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Simultaneous Cranial Subarachnoid Hemorrhage-Subdural Hematoma and Spinal Subarachnoid Hemorrhage

Eşzamanlı Kraniyal Subaraknoid Kanama-Subdural Hematom ve Spinal Subaraknoid Kanama

Hatice Kaplanoğlu[1], Veysel Kaplanoğlu[2], Aynur Turan[1], Onur Karacif[1]

[1]University of Health Sciences Turkey, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Clinic of Radiology, Ankara, Turkey
[2]University of Health Sciences Turkey, Keçiören Training and Research Hospital, Clinic of Radiology, Ankara, Turkey

ABSTRACT

Patients with traumatic intracranial subarachnoid hemorrhage (SAH) rarely develop spinal subarachnoid hemorrhage (SSAH) without direct spinal injury. We present the case of a 76-year-old male patient with traumatic intracranial SAH and subdural hematoma, back pain and weakness in the both lower limbs radiating to the legs three days after the trauma. After worsening of pain and numbness, the patient underwent a lumbar magnetic resonance imaging 7 days after the trauma, in which blood was seen in the spinal canal in the lumbosacral region. The bleeding was considered SSAH because of the liquid level. The patient underwent conservative treatment because the patient was found to be at high cardiac risk and the neurological deficit was mild. In patients with traumatic intracranial hemorrhage and delayed pain or neurological deficits, SSAH should be suspected in the first period of trauma.

Keywords: Intracranial bleeding, spinal subarachnoid hemorrhage, back pain, magnetic resonance imaging

ÖZ

Çok nadiren, travmatik intrakraniyal subaraknoid hemorojisi (SAH) olan hastalarda, doğrudan omurga yaralanması olmadan spinal subaraknoid kanama (SSAH) ortaya çıkabilir. Travmatik intrakraniyal SAH ve subdural hematomu olan 76 yaşındaki erkek hastada, yoğun bakım takibi sırasında travmadan üç gün sonra bacaklarına yayılan sırt ağrısı ve bilateral alt ekstremitede güçsüzlük ortaya çıktı. Ağrı ve uyuşmanın kötüleşmesi üzerine, travmadan 7 gün sonra hastaya lomber manyetik rezonans görüntüleme yapıldı. Lumbosakral bölgede intraspinal kanama görüldü. Kanamanın sıvı seviyesi göstermesi sebebiyle SSAH olarak değerlendirildi. Hasta kardiyak açıdan yüksek riskli bulunduğu için ve nörolojik defisiti hafif olduğu için konservatif tedavi uygulandı. Travmatik intrakraniyal kanaması olan ve gecikmiş ağrı veya nörolojik defisitleri olan hastalarda, travmanın ilk döneminde, intraspinal kanamadan şüphelenilmelidir.

Anahtar Kelimeler: İntrakraniyal kanama, spinal subaraknoid kanama, sırt ağrısı, manyetik rezonans görüntüleme

Introduction

Spinal subdural hematoma (SDH) and traumatic spinal subarachnoid hemorrhage (SSAH) are rare, and the exact mechanism for their pathogenesis is not clearly understood (1). Spinal SDH is most common in the thoracic and thoracolumbar regions (1). The causes of spinal SDH-SSAH include hemorrhagic disorders, traumas, the transition of subarachnoid hemorrhage (SAH) to the subdural space, vascular malformation, anticoagulation use, spinal surgery, lumbar puncture, or spinal anesthesia (1,2). In addition, spinal tumors, diabetes, chronic kidney failure, and alcoholism have been reported as causes of spinal SDH (1). Traumatic intracranial bleeding can cause spinal bleeding without direct damage to the spine. Traumatic SSAH or spinal SDH is thought to be caused by the migration of intracranial traumatic SAH or SDH without direct spinal injuries (3).

There are a few reported cases with simultaneous cranial SDH-SAH and SSAH (3). In this article, we present a male patient with post-traumatic cranial SAH-SDH and simultaneous spinal SAH.

