

## Contralateral Subdural Effusion Occurring in Growing Skull Fracture: A Case Report

### Büyüyen Kafatası Kırığında Ortaya Çıkan Kontralateral Subdural Efüzyon: Bir Olgu Sunumu

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#### ABSTRACT

Growing skull fractures are a rare complication that is usually seen in head-injured children under the age of 3 years. Primer treatment is the repair of dural damage by surgery. Traditional treatment modalities may be inadequate in some complicated cases. Shunt treatment option should be kept in mind for these cases.

**Key Words:** Subdural effusion, growing skull fracture, leptomenigeal cyst, Craniocerebral trauma

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#### ÖZET

Büyüyen kafatası kırıkları genellikle 3 yaş altı çocukların kafa travmalarında görülen nadir bir komplikasyondur. Primer tedavisi cerrahi ile dural hasarın tamiridir. Bazı komplike vakalarda geleneksel tedavi modaliteleri yetersiz kalabilmektedir. Shunt ile tedavi seçeneği bu tür vakalarda akılda tutulmalıdır.

**Anahtar Sözcükler:** Subdural efüzyon, büyüyen kafatası kırığı, leptomenigeal kist, kraniyoserebral travma

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#### INTRODUCTION

Growing skull fractures (GSFs) are a rare complication that is usually seen in head-injured children under the age of 3 years(1,2). It is seen very rarely in adulthood and often a delayed diagnosis.3 Although the fracture line is mostly localized in the parietal bone, but it is rarely seen in the base of the head and in the orbital and frontal bones(2,4). It occurs a few months after a head trauma(5). Symptoms such as a pulsatile scalp mass, seizure, and focal neurological deficit may be seen. Therefore, early diagnosis and treatment is very important(4). Standard treatment modality is dural repair and cranioplasty(6).

In this paper, we presented a case of growing skull fracture who presented with left hemiparesis and had contralateral subdural effusion.

#### CASE REPORT

A 16-year-old female patient was admitted to the emergency room with a headache complaint after a fall from a height. Radiologic examination revealed a depressed fracture line in the left frontal bone (Figure 1). Neurological examination revealed no neural deficits. The patient was discharged by recommending an outpatient appointment two weeks later. Before the appointment on the second month, she presented with an enlarged, palpable and pulsatile scalp mass on the opposite side of trauma and with left hemiparesis (3/5). Then, radiologic examination revealed GSF and right subdural effusion associated with it (Figure 2). The patient was taken into operation after receiving detailed approval from her parents.

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The patient underwent subdural-peritoneal shunt placement under general anesthesia. In post-operative computerized tomography, subdural effusion, shift and leptomeningeal cyst disappeared (Figure 3). Neurological examination revealed complete motor recovery. The patient was discharged on postoperative day 4. The patient had no radiologic or clinic problems during two-year follow-up.

