Ege Journal of Medicine / *Ege Tıp Dergisi* 2016;55(4): 210-212

Spontaneous and rapid resolution of post-traumatic acute subdural hematoma

Post-travmatik akut subdural hematomun spontan ve hızlı rezolüsyonu

Özgür Demir[1] Faruk Tonga[2]

[1]Gaziosmanpaşa University Faculty of Medicine, Department of Neurosurgery, Tokat, Turkey
[2]Amasya State Hospital, Clinic of Neurosurgery, Amasya, Turkey

Abstract

A-63-year old woman was brought to our clinic with signs of intracranial herniation due to acute subdural hematoma (ASDH) after being involved in a traffic accident. On admission, she had hemiparesis and anisocoria and she was comatose with a Glasgow Coma Scale (GCS) score of 8. Brain computed tomography (CT) showed ASDH including low density areas in left temporoparietal region and evident midline shift. The patient was given mannitol as conservative treatment in the emergency room. Approximately one and a quarter hours later, her neurological level spontaneously improved; and her GCS score rose to 13. One and a half hours later, Control CT showed significant reduction in ASDH and midline shift. On the second day she was totally alert with a GCS score of 15. The second control CT taken approximately fifteen hours after her admission revealed no pathology. She was discharged with no neurological deficit. This case illustrates rapid and spontaneous resolution of ASDH. In the patient's initial CT, low density areas indicating the co-mingling of hematoma with cerebrospinal fluid (CSF) were observed. Therefore, we consider the dilution and washing out of hematoma with CSF as the main cause of the spontaneous and rapid resolution of ASDH.

Keywords: Subdural hematoma.

Öz

Altmış üç yaşındaki kadın hasta trafik kazası sonrası gelişen akut subdural hematoma (ASDH) bağlı intrakranial herniasyon bulgularıyla kliniğimize getirildi. Başvuru sırasında hemiparezi ve anizokori olup 8 Glaskow Koma Skalası (GKS) ile komatözdü. Beyin bilgisayarlı tomografisinde sol temporoparietal bölgede, içinde düşük dansiteli alanlar bulunan ASDH'u ve belirgin orta hat şift mevcuttu. Acil serviste konservatif tedavi olarak mannitol verildi. Yaklaşık olarak bir saat on beş dakika sonra spontan olarak nörolojik durumunda düzelme görüldü ve GKS skoru 13'e yükseldi. Yaklaşık bir buçuk saat sonraki kontrol BT'sinde ASDH'de ve orta hat şiftinde belirgin azalma olduğu görüldü. İkinci gün hasta tam olarak kendindeydi ve GKS skoru 15 idi. Hastanın başvurusundan yaklaşık olarak onbeş saat sonra çekilen ikinci kontrol BT'de herhangi bir patolojik bulgu görülmedi. Hasta nörolojik defisitsiz olarak çıkarıldı. Bu olgu, ASDH'nin spontan ve hızlı olarak emilebildiğini gösteren bir örnektir. Hastanın ilk BT'sinde hematomun beyin omurilik sıvısı (BOS) ile karıştığını gösteren düşük dansiteli alanlar gözükmekteydi. Bu nedenle olgumuzda ASDH'nin spontan ve hızlı rezolüsyonunda ana nedenin hematomun BOS ile dilüe olup yıkanması olduğunu düşünmekteyiz.

Anahtar Sözcükler: *Subdural hematom.*

Introduction

Rapid resolution of ASDH on CT and signs of herniation are well known entities with several reported cases (1,2). There are some mechanisms that have been proposed as the reason of acute resolution of ASDH. Dilution and wash-out of the hematoma by CSF after tearing of arachnoid membrane is the mostly accepted proposal (3). The other ones are compression and redistribution of hematoma because of acute brain swelling; and redistribution of hematoma throughout skull fractures (4). Here we present a case with ASDH who developed signs of herniation that resolved with conservative therapy approximately one and a half hours after the admission.

Case Report

A 63 year-old woman was transferred to our hospital after being involved in a traffic accident. On admission, she had hemiparesis and anisocoria. She was comatose with a Glasgow Coma Scale (GCS) score of 8. Her initial

Corresponding Author: Özgür Demir
Gaziosmanpaşa University Faculty of Medicine, Department of Neurosurgery, Tokat, Turkey
Received: 11.09.2015 Accepted: 19.10.2015

CT revealed ASDH in left temporoparietal region with low density areas and marked midline shift (Figure-1). Mannitol was initially given as anti-edema therapy. While we were trying to improve the general condition of the patient, her neurological level increased spontaneously with a GCS score of 13 approximately one and quarter hours later. No hemiparesis was observed in her neurological examination. One and a half hours later, control CT revealed obvious reduction of ASDH and midline shift (Figure-2a). Then, conservative treatment was continued to be given to the patient in our clinic. On the second day, she was completely alert with a GCS score of 15. The second control CT taken approximately 15 hours after her admission showed no midline shift and a total resolution of ASDH (Figure-2b). The patient was discharged on the sixth day with excellent neurological condition. The patient was given an appointment date for re-evaluation.

Written informed consent was obtained from the patient for publishing the individual medical records.

