The Headache after Spinal Anesthesia is Not Always Innocent!

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**Abstract**

Post-dural puncture headaches are the main complications developed after spinal anesthesia. Post-dural puncture headache (PDPH); long duration of pain, the disappearance of postural character and lack of relief by conservative treatment should suggest other causes such as intracranial subdural hematoma. We present a 26-year-old patient who underwent spinal anesthesia due to pilonidal sinus and developed subdural hemorrhage.

**Keywords:** Post-Dural Puncture Headache; Spinal Anesthesia; Subdural Hematoma

**Introduction**

Spinal anesthesia is a regional anesthesia technique characterized by rapid onset and a definite performance endpoint, easy application, high success rates, low cost, minimal side effects, and complications. Spinal anesthesia is advantageous for the lower extremity, perineal, urological, vascular, abdominal and gynecological procedures [1]. Post-dural puncture headache (PDPH) is a benign condition and a common complication of spinal anesthesia [2,3]. This type of headache is usually posture-dependent and accompanied by nausea, vomiting, dizziness, and sometimes headaches may be accompanied by pain in the extremities, hearing loss, paresthesia in the scalp, and paralysis in the cranial nerves (oculomotor nerve paralysis). The pain is usually mild. The pain regresses with bed rest, hydration, analgesics, and caffeine in most cases within 48 hours [4]. Rarely, PDPH may take a long time as a symptom due to intracerebral hemorrhage or intracranial subdural hemorrhage [3]. We present a young patient who underwent spinal anesthesia for pilonidal sinus surgery and developed an intracranial subdural hematoma.

**Case Report**

A 26-year-old male patient was admitted to our emergency department with a headache that started four days ago and was getting intense. On physical examination, the following information was obtained: TA: 130/80 mm/Hg, fever: 37°C, conscious, oriented, and cooperative. GCS: 15, normal neurological examination, no neck stiffness, pupils were isochoric, and other system examinations were normal. In the case history; he had no known chronic disease. When the history was investigated, it was learned that the patient was diagnosed with pilonidal sinus four days ago in the general surgery service and was operated with spinal anesthesia. The patient was
discharged from the hospital one day after the operation upon no further complications. The patient who had a headache on the second postoperative day had been advised to hydrate and take analgesic after spinal anesthesia. He did not respond to these treatments, and the headache gradually increased resulting in him applying to our emergency department. No pathological findings were found in laboratory tests (CBC, hemorrhage profile). Intravenous 25 mg dexketoprofen and 500cc saline were administered. However, brain computed tomography (BCT) was planned as the patient stated that there was no decrease in the severity of the pain. In BCT scan; subdural hemorrhage of 4 mm was observed at the deepest part at the extra-axial distance of the right cerebral hemispheres, and the hypersensitivity of the tentorium cerebelli level was observed and the suspicion of subarachnoid hemorrhage was found (Figure 1). The patient was admitted to the hospital with a consultation with the Brain and Nerve Surgery. He was treated conservatively with analgesic and intravenous fluid supplementation. One week later, he had been discharged due to normal BCT and physical examination.

**Figure 1: Subdural hemorrhage in cranial CT**

**Discussion**

Serious complications after spinal and epidural anesthesia are seen in less than 0.05% of the procedures. In a case series study of 1.5 million patients, hemorrhagic complications were more frequent after epidural anesthesia (1: 150,000) than spinal anesthesia (1: 220,000) [5]. In a comprehensive study conducted in Switzerland in 2004; it is stated that neurological complications developed in 127 cases after central neuroaxial block, and the risk ratio was evaluated as 1/20,000-30,000, and in 2 of these 127 cases, subdural hematoma due to spinal block was reported [6].

Spinal anesthesia is the most widely used technique among regional anesthesia techniques and this increases its importance. During the spinal anesthesia, the patient consciousness important because of its ability to regulate pulmonary functions and decrease of peripheral venous return and decrease intra-operative bleeding. The rapid onset and outcome control of anesthesia, good side effects and minimum complications, ease of administration, low costs, and high patient satisfaction are the other important advantages [4,7].

