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CASE REPORT

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Conservative management of a large brain abscess in a child with severe manifestations: A case report from Syria

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Abstract

Otogenic brain abscesses are rare but usually life-threatening conditions particularly in developing countries. Our patient attended to the emergency department with extremely serious manifestations due to a large brain abscess. The borderline dimensions of the abscess (2.4 cm) with (GCS <12) as well as the lack of surgical capabilities were the factors that addressed to treat her with the available medication only. Fortunately, 2-year follow-up did not show any recurrence. This case sheds a light on unusual management of large abscesses in imperfect circumstances, which makes it high educational value.

KEYWORDS

brain abscess, otitis media

1 | INTRODUCTION

Otogenic brain abscess is a rare challenging entity in developing countries. Herein, a 7-year-old child was fully recovered with medical treatment alone despite the neurological deterioration caused by a large abscess. Two-year follow-up was uneventful. Further studies are needed to investigate the efficiency of medical treatment alone in such conditions.

Brain abscess is considered one of the intracranial complications of otitis and mastoiditis. Intracranial complications resulting from otitis media and mastoiditis still indicate severe rates of mortality despite the improvement of imaging techniques and treatment methods.[1]

Brain abscess management includes two main categories: Medical treatment in which antibiotics are used and neurosurgical interventions such as ultrasound or CT-guided needle aspirations, neurosurgical drainage, and excision.[2]

We report a unique case management of a child presented with serious neurological deterioration caused by temporal lobe abscess measuring 2.4 cm. The patient had to be treated with available medication due to the lack of surgical capabilities in the city at the time. She remarkably recovered with medical treatment alone and was discharged from the hospital without any neurological sequelae.

2 | CASE REPORT

A 7-year-old Syrian female presented to the emergency department with seizures. The complaint started 2 h before the attendance when she had eyeballs deviation toward the right side, blurred consciousness, and loss of response to the surroundings. Few minutes later, a urinary incontinence occurred, and a convulsion started in the right side of the body which was diagnosed as focal

to bilateral Tonic-clonic seizure. Despite the generalizing of the convulsions in the four extremities, they remained more intense in the right side. The patient had a frontal headache without fever. The patient's family also reported fatigue and a foaming spilled out of the patient's mouth for about half an hour.

Once the patient arrived to the emergency room, IV phenytoin (15 mg/kg) was loaded and the convulsions therefore were controlled after 20 min. In addition, maintenance doses of phenytoin (5 mg/kg/day), vancomycin (15 mg/kg/6 h), and ceftazidime (100 mg/kg/day) were also established. Patient's medical history was remarkable for otalgia, which occurred 3 weeks prior to attendance. The patient went to a public swimming pool several times before. She had an acute otitis media and treated with insufficient doses of antibiotics. The patient had no surgeries before. Family history did not identify individuals with similar incidents. No congenital diseases were identified despite the fourth degree of consanguinity between her parents.

At the time of presentation, the clinical examination was normal with normal vital signs. The psychomotor development was appropriate to her age.

Ninety minutes after admission, Glasgow coma scale was 11/15. Pupils were symmetrical and interacting. On the second day of admission, neurological assessment showed a responsive and conscious patient without meningeal signs. We observed muscular hypotonia in the upper extremities which was more severe in the left limb.

Based on the neurological findings identified by physical examination, the primary differential diagnoses included brain abscess, brain tumor, and hydatid cyst.

Laboratory findings showed elevation of C-reactive protein (30 mg/dl) and white blood cell count (16,300 / mm^3), hemoglobin of (10.6 g/dl), and platelet count of (676×10^9 /L). However, serum creatinine and urea blood levels were (0.37 mg/dl) and (18 mg/dl), respectively.

Computed tomography showed cerebral edema with a low-density area on the left temporal lobe (Figure 1). Furthermore, MRI revealed a mass of 24 mm surrounded

FIGURE 1 Axial CT image shows cerebral edema with low-density area (circle)

by edema of the left temporal lobe, showing a low signal intensity on T1 and a high signal intensity in T2-FALIR, with a high signal on diffusion-weighted magnetic resonance imaging (DWI). The circumferential enhancement with clear and regular boundaries indicated an abscess. We also noted a left mastoiditis of the brain secondary to the otitis media (Figure 2).

The treatment was modified according to MRI results vancomycin (60 mg/kg/day), ceftazidime (200 mg/kg/day), Metronidazole (30 mg/kg), retaining the dose of phenytoin and adding dexamethasone to relieve symptoms of cerebral edema. The previous phase of treatment lasted for 4 weeks. Afterward, new MRI images showed a dramatic diminish in the abscess size to reach 1.7 cm (Figure 3). As a result, the patient improved clinically.

