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CASE REPORT

Conservative Management of Large Vertex Extradural Hematoma: A Case Report

Bekir TUNÇ [1], Emin ÇAĞIL [2], Göksal GÜNERHAN [2], Egemen IŞITAN [3]

[1] Çorum Erol Olçok Training and Research Hospital, Department of Neurosurgery, Çorum/Türkiye
[2] University of Health Sciences, Ankara Sehir Training and Research Hospital, Department of Neurosurgery, Ankara/Türkiye
[3] Yüksek İhtisas University, Liv Hospital, Department of Neurosurgery, Ankara/Türkiye

ÖZET

Aksiyal kesitli beyin bilgisayarlı tomografi taramaları tanı için tek başına kullanıldığında Verteks ekstradural hematomlar atlanabilir. Bu hastalarda gerekli koşullar sağlandığında konservatif tedavi tercih edilebilir. 24 yaşında mental retarde erkek hasta aynı seviyeden düşme ve kafa travması ile acil servise başvurdu. Acil serviste yapılan nörolojik muayene ve aksiyel kesitsel beyin bilgisayarlı tomografisi normal olarak değerlendirilerek hasta taburcu edildi. 2 gün sonra baş ağrısı şikayeti ile başvuran hastanın aksiyel, koronal ve sagital rekonstrükte beyin bilgisayarlı tomografi kesitlerinde kemik kırığı komşuluğunda verteks ekstradural hematom tanısı kondu. Mental retardasyon nedeniyle nörolojik muayenede yaşanan zorluklara rağmen çok yakın nörolojik muayene ile cerrahi tedavi planlanmadı. Hasta 2 gün beyin cerrahisi yoğun bakım ünitesinde, 7 gün beyin cerrahi servisinde izlendi. Nörolojik takiplerinde anormallik olmaması ve hematom boyutunda artış olmaması üzerine taburcu edildi. Bir ay sonraki ilk poliklinik takibinde hematom tamamen rezorbe olmuştu. Hasta yakın bilinç ve nörolojik muayene takibi ile konservatif olarak tedavi edildi. Acil servise kafa travması ile başvuran hastalarda yapılan beyin bilgisayarlı tomografisinde verteks ekstradural hematomların atlanmaması için aksiyal kesitlere ek olarak koronal ve sagittal kesitlerin rekonstrüksiyonu yapılmalıdır. Verteks ekstradural hematomlar nörolojik olarak yakından incelendiği, motor defisit olmadığı ve kontrol görüntülemede hematom boyutunda artış olmadığı sürece konservatif tedavi tercih edilebilir.

Anahtar kelimeler: Ekstradural hematom, Konservatif tedavi, Travma, Verteks

ABSTRACT

Vertex extradural hematomas may be missed when axial section brain computed tomographic scans are used alone for diagnosis. Conservative treatment may be preferred in such patients when actualized the essential conditions. A 24-year-old mentally retarded male patient was admitted to the emergency department with a history of falling from the same level and head trauma. Neurological examination and axial cross-sectional brain computed tomography performed in the emergency room were evaluated as normal, and the patient was discharged. Vertex extradural hematoma adjacent to the bone fracture was diagnosed with axial, coronal and sagittal reconstructed brain computerized tomography sections of the patient who came back with headache complaint 2 days later. Despite the difficulties in neurological examination due to mental retardation, surgical treatment was not planned with very close neurological examination. The patient was followed up in the neurosurgery intensive care unit for 2 days and in the neurosurgery service for 7 days. He was discharged because there was no abnormality in his neurological follow-ups and no increase in hematoma size. In the first outpatient follow-up, one month later, the hematoma was completely resorbed. The patient was treated conservatively with close conscious and neurological examination follow-up. In order not to miss vertex extradural hematomas in the brain computed tomography performed in patients presenting to the emergency department with head trauma, coronal and sagittal sections should be reconstructed in addition to axial sections. Conservative treatment can be preferred if vertex extradural hematomas are neurological examined closely, no motor deficits and there is no increase in hematoma size in control imaging.

