

# Infratentorial Subdural Empyema

## İnfratentoryal Subdural Ampiyem

### ABSTRACT

Infratentorial subdural empyema is a life-threatening rare complication of bacterial meningitis. Infratentorial subdural empyemas constitute only a small portion of all cases with intracranial infectious diseases. We present a 15-year-old boy with infratentorial subdural empyema. Empyema was diagnosed with serial follow-up computed tomography and magnetic resonance imaging while he was being treated for bacterial meningitis secondary to neglected mastoiditis. The patient was successfully treated with emergent surgery and appropriate antibiotics. Empyema should be considered in patients with suspected or proven bacterial meningitis and associated ear nose throat infection with neurological signs that suggest a posterior fossa lesion.

**KEYWORDS:** Infratentorial, Subdural empyema, Surgery

### ÖZ

İnfratentoryal subdural ampiyem bakteriyel menenjitin hayatı tehdit eden nadir bir komplikasyonudur. İnfratentoryal subdural ampiyemler kafa içi enfeksiyöz hastalıklı olguların küçük bir kısmını oluşturur. Bu yazıda, infratentoryal subdural ampiyemi olan 15 yaşında bir erkek olgu sunulmaktadır. Olguda ampiyem tanısı, ihmal edilmiş mastoidit sonrası gelişen bakteriyel menenjit nedeniyle tedavi edilirken yapılan seri kontrol beyin tomografisi ve manyetik rezonans görüntüleme ile konuldu. Hasta acil cerrahi ve uygun antibiyotiklerle başarılı bir şekilde tedavi edildi. Kulak burun boğaz enfeksiyonuyla ilişkili şüpheli veya kesin bakteriyel menenjitli olgularda arka çukurla ilgili nörolojik belirtiler varsa ampiyem düşünülmalıdır.

**ANAHTAR SÖZCÜKLER:** Cerrahi, İnfratentoryal, Subdural ampiyem

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## INTRODUCTION

Infratentorial empyema represents an uncommon form of intracranial purulent collection that usually arises from neglected otogenic infections (5,6). It is a neurosurgical emergency and prompt surgical intervention is required in most cases.

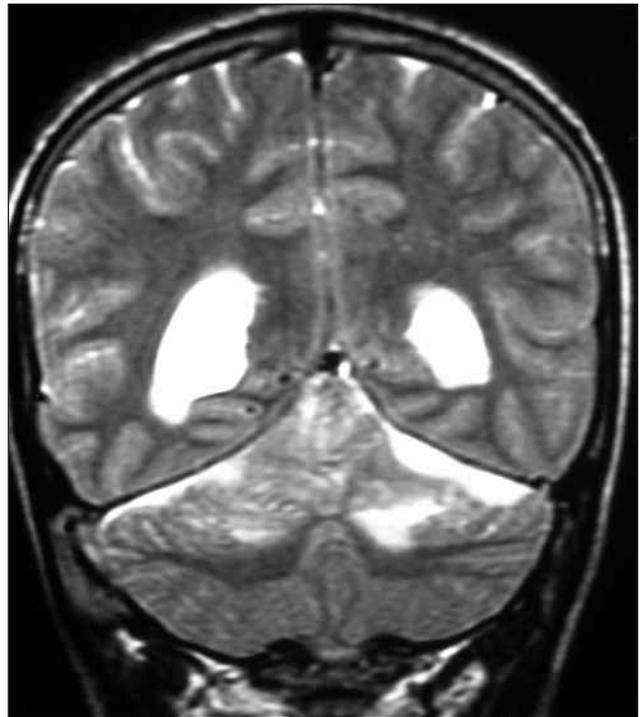
We present a case of a patient with an infratentorial subdural empyema due to mastoiditis that was treated at our department.

