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## CASE REPORT

### Intracranial rebleeding post spinal anesthesia in pregnant patient with undiagnosed chronic subdural hematoma: case report



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**Abstract** Intracranial hematoma after spinal anesthesia is a rare complication. It generally presents with posture-dependent headache that becomes persistent. We describe the case of patient submitted to spinal anesthesia for cesarean section who presented a non-posture-dependent headache, resistant to clinical treatment, that progressively worsened and with symptoms of intracranial hypertension. The patient had a history of head trauma without symptoms. The CT-scan revealed a chronic bilateral parietal hematoma with a recent bleeding component, treated surgically. We concluded that spinal puncture led to chronic hematoma to rebleed. We have reported the case to draw attention to the importance of investigating atypical headache after spinal anesthesia. © 2021 Published by Elsevier Editora Ltda. on behalf of Sociedade Brasileira de Anestesiologia. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

#### Introduction

Spinal anesthesia is probably the most used anesthetic technique for cesarean delivery due to its efficacy and safety. Moreover, spinal anesthesia is a better choice compared to general anesthesia for emergency cesarean delivery. It has a

very low rate of postoperative complications; amongst them headache is the most common. Headache diagnosis is based on its clinical manifestations. It typically starts in the first 24 to 48 hours after dural puncture, is posture-dependent and self-limited, and without treatment it resolves within five days. Manifestation changes, especially absence of posture correlation and longer duration, elicits the suspicion of other diagnoses, such as subdural hematoma.<sup>1,2</sup> Considering that few cases are reported in the literature and

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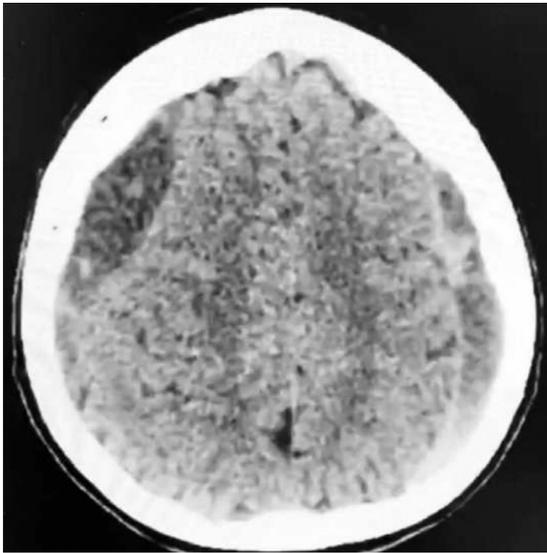
the potentially fatal progress of this neurological complication, signs suggesting the presence of intracranial hematoma need to be promptly recognized and appropriate treatment instituted. We aim to report the case of an obstetric patient presenting an undiagnosed chronic bilateral subdural hematoma, who presented chronic hematoma rebleeding after spinal anesthesia for cesarean delivery, and therefore draw attention to the need of thoroughly evaluating patients showing atypical postdural puncture headache. The patient consented to the publication of the case report.

## Case report

A 36-year-old patient diagnosed with bilateral parietal subdural hematoma was scheduled for urgent subdural hematoma evacuation. Forty-five days before, she had been submitted to elective cesarean delivery under spinal anesthesia. With the patient in left lateral position the spinal anesthesia technique had been performed after a single puncture using a 27G cutting bevel spinal needle. The local anesthetic used was 0.5% bupivacaine (12.5 mg) combined with glucose and morphine sulfate (100 µg). No complications were reported. However, soon after the end of the surgery, the patient complained of headache and was medicated with dipyrone, which was maintained postoperatively. She was discharged from the hospital complaining of non-postural, occipital headache with progressive worsening. Pain intensity was six out of ten on the numerical pain scale when lying down, and nine when standing upright. As her condition persisted and worsened, the patient sought care at the emergency room twice and received symptomatic medication, such as dipyrone and tramadol, without obtaining satisfactory relief from the symptoms. Within 45 days after delivery, she progressively developed severe headache, resistant to common analgesics, associated with dizziness, nausea, paresthesia in the left hemiface and upper limb, horizontal diplopia, and high blood pressure. She sought care from a neurosurgeon who ordered a cranial Computed Tomography (CT) scan. It revealed the presence of bilateral frontoparietal subdural collections, compatible with chronic hematomas, and areas of recent bleeding (Fig. 1). Urgent hematoma evacuation was indicated. On admission to the operating room, her blood pressure was 170/100 mmHg and heart rate 62 beats per minute, and she underwent total intravenous general anesthesia with target-controlled infusion of propofol and remifentanyl. The surgery confirmed the recent rebleeding of a chronic hematoma suggested by the CT scan imaging. The procedure was uneventful, and she was discharged the next day and had full recovery, without sequelae. Cranial CT and cranial arterial CT angiography were performed 45 days later, with normal results. As background, the patient reported head trauma that occurred one year and five months before the cesarean delivery. A pack of juice boxes had fallen on her head at work. She presented dizziness and a subgaleal hematoma. She was evaluated at an emergency unit and submitted to a cranial CT scan that showed no abnormalities. She progressed asymptomatic and returned to her activities. She reported no complications during her pregnancy, only a few episodes of low-intensity and sporadic headaches. Routine tests performed during this period were normal.

