

A rare complication of chronic subdural hematoma surgery; Subgaleal cerebrospinal fluid leakage. Case Report

Kronik subdural hematom cerrahisinin nadir bir komplikasyonu: Subgaleal serebrospinal sıvı kaçağı. Olgu sunumu

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Abstract

Chronic subdural hematoma is predominantly a disease of the elderly and is rare in children. We report here a rare case of chronic subdural hematoma associated with arachnoid cyst in a 9-year-old child due to ball struck to his head while he was playing football. No altered mental state or focal neurological deficits were observed. The hematoma drainage was performed with one burr-hole. One week later, the patient was admitted to our clinic with complaint of scalp swelling. Physical examination revealed subcutaneous fluctuation beginning from the vertex. The authors reported a case of sports related chronic subdural hematoma in association with arachnoid cyst and a rare complication of subdural hematoma during postoperative period.

Pam Med J 2013;6(3):158-161

Key words: Chronic subdural hematoma, subgaleal cerebrospinal fluid leakage, surgery, arachnoid cyst.

Özet

Kronik subdural hematom genellikle erişkin hastalığı olmakla birlikte çocuklarda nadirdir. Bu yazıda 9 yaşında erkek hastada futbol oynarken kafasına top çarpmasına bağlı gelişen araknoid kist ile ilişkili kronik subdural hematom olgusunu sunduk. Mental durum değişikliği veya nörolojik bozukluk gözlenmedi. Tek burr hole ile hematom drenajı yapıldı. Bir hafta sonra, hasta saçlı deride şişlik şikayetiyle kliniğimize başvurdu. Fizik muayenede verteksten başlayan subkütanöz fluktuasyon mevcuttu. Yazarlar kronik subdural hematomun ameliyat sonrası döneminde gelişen nadir bir komplikasyonunu ve araknoid kist ile ilişkili spora bağlı kronik subdural hematom olgusu bildirmektedir.

Pam Tıp Derg 2013;6(3):158-161

Anahtar sözcükler: Kronik subdural hematom, subgaleal serebrospinal sıvı kaçağı, cerrahi, araknoid kist.

Introduction

Chronic subdural hematoma (CSDH) that rare in children represents one of the most common and the least understood entities in pediatric traumatology. The well known etiologies of chronic subdural hematomas are hematologic disorders, mild traumas, anticoagulant therapy and also child abuse [1]. In neurosurgical practice, it is often difficult to differentiate whether a CSDH in pediatric age is caused by an accident or non-accidental head traumas [1]. We report a case of 9 year old male

patient with scalp swelling one week after the operation of chronic subdural hematoma due to ball struck. Also cranial computed tomography (CT) revealed an ipsilateral middle fossa arachnoid cyst (AC) associated with chronic subdural hematoma.

Case

A nine-year-old boy presented to emergency department with complaints of headache, nausea and vomiting. The initial physical and neurological examination done by pediatric

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Gönderilme tarihi: 25.04.2013

Kabul tarihi: 27.08.2013

department demonstrated no abnormal findings. Cranial computed tomography scan was performed because of ball struck to his head while he was playing football one month ago. Cranial CT revealed a 15 mm left frontoparietal huge CSDH with 9 mm mid-line shift and left temporal arachnoid cyst (Fig 1). Routine

laboratory studies and blood tests he was not using any anticoagulant therapy. We could not identify any clues of physical findings attributable to child abuse. We thought that CSDH was due to the sport trauma. One burr hole drainage was performed and the motor-oil like subdural hematoma was evacuated.

