

# A Case Report Of A Cranial Subdural Hematoma Due To A Rare Complication Of Spinal Anesthesia

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## Citation

I Aysel, N Sertoz, M Uyar. *A Case Report Of A Cranial Subdural Hematoma Due To A Rare Complication Of Spinal Anesthesia*. The Internet Journal of Anesthesiology. 2010 Volume 29 Number 1.

## Abstract

Subdural hematoma (SDH) is a rare, but documented and life-threatening complication after dural punctures often manifested by post-dural puncture headache (PDPH). Case Report A 28 year old man underwent anterior cruciate ligament reconstruction with combined epidural spinal anesthesia. On the first postoperative day, the patient experienced a mild frontal headache, which was assumed to be PDPH by the surgeons. Ten days after operation, the nature of his headache changed and exacerbated. After neurosurgical consultation, computed tomography scan revealed a subdural hematoma (4mm) in the left fronto-temporo-parietal region without mass effect. No surgical procedure was applied. Consequently, when a patient complains of severe, prolonged headache, unrelieved by conservative treatment after spinal anesthesia, the possibility of subdural hematoma should be considered.

## INTRODUCTION

Subdural hematoma (SDH) is a rare, but documented and life-threatening complication after dural punctures often manifested by post-dural puncture headache (PDPH)<sup>1</sup>.

Cases have been reported after following accidental dural puncture with epidural needle, spinal anesthesia or diagnostic lumbar puncture<sup>2</sup>.

We report a case of cranial subdural hematoma in a patient who had undergone combined epidural spinal anesthesia for anterior cruciate ligament reconstruction.

## CASE REPORT

A 28 year old man underwent anterior cruciate ligament reconstruction with combined epidural spinal anesthesia. In his brief history, the patient had a headache, which was related to frontal sinusitis treated with medical treatment. He had no trauma, headache, or coagulation abnormalities before the surgery. The preoperative laboratory blood tests, including platelet count, prothrombin time (PT), and activated partial thromboplastin time (APTT) were normal. The patient received no anticoagulants. After premedication with 2 mg midazolam IV (intravenous), the patient was taken in the operating room and he was monitored.

The skin was anesthetized with 2 mL of lidocaine 2%. 18G Touhy epidural needle (Perifix; B.Braun, Germany) was

inserted via L<sub>3-4</sub> interspace, under sterile conditions using a loss of resistance technique, at the first attempt (without difficulty) while keeping the patient in the sitting position. Lumbar puncture was performed with a 25-gauge Quincke (Spinocan; B.Braun, Germany) spinal needle in the sitting position, at the midline L<sub>4-5</sub> interspace. Cerebrospinal fluid (CSF) was obtained at the first attempt, and 3 mL of hyperbaric bupivacaine 0.5% was injected into the subarachnoid space, providing effective anesthesia. Sensory block was tested with pinprick test at T<sub>10</sub> dermatomal level. The patient was given additional 5 ml 1% lidocaine (50 mg) 105 minutes after the application of spinal anesthesia procedure. The intra-operative period ended successfully, and the hemodynamic parameters were stable for three hours throughout the operation. During the operation the patient was given 3L of IV fluids. Post-operative patient controlled analgesia (PCA) with % 0.125 Bupivacaine + 2µg/ml Fentanyl solution was satisfactory (loading 10 ml, set rate 5 ml, bolus 7 ml, lock out 30 min). Epidural catheter was withdrawn on the 36<sup>th</sup> postoperative hour after routine laboratory results were checked. The immediate postoperative recovery was uncomplicated. On the first postoperative day, the patient experienced a mild frontal headache, which was assumed to be PDPH by the surgeons, and IV fluids, which include paracetamol 250 mg, propifenazon 150 mg and caffeine 50mg, were administered. The headache improved partially following hydration and

