

## Bilateral Subdural Hematoma Following Spinal Anesthesia for Cesarean Delivery: A Rare Complication of Post-Dural Puncture Headache

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<p><b>Abstract:</b> Spinal anesthesia is a widely used and preferred technique for cesarean delivery due to its safety and effectiveness, though complications like post-dural puncture headache (PDPH) are well-documented, with progression to bilateral subdural hematoma (SDH) being exceedingly rare. This report describes a 34-year-old woman with no prior medical history who underwent elective cesarean delivery under spinal anesthesia and developed a positional headache two days postoperatively, which later became constant and was accompanied by right hemiparesis and visual disturbances. Brain imaging confirmed bilateral SDH, and the patient was managed conservatively with analgesics, corticosteroids, and supportive care, achieving full functional recovery with no significant neurological deficits at three months. This case highlights the importance of early recognition of neurological symptoms and prompt imaging in patients with persistent or worsening postoperative headaches, emphasizing the need for clinicians to consider SDH as a potential complication of PDPH.</p> <p><b>Keywords:</b> Subdural hematoma, spinal anesthesia, cesarean section, neurological complications, case report.</p> <p><b>Copyright © 2024 The Author(s):</b> This is an open-access article distributed under the terms of the Creative Commons Attribution <b>4.0 International License (CC BY-NC 4.0)</b> which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.</p>	<p style="text-align: center;"><b>Case Report</b></p>
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### INTRODUCTION

Spinal anesthesia is widely used for cesarean delivery due to its safety, reliability, and ability to minimize systemic drug exposure to the fetus. Despite its benefits, complications can occur, including post-dural puncture headache (PDPH), which affects approximately 1–3% of cases, depending on needle type and size [1, 2]. PDPH arises due to cerebrospinal fluid (CSF) leakage, leading to intracranial hypotension, venous engorgement, and positional headaches.

In rare cases, PDPH progresses to subdural hematoma (SDH), caused by traction and rupture of bridging veins due to intracranial pressure changes [3, 4]. While unilateral SDH is more frequently reported, bilateral SDH remains exceptionally uncommon, especially in obstetric populations. Risk factors may include multiple dural punctures, large-gauge needles, and prolonged hypotension. Early diagnosis is challenging, as SDH symptoms can mimic benign PDPH, delaying appropriate intervention.

This case report describes a rare presentation of bilateral SDH following spinal anesthesia for elective cesarean section. The report highlights the importance of prompt neuroimaging and a multidisciplinary approach to management in such cases.

### CASE REPORT

A 34-year-old gravida 2, para 2 woman with no history of medical, neurological, or coagulation disorders underwent elective cesarean delivery under spinal anesthesia using a single midline puncture with a 25-gauge Quincke needle. A dose of 12 mg of 0.5% hyperbaric bupivacaine was administered, and the procedure proceeded uneventfully.

#### Postoperative Course:

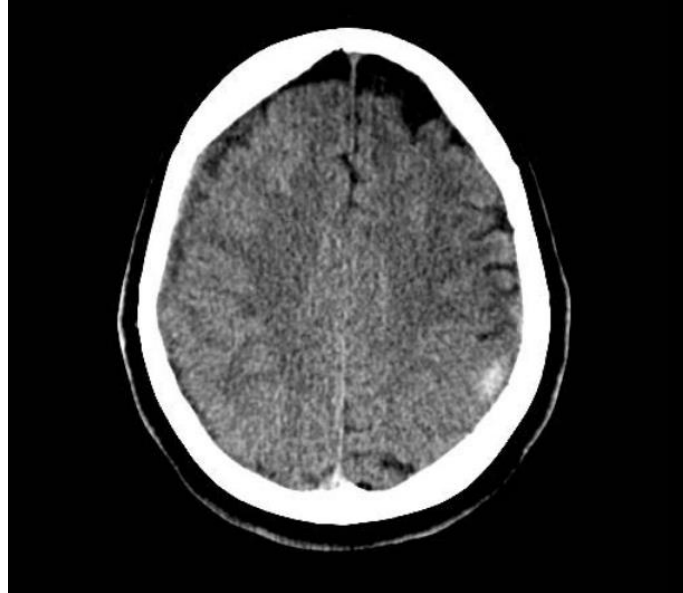
**Day 2:** The patient developed a severe, positional headache that was relieved when lying flat but worsened with sitting or standing.