Case Report

A 76-year-old man is rushed to the emergency room for a head trauma, with a history of hypertension, diabetes, and coronary artery bypass surgery 20 years ago. The physical and clinical examinations revealed a temperature of 37.5 °C, pulse rate of 110 beats/min, blood pressure of 125/80 mmHg, respiratory rate of 19 breaths/min, and oxygen saturation

Address for Correspondence/Yazışma Adresi: Hatice Kaplanoğlu MD, University of Health Sciences Turkey, Dışkapı Yıldırım Beyazıt Training and Research Hospital, Clinic of Radiology, Ankara, Turkey
Phone: +90 505 892 30 61 **E-mail:** hatice.altnkaynak@yahoo.com.tr **ORCID ID:** orcid.org/0000-0003-1874-8167

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of 96% at room air. On neurological examination, the general condition was medium, he was cooperative and orientated, was dysarthric, had a good comprehension, and a GCS of 15. His pupils were isochoric, and his eyes were free in all directions. He had no facial asymmetry, upper and lower extremity examination was unremarkable, he presented no motor and sensory loss, and the cerebellar tests were unremarkable. He was on aspirin but did not take anticoagulants. A brain computed tomography (CT) was performed to assess the patient's impaired consciousness; SAH was observed in both hemispheric cortical sulci, basal cystern, bilateral silvian and interhemispheric fissures (Figure 1). We found a 12 mm thick SDH in the left temporoparietal region (Figure 2). The patient was hospitalized in neurosurgery intensive care unit. No aneurysm was detected on cranial CT angiography. Three days after the trauma, he developed back pain radiating to his legs and weakness in the bilateral lower extremities. A lumbar magnetic resonance imaging (MRI) was performed on day 7 after the trauma to investigate the increased pain and numbness. On lumbar MRI, the L5-S2 vertebra corpus projections were leveled in the subarachnoid area, with mild hyperintensity on T1AG and mild hypointensity on T2AG, and a 50x10 mm SAH was detected (Figure 3). We proposed a conservative treatment instead of surgery due to his heart disease, signs of infection, and the mild neurological deficit. After one month of follow-up, the patient was discharged with no neurological deficit and a good mobilization and oral intake. We obtained an informed consent from the patient.

Discussion

Spinal SDH-SSAH usually occurs due to trauma, coagulopathy, vascular malformation, spinal puncture, lumbar instrumentation, and other invasive procedures, or may occur spontaneously (4). SSDH may occur in patients with traumatic intracranial SDH (3), and is most common in the thoracic region. It manifests as a sudden back pain radiating to the upper or lower extremities or trunk, and can cause motor dysfunction, sensory deficiency, and autonomic dysreflexes (5). It commonmy occurs in adults over 50 years old (1).

The spinal subdural space is avascular and a hemorrhage is thought to be from the subarachnoid region (1). This is supported by the presence of accompanying SAH in several cases with spinal SDH. When the arachnoid membrane is torn, bleeding from the subarachnoid space extends into the subdural space (5). If there is a rupture in the arachnoid, intracranial SDH leaks from the subarachnoid space to the arachnoid, this facilitates spontaneous resolution and migration of the SDH (3). Also, a raised intracranial pressure due to the intracranial SDH can push the hematoma directly into the skull base or spinal canal through the subdural space (1).

The spinal subdural space is void of large blood vessels or bridging veins that serve as a source for SDH (6). The simultaneous occurrence of cranial SAH and spinal SDH in different regions is extremely rare. The cranial SAH can extend to the spinal SAH and then through the arachnoid membrane to extend to the spinal subdural space. The opposite form, which moves from the spinal to the cranial region, can also be seen (6). In addition, the large amount of SAH extending from the cranium to the spinal area can compress the spinal cord or cause laceration in the arachnoid membrane, causing SSDH (1).

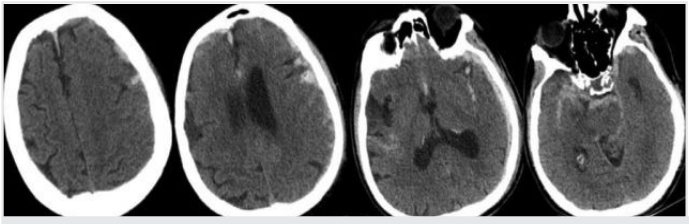

Figure 1. SAH is observed in bilateral hemispheric cortical sulcus, basal cystern, and bilateral silvian fissure and interhemispheric fissure

SAH: Subarachnoid hemorrhage

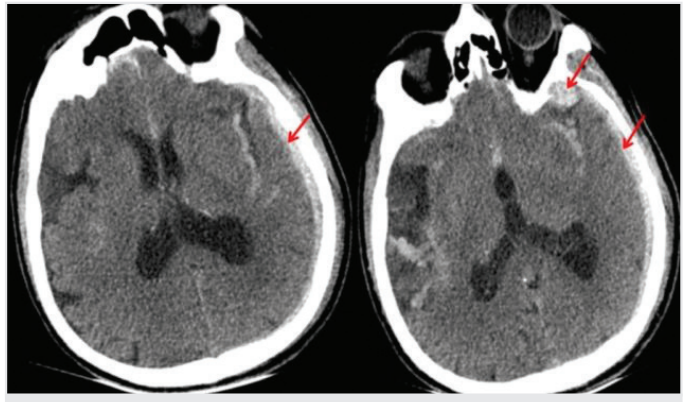

Figure 2. SDH is observed in the left temporoparietal (red arrow)

