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CASE REPORT / OLGU SUNUMU

Isolated Fourth Ventricle Hemorrhage Following Minor Trauma: A Case Report

Minör Travma Sonrası İzole Dördüncü Ventrikül Kanaması: Olgu Sunumu

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ABSTRACT

Aim: Isolated fourth ventricle hemorrhage is an extremely rare clinical pathology and is usually associated with severe trauma. Ventricular hemorrhages are usually seen in the lateral ventricles and are often accompanied by cerebral contusions, skull fractures, or parenchymal hemorrhages. The fourth ventricle, which has an anatomical position surrounded by the brain stem and cerebellum, is less sensitive to trauma compared to other ventricles.

Case Presentation: In this case report, a 3-year-old child was presented to the emergency department with a gait disturbance following a backward fall from a chair. The neurological examination of the patient was normal, except for a gait disturbance (ataxic gait). Cranial computed tomography (CT) imaging showed a hemorrhage of approximately 1 cm in the fourth ventricle. The patient was hospitalized for close follow-up and observation. After 12 hours, the gait disturbance had completely disappeared, and the hemorrhage had also resolved on the CT image.

Conclusion: This case report highlights the recognition of isolated fourth ventricular hemorrhage in clinical practice, possible mechanisms underlying it, management strategies, and prognostic considerations in the context of pediatric trauma.

Keywords: Epidural hemorrhage, fourth ventricle hemorrhage, head injury, intracerebral hemorrhage, subdural hemorrhage

ÖZ

Amaç: İzole dördüncü ventrikül kanaması oldukça nadir görülen bir klinik patolojidir ve genellikle ağır travma ile ilişkilidir. Ventriküler kanamalar genellikle lateral ventriküllerde görülür ve sıklıkla beyin kontüzyonları, kafatası kırıkları veya parankimal kanamalar eşlik eder. Beyin sapı ve beyincik ile çevrili anatomik bir konuma sahip olan dördüncü ventrikül, diğer ventriküllere göre travmaya daha az duyarlıdır.

Olgu Sunumu: Bu olgu sunumunda, sandalyeden geriye doğru düşme sonucu yürüme bozukluğu şikayeti ile acil servise başvuran 3 yaşında bir çocuk hasta sunulmuştur. Hastanın yürüme bozukluğu (sarhoş gibi yürüme) dışında nörolojik muayenesi normaldi. Kranial bilgisayarlı tomografi (BT) görüntülemede dördüncü ventrikülde yaklaşık 1 cm'lik lezyon izlendi. Hasta yakın takip için hastaneye yatırıldı. 12 saat sonra yürüme bozukluğu tamamen ortadan kalktı ve BT görüntüsünde kanama kayboldu.

Sonuç: Bu olgu sunumu, pediatrik travma bağlamında izole dördüncü ventrikül kanamasının klinik pratikte tanınmasının, altında yatan olası mekanizmaların, tedavi stratejilerinin ve prognostik hususların önemini vurgulamaktadır.

Anahtar Kelimeler: Epidural kanama, dördüncü ventrikül kanaması, kafa travması, intraserebral kanama, subdural kanama

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Introduction

Traumatic cerebral hemorrhages are the cause of high morbidity and mortality in the pediatric population, and these hemorrhages are usually seen as epidural, subdural, and intracerebral hemorrhages (1,2,3,4). Trauma-related intraventricular hemorrhages may also be seen in this age group (5,6). Ventricular hemorrhages are usually seen in the lateral ventricles and are often accompanied by cerebral contusions, skull fractures, or parenchymal hemorrhages. The fourth ventricle, which is anatomically positioned between the brain stem and cerebellum, is less sensitive to trauma compared to other ventricles (7,8,9). According to our literature search, we did not encounter any traumatic isolated fourth ventricular hemorrhage in childhood.

In this report, we are presenting a 3-year-old case with isolated 4th ventricular hemorrhage due to minor trauma.

Case Presentation

A 3-year-old male child was brought to the emergency department with a complaint of gait disturbance after falling on his back from a chair. Physical examination revealed edema on the scalp and periorbital ecchymosis. Neurological examination was normal except for gait disturbance (ataxic gait). His Glasgow Coma Score was 15. The patient had no history of any bleeding disorder, such as hemophilia, that would increase the likelihood of bleeding in his personal or family history. The patient had no known chronic disease. The initial cranial CT showed an isolated fourth ventricular hemorrhage (Figure 1). The patient was admitted to the hospital ward for follow-up. During hospitalization, no clinical deterioration occurred. A follow-up CT scan at 24 hours showed complete resolution of the hemorrhage (Figure 2). The gait disturbance resolved in parallel with the radiological improvement, and the patient was discharged on the second day of hospitalization. No additional radiological imaging was performed because the patient's clinical and radiological findings improved very rapidly simultaneously. The patient remains under clinical follow-up with no complaints.

Discussion

Ventricular hemorrhage is a rare pathology in the pediatric population. The etiology of ventricular hemorrhages in children includes intracranial tumors, arteriovenous malformations, and Moyamoya disease (10). Ventricular hemorrhages are frequently observed in the lateral ventricles in the literature, but isolated bleeding in the fourth ventricle is extremely rare. Das et al recently reported a primary isolated fourth ventricular hemorrhage, but their case had no history of trauma (11). However, no isolated fourth ventricular hemorrhage related to trauma has been encountered in the literature. Our case is the first in the literature to address this issue.

