

Rapid Resolution of Acute Subdural Hematoma and Effects on the Size of Existent Subdural Hygroma: A Case Report

Subdural Hematomun Hızlı Rezolüsyonu ve Önceden Var Olan Subdural Higroma Boyutlarına Etkisi: Olgu Sunumu

ABSTRACT

The diagnosis and management of acute subdural hematoma is important in neurosurgery practice. Rapid spontaneous resolution of acute subdural hematoma within a few hours is seen rarely on the CT scan. We present a case that enlarged the existent subdural hygroma showing rapid resolution of acute subdural hematoma with resolution in 9 hours after the trauma. Additionally, the follow-up CT scans in the 1st month showed the decrease of enlargement of subdural hygroma. The resolution of acute subdural hematoma and effect of acute subdural hematoma on subdural hygroma must be considered during management. The relation of acute subdural hematoma and subdural hygroma is important for the resolution and management of acute subdural hematoma.

KEY WORDS: Acute subdural hematoma, Computed tomography, Rapid resolution, Subdural hygroma

ÖZ

Nöroşirurji pratiğinde akut subdural hematomun tanısı ve tedavi yönlendirilmesi önemlidir. Bilgisayarlı tomografi de(BT)akut subdural hematomun bir kaç saat içinde hızlı spontan rezolüsyonu nadir olarak görülür. Biz yaklaşık 9 saat içinde spontan rezolüsyon olan ve altta mevcut olan subdural hygroma boyutlarını genişleten akut subdural hematom olgusu sunuyoruz. Ek olarak, olgunun birinci ay kontrol BT'sinde subdural higroma boyutlarının küçüldüğü gözlemlendi. Olgunun takiplerinde akut subdural hematomun rezolüsyonu ve subdural hematomun altta bulunan subdural higroma üzerine etkisi önemlidir. Akut subdural hematom ve subdural higroma arasındaki bağlantı akut subdural hematomun rezolüsyonu ve tedavinin yönlendirilmesi açısından önemlidir.

ANAHTAR SÖZCÜKLER: Akut subdural hematom, Bilgisayarlı tomografi, Hızlı rezolüsyon, Subdural higroma

Murat COŞAR¹

Olca EŞER²

Adem ASLAN³

Yüksel ELA⁴

^{1,2,3} Afyon Kocatepe University, Faculty of Medicine, Neurosurgery Department, Afyonkarahisar, Turkey

⁴ Afyon Kocatepe University, Faculty of Medicine, Anesthesiology Department, Afyonkarahisar, Turkey

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Correspondence address:

Murat COŞAR

Afyon Kocatepe University,
Faculty of Medicine, Neurosurgery
Department, Afyonkarahisar, Turkey
Phone: +90 505 8041362

INTRODUCTION

Acute subdural hematoma (ASDH) is collection of fresh blood under the duramater, often large enough to compress the brain and with a mortality rate of 60%-80% [1]. The natural history of the ASDH is not fully understood because of the early surgical intervention [4]. Rapid spontaneous resolution of ASDH is seen rarely. Several mechanisms of spontaneous resolution of acute subdural hematoma have been reported [3]. The majority of subdural hygromas (SDGs) are secondary to trauma. In this article, we present an ASDH patient that developed over SDGs and resolved within 9 hours while contributing to the enlargement of the SDG.

CASE REPORT

An 8-month-old child was admitted to our emergency room with a complaint of seizure after falling down the stairs. Physical examination was normal except for echymosis on the right temporal scalp. After the postictal period, the neurological examination of the patient was normal. Routine laboratory examination (including coagulation studies) was in normal range.

The plain radiography of the skull was normal. Initial computed tomography (CT) was performed 1 hour after trauma. CT revealed an ASDH (with a width less than 1 cm) on the right frontoparietal region on the base of bilateral frontoparietotemporal existent SDG without cerebral contusion and brain swelling (Figure 1). The tension of the anterior fontanel was normal and we did not detect any increase in the head circumference of child. An operation was therefore not planned and medical therapy was chosen for the treatment.

The follow-up CT was performed 8 hours after the initial CT. The follow-up CT showed us that the ASDH on the base of existent SDG was vanished (Figure 2) but we observed that the width of previous SDG had increased. The clinical course of the patient was uneventful. The patient was discharged 7 days after trauma.