We decided to withdraw phenytoin gradually and discontinue Metronidazole. Otherwise, the treatment with vancomycin and ceftazidime continued for additional 4 weeks. Eventually, MRI revealed that healing occurred, and antibiotics were therefore discontinued (Figure 4).

The patient was discharged without any neurological sequelae after 8 weeks of hospitalization. Follow-up for 2 years, consisted of monthly monitoring through a neurological evaluation, did not show any recurrence of symptoms or neurological complaints.

3 | DISCUSSION

Intracranial complications due to acute otitis media and mastoiditis are rare but often life-threatening.[3] Only meningitis is considered more common than brain abscesses as an intracranial complication of otitis media.[4]

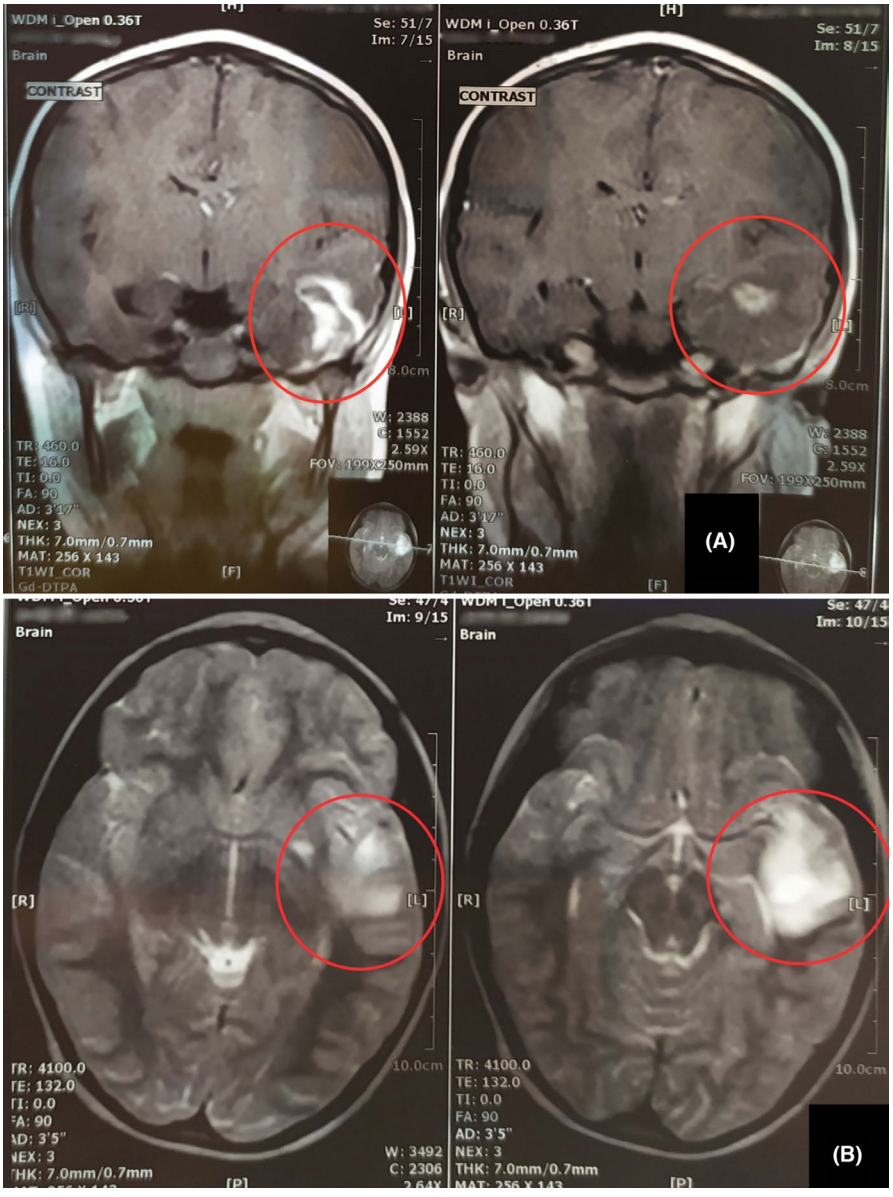

FIGURE 2 (A) Coronal T1 contrast-enhanced MRI and (B) Axial T2 MRI show 24 mm mass surrounded by edema (circle)

