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Case Report / Olgu Sunumu

Intracranial Hematoma After Spinal Anesthesia

Spinal Anestezi Sonrası Gelişen İntrakraniyal Hemoraji

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Abstract

Intracranial hemorrhage is a rare but life-threating complication of spinal anesthesia. Herein, we describe such a rare case that was diagnosed as parenchymal intracerebral hemorrhage after spinal anesthesia. We also aim to raise awareness of its diagnosis and treatment.
Keywords: Spinal anesthesia, parenchymal intracerebral hemorrhage, epileptic seizure

Öz

Spinal anesteziye bağlı gelişen komplikasyonlardan biri olan intrakraniyal hemoraji, nadir görülen ancak hayatı tehdit eden bir durumdur. Bu olguyu sunarak spinal anestezi sonrası nadir görülen bir komplikasyon olan intraserebral parankimal hemorajinin tanı ve tedavisinde farkındalığı artırmayı amaçladık.
Anahtar Kelimeler: Spinal anestezi, intraserebral parankimal hemoraji, epileptik nöbet

Introduction

Spinal anesthesia is a safe and frequently used method of anesthesia. Rarely, complications may occur after spinal anesthesia. The most common complication is headache (postdural puncture headache) developing after dural puncture (1). Its incidence varies between 0.4-6% (2,3,4). Other complications are localized pain, infection at the puncture site, bleeding, meningitis, spinal extradural bleeding, spinal subdural bleeding, and spinal subarachnoid hemorrhage. More rarely, subdural and extradural cranial hemorrhages and cranial nerve deficits can be seen (5). The incidence of intracerebral bleeding after spinal anesthesia has been reported as 1 in 500,000 (6). Therefore, we found it worthy to present a rare patient in whom we detected intracerebral parenchymal hemorrhage after spinal anesthesia.

Case Report

A 22-year-old woman was admitted to our clinic with an epileptic seizure and right hemiparesis. It was learned from her history that she had no systemic disease, and gave birth under spinal anesthesia with normal spontaneous vaginal route 1 week before admission to our clinic. Beginning on the 3rd day after birth, analgesics were recommended in the external center where she was admitted with symptoms of nausea, vomiting, and headache. After her symptoms did not improve, she was admitted to the emergency clinic of our hospital on the day of hospitalization. It was learned that she had a convulsive attack, which started with involuntary movements of her right hand followed by deviation of her head and chin to the left. Then, the seizure continued with contractions in the arms and legs, foam coming out of her mouth, loss of consciousness, lasting about 1 minute. When the headache was questioned, it was learned that it was localized in the frontal regions, bilateral, orthostatic, and postural. She did not have photophobia, but did have phonophobia and also occasional tinnitus in both ears.

In the vital signs of the patient, who did not report hypertension, her body temperature was 36.6 °C, blood pressure was 110/80 mmHg, and pulse was 82/min. In a neurologic examination, she was fully conscious and she had right hemiparesis.

In brain computed tomography (CT) and cerebral magnetic resonance imaging (MRI), a hematoma, approximately 1x0.5 cm in size, was found subcortically in the left parietal lobe

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(Figure 1, 2). In MR angiography and venography, the left transverse sinus was hypoplastic and arterial structures were normal (Figure 3). No significant abnormality was detected in the electrencephalography examination.

In laboratory examinations, liver function tests (alanine aminotransferase: 23 U/l, aspartate transaminase: 26 U/l) and kidney function tests (blood, urea, nitrogen: 17.1 mg/dl, creatinine: 0.71 mg/dl) were evaluated as normal. Iron deficiency anemia and low vitamin B12 level (hemoglobin: 9.9 g/dl, iron: 34 mcg/dl, ferritin: 6 ng/ml, B12: 85 pg/ml) were detected. There was a moderate C-reactive protein elevation (0.849 mg/dl) due to a urinary tract infection. In a peripheral smear performed for bleeding etiology, platelet count and functions were evaluated as normal. The bleeding time, partial thromboplastin time (PTT) (11.3 sec), international normalized ratio (0.95), and activated PTT (23.8 sec) were within normal limits. No cerebrospinal fluid (CSF) examination was performed because the patient did not accept lumbar puncture. Antiepileptic drug treatment was not started because the patient had only one seizure in the acute period and no epileptic seizure was observed in the clinical follow-up. Her seizure was evaluated as an acute symptomatic seizure. Bed rest, intravenous hydration, and dexamethasone were started to treat headaches.

