

An 'S-shaped' Sign in Cerebral Angiography: Subdural Empyema in a Young Man: Case Report

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✓ Interhemispheric subdural empyemas are uncommon in healthy young people. Since they may occur with nonspecific signs and symptoms in the early period, they should be considered in the differential diagnosis of other nervous system infections, subdural hematoma, and subarachnoid haemorrhage. Generally, they develop secondary to paranasal sinus infections. Clinical profile, which varies depending on the localization, is named as "falx syndrome". Typical appearance of such lesions on cerebral angiography is called an 'S-shaped deformity'. They show similar clinical and radiological characteristics with the interhemispheric subdural hematomas. The treatment is surgical drainage and high-dose antibiotherapy for 4-6 weeks.

Our patient was a case of interhemispheric subdural empyema which developed after frontal sinusitis. While clinical manifestation was 'falx syndrome', angiography revealed an "S-shaped" deformity.

Key words: Cerebral angiography, falx syndrome, interhemispheric subdural empyema

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Subdural Ampiyemli Genç Olguda Anjiyografik 'S Biçimli Deformite' Bulgusu: Olgu Sunumu

✓ İnterhemisferik subdural ampiyemler genç sağlıklı insanlarda nadiren görülürler. Başlangıç evresinde spesifik olmayan bulgularla ortaya çıkabileceğinden diğer sinir sistemi enfeksiyonları, subdural hematoma ve subaraknoidal kanamanın ayrıntı tanısında düşünölmelidirler. Daha çok paranasal sinus enfeksiyonlarına sekonder gelişirler. Lokalizasyona bağılı oluşturdukları tipik klinik tabloya "falks sendromu" adı verilir. Serebral anjiyografide oluşturdukları tipik görüntü "S biçimli deformite" adını alır. İnterhemisferik subdural hematomlarla benzer klinik ve radyolojik özellikler gösterirler. Tedavisi cerrahi drenaj ve 4-6 hafta süre ile yüksek doz antibiyoterapidir.

Olgumuz, frontal sinüsiti sonrası ortaya çıkmış interhemisferik subdural ampiyem olgusu olup, klinik olarak "falks sendromu", anjiyografik olarak "S biçimli" deformite görölmektedir.

Anahtar kelimeler: Serebral anjiyografi, falks sendromu, interhemisferik subdural ampiyem

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Subdural empyemas constitute 15-25 % of the entire pyogenic intracranial infections. While 70-80 % of those display a localization in the convexity, 10-20 % localize in the parafalcine and may extend to the interhemispheric fissure ⁽³⁾. They are encountered most frequently due to retrograde spread of paranasal venous thrombophlebitis originating

from sinus infections ⁽²⁾. Moreover, they may develop following otitis media, head trauma, and craniotomy. They are more commonly seen among children and elderly, whereas exhibiting a lower incidence in young healthy patients. Since there is no limiting factor in the subdural space, they may demonstrate a rapid spread and lead to sudden clinical progression. Therefore,

treatment requires emergency surgical drainage. Lesions are mostly observed to be unilateral because subdural space is limited by falx in the middle and by tentorium posteriorly.

Interhemispheric subdural empyemas may clinically be characterized with convulsions starting from the lower extremity and generalizing without spreading to the face along with sensorial and motor hemiparesis beginning from the lower extremity. This profile is described as “falx syndrome”^(7,9). Similarly, subdural hematomas with interhemispheric localization can lead to such a clinical profile. In those cases, anteroposterior projections of cerebral angiograms demonstrate laterally pushed pericallosal and callosomarginal branches of anterior cerebral artery and formation of an avascular area across the falx along with extension of anterior cerebral artery from the free margin of the falx to the other side. This appearance has been defined as an ‘S-shaped deformity’⁽⁶⁻⁸⁾. However, recently, computer tomography (CT) and magnetic resonance imaging (MRI) are used to reveal those lesions.

CASE REPORT

The 19-year-old male patient presented because of a headache started one week before and a within the past 3 days. History of the patient showed no remarkable event. Systemic examination was normal and neurological examination exhibited no findings other than a mild confusion and a neck stiffness. Laboratory tests were normal. The case was admitted to the infectious diseases clinic for differential diagnosis between central nervous system (CNS) infection and subarachnoid haemorrhage (SAH). Contrast-enhanced cranial MRI was normal (Figure 1). Cerebral angiography performed on the 5th day displayed an extension of the right pericallosal artery from midline to the right alongside an avascular area in the midline (Figure 2). Monoparesis was noted in the left lower extremity of the patient. Repeated con-



Figure 1. The first MRI at application.