However, there is a risk of spinal anesthesia-induced hypo-tension, insufficient time of anesthesia, and unsafe spinal block spread [8]. Complications after spinal puncture are well known and can be listed as epidural, subdural, subarachnoid hemorrhage, epidural abscess, cerebrospinal fluid hypotension-hypovolemia, anterior spinal artery thrombosis following prolonged hypotension, arachnoiditis or myelitis, acute prolapse of the intervertebral disc. Although intracranial hemorrhage is less common, the most common type of its is subdural hematoma. Intraventricular or subarachnoid hemorrhage is associated with intracranial aneurysms and is very rare [5]. The most common complication is postdural puncture headache due to Quincke type needles [8,9].

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Factors affecting the incidence of PDPH include; patient’s age, sex, pregnancy, previous PDPH history as well as the size of the needle used, the shape of the needle tip, the number of lumbar puncture interventions, the use of the midline to the lateral lumbar puncture, the type of local anesthetic agent, and the experience of the practicing physician [10]. Our patient also developed a subdural hematoma, although 20 mg of 0.5% bupivacaine hydrochloride was injected from the L4-5 vertebral space using a Quicke type 22G fine spinal needle. Because the hematoma was small, it did not require surgical decompression.

![Figure 2: The area of lumbar puncture](image)

The pathophysiology of subdural hemorrhage due to spinal anesthesia is not fully known. The most likely mechanism is that differential pressure changes between cerebrospinal fluid and intravascular cavities during spinal puncture can lead to bleeding directly or indirectly in the spinal vessels, leading to bleeding with dural leakage. The veins feeding the spinal cord are very small and their lacerations do not cause symptoms. However, intravascular pressure changes in the spinal veins passing through the subdural and subarachnoid cavity cause tears in the vessels and secondary spread to the subarachnoid and subdural space [5].

PDPHs are more common when large needles are used; however, unsuccessful spinal anesthesia procedure may be seen even though thinner needles (below 29G) are used. PDPHs are also more common in sharp-edged needles (Quincke type) than non-cutting pencil tip types (Whitacre or Sprotte type). However, the use of the needle with the inclination parallel to the long spine axis when the Quincke needle is used is known to reduce the risk of PDPH and bleeding. Similarly, most cases of subdural hematomas after lumbar puncture are attributed to the use of large caliber needles. However, regardless of the needle type, dural puncture continues to be traumatic and subdural hematoma may develop even if used very thinly [4,11,12].

Subdural hematomas are rare complications of spinal anesthesia. Most patients with headaches are unlikely to be treated without investigation, but failure to recognize intracranial hemorrhage can lead to permanent and fatal consequences [12,13]. In patients presenting with non-positional headache or neurological symptoms, early diagnosis should be made with BCT screening. After diagnosis, treatment depends on the severity of the symptoms and the size of the hematoma. In small hematomas below 10 mm, without shifts in brain or shifts of less than 5 mm, and mild symptoms, bed rest, hydration and analgesia, conservative management such as that of PHPD...

may be sufficient. Surgery should be considered in more severe cases with neurological deficits, bleeding greater than 10 mm and shift of more than 5 mm. In patients with unresponsive or recurrent hemorrhage, epidural blood patch with surgical evacuation should be considered [9].

Conclusion

In conclusion; although spinal anesthesia is frequently used, its complications are very low. However, even if there are no known risk factors, there is always a risk of complications and it may be mortal. Subdural hemorrhage due to spinal anesthesia is very rare and its mechanism is not fully understood. All patients undergoing spinal puncture should be instructed to report neurological abnormalities after a puncture. If the headache after spinal anesthesia persists despite conservative treatment, subdural hemorrhage should be considered if it gains a non-postural character or spreads to the cervical region. Since it may be mortal, emergency physicians should be aware of this issue and should go to differential diagnosis with imaging methods (computed tomography or magnetic resonance).

Bibliography