Keywords: Extradural hematoma, Conservative treatment, Trauma, Vertex

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Corresponding Author: Emin Çağıl **Correspondence Adress:** University of Healthy Science, Ankara City Hospital, Dept. of Neurosurgery, Üniversiteler Mah. 1604. Cad., No:9, 06800, Çankaya, Ankara, Türkiye Mail: emincagil.md@gmail.com Received: 20.08.2023; Accepted: 22.09.2023

INTRODUCTION

Extradural hematomas (EDH) are one of the most common neurosurgical emergencies. EDH is seen in approximately 1% of patients presenting with head trauma(1). Acute extradural hematomas often occur with the accumulation of blood in the epidural space due to the bleeding of the arteria meningea media and its branches after trauma. Rarely, the source of bleeding may be the venous sinuses (most likely the superior sagittal sinus) and the diploic vein (2). Venous-originated EDH estimated as approximately 10% of all extradural hematomas and is predominantly seen in the pediatric age group (3). Venous-originated EDHs has an advantage as the slow expansion of the bleeding eventuates early coagulation. Therefore, these type of EDHs are more suitable for conservative treatment compared to EDHs originating from arteries (4). Vertex extradural hematomas (VEDH) is rare and also usually a venous-originated type of bleeding. The rate of VEDH among EDHs is seen as 1.2-8.2% in various literature studies (5). Mortality of vertex extradural hematomas is around 18-50% (1). The most significant radiological imaging method in diagnosis is computerized brain tomography (CT). However, they may also have a heterogeneous or hypodense appearance (6). In the treatment, the extradural hematoma is usually evacuated by surgical intervention (3). In this case, we present a case of vertex extradural hematoma that was followed and treated conservatively without surgical decompression.

CASE PRESENTATION

A 24-year-old mentally retarded male patient admitted to the emergency department with a history of head trauma after falling from the same level. The patient has a history of loss of consciousness/seizure that cannot be properly described by his relatives after trauma. Brain CT with only axial section was taken at the first admission to the emergency department. No pathology seen in this CT, and he was discharged from the emergency room without any neurology/neurosurgery consultation. The patient re-admitted to the emergency department with the complaint of headache after 24 hours. Neurological examination of the patient was evaluated as Glasgow Coma Scale (GCS) 13 and no motor deficit. In the anamnesis, it was reported by his relatives that the patient was retarded in verbal responding and that he answered the questions with inappropriate words. These examination findings were considered normal for the patient. The patient was consulted to the neurosurgery department by the emergency physicians. Suspicious brain CT with axial sections was examined and it was requested to repeat the brain CT including axial, sagittal and coronal sections (Figure 1). Vertex extradural hematoma was diagnosed in the newly taken brain CT.

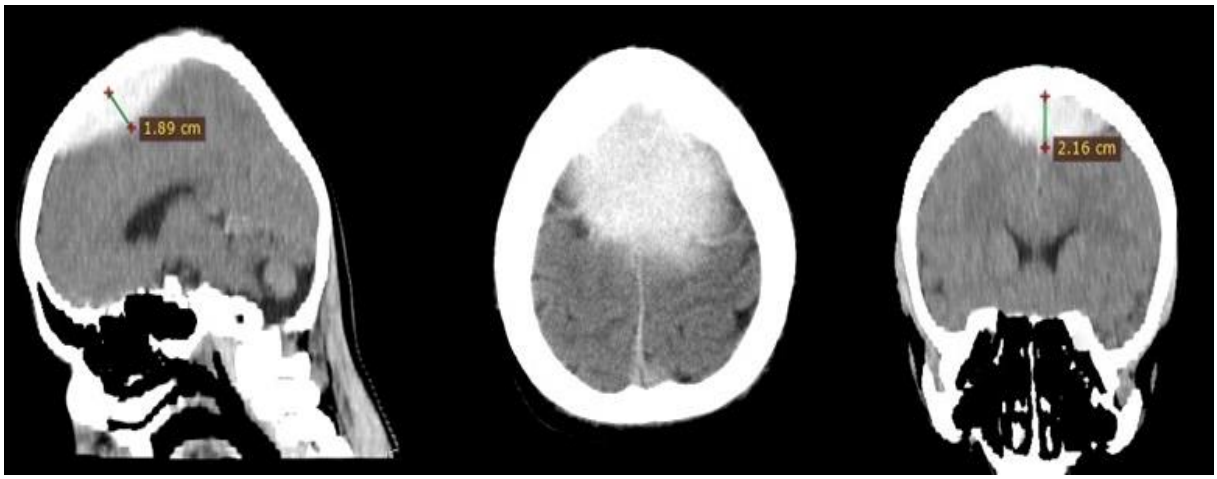

Figure 1: CT axial, sagittal, coronal scans showing vertex epidural hematoma.