Figure 2. The cerebral angiography on the fifth day.

trast-enhanced cranial MRIs revealed a lesion in the right interhemispheric region which was thought to be a subdural empyema (Figure 3). The patient was transferred to the neurosurgery clinic and the empyema was drained by performing right occipital craniotomy. The lodge was irrigated. Postoperative drainage was applied for 48 hours. The patient showed a rapid clinical recovery in the postoperative period. *E.coli* was isolated from the culture of the drainage fluid. Following six weeks of vancomycin, ceftriax-

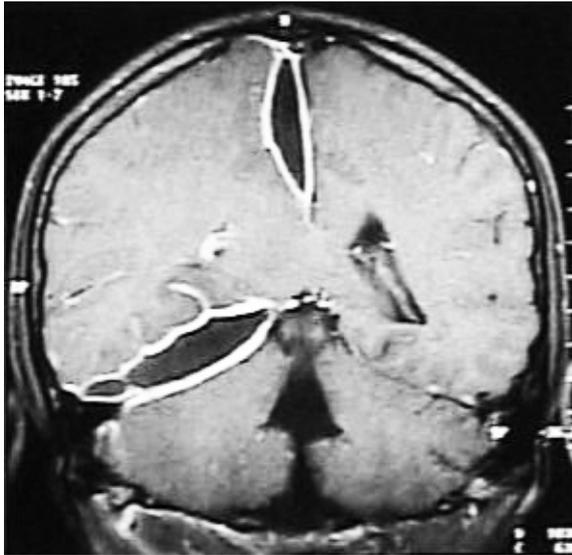


Figure 3. MRI after angiography.

one, metronidazole therapy, the patient was discharged with an improved health state and without any deficit.

DISCUSSION

Interhemispheric subdural empyemas are intracranial infections rarely seen among healthy young patients. Although they typically demonstrate a clinical profile with interhemispheric subdural hematomas, they may also present with nonspecific signs such as disorientation, neck stiffness and headache. Therefore, interhemispheric differential diagnosis of an subdural hematoma should comprise other nervous system infections and cerebral vascular pathologies. At an early period, they may go undetected particularly on noncontrast CT or MRI images. In the current study, our patient had complaints such as headache and neck stiffness on admission and subsequent cranial MR examination was evaluated to be normal (Figure 1). The angiography performed 5 days later showed the formation of an avascular area due to laterally displaced pericallosal artery on the anterioposterior projection (Figure 2), and the repeated MRI of the patient revealed an interhemispheric subdural empyema (Figure 3). Review of previous

MR images retrospectively displayed minimal interhemispheric contrast (Figure 1).

Despite advances in the imaging and surgical techniques, subdural empyemas continue to exhibit higher mortality rates as 10-20 %⁽¹⁾. Therefore, treatment bears importance. Surgical drainage and high-dose systemic antibiotherapy may be applied. While burr hole or craniotomy can be surgically preferred in cases with subdural hematoma, in our opinion, craniotomy should be used for cases with interhemispheric empyema. Thus, drainage and irrigation can be carried out more effectively. Moreover, drainage should not be discontinued during the postoperative period.

Although cultures of these cases generally do not show any growth, anaerobic or microaerophilic streptococci and staphylococci are the most common microorganisms alongside less common gram negative and anaerobic organism growths⁽²⁾. In the literature, there are cases which showed uncommon growths such as salmonella in cultures which are clinically consistent with gastroenteritis⁽⁵⁾. It should be kept in mind that all those organisms are resistant to most of the antibiotics and that subdural penetration of the antibiotics is poor. The most frequently used antibiotics are β -lactam penicillins, third generation cephalosporins, and metronidazole. Recently, linezolid has been started to be used, as well⁽⁴⁾.

CONCLUSION

Those cases bear typical characteristics with regard to clinical and radiological properties. Infection can spread rapidly into the subdural space and cause sudden clinical aggravation. Moreover, they can show complications by penetrating into the cortex and causing intracerebral abscess formation together with development of ischemia due to venous thrombophlebitis. Therefore, interhemispheric subdural empyemas

should be considered in the differential diagnosis and treated without losing time.

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