first choice for the treatment was a beta-lactam (high dose penicillin, cephalosporin, or carbapenem) in combination with metronidazole or other drugs for anaerobic coverage. The usual treatments were high-dose penicillin or either cefuroxime or ceftriaxone in combination with metronidazole for abscess secondary to ENT infection and in more recent years meropenem in combination with metronidazole for culture-negative infections.[2] The choice and length of antibiotic treatment were not uniform; changes in the treatments were common, based on individual microbial findings, tolerability, and/or the treating physicians' preferences. Medical management with oral broad-spectrum antibiotics

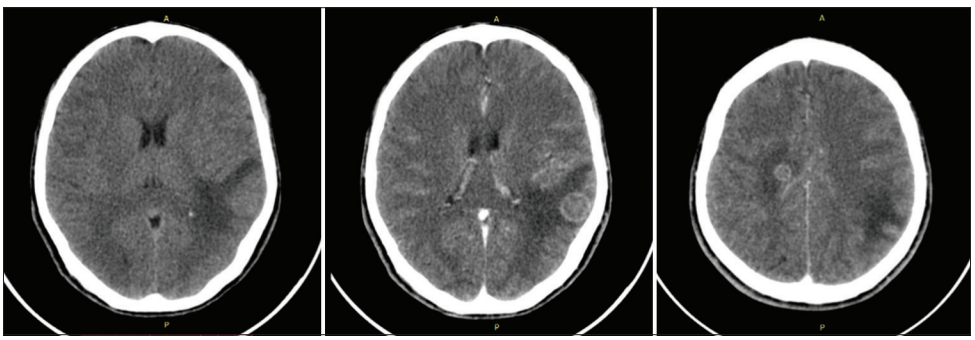

**Figure 1:** Computed tomography scans with contrast shows multiple ring enhancing lesions in the right frontal and left parietal lobes.

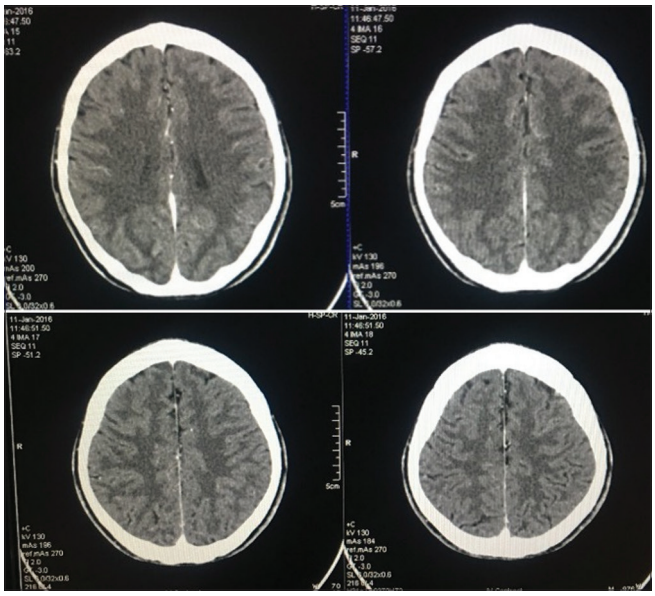

**Figure 2:** Repeat cranial computed tomography showed complete resolution of the ring enhancing lesions after 8 weeks of the treatment.

and anti-infective medications such as a third-generation cephalosporin and metronidazole in this study has shown to be effective coverage for brain abscess. This regimen targeted streptococcus as the most likely cause of this hematogenous spread from the lung focus being isolated in 50% of all cases.[3]

## CONCLUSION

In an immunocompetent patient who chose conservative management, oral targeted antibiotics can be an alternative to surgical drainage, provided that there are good monitoring and neuroimaging to document resolution of the brain abscess. In multiple brain abscesses, with a high index of hematogenous spread, an empiric oral antibiotic regimen is targeted toward the site of primary infection.

### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent.

### Financial support and sponsorship

Nil.

### Conflicts of interest

There are no conflicts of interest.

## REFERENCES

1. Su TM, Lan CM, Tsai YD, Lee TC, Lu CH, Chang WN, *et al*. Multiloculated pyogenic brain abscess: Experience in 25 patients. Neurosurgery 2003;52:1075-80.
2. Helweg-Larsen J, Astradsson A, Richhall H, Erdal J, Laursen A, Brennum J. Pyogenic brain abscess, a 15 year survey. BMC Infect Dis 2012;12:332.
3. Grigoriadis E, Gold WL. Pyogenic brain abscess caused by *Streptococcus pneumoniae*: case report and review. Clin Infect Dis 1997;25:1108-12.

**How to cite this article:** Paber JKNB. Conservative management of multiple pyogenic brain abscess from a rare hematogenous spread. Ann Med Res Pract 2022;3:5.