

A Case of Pediatric Brain Abscess Secondary to Rhinosinusitis

Rinosinüzite Sekonder Gelişen Pediatrik Beyin Absesi Olgusu

 Yalçın Kara

¹Eskişehir City Hospital, Department of Pediatric Infection, Eskişehir, Türkiye

Dear Editor,

Acute bacterial rhinosinusitis is a common childhood infection and a frequent complication of viral infections or allergic inflammations of the upper respiratory tract. Untreated cases may have serious complications such as meningitis, orbital cellulitis, epidural, and brain abscesses. ^[1,2] Brain abscesses rarely seen in pediatric infections with high mortality and morbidity rates, are mostly observed secondary to extracranial spread of rhinosinusitis and acute otitis media, hematogenous spread, and penetrating trauma. ^[3] The most common predisposing factors are immunodeficiencies, cyanotic heart, and hematologic diseases.

A 16-year-old boy was admitted to the emergency service due to seizure. It was learned from his history that he was admitted to the hospital 10 days ago due to a headache and high fever. With the diagnosis of acute sinusitis, azithromycin, and ornidazole treatment was started, but there was no improvement in his complaints. On physical examination, clouding of consciousness and postnasal purulent discharge were detected. Remarkable laboratory test results: WBC: 22.500/mm³, platelets 156.000/mm³, C-reactive protein 226 mg/L. Brain tomography revealed a 4-cm suspicious abscess or mass lesion in the right frontal region of the brain compatible with right frontal and ethmoid sinusitis. Upon consultation with pediatric neurology and neurosurgery departments, cranial MRI and MR spectrometry were performed which revealed a lesion compatible with a 4-cm brain abscess, brain edema, shift, and acute sinusitis in the right frontal region (**Figure 1**).

Treatment with cefotaxime, vancomycin, and metronidazole was started for acute sinusitis, and hypertonic sodium infusion and levetiracetam treatment for brain edema.

Surgical drainage of the abscess >2 cm was performed by neurosurgery. Gram staining and culture of the abscess material were unremarkable.

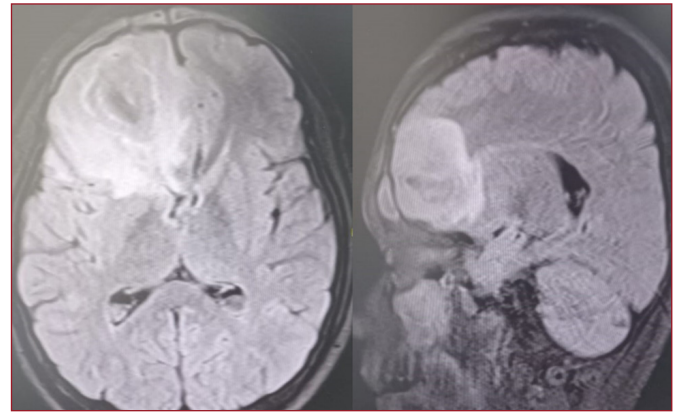


Figure 1. MRI Image of the Case

Upon evaluation by pediatric immunology, cardiology, and hematology departments, immunodeficiency, cyanotic heart disease, and hematologic disease were not detected. The lesion was evaluated as an inappropriately treated brain abscess secondary to acute sinusitis. In the 2nd week of treatment, edema surrounding the abscess, shift, and pressure regressed, but the abscess did not shrink, so the treatment with meropenem, vancomycin, and metronidazole was initiated. Antiedema therapy was discontinued, and antibiotherapy was maintained for 9 weeks until the abscess size was <2 cm. When the abscess shrank below 1 cm in the control cranial images he was discharged with follow-up recommendations.



Acute bacterial sinusitis is one of the most common and clinically diagnosed infectious diseases of childhood. And current guidelines recommend amoxicillin, amoxicillin-clavulanic acid, and cephalosporins (ie. cefdinir) as the first-line treatment. Considering the high drug resistance in our country, macrolides are not the first choice in patients without a history of penicillin allergy.^[2] If not treated appropriately, serious cranial complications preventable with timely appropriate antibiotherapy may develop. Brain abscesses are rare but mortal infectious diseases in childhood. The most common cause is the extrasinus spread of infections such as acute rhinosinusitis.^[3] A combination of medical and surgical treatment is usually recommended for abscesses >2 cm. For abscesses <2 cm and inoperable multiple abscesses only medical treatment is an option. Although the duration of treatment depends on the size, location, causative agent, and treatment response, medical treatment is recommended for approximately 6-12 weeks until the abscess is <2 cm.^[4]

ETHICAL DECLARATIONS

Referee Evaluation Process: Externally peer-reviewed.

Conflict of Interest Statement: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

Author Contributions: All of the authors declare that they have all participated in the design, execution, and analysis of the paper, and that they have approved the final version.

REFERENCES

1. Cherry JD, Kuan EC, Shapiro NL. Rhinosinusitis. In: Cherry JD, Harrison GJ, Kaplan SL, Steinbach WJ, Hotez PJ (eds). *Feigin and Cherry's Textbook of Pediatric Infectious Diseases*. 8th ed. Philadelphia: Elsevier Saunders 2019:137-44.
2. Marom T, Alvarez-Fernandez PE, Jennings K, Patel JA, McCormick DP, Chonmaitree T. Acute bacterial sinusitis complicating viral upper respiratory tract infection in young children. *Pediatr Infect Dis J* 2014;33:803-8.
3. Bodilsen J, D'Alessandris QG, Humphreys H, et al. Corrigendum to "European society of clinical microbiology and infectious diseases guidelines on diagnosis and treatment of brain abscess in children and adults" *Clin Microbiol Infect*. 2024;30(5):698.
4. Milinis K, Thiagarajan J, Leong S, et al. Review of management practices of sinogenic intracranial abscesses in children. *J Laryngol Otol*. 2023;137(10):1135-40.