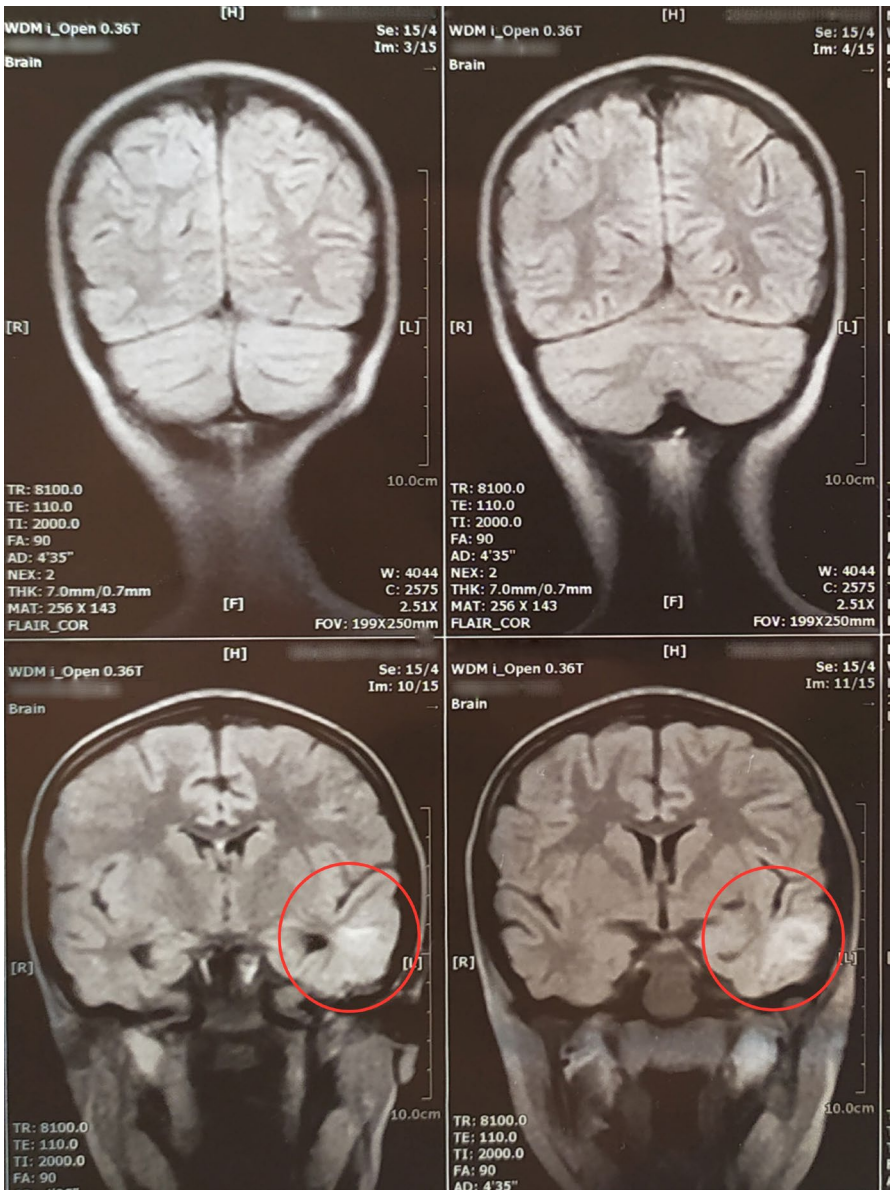

FIGURE 3 Coronal MRI T2-Flair image shows 1.7 mm mass (circle)

Temporal lobe represents the most common site of otogenic brain abscesses approximately 57.5% of the entire cases. A preponderance of males over females was found among patients by a greater than double, and this may be due to males are more exposed to outdoor activities with greater chances of ear infection.[5,6]

However, poor personal hygiene and lower educational achievement, poverty and starvation, overcrowding and poor ventilation, indiscriminate use of antibiotics, and the lack of medical and surgical capabilities are suspected to be responsible for the extreme complications of middle ear infections in the developing countries.[7]

Since the widespread availability of CT, the complaint of headache has decreased, but remained the most common symptom until present. Patients may also develop fever, chills, and changes in mental state. Focal neurological signs and seizures are considered serious manifestations; however, Tonic-clonic seizures usually distinguish frontal lobe abscesses. Vomiting is a more significant symptom as usually reveals an increased intracranial pressure.[2,5]

There are various methods to treat otogenic brain abscess, which made the treatment of choice ambiguous. Most studies have supported the idea of treatment based on both intravenous antibiotics and surgical drainage via burr hole aspiration, craniotomy, or mastoidectomy.[5] Despite the likelihood of recurrence in 70% of patients, aspiration is considered the preferred method of drainage and a better method than surgical excision, which may lead to permanent neurological sequelae and increase the danger of epilepsy.[8,9]