The second follow-up CT scan 1 month after trauma showed complete resolution of ASDH, but the width of SDG had decreased minimally when compared with previous CT scans (Figure 3). The clinical course of the patient was uneventful.

The parents of the child did not accept the 3rd follow-up CT in the 3rd month after trauma because of the good neurological and physical condition of the child.

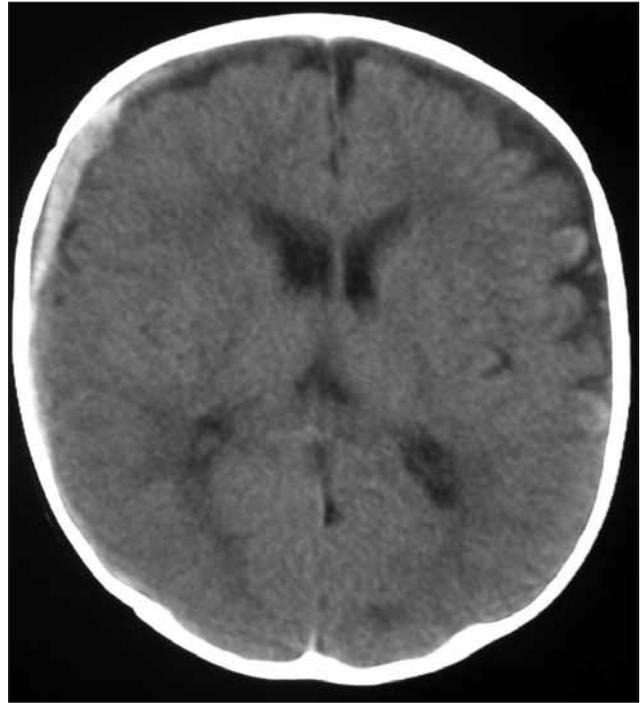


Figure 1: The initial axial CT scan shows the right frontoparietal acute SDH on the base of existent SDG.

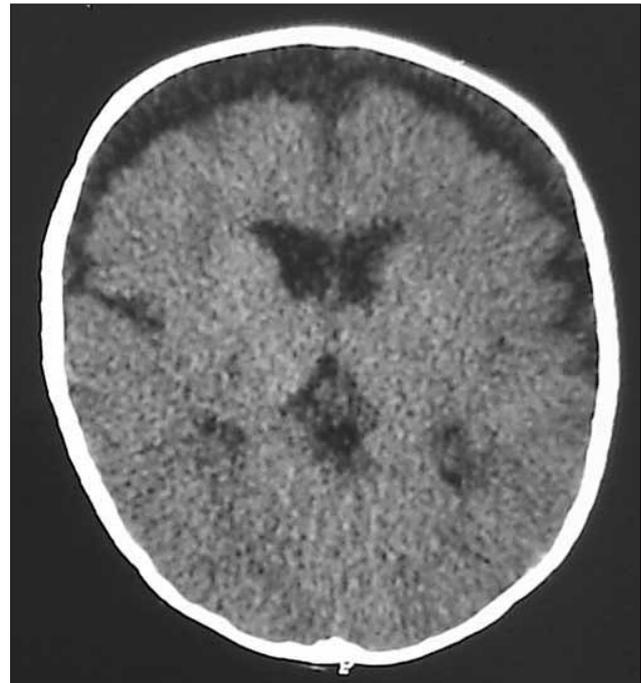


Figure 2: The second axial CT scan (9 hours after the trauma) shows the resolution of acute SDH and enlargement of existent SDG.