The patient was followed up in the neurosurgery intensive care unit. Neurological follow-up was performed by a neurosurgeon or trained nurse every hour. 72 hours later, the patient was followed up in the neurosurgery service, where the on-duty doctor and nurse were present. Pupil diameter, pulse rate, blood pressure, respiratory patterns of the patients and GCS score were followed. Despite the patient had a seizure once during the follow-up, surgery was not planned for the patient who had no regression in neurologic examination and no decrease in GCS after seizure control, In the control brain CT taken 72 hours later, there was no change in VEDH volume. During the follow-up, his urinary catheter was removed, but a bladder globe developed due to inability to urinate. Thereupon, a urology consultation was requested. Neurogenic bladder was diagnosed, and existing urinary dysfunction was attributed to a cranial trauma. Bladder exercise was performed by reinserting the urinary catheter. The patient was mobilized frequently, on the 3rd day of the neurosurgery service follow-up, the catheter was removed without any complications. The patient was discharged on the 5th day of the service follow-up. It was observed that the patient, who came to the control one month later, was freely mobilized and did not have any urinary dysfunction. In the control brain CT of the patient, VEDH was completely resorbed without surgical intervention (Figure 2).

Since the patient in the case report, we presented was mentally retarded, detailed written consent was obtained from the next of kin.

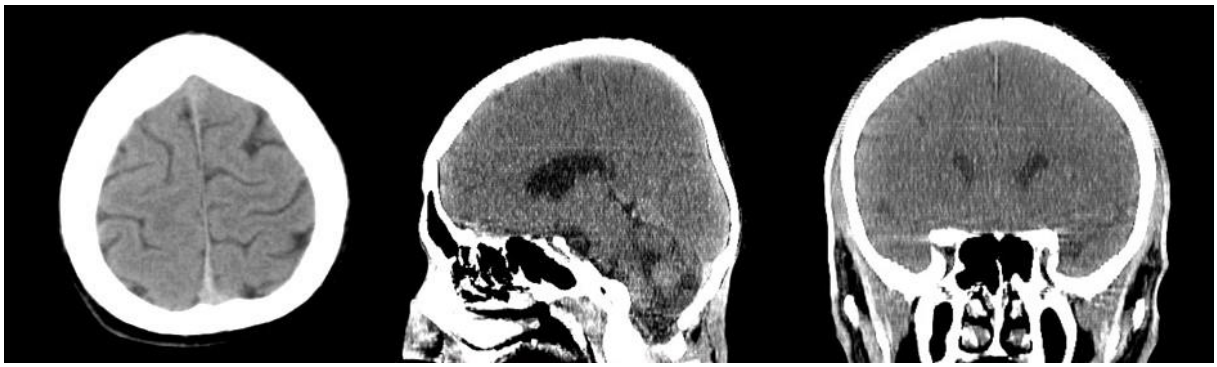

Figure 2. Imaging at last follow-up (one month later), showing complete resorption of the VEDH with ongoing ossification of the fracture.

DISCUSSION

Extradural hematomas arising at the vertex indicate a distinct group (2,7). The incidence of VEDHs has been reported to be 1,2%–8,2% , and VEDHs associated mortality reported as 18 to 50% (6,7). Although it is so rare among extradural hematomas, the mortality rate is high. There is a high mortality rate, especially in superior sagittal sinus injuries (1). Damage to the superior sagittal sinus also complicates the surgery (8).

When the VEDH is suspected, coronal and sagittal scans of head CT should be reconstructed to confirm hematoma (8). VEDH is difficult to detect in a patient with only axial sectional brain CT scan, and vertex hematomas may be overlooked in patients who admitted to the emergency department. As the causes of miss outed vertex hematomas.

1. If CT sections are taken as thick, the image in the vertex may be skipped (9), If only axial section is to be evaluated, other reconstructions may not be necessary if the section interval is 1 mm (9).

2. Bone window and vertex hematoma can have the same isodense appearance (5,9),

3. Artifact of the bone structure in the vertex part (1,7,9),

4. Low hematoma volume (3).

Magnetic resonance imaging (MRI) can be also useful, but it may cause delay in diagnosis and treatment because of cost and accessibility. CT venogram is an another useful examination when superior sagittal sinus injury is suspected (6).

In our patient, only the axial image was taken at the first admission to the emergency department, and the diagnosis of VEDH was missed. Axial, coronal and sagittal section brain CT was performed to the patient whose complaints increased in the following days, and the VEDH was diagnosed. MRI is instructive in hospitals where axial, coronal and sagittal reconstruction cannot be performed with CT images (10).

In regard of VEDH's interhemispheric location, it may compress motor cortex that usually cause lower extremities paresis. VEDH can cause symptoms with different

mechanisms that are compression of blood clot, obstruction of the superior sagittal sinus by trauma, disrupted cerebrospinal fluid flow and reabsorption (10).