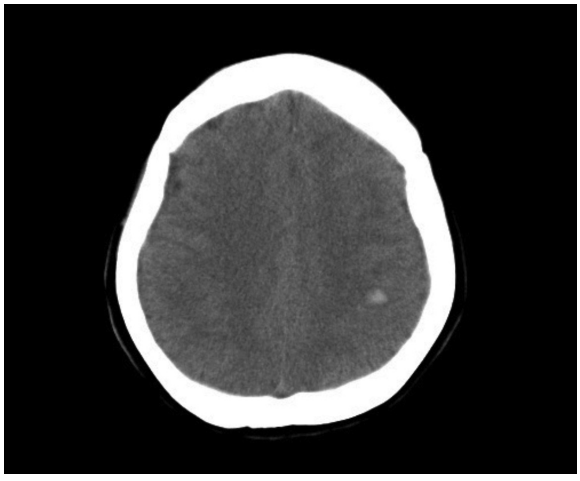

Figure 1. Hematoma image in CT
CT: Computed tomography

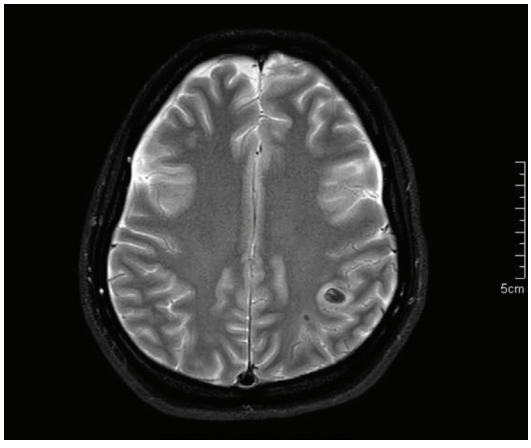

Figure 2. Hematoma image in MRI
MRI: Magnetic resonance imaging

The hematoma was observed to be resorbed in the follow-up brain CT 10 days later (Figure 4) and the last neurologic examination was evaluated within normal limits. Her headache improved completely.

Discussion

The most common complication associated with spinal anesthesia is postural headache. The leakage of CSF through a dural hole leads to a decrease in CSF volume and a decrease in intraspinal and intracranial pressures. This change in CSF dynamics triggers the caudal movement of the spinal cord and brain, which causes traction of the dura, cranial nerves, and bridge veins, resulting in headache and bleeding (7). Cerebral veins are short vascular structures that extend from the brain to the dura matrix. These bridge veins are flat, do not show tortiosity, and do not allow the brain to be displaced. The thinnest part of the bridge veins is in the subdural space and the thickest part is in the subarachnoid part. This means that the bridge veins are more fragile in the subdural space than in the subarachnoid part. In cases of traction and cerebral atrophy, subdural bleeding occurs with this mechanism (8).