**Day 8:** The headache became constant, and the patient reported blurred vision and weakness in the right upper and lower limbs. Neurological examination revealed

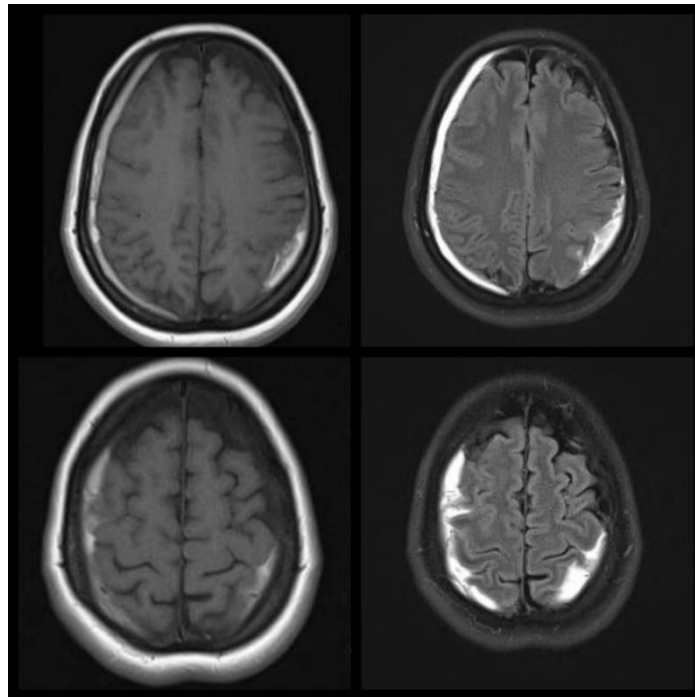
reduced motor strength (4/5) on the right side and papilledema in the right eye.

**Day 11:** The patient presented to the hospital with persistent headache, hemiparesis, and visual symptoms.

**Brain Imaging:** A non-contrast brain CT revealed bilateral subdural hematomas measuring 7 mm on the right and 5 mm on the left (Figure 1). MRI confirmed hyperintense signals on T1 and T2-weighted sequences, consistent with late subacute SDH (Figure 2). Brain MRV was normal, ruling out venous thrombosis.



**Figure 1: Brain CT Scan**



**Figure 2: Brain MRI: T1 and T2**

**Management:**

The patient was admitted and managed conservatively: Intravenous dexamethasone (4 mg TID) and oral caffeine to address intracranial hypotension.

Acetaminophen (1 g TID) for headache relief.

Prophylactic levetiracetam (500 mg BID) to prevent seizures.

Adequate hydration and bed rest were encouraged.

**Outcome:**

The patient's headache improved significantly within 48 hours of treatment. Follow-up brain CT performed on day six showed a reduction in hematoma size. At discharge, the patient exhibited near-complete

recovery, with motor strength returning to baseline. At the three-month follow-up, she had no residual deficits (modified Rankin Scale = 1).

## DISCUSSION

The presented case outlines a rare but significant complication following cesarean section, SDH associated with post-dural puncture headache (PDPH) and intracranial hypotension. Although uncommon, this complication warrants attention due to its potential for severe neurological deficits if not promptly recognized and managed appropriately [4].

The development of PDPH, characterized by a positional headache exacerbated by sitting or standing, is a well-documented complication following spinal anesthesia [5]. As observed in this case, the progression to SDH is exceedingly rare. The underlying mechanism linking PDPH to SDH remains speculative. Still, it may involve changes in intracranial pressure dynamics, leading to venous engorgement, tearing of bridging veins, and subsequent bleeding within the subdural space [6].

Management of this condition involved a multifaceted approach to address the underlying cause and symptomatic relief. Medical support care, prophylactic anti-epileptic therapy, and analgesic medication were administered to alleviate symptoms and prevent further neurological compromise [3]. Caffeine and dexamethasone were also utilized to counteract suspected intracranial hypotension, although the definitive etiology remains speculative [5]. The favorable outcome observed in this case, with resolution of symptoms and minimal residual deficits at follow-up, underscores the importance of early recognition and intervention. Nonetheless, the rarity of this complication highlights the need for heightened vigilance among healthcare providers, particularly in the postoperative management of patients undergoing spinal anesthesia for cesarean delivery.

## CONCLUSION

Bilateral subdural hematoma, while rare, is a critical differential diagnosis in patients presenting with persistent or worsening headaches after spinal anesthesia. Early diagnosis and multidisciplinary management are essential to minimize long-term neurological deficits.

## Compliance with Ethical Guidelines

Written informed consent was obtained from the patient and ethical approval was obtained from the Ethics Committee of Kermanshah University of Medical Sciences (IR.KUMS.REC.1403.470).

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