Nearly all VEDHs are accompanied by bone fracture (4). In our case, a non-displaced fracture line was accompanied at the vertex level, especially in the left neighbourhood of the superior sagittal sinus, which can be distinguished in coronal sections (Figure 3).

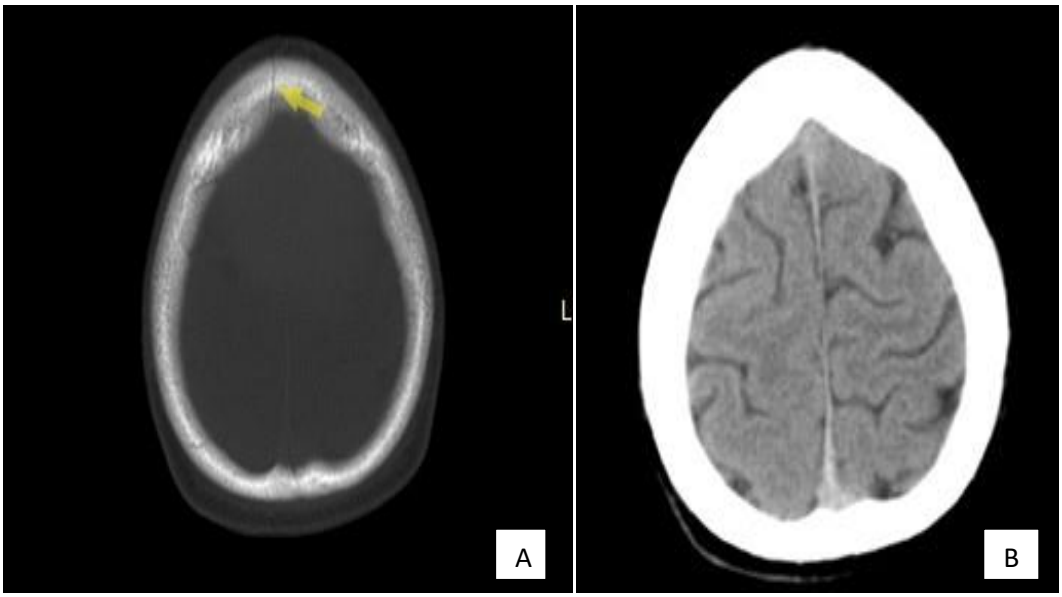

Figure 3. A) Non-displaced fracture line on right frontal bone (yellow arrow), B) The image of the superior most slice showing the cerebral sulcus and gyrus, proving that the haematoma could not be detected by routine axial brain CT examination at the first presentation to the emergency department.

VEDHs have non-localized and non-specific clinical findings (2). The most common symptom is headache. In addition, there may be symptoms such as vomiting, seizures, numbness or loss of strength in the extremities, and cranial nerve paralysis (2,8). Emergent surgical evacuation should be considered, especially when there is motor deficit. Our patient also came to the emergency department again with a complaint of headache and had a seizure once in the follow-up, but there was no loss of strength in the extremities. Being mentally retarded also made neurological examination difficult and required close follow-up.

VEDH has limited literature compared to other extradural hematomas. Considering that VEDH is venous-originated most likely, VEDH may regress spontaneously. The resorption period is approximately six weeks in patients who do not undergo surgery. In our case, the last CT showed that VEDH resolved, and no pathology remained in four weeks. Conservative treatment can be applied if there

are no neurological symptoms, but VEDHs may worsen rapidly and unpredictably. Care should be taken in the surgery of VEDHs because there is a possibility of rupture of the superior sagittal sinus.

Due to the difficulty of the surgical technique, conservative treatment should be preferred in patients without neurological deficits, but otherwise, surgical treatment should be performed (10). Although seizures were observed in our patient, conservative treatment was continued because there was no change in hematoma sizes in control brain CT scans and there was no lateralizing motor deficit. Medical epileptic seizure control was achieved in the patient. The patient was discharged after his neurological status improved and his GCS score was 13 (the patient's normal value, according to the patient's relatives). And at the patient's first outpatient follow-up, one month later, VEDH was completely resorbed (Figure 2).

CONCLUSION

In order not to miss VEDHs, coronal and sagittal reconstruction should be performed in addition to brain CT axial sections taken in emergency services. Conservative treatment should be chosen unless there is no motor deficit in VEDHs and no increase in hematoma size in control CTs. For this reason, VEDH patients included in the conservative treatment program should be followed up by trained doctors and nurses. It should be kept in mind that even a large VEDH patient with an additional disease such as mental retardation that complicates the neurological examination can recover without surgery with close follow-up. This approach may differ according to hospital and intensive care conditions.

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Conflicts of interest: The authors have no conflicts of interest to declare.

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