SDH: Subdural hematoma

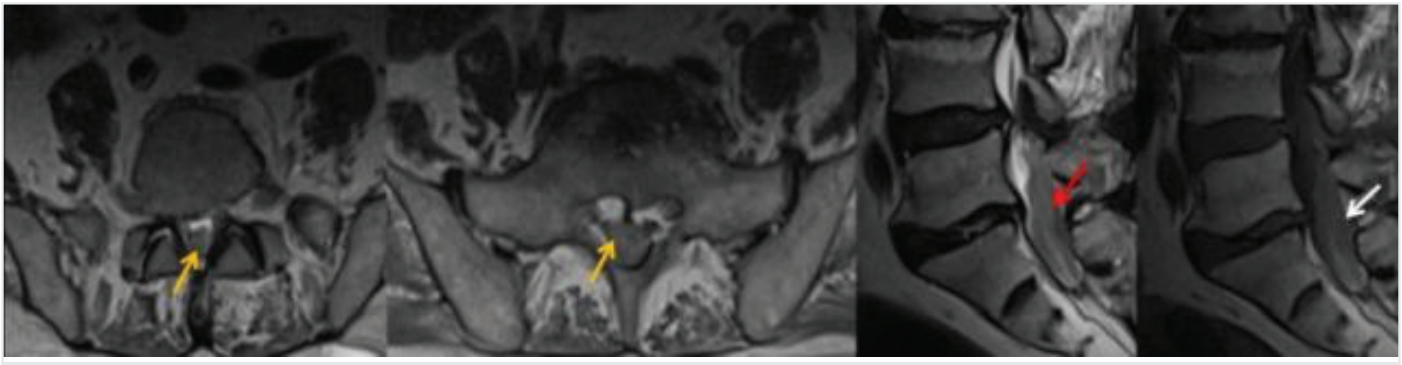

Figure 3. L5-S2 vertebral corpus projections at the level of the subarachnoid, mild hypointensities in T2AG on axial (yellow arrow) and sagittal (red) views, mild hyperintensities on the sagittal T1AG (white arrow), and SAH is observed

SAH: Subarachnoid hemorrhage

The anterior and posterior spinal cisternes are lined to the posterior cranial fossa cystern via the foramen magnum. Therefore, blood can pass from the intracranial subarachnoid to the spinal subarachnoid. This migration occurs most likely with large SAHs or after the patient's early uprising (7). The authors argued that blood in the intracranial subarachnoid space may migrate to the subarachnoid space in the most caudal part of the spinal canal (8). In this article, SSAH was detected in the lumbosacral region on a lumbar MRI done seven days later in the patient with traumatic intracranial SDH and SAH.

SSAH is located intradural extramedullary. It extends across multiple vertebral corpus levels and can also be seen as a focal clot. The hematoma typically shows the liquid-fluid level at the bottom of the dural sac or other dependant parts (thoracic vertebra in the supine position). However, a hematoma is located in the ventral spinal cord/cauda equina (9). SDHs are crescentric in shape, they do not show liquid-liquid leveling, and the dura dark signals separate this collection from the epidural adipose tissue. Spinal SDH and SAH can occur simultaneously (9).

Emergency decompressive surgery is the first treatment option for spinal SDH-SAH in patients with worsening neurological conditions. Conservative treatment is a good option for patients with minimal neurological disorders (3), which has been be proven to have a good clinical outcome (6). Syringomyelia SSAH and arachnoid cysts associated with arachnoiditis are rare complications (10).

Patients with traumatic brain injury may present with delayed spinal bleeding. Patients presenting with traumatic intracranial SAH or SDH with delayed pain or neurological deficits should be evaluated immediately for spinal SAH or SDH in the first period of trauma, even in the absence of symptoms of direct spinal injury or spinal injury.

Ethics

Informed Consent: Written informed consent was obtained from patient.

Peer-review: Externally peer-reviewed.

Authorship Contributions: Surgical and Medical Practices - H.K., V.K.; Concept - A.T.; Design - H.K., O.K.; Data Collection or Processing - H.K., V.K., O.K.; Analysis or Interpretation - H.K., V.K.; Literature Search - H.K., A.T.; Writing - H.K., O.K.

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