CASE REPORT

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Delayed Onset of Intracranial Subdural Hematoma Following Spinal Anesthesia for Cesarean Section

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ABSTRACT In obstetric patients undergoing spinal anesthesia, intracranial subdural hematoma is a rare yet serious complication. This report highlights a case of acute subdural hematoma occurring 14 days after spinal anesthesia for cesarean section. Initially, the condition mimicked a post-dural puncture headache but gradually worsened. The patient experienced a seizure, prompting urgent cranial computerised tomography imaging, which revealed a subdural hematoma. An emergency craniotomy was performed to evacuate the hematoma. Neurological symptoms necessitated thorough investigation for intracranial pathologies. Fortunately, the patient recovered fully without sequelae. This case emphasizes the importance of vigilance for intracranial hematoma in clinical practice following spinal anesthesia.

Keywords: Subdural hematoma; cesarean section; spinal anesthesia

Spinal anesthesia is a commonly utilized technique, particularly in obstetric procedures. Despite its numerous benefits, it carries the risk of various complications. Post-dural puncture headache (PDPH) stands as the predominant complication associated with spinal anesthesia.[1] This headache typically manifests as positional and mild in intensity, often resolving promptly with conservative measures such as supine rest, hydration, and analgesics.[2] However, persistence of symptoms despite these interventions or any alteration in their character may herald the onset of a more severe intracranial pathology. In addition to PDPH, other causes of headache in the postpartum period include migraines, tension headaches, preeclampsia, intracranial hemorrhage, and cerebral vein trombosis.

Subdural hematoma represents a rare yet critical complication following spinal anesthesia, with approximately 50 documented cases in the medical literature. Notably, PDPH may serve as an initial indicator of this life-threatening condition.[3] Thus, clinicians must maintain vigilance for any neurological symptoms suggestive of intracranial pathology.

Here, we present a case of subdural hematoma occurring 14 days post-spinal anesthesia administered prior to cesarean section.

CASE REPORT

A 32-year-old primigravida with a singleton pregnancy presented to our clinic at 6 weeks of gestation for her initial assessment. She had no history of smoking, alcohol consumption, or any significant medical conditions or drug usage. Preconception evaluations, screening tests, and ultrasound scans all yielded normal results, with an uneventful first trimester of pregnancy.

At 22 weeks of gestation, the patient returned to our clinic reporting pelvic pain. Ultrasound exami-

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nation revealed funneling and cervical dilatation, prompting the performance of an emergency transvaginal cervical cerclage without complications. Following a two-day hospitalization, she was discharged and subsequently attended weekly follow-up appointments until 36 weeks of gestation.

During her pregnancy, the patient received oral indomethacin (4*25 mg) until 32 weeks, thereafter transitioning to oral nifedipine (4*10 mg), alongside vaginal progesterone (2*200 mg) until 34 weeks. There was no administration of anticoagulant or antiplatelet therapy throughout her pregnancy. The patient experienced a weight gain of 12 kilograms, and routine blood tests, including complete blood count, liver and kidney function tests, thyroid hormone levels, and coagulation parameters, remained within normal limits throughout the follow-up period, with the most recent tests performed at 36 weeks of gestation.

At 36+6 weeks of gestation, the patient presented with membrane rupture, leading to the removal of the cervical cerclage. Despite the absence of medication to induce labor, a cesarean section was performed 8 hours later due to acute fetal distress. The procedure, conducted under spinal anesthesia using a 25-gauge Sprotte needle and bupivacaine, proceeded uneventfully following the infusion of 1,000 mL of crystalloid solution (ringer lactate). Vital signs remained stable throughout the cesarean section, culminating in the delivery of a healthy baby girl (3,500 g, Apgar score 8-9).

The patient experienced an uncomplicated recovery and was discharged on the second day postoperation with oral cefuroxime (2x500 mg), paracetamol (4x500 mg), and enoxaparin sodium (4,000 intrauterin for 10 days). She did not report any headaches upon discharge.

On the fourth postoperative day, the patient returned for a routine follow-up appointment, reporting a new-onset, mild headache exacerbated by head movements but unaccompanied by nausea. There were no signs indicative of preeclampsia or neurological deficits, and no history of head trauma or accidents. Given the clinical presentation, a diagnosis of PDPH secondary to spinal anesthesia was considered. The patient was advised to rest in a supine position, increase oral fluid intake, and consume caffeinated beverages alongside oral analgesics.

Fourteen days post-surgery, the patient experienced a seizure at home, prompting transportation to a tertiary hospital via ambulance. According to her husband, the headache localized to the right side of her head, extending to the back of her right eye, and became intolerable before the onset of the seizure. Upon arrival at the hospital, the patient was unconscious and in a postictal state, with elevated blood pressure (170/110 mmHg) but otherwise stable vital signs.

Emergency cranial computed tomography imaging revealed an acute subdural hematoma measuring 19 mm in thickness on the right hemisphere's convexity, accompanied by a 10 mm midline shift, with no evidence of tonsillar herniation (Figure 1).