The branches of the anterior choroidal artery, the posterior choroidal artery, and the posterior cerebral artery supply the ventricular system. On the other hand, the fourth ventricle is supplied by the branches of the posterior inferior cerebellar artery (PICA) and anterior inferior cerebellar artery (AICA). These arteries can be easily damaged in cases of trauma or vascular anomalies. Considering this blood supply pattern, especially in the pediatric population, which has more fragile vascular structures, even mild trauma can lead to bleeding within the fourth ventricle (12,13).

One of the significant complications of fourth ventricular hemorrhage is hydrocephalus. Bleeding that occurs in the fourth ventricle, located in a key site for cerebrospinal fluid circulation, can clot and block the flow of cerebrospinal fluid. Therefore, obstructive hydrocephalus may develop, leading to an increase in intracranial pressure and neurological deterioration (14). However, in our case, fortunately, hydrocephalus did not develop due to the small and rapid disappearance of the fourth ventricular hemorrhage. We believe that the bleeding was cleaned by the washing effect of cerebrospinal fluid (CSF). This situation may suggest that isolated small ventricular hemorrhages that do not form a blockage often have a good prognosis. In our patient, we didn't perform any more radiological imaging techniques due to the known etiology of the hemorrhage and rapid resorption. However, in pediatric patients with isolated ventricular hemorrhage, it may be important to exclude additional vascular pathologies with advanced imaging techniques such as magnetic resonance angiography.

Written informed consent was obtained from the patient's parent.

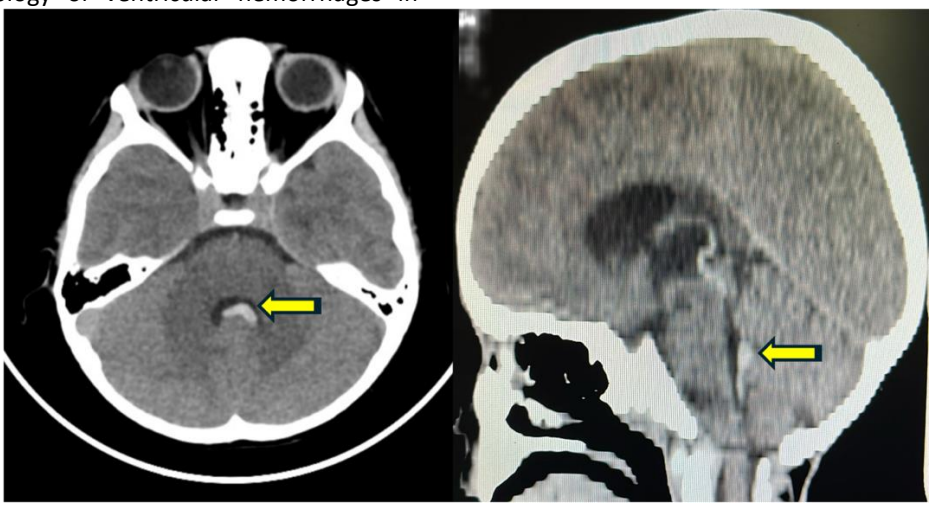

Figure 1. Axial and sagittal CT images of the brain showing hemorrhage in the fourth ventricle. The arrow illustrates bleeding.

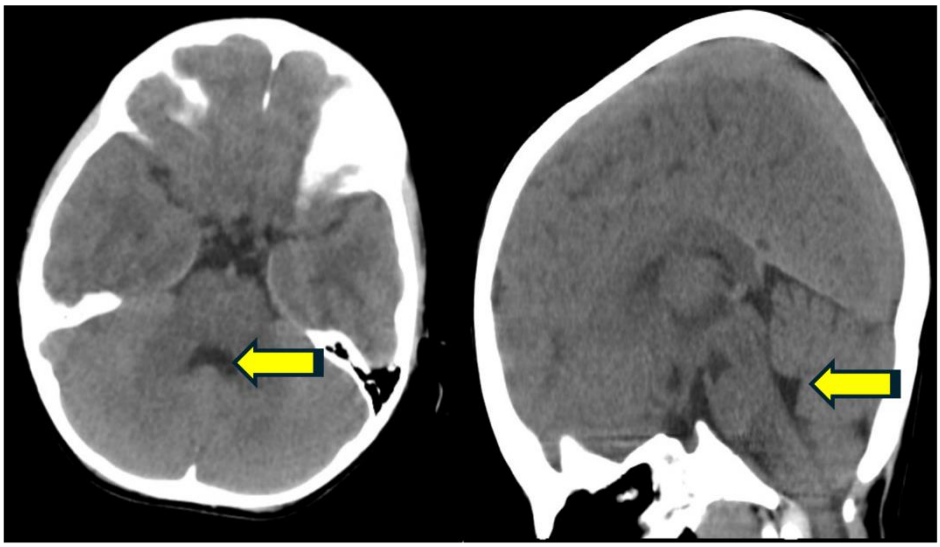

Figure 2. After 24 hours, the hematoma had completely resolved.

Conclusion

This case shows that isolated fourth ventricular hemorrhage, even after minor trauma, may occur. In the presence of any abnormal neurological sign or symptom, a brain CT scan should be performed as the first line of investigation. Patients with this type of hemorrhage should be followed carefully for the possible development of disruption of the flow of CSF and the potential development of hydrocephalus. It is thought that more reporting of such cases in the literature will contribute to a better understanding of clinical management strategies.
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Informed Consent: Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review in this journal.

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