## Discussion

The present case underlines two important clinical issues: the presence of chronic bilateral subdural hematoma that was not diagnosed because it progressed without symptoms and the difficulty to classify the patient's headache as postdural puncture headache due to its atypical clinical manifestation. Intracranial bleeding is a rare and potentially fatal complication after spinal anesthesia or inadvertent dural tap in epidural anesthesia. Postdural puncture headache usually presents as an early headache resulting from CSF loss and consequent caudal displacement of the brain, pulling pain sensitive structures. These same forces can stretch and rupture dural bridging veins, dural sinus walls or small cerebral cortical veins, with consequent hemorrhage and subdural hematoma development.<sup>1,2</sup> Intracranial hematomas are very common after severe trauma, but they can also occur following an unnoticed minor trauma, especially in elderly patients, who present intracranial space widening due to physiological atrophy of the brain. Non-traumatic causes are less common, such as ruptured aneurysms or cortical arteries, hypertensive cerebral hemorrhage, arteriovenous malformations, coagulopathies, use of anticoagulant or illicit drugs, and hypertensive disease during pregnancy. Moreover, pregnant patients present hormonal-induced physiological changes that modify coagulation and the structure of circulation, increasing the risk of ischemia and bleeding even more.<sup>3</sup> In the case here reported, the patient did not show coagulation disorders nor was taking anti-coagulant medications. There was also no report of high blood pressure during pregnancy that could lead to cranial bleeding, and the cesarean delivery went uneventful. After recovery from neurosurgery, tests did not identify possible preexisting vascular anomalies. The patient probably already had an undiagnosed chronic subdural post-trauma hematoma, which, despite asymptomatic for several months, rebled after spinal anesthesia. The incidence of intracranial subdural hematoma following lumbar puncture is estimated from 1:500,000 to 1,000,000.<sup>1</sup> However, according to other authors,<sup>4</sup> the actual incidence of subdural hematoma is unknown, and it may be higher than what is suggested by the few reported cases. Nonetheless, the rebleeding of a chronic subdural hematoma after spinal anesthesia is a very rare condition.<sup>4</sup> Postdural puncture headache has a very well-defined set of clinical features. The headache of the patient reported here was atypical, without a postural component, had a very early onset, and was persistent and unresponsive to analgesic therapy. Obstetric patients often complain of postpartum headache.<sup>3</sup> The most common types are tension headache and migraine. Most of the cases are treated without investigation, which can make etiology identification challenging, as in the case we described. Reviewing the literature, Amorim et al.<sup>2</sup> reported 33 cases of intracranial subdural hematoma after spinal anesthesia. The time elapsed between spinal anesthesia and onset of symptoms ranged from four hours to 29 weeks. Headache, present in 74.3% of cases, was the main symptom. Other findings were altered state of consciousness, vomiting, hemiplegia or hemiparesis, diplopia or paresis of the VI cranial nerve, and speech disorder. The authors listed as contributing factors pregnancy, multiple punctures, use of anticoagulants, intracranial vascular



**Figure 1** Heterogeneous bilateral frontoparietal subdural collections, with a higher attenuation component, compatible with chronic hematomas and areas of recent bleeding. They promote a compressive effect, erasing the cortical folds of the area.

abnormalities, and cerebral atrophy. No factors were reported for 15 cases. In the present case, in addition to headache, the patient also showed intracranial hypertension symptoms, such as dizziness, nausea, paresthesia and visual complaints. During the development of a chronic subdural hematoma, three periods can be distinguished.<sup>5</sup> The first corresponds to the trauma event that can be single or multiple, with or without clinical symptoms, leading to hematoma formation, and is the starting point for chronic hematoma development. The second period follows, and it is a latency phase when the hematoma develops and slowly grows in volume. The blood clot becomes liquefied by fibrinolytic activity and a membrane develops on both dura and arachnoid surfaces, facilitating hematoma encapsulation and the occurrence of micro-hemorrhages due to fragility of newly formed vessels. During this period, patients can remain asymptomatic for weeks to years. Clinical manifestations occur during the final period, when there is progressive decompensation of the intracranial capacity due to the continuous growth of the hematoma capsule. Since it takes considerable time for the capsule to form, in the patient reported here the hematoma could have evolved after the reported trauma, and then became chronic and asymptomatic. The CT imaging before intracranial hematoma

evacuation showed signs of a chronic hematoma nature and a recent bleeding (Fig. 1). The present case shows that spinal anesthesia, which can be associated with the occurrence of subdural hematoma, can also make an undiagnosed chronic subdural hematoma rebleed. It is very likely that the CSF leakage due to the dural puncture decreased intracranial pressure and led the capsule of the existing hematoma to rebleed. This occurs because of the tight adhesion existing between the hematoma capsule and the dura mater, resulting in herniation syndrome.

## Conclusion

A spinal anesthesia puncture triggered the rebleeding of a chronic hematoma and caused an atypical post-cesarian headache. Anesthesiologists and ER physicians should consider the presence of subdural hematoma in patients with persistent postdural puncture headache. Early diagnosis and treatment of potential intracranial complications can be attained with the comprehensive assessment of these patients.

## Informed consent

Written informed consent was obtained from the patient for the publication of this report.

## Conflicts of interest

The authors declare no conflicts of interest.

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