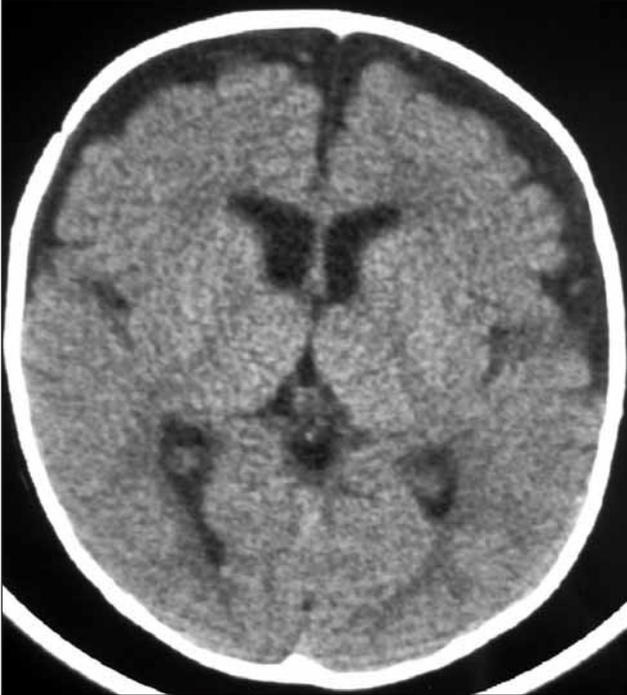


Figure 3: The third axial CT scan (one month after the trauma) shows the minimal decrease in the enlargement of SDG.

DISCUSSION

The localization of SDH and SDGs are between duramater and arachnoid layer. It is difficult to distinguish the SDH and SDGs on radiological images, especially on CT. Traumatic ASDH is found in 10-20% of all major trauma cases [1]. The most common sites for ASDH are the fronto-parietal convexities, middle cranial fossa and interhemispheric fissure [5]. SDG is defined as an acute or chronic accumulation of CSF in the subdural space, frequently with modified composition [13]. The majority of SDGs are secondary to trauma. Commonly accepted theory relates to tearing or disruption of the arachnoid layer resulting in one-layer flap, causing CSF leak and accumulation in the subdural space preventing reabsorption [10].

ASDH is a neurosurgical emergency. The majority of patients undergo urgent neurosurgical intervention and the true incidence of rapid resolution and redistribution of ASDH is therefore underestimated. We did not choose the surgical option for treatment because of the neurological and radiological features of the patient.

Our case showed the rapid resolution of the

ASDH that developed over SDG and contributed to the size of the SDG. There have been several reports describing mechanisms of spontaneous ASDH resolution [1,5,9,12]. Several possible hypotheses have been suggested: 1) the hematoma is diluted by cerebrospinal fluid (CSF) due to tearing of the arachnoid membrane and is washed out, 2) the hematoma is compressed by the pressure produced by acute cerebral swelling and redistributed, 3) Cerebral atrophy may facilitate accommodation and redistribution of ASDH, 4) the potential for communication between intracranial and epicranial hematomas, 5) duramater tears or skull fractures may allow the clot to be pushed into the diploic bone of the skull or soft tissues. We think that the resolution of our patient's ASDH was because of the dilution of CSF and cerebral atrophy of the patient.

Nagao et al. [11] speculated in a pediatric case that the hematoma was exposed, diluted, and washed out by participation of the CSF. Nikawa et al. [12] described four cases in which dilution by CSF may have been responsible for rapid resolution of the ASDH. Subdural hygroma as in our case may help the rapid resolution of ASDH.

CT findings of ASDH are hyperdense crescent-shaped collection lying between the inner table of the skull and cerebral hemisphere. It is difficult to distinguish SDH and SDG on CT scans, but MRI and doppler USG can contribute to the diagnosis of subdural fluid effusion [2]. However, mechanisms for the spontaneous resolution of ASDH are still unclear. Kato et al. [6] emphasized an important detail, and called it as low-density band. The low-density band between the hematoma and inner wall of the skull bone on the CT represents co-mingling of the hematoma. The low-density band suggests the flow of CSF into the subdural space.

The characteristic features of CT findings of rapid resolution of ASDH were as follows: 1) participation of CSF at the lateral portion of the hematoma was recognized during the early period after injury, 2) no cerebral contusion was identified, 3) acute cerebral swelling was not identified [7].

The management of ASDH is by surgery or conservative approach. If the midline shift of cerebral parenchyma is greater than 5 mm due to an intracranial mass lesion, several authors have advocated immediate decompressive craniectomy [7]. Conservative treatment of patients with ASDH is

certainly not preferable to operative procedures [8] but surgical prognosis is not good enough. Kato et al. [6] speculated osmotherapy would have provided enough space for hematoma to show rapid redistribution. Therefore the most important factor in ASDH resolution appears to be participation of CSF and the presence of a wide subdural space in which the hematoma can be redistributed.

CONCLUSION

We conclude that subdural existence of CSF contributes to rapid resolution of ASDH. Additionally, the increase in SDG size may become balanced in the weeks following the trauma.

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