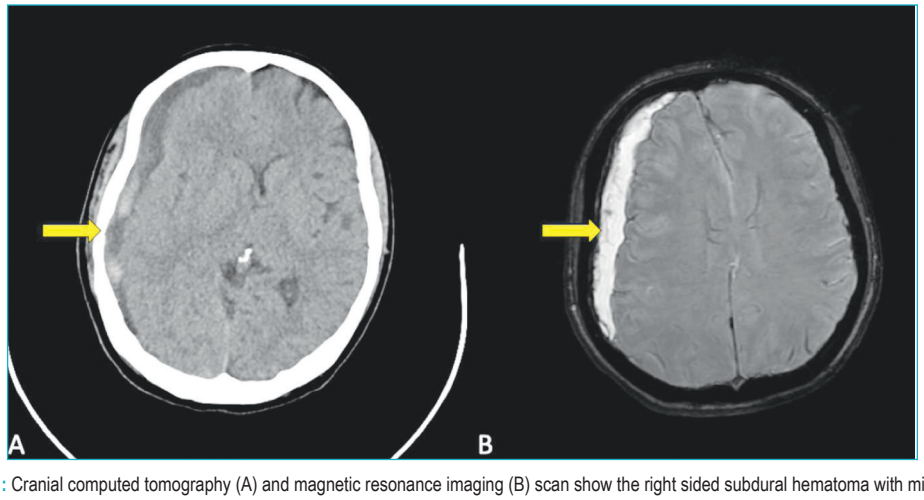

FIGURE 1: Cranial computed tomography (A) and magnetic resonance imaging (B) scan show the right sided subdural hematoma with midline shift.

The patient was promptly admitted to the intensive care unit and underwent emergency hemicraniectomy for hematoma evacuation. Following surgery, she experienced an uneventful recovery and was discharged two days later. Subsequent follow-up examinations at three months revealed no neurological deficits.

A written consent was obtained from the patient.

DISCUSSION

Here, we present a case detailing the occurrence of a subdural hematoma in a young, otherwise healthy woman, which manifested two weeks subsequent to spinal anesthesia administered prior to cesarean section. Through this case, we aim to underscore the significance of recognizing neurological complications associated with spinal anesthesia. Maintaining a high index of suspicion for potential symptoms and promptly conducting imaging studies can be paramount in saving lives.

Spinal anesthesia is a prevalent modality in obstetric procedures, offering numerous advantages such as mitigating the risks associated with general anesthesia for both mother and fetus. However, it is not without its complications, which may include headache, hypotension, hemorrhage, infection, neurological injury, and intracranial hematoma.[2]

While subdural hematoma remains an uncommon sequela of spinal anesthesia, it carries significant potential morbidity and mortality, occurring in approximately 1 in 500,000 obstetric patients undergoing spinal anesthesia for surgery.[3] The precise etiology and pathophysiological mechanisms underlying subdural hematoma remain elusive, though predisposing factors may include pregnancy, dehydration, utilization of large-gauge needles or multiple punctures, hematological disorders or coagulopathies, alcohol consumption, and intracranial anomalies.[3-5] Nevertheless, a significant proportion of cases present without identifiable risk factors.

Clinical manifestations of subdural hematoma may encompass persistent non-postural headache, vomiting, alterations in consciousness, or other neurological deficits.[4,5] Persistent headache subsequent to spinal anesthesia should prompt consideration of subdural hematoma, particularly if there is a change in headache characteristics, which may signify early intracranial pathology.[6]

Furthermore, in considering the differential diagnosis, cerebral vein thrombosis should also be considered, particularly in the postpartum period where hypercoagulability is heightened. This condition presents with headaches, seizures, and focal neurological deficits, which may overlap with the clinical presentation of subdural hematoma. Imaging modalities such as magnetic resonance imaging with venography can aid in distinguishing between subdural hematoma and cerebral vein thrombosis. Therefore, clinicians should remain vigilant and consider multiple differential diagnoses when evaluating patients presenting with post-spinal anesthesia headaches and neurological symptoms.[7]

Case reports suggest that subdural hematomas typically manifest 2-4 weeks post-spinal anesthesia, although acute presentations within the initial 2 days have been documented.[1] Acute hematomas often manifest abruptly with non-postural headache and additional neurological symptoms, such as disorientation or visual disturbances. Conversely, subacute or chronic hematomas may present days or weeks following anesthesia. Initial symptoms may resemble postural headaches, suggestive of orthostatic hypotension, which initially respond to conservative measures.[4] However, over time, headaches may intensify, becoming refractory to analgesia or accompanied by neurological deficits.

In the present case, the atypical headache pattern initially did not raise suspicion for intracranial pathology. The emergence of a seizure with concomitant hypertension 2 weeks post-anesthesia underscored the urgency of further evaluation. Absent timely intracranial imaging, misinterpretation as eclampsia could have occurred. This case underscores the criticality of promptly investigating post-spinal headache through intracranial imaging to avert life-threatening sequelae.

In conclusion, although subdural hematoma remains a rare complication, maintaining awareness of its possibility is imperative. In cases where patients

present with suspicious PDPHs, immediate investigation via intracranial imaging can be life-preserving.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

This study is entirely author's own work and no other author contribution.

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