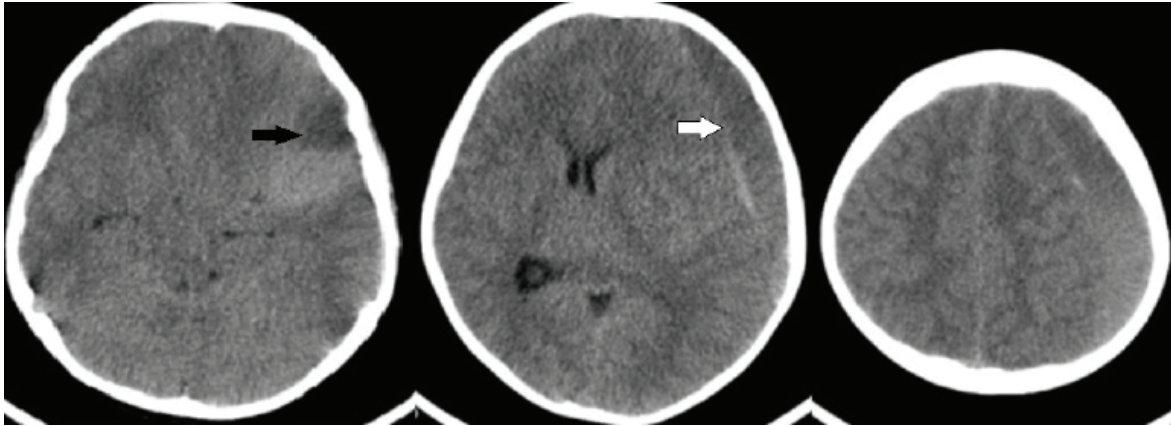


Figure 1. Preoperative cranial CT. Left frontoparietal chronic subdural hematoma (white arrow) and left sylvian fissure arachnoid cyst compressed by hematoma (black arrow).

The outer membrane of the CSDH was thin, fragile and fibrotic. A non negative subdural drainage was left in the subdural area. Drainage pulled on postoperative first day and a control cranial CT was performed. Control cranial CT revealed 5 mm subdural hematoma, absence of midline shift and pneumocephalus in the left parietal region. The patient was discharged from the hospital. One week later, he was taken to our neurosurgery department for scalp swelling. Neurological examination was normal. Physical examination revealed subcutaneous fluctuation beginning from the vertex. Cranial CT revealed AC extending from left middle cranial fossa to sylvian fissure and fronto-parietal subgaleal cerebrospinal fluid (CSF) with 9 mm at the most thick place (Fig. 2). The hemorrhagic subgaleal fluid was evacuated and subgaleal drainage was put on the burr hole. Compressive bandage was done for 7 days. The subgaleal drainage was pulled off on the second operative day. One week later, the patient was discharged from hospital and during one month follow-up cranial MRI and physical examination revealed no evidence of CSDH and scalp swelling.

Discussion

CSDH are usually produced by minor trauma and occur predominantly in the older person. CSDH can also occur in children and mostly result from fall down from height, child abuse, coagulation abnormalities (anticoagulant treatment, leukemia, hemophilia, and vitamin K insufficiency), vascular disease such as aneurysm or arteriovenous malformation, or [1,2]. Jayawant et al. reported that most subdural hemorrhages in children younger than 2 years are due to child abuse [2]. We could not identify any clues of physical findings attributable to child abuse in our case. It is well known to cause CSDH, especially in young patients. ACs most commonly occur in the middle cranial fossa and have a slight predilection for the left side. Mori et al. reported the patients with AC rate as 1.5% in a series of 541 patients with CSDH [3]. Conversely, 8-17% of cases of ACs were complicated by CSDH after head trauma [4]. AC has increased risk of a CSDH, the most frequent hemorrhagic event associated with AC. Hypotheses explaining the mechanism of CSDH in association with ACs can be categorized into