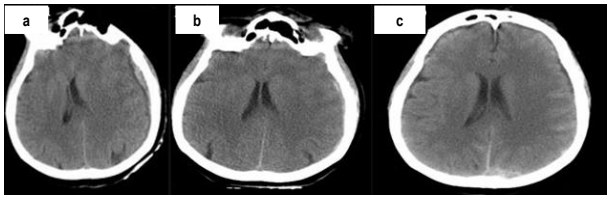

Figure-1. a. Initial CT revealed ASDH with low density areas and marked midline shift. **b.** First control CT taken approximately one and a half hours after admission showed spontaneous obvious reduction of ASDH and midline shift. **c.** Second control CT taken approximately 15 hours after admission showed no midline shift and a total resolution of ASDH.

Discussion

ASDH is a life threatening condition with a high mortality rate. Today, the gold standard of treatment is urgent surgery for ASDH because of the mass effect of hematoma (5). We also thought that urgent surgery should be implemented in our case. But while we were trying to improve the general condition of the patient, the patient's neurological level increased spontaneously in a period of one and a quarter hours.

Our report and several reports in the literature supported that ASDH may reduce and disappear spontaneously (1,2). So there is an important question to be answered. Is conservative treatment adequate for all the patients with ASDH? In order to answer this question, we should know the spontaneous resolution of ASDH. However, it is still unclear. Some hypotheses for spontaneous resolution of ASDH have been put forward: ASDH is diluted and washed out by CSF, compression and redistribution of hematoma because of acute brain swelling and redistribution of hematoma throughout skull fractures (3,4). According to us, the first hypothesis is the most acceptable. Because almost all cases including ours showed mixed density hematoma and low density band which represents co-mingling of the hematoma with CSF. We did not identify skull fracture on CT of our patient. In most of the cases, spontaneous rapid resolution of ASDH without skull fractures and brain swelling was observed (6,7).

It is suggested in some reports that dissociation between the skull and the brain can be significant for the redistribution as it provides space for hematoma to move (3). Most of the reported cases-including ours- occurred in elderly patients or infants. Some reports demonstrated the redistribution of ASDH into other subdural areas on magnetic resonance imaging (8,9).

Some authors have advocated implementing urgent surgery in cases of severe head injury involving a midline shift of greater than 5 mm due to intracranial mass lesion (10). According to these criteria, almost all of the reported cases required urgent surgery. However, conservative treatment was sufficient enough for all of them-including our case. The marked midline shift in our patient improved within one and a half hours.

Almost all of the patients-including ours-reported to have rapid spontaneous resolution of ASDH were comatose. Most of them had also anisocoria. These neurological deficits spontaneously and rapidly recovered in all of the reported cases (7). Our patient recovered neurologically within one and a quarter hours.

We have obtained little data to predict spontaneous rapid resolution of ASDH in the view of the literature. The images of mixed density hematoma and low density band which represent the co-mingling of the hematoma with CSF on CT are the most important predictive factors. Age may be a predictive factor; because the width of the subdural space is important for the redistribution of hematoma. Neurological status of patients, midline shift images on CT and skull fractures had no significant importance to predict spontaneous rapid resolution of ASDH.

References

1. Aoki N. Acute subdural haematoma with rapid resolution. Acta Neurochir 1990;103(1-2): 76-8.
2. Zhuang Z, Luo J, Ou C, Chen B, Liu B. The clinical and CT features of rapid spontaneous resolution of traumatic acute subdural hematoma: A retrospective study of 14 cases. Brain Inj 2015;17(1):1-7.

3. Nagao T, Aoki N, Mizutani H, Kitamura K. Acute subdural hematoma with rapid resolution in infancy: Case report. Neurosurgery 1986;19(3):465-7.
4. Duman H, Ziyal İM, Türkmenoğlu O, Mülüman M, Aydın Y. Semptomatik akut subdural hematomun erken spontan rezolüsyonu: Bir çocukluk dönemi olgusu. Türk Nöroşirürji Dergisi 2001;11(1):222-5.
5. Levati A, Farina ML, Vecchi G, Rossanda M, Marrubini MB. Prognosis of severe head injuries. J Neurosurg 1982;57(6):779-83.
6. Yuksel M, Saglam C, Goktekin MC, Tas M, Mesut A. A case of intracranial migration and rapid spontaneous resolution of traumatic acute subdural hematoma. Medical Science and Discovery 2015;2(3):233-5.
7. Kimura H, Nogaki H, Sawa H, Tamaki N. Rapid spontaneous resolution of a severe acute subdural hematoma in an elderly woman. No Sinkei Geka 2000;9(1):561-4.
8. Huang SH, Lee HM, Lin CK, Kwan AL, Howng SL, Loh JK. Rapid resolution of infantile acute subdural hematoma: A case report. Kaohsiung J Med Sci 2005;21(5):291-4.
9. Wong ST, Yuen MK, Fok KF, Yuen SC, Yam KY, Fong D. Redistribution of hematoma to spinal subdural space as a mechanism for the rapid spontaneous resolution of posttraumatic intracranial acute subdural hematoma: Case report. Surg Neurol 2009;71(4):99-102.
10. Cooper PR, Rovit RL, Ransohoff J. Hemicraniectomy in the treatment of acute subdural hematoma: A re-appraisal. Surg Neurol 1976;5(1):25-8.