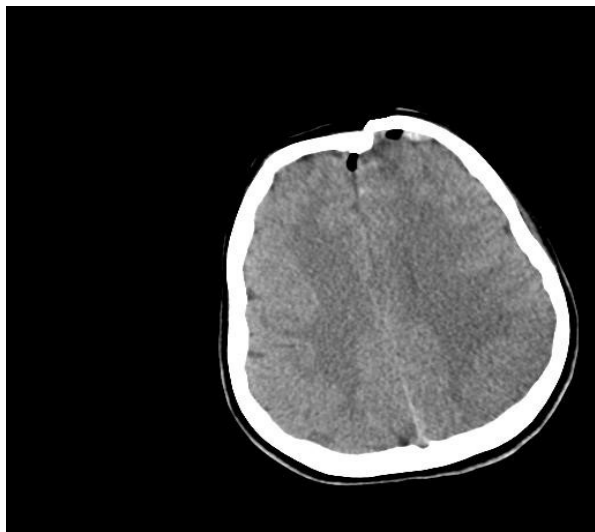


Figure 1: Left frontal bone depressed fracture line was observed on CT scan

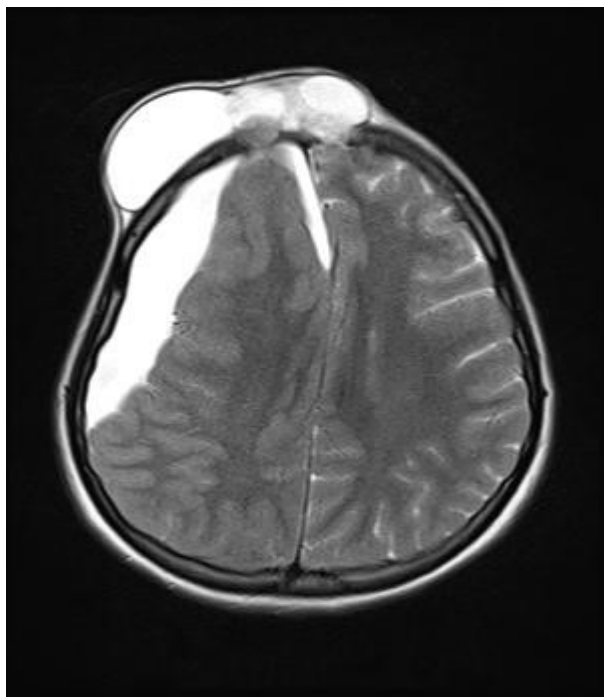


Figure 2 : T2-weighted axial MRI showing post traumatic leptomeningeal cyst and contralateral subdural effusion



Figure 3 : It was observed that subdural effusion and leptomeningeal cysts were disappearing on CT scan postoperatively

### DISCUSSION

Although the terms such as cephalohydrocele, traumatic meningocele, craniocerebral erosion, and post-traumatic cranial erosion have been used for this complication, first described by John Howship in 1816(1,7). posttraumatic leptomeningeal cyst and growing skull fracture are the widely accepted terms nowadays(2,8).

We also preferred to use the term GSF in our study so as not to create meaning confusion with congenital leptomeningeal cysts.

GSF is a rare complication of childhood head injuries. It has been reported to be seen in 0.05-1.6% of skull fractures. Half of the cases are under the age of 1 year, and 90% are under the age of 3 years(2-5,9). Although there are some authors who say they cannot be seen over the age of 8 years(5), cases diagnosed in adulthood are rare(4,5). When our case was 16 years old, skull fracture occurred after trauma. Then, GSF developed at two months.

The exact mechanisms behind GSF are still unclear. However, a dural tear has been detected in all cases, and the bone defect is thought to be enlarged with the pulsatile pressure of the cerebrospinal fluid and the brain parenchyma(4). The detection of GSFs especially under the age of 3 years is supported by the fact that the skull and brain tissue exist in the growth period.

GSF is most commonly seen in the parietal region and on the left side(10). In a study of Prasad et al. involving 43 patients, it was detected in the parietal and frontal regions (respectively, 15 patients and 14 patients). In one of these patients, ipsilateral subdural effusion was observed after left frontal GSF. This case is the first case of subdural effusion after GSF that we find in the literature. Our case had contralateral subdural effusion after left frontal GSF. We did not find a case of contralateral subdural effusion after GSF in the literature(7).

Although plain graph has a specific diagnostic value in the diagnosis of GSF, computerized tomography (CT) is generally used today. A possible association of the leptomeningeal cystic with the ventricle beside the bone defect can be assessed in CT(4). In a study of De Djientcheu et al., it has been reported that dural damage, which should absolutely exist in the pathophysiology of GSF, can be evaluated with USG(1,11).

The primary treatment for these lesions is surgery. Although there are some authors in the literature who follow these cases without performing an operation, the general view is early surgery without developing neurological deficit. In the operation, the duraplasty, cranioplasty, and cyst decompression are aimed(1).

However, when we examine the literature, conventional surgical treatment seems to be inadequate in atypical and difficult cases.6 In such cases, the treatment method can be shaped according to the surgeon's experience. The shunt treatment of GSF has been previously reported twice. It was used because of hydrocephalus and porencephalic cyst in these cases and ipsilateral subdural effusion in one case(6,12). In our case, because the fracture line of the left frontal bone was very close to the sinus and contralateral subdural effusion was present, we chose to insert only subdural-peritoneal shunt. The patient had no radiologic or clinic problems during two-year follow-up. Our case is the sixth case in the literature who was treated by shunt placement, except for conventional surgical methods.

**CONCLUSION**

As a result, linear skull fractures should be followed radiographically and clinically at regular intervals until definite closure is achieved. If GSF develops, it should be treated early without neurological problems. Dural damage should be examined using ultrasound. Shunt treatment option should be kept in mind for atypical and difficult cases.

**Conflict of interest**

No conflict of interest was declared by the authors.

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