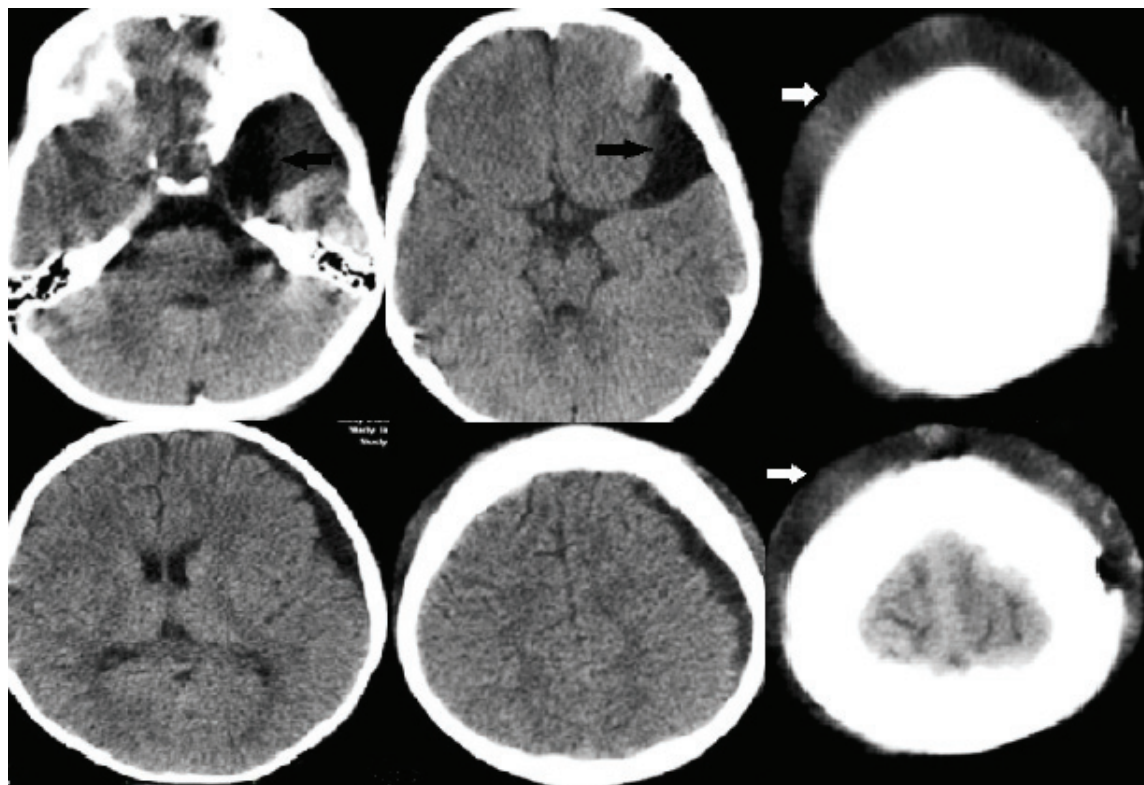


Figure 2. Cranial CT one week later. Subgaleal CSF (white arrows) and arachnoid cyst extending from temporal lobe to sylvian fissure (black arrows).

two groups. First, in response to mild trauma, flow changes within the cerebrospinal fluid (CSF) could be magnified by AC leading to rupture of the bridging veins or vessels in the cyst wall [5]. In the second theory, it is hypothesized that ACs are less compliant than normal brain, resulting in reduced intracranial cushioning following minor trauma. Thus hemorrhage may occur from bridging veins resulting in subdural hematomas [5].

Since the first report by Kawanishi [6], there were only eight previously reported cases of sports-related CSDHs in association with ACs in children [4]. Also there are reports in the literature about soccer related head injuries but there are a few reports regarding CSDH [7,8]. Our patient's CSDH occurred after playing football one month ago.

The common presentations of CSDH are headache, nausea, vomiting, hemiparesis, sensory deficits, language disturbances, gait problems, and decreased consciousness. Headache is a common presentation in younger patients than in the elderly. This is partly due to the small intracranial space available to the hematoma for expansion before it creates pressure on the adjacent brain tissue.

One of the treatment options of CSDH is surgical evacuation. There are many operation techniques for CSDH; one or two burr hole with or without irrigation, twist drill craniostomy, craniotomy and subdural membrane excision, percutaneous needle trephination and reservoir shunting for irrigation and drainage. We performed one burr hole with irrigation.

In the literature, surgical complication occurs between 3% and 28% [9]. Rohde et al [9] reported complication rate of 20,5% in a series of 376 patients with CSDH treated by burr-hole craniotomy. Surgical complications of CSDH are seizure, subdural empyema and other infections, acute and chronic subdural hematoma, intracerebral hemorrhage, epidural hematoma, intracerebral abscess and pneumocephalus [9]. There is no any case with subgaleal fluid following CSDH surgery either at children or adult in the literature.

CSF leakage is a well known complication following large frontotemporal craniotomy, cranial base surgery and posterior fossa surgery. CSF can leak through a dural defect, a fistula or a suture line and then pool in both the epidural and subcutaneous spaces. CSF makes the subgaleal surfaces very smooth, preventing

adhesion/healing of the subgaleal layers to each other [10]. This complication is often self limiting, but in some cases it is persistent and results in prolonged hospitalization and occasionally necessitating revision surgery. The conventional treatments of this complication are compressive bandage, local aspiration of fluid, subcutaneous drainage and ventricular or spinal drainage [10]. We treated our patient with subcutaneous drainage on the burr hole and compressive bandage. Post operative cranial MRI in the first month has shown complete resolution of the CSDH and subgaleal CSF. We have two hypotheses for CSF leakage. AC can even rupture spontaneously, so we speculate that CSF leakage may occur due to the tear of arachnoid cyst wall during trauma or surgery. Second, at the time of the admission to hospital, the AC was compressed by CSDH. After the surgery, the compression was decreased and the AC began to grow. The growing arachnoid cyst increased the intracranial pressure so that CSF leaked to the subgaleal space through the burr hole.

As a conclusion, the association between the arachnoid cyst and CSDH is not uncommon. Also we have not detected any subgaleal CSF leakage after CSDH surgery in literature review. Subgaleal CSF leak could occur after CSDH surgery and must be treated immediately because of its own complication such as induced meningitis and prolonged bed rest.

Disclosure or Disclaimer: The authors declare no potential conflicts of interest.

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