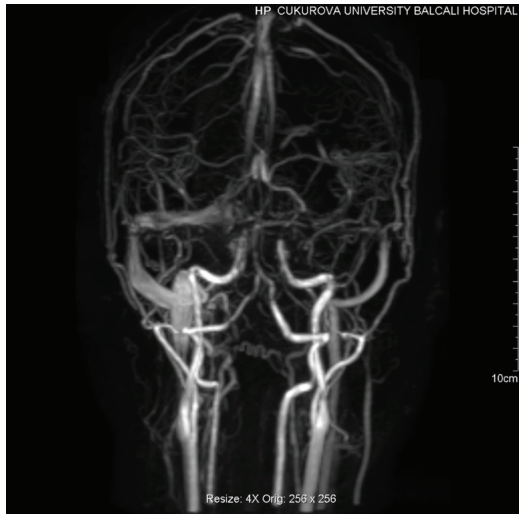

Figure 3. MRI and MR venography
MRI: Magnetic resonance imaging

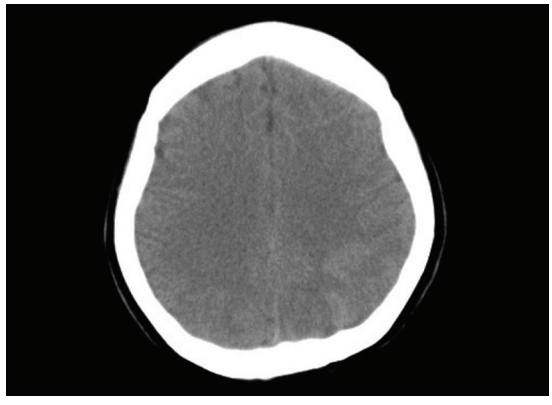

Figure 4. Brain CT taken after hematoma resorbed
CT: Computed tomography

Cerebral atrophy, dehydration, anticoagulant use, arteriovenous malformation and excessive CSF leak are conditions that contribute to the development of subdural hemorrhage (8). Although our patient had an intraparenchymal hemorrhage, there was no history of anticoagulant use and coagulation parameters were within normal limits. No aneurysm or arteriovenous malformation was detected.

In the study conducted by Zeidan et al. (8), it was found that 19 of 21 patients who developed subdural hemorrhage after epidural anesthesia were obstetric patients and it was concluded that pregnant women were at high risk of developing postural headaches. The reasons for this were shown as a decrease in CSF due to peripartum dehydration, postpartum diuresis, the sudden decrease in intraabdominal pressure during delivery, and a decrease in epidural venous pressure due to decrease in compression by vena cava (8). Our patient was also in the postpartum period and presented with a rare intracerebral hemorrhage. In the literature, cases of intracerebral hemorrhage developing after spinal anesthesia have been reported rarely (5,9,10). Patients who developed subdural hemorrhage after spinal anesthesia have been reported in Turkey (11,12).

In the classification of the International Headache Society, the diagnostic criteria of headaches that develop after dural puncture include the appearance of a headache within 5 days after puncture, the presence of CSF pressure below 60 cm H_2O, and/or the demonstration of CSF lake by imaging methods (Table 1) (13). In our patient, headache appeared on the third day after dural puncture. In addition, the characteristics of the headache were compatible with low CSF pressure headache characteristics. A CSF examination could not be performed because the patient did not accept lumbar puncture and no information about CSF pressure was obtained. In neuroimaging findings of intracranial hypotension, cerebral MRI can show pachymeningeal involvement, subdural fluid collection (hematoma), prominence of venous structures, and findings related to congestion, hypophyseal hyperemia, and downward displacement of brain tissue. In spinal MRI, spinal ponding, meningeal diverticula, enlargement of epidural and intradural veins, and dural enhancement can be seen (14).

In treatment, surgical and conservative approaches are used for intracranial hemorrhage. For intracranial hypotension, bed rest, methylxanthine derivatives, corticosteroids, non-steroidal anti-inflammatory drugs, and epidural blood patches are recommended (14).

In conclusion, intracerebral hematoma, which is rarely seen after spinal anesthesia, should be kept in mind as a serious neurologic complication. For this reason, in patients presenting with headache and vomiting after spinal anesthesia, neuroimaging (brain CT, cerebral MRI, cerebral MR venography and MR angiography) should be planned after a neurologic examination. With early diagnosis and treatment, complications that can extend to severe morbidity and mortality can be prevented.

Table 1. Classification of the International Headache Society

7.2. Headache attributed to low cerebrospinal fluid pressure
A. Any headache fulfilling criterion C
B. One or both of the following
- CSF pressure <60 cm H_2O
- Evidence of CSF leakage on imaging
C. Headache has developed in temporal relation to the low CSF pressure or CSF leakage
D. Not better accounted for by another ICHD-3 diagnosis
7.2.1. Post-dural puncture headache
A. Headache due to low CSF pressure that meets the criteria in 7.2 and the criteria in C
B. History of dural puncture
C. Headache has developed within 5 days of the dural puncture
D. Not better accounted for by another ICHD-3 diagnosis

CSF: Cerebrospinal fluid, ICHD: International Classification of Headache Disorders

Ethics

Informed Consent: Written consent was obtained from the patient.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: C.Ç., Concept: C.Ç., M.T.P., H.B., Design: C.Ç., Data Collection or Processing: C.Ç., Analysis or Interpretation: C.Ç., M.T.P., H.B., Literature Search: C.Ç., Writing: C.Ç.

Conflict of Interest: No conflict of interest was declared by the authors.

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