## CASE REPORT

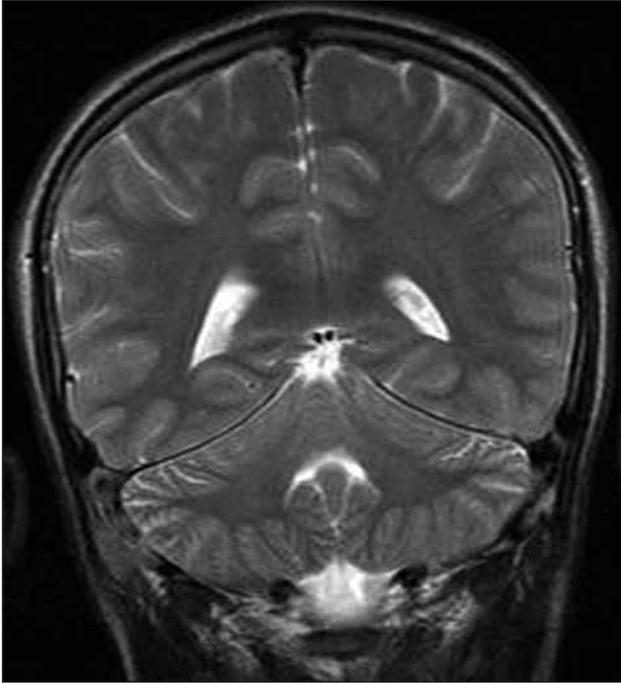
A 15-year-old boy had been admitted to the pediatrics clinic with a 3-day history of fever, headache and earache. On admission, his fever was 40 °C and neck stiffness was present. Lumbar puncture revealed a CSF leukocyte level of 4200/mm<sup>3</sup> (90% neutrophils), protein of 165 mg/dl, and glucose of 165 mg/dl. Initial brain computed tomography (CT) was normal. Otorhinolaryngologic examination disclosed a left otitis media and temporal bone CT had revealed left otitis media and mastoiditis. He was hospitalized with a diagnosis of bacterial meningitis, otitis media and mastoiditis. Empirical therapy was started with ceftriaxone and vancomycin. Brain CT was performed on the 15th day of follow up as headache and high fever persisted. Pediatricians referred the patient to our department. CT examination revealed hypodense foci over the cerebellar convexity under the tentorium with slight rim enhancement by contrast and ventricular dilatation (Figure 1). Magnetic resonance imaging (MRI) revealed bilateral subdural empyema in the posterior fossa exhibiting a high signal on T2-weighted images (Figure 2). The patient was transferred to our clinic and an external ventricular drainage was placed. Surgery was performed via a wide posterior craniectomy in a sitting position. Yellowish-white pus was drained and samples were obtained for microbiological examination. The site of empyema was irrigated with a diluted gentamicin solution after evacuation of pus. Mastoidectomy was performed at the same session. No postoperative complication occurred. The external ventricular drainage was removed on the third postoperative day. No organisms grew in the pus culture. Antibiotic therapy was continued for 6 weeks. There were no signs of recurrence during 2 years of follow up (Figure 3).



*Figure 1: Axial CT image demonstrates hypodense foci with slightly rim enhancement by contrast along the tentorium and development of hydrocephalus.*



*Figure 2: T2-weighted coronal image demonstrating subdural collection along the undersurface of the tentorium bilaterally.*



**Figure 3:** T2-weighted coronal image showing clearing of the subdural empyema and significant decrease in ventricle size at two years follow up MRI.

## DISCUSSION

Infratentorial subdural empyema is a rare condition with 33 cases reported in the literature (1,4,6). The overwhelming majority of infratentorial empyema cases follow a neglected otogenic sepsis as was the case in our patient. Other sources include trauma and paranasal sinusitis (3-6).

Common clinical features include fever, headache, vomiting, meningism and otorrhea. Cerebellar findings and cranial nerve deficits are absent in most cases. The incidence of hydrocephalus associated with infratentorial empyema has been reported to be 77% to 93% in the largest series. Hydrocephalus was managed with external ventricular drainage in most cases. Approximately 20% patients required shunt placement (4, 6).

MRI remains the preferred imaging modality for detecting infratentorially located subdural empyema, because of its multiplanar capabilities,

improved soft tissue imaging, and the absence of scanning artifacts related to the osseous skull base. CT can fail to detect the development of subdural empyema (1).

Neurosurgical intervention should be regarded as the first choice therapy. We found two cases with infratentorial subdural empyema who were treated only with antibiotherapy in the literature (1,2). We believe that antibiotherapy without surgical intervention can only be performed in selected cases because of the need of a long course of therapy, potential neurological unstable state of the patients and higher possibility of relapse of symptoms. It is ideal to perform mastoidectomy in the same operative session as the empyema evacuation (6). This may prevent reaccumulation in the subdural space.

In conclusion, infratentorial subdural empyema must be kept in mind in patients with bacterial meningitis and associated ear infection. Although infrequent, it displays a high morbidity and mortality that can be reduced with wide availability of computer-based imaging, better medical facilities and the possibility of prompt surgical intervention.

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