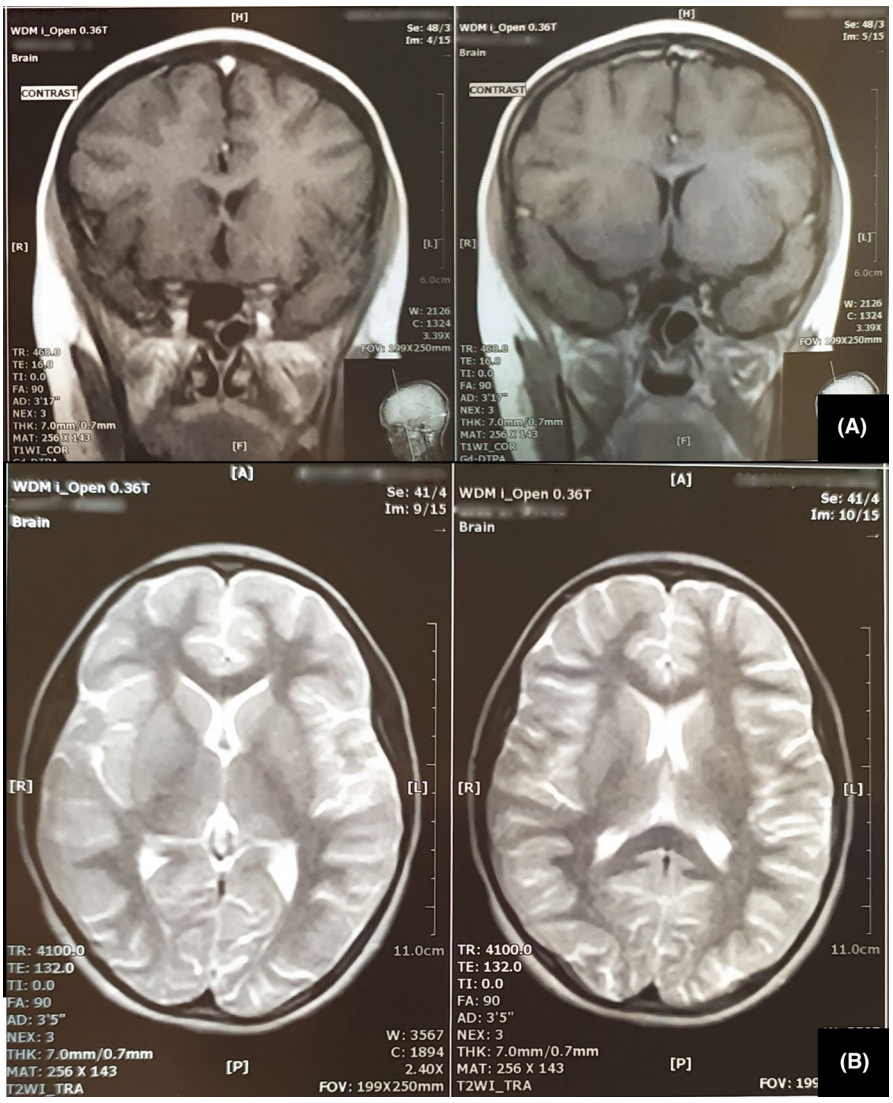

FIGURE 4 (A) Coronal MRI T1 and (B) Axial MRI T2 images reveal full recovery

Non-operative treatment of brain abscesses has occasionally been proposed when the abscesses are multiple, inaccessible, or for high-risk surgical candidates. Furthermore, medical treatment consisting of antibiotics, steroids, and anticonvulsants is considered appropriate in abscesses measuring less than 2 cm in diameter and the infecting organism is known.[9–11]

However, some authors suggest that medical treatment alone could be reserved for abscesses <2.5 cm, if the patient is in good initial clinical condition (GCS >12) and when the etiology is well-known. Regarding our case, the borderline dimensions (2.4 cm), (GCS <12) as well as the lack of surgical capabilities at that time, were the factors that addressed to a conservative approach.[12]

In conclusion, medical treatment alone of a large abscess in a patient presented with neurological deterioration and low GCS is an uncommon and challenging idea, which may carry undesirable consequences. However, in the presented case, the medical staff resorted to medical treatment alone due to the lack of surgical capabilities for such complex cases. It was remarkable that the patient recovered without any neurological consequences, which paves the way for further studies to investigate the possibility of making a decision to rely on medical treatment alone as an effective treatment in such cases, thus avoiding the potential risks of surgery.

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CONFLICT OF INTEREST

No conflicts of interest.

AUTHOR CONTRIBUTIONS

AH, AF, GG, AR, and SR: conception and design. AH, AF, and AR: analysis and interpretation of the data. AH, AF, GG, AR, and SR: drafting of the article. MK and MS: critical revision of the article for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

ETHICAL APPROVAL

No ethics approval is required.

INFORMED CONSENT

Patient's parents' consent was obtained for the publication of this case report.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

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