

# Subarachnoid Hemorrhage Presenting as Post-dural Puncture Headache:

## A Case Report

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### Abstract

A case of subarachnoid hemorrhage following spinal anesthesia for prostate radioactive seed implantation is reported. The implications of the differential diagnosis of post-dural puncture headache are discussed.

**Key Words:** Spinal anesthesia, cerebral aneurysm, anesthetic complications, post-dural puncture headache.

POST-DURAL PUNCTURE HEADACHE (PDPH) is one of the most common complications of spinal or epidural anesthesia (1). Caused by leakage of cerebrospinal fluid (CSF) from the dural puncture site and the resultant stretching of intracranial dural veins brought about by the associated pressure gradient shift, the headache is typically self-limiting and without sequelae.

Intracranial bleeding is a much rarer, but decidedly more serious complication of spinal or epidural anesthesia. There are few reports on it in the literature; most of them describe subdural hematoma formation (2–6). The mechanism is characterized as an extension of post-dural puncture headache: if the CSF pressure gradient after dural puncture is great enough, stretched dural veins can tear and create a subdural hematoma (2). When post-spinal or post-epidural bleeding occurs in the subarachnoid space, it is typically limited to the spinal levels surrounding the dural puncture site (7, 8). This is in contrast to intracranial subarachnoid hemorrhage (SAH) following spinal or epidural anesthesia, which is extremely rare (9). Such a complication is easily misdiagnosed, because the severe headache of subarachnoid hemorrhage may be mistaken for the more common post-dural puncture headache. We describe a case of postoperative SAH presenting as PDPH in a patient with previously undiagnosed intracerebral aneurysms.

### Case Report

A 59-year-old man with prostate cancer presented for implantation of radioactive seeds to the prostate, on an ambulatory basis. His medical history was remarkable for hypertension and hypothyroidism. Medications included enteric-coated aspirin 325 mg PO qd (stopped 15 days prior to surgery), amlodipine 10 mg PO qd, propranolol 80 mg PO tid, levothyroxine 100 µg PO qd, liothyronine 25 µg PO qd, flutamide 250 mg PO tid, and amoxicillin/clavulanate 875 mg PO bid. The patient denied a history of back problems or bleeding diathesis. Preoperative laboratory results included an international normalized ratio (INR) of 0.9, activated partial thromboplastin time (aPTT) of 28 sec, and platelet count of 209,000/µL. While he had no history of spinal or epidural anesthesia, he had undergone general anesthesia in the past without complications. After prehydration with 1000 mL of Plasma-Lyte A® (Baxter Healthcare Corp., Deerfield, IL) and premedication with midazolam 2 mg i.v., spinal anesthesia was performed via a midline approach, with the patient sitting. Landmarks were easily palpated and a single puncture produced clear CSF. A hyperbaric solution of 2 mL 0.75% bupivacaine with dextrose was injected at the lumbar 3–4 interspace using a 27-gauge Whitacre spinal needle via an 18-gauge introducer. A satisfactory level of anesthesia was obtained to T10 and the surgical procedure was completed without incident. Blood pressure, 160/80 mm Hg upon the patient's arrival at the hospital earlier in the day, ranged from 180–190/80–85 mm Hg in the operating room for the several minutes preceding placement of

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the spinal, then quickly settled to a steady 110–120/70 mm Hg for the duration of the procedure. The patient remained comfortable and lucid and continued to communicate with the anesthesiologists throughout the procedure.

After an uneventful postoperative course in the post-anesthesia care unit, the patient was discharged home; he was awake, alert, and ambulating. On routine telephone follow-up the next day, the patient's family reported that he was experiencing a headache unresponsive to acetaminophen. While the headache was more intense with the patient sitting or standing, it did not completely resolve when he lay flat. A subsequent telephone contact later in the day found the patient's headache to be improving. He remained alert and coherent until the early morning of the second postoperative day, when he was found by his family to be confused and not fully alert, and was brought to the hospital. On arrival at the emergency department, the patient was somnolent but arousable, with a pulse rate of 85 bpm and a blood pressure of 182/114 mm Hg. A computed tomography (CT) scan of the head and a subsequent cerebral angiogram revealed a subarachnoid hemorrhage and three intracerebral aneurysms — bilateral pericallosal and left middle cerebral artery. The acute bleed was thought to have occurred at the left pericallosal site. Emergency craniotomy was performed, and the three aneurysms were clipped successfully. After effective medical treatment of symptomatic vasospasm in the first postoperative week, the patient was discharged to a rehabilitation facility with resolving unilateral motor weakness.

### Discussion

Bottiger and Diezel described a similar incident of post-dural puncture SAH in a patient with a preexisting cerebral aneurysm (9). The authors theorized a mechanism of transmural stress from the CSF pressure gradient, resulting in the rupture of vulnerable aneurysms. Whether the subarachnoid hemorrhage suffered by our patient can be attributed to this mechanism or was related to possible postoperative hypertension following discharge to home, remains unclear. In either case, it is instructive to highlight the differences in presentation between PDPH and SAH, given the potential ease with which the more serious of the two can initially be masked.

PDPH is classically characterized as a positional headache that starts at the top of the head or the occiput and extends down the back of the neck. The headache may rarely occur at the

time of dural puncture or, conversely, several days or even weeks afterwards, but is most commonly reported to commence on the day following the procedure. Patients typically report that the pain, while not responsive to acetaminophen or other analgesics, resolves upon their assumption of a supine position, and returns upon sitting or standing. Photophobia and nausea can also be present. Subarachnoid hemorrhage, while also presenting as pain, is often described as the "worst headache of one's life." Furthermore, the headache of SAH is not positional and can be accompanied by changes in mental status. Because treatment of these two conditions is quite different, it is important to recognize these differentiating factors as early as possible. The often-used approach of "watching and waiting" in PDPH could lead to disastrous consequences in a case of SAH.

As a final recommendation, although most aneurysms are occult, a history indicative of an existing aneurysm, or which suggests the possibility of an existing intracranial aneurysm, should act as a restraint in administering spinal or epidural anesthesia.

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