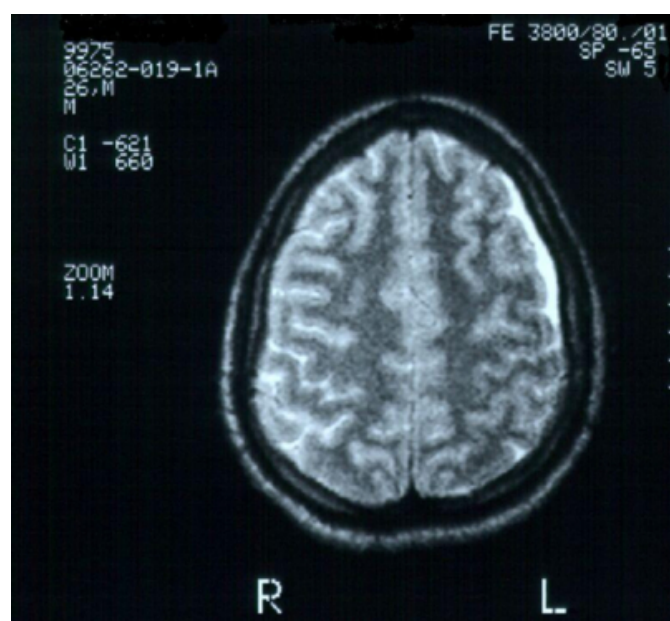
bed rest. The patient was discharged on the third postoperative day with prescriptions for anti-inflammatory analgesics, caffeinated drinks, and bed rest.

Ten days after operation, the nature of his headache changed and exacerbated. The patient described moderate to severe frontal headache, and pain did not respond to analgesics and bed rest. The neurological examination revealed that the upper and lower extremity strength was 5 of 5 bilaterally. There were no meningeal signs or papilledema. The laboratory tests, including hemoglobin, leukocyte and platelet counts, bleeding time, clotting time, PT, APTT, and liver and renal functions, were normal. After neurosurgical consultation, computed tomography scan revealed a subdural hematoma (4mm) in the left fronto-temporo-parietal region without mass effect (Figure 1).

No surgical procedure was applied. On the 15<sup>th</sup> day postoperatively, the patient was discharged from the hospital, because his headache decreased to a level that he did not need any analgesic and in his control CT there was no progress in his subdural hematoma. In his one month follow-up period the patient did not complain of headache and his subdural hematoma regressed. There was no residual neurologic deficit (Figure 2).

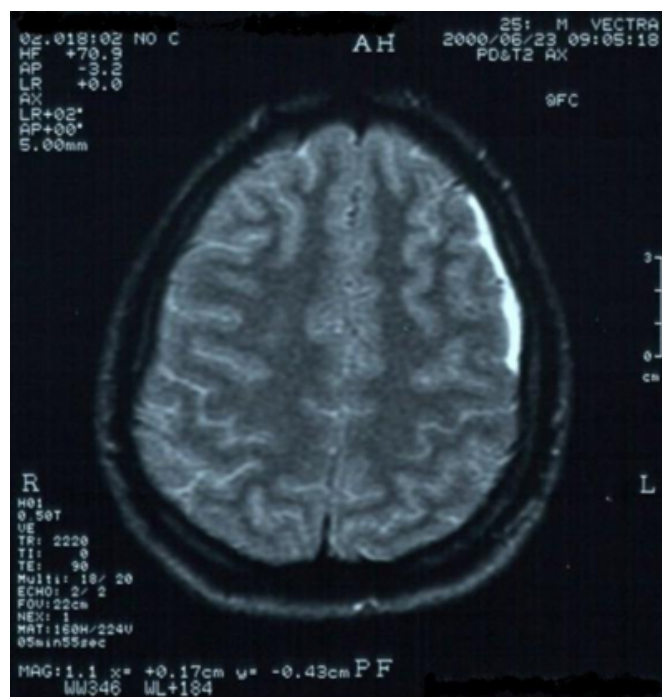
### Figure 1

Figure 1: Subdural hematoma (4mm) formation in the left fronto-temporo-parietal region



### Figure 2

Figure 2: Regression of subdural hematoma at the seventh day CT scan



## DISCUSSION

The most frequent complication of lumbar puncture is headache, affecting about 40% of cases<sup>3</sup>. The PDPH is posture dependent, mild and it usually responds to increased fluid intake, bed rest and analgesics. PDPH occurs or worsens shortly after assuming the upright position and disappears or improves after resuming the recumbent position. Additional symptoms may include neck pain, nausea, emesis, interscapular pain, photophobia, diplopia, dizziness, hearing changes, visual blurring, cranial nerve palsies, and radicular upper extremity symptoms<sup>4</sup>.

Persistent and more severe headache may be due to subdural hematoma formation<sup>5</sup>. PDPH was more frequent earlier at the times, when Quincke point spinal needles of large sizes were used. Though subdural haematoma<sup>1</sup> and intracerebral haemorrhage<sup>6</sup> have been reported even with 26G spinal needles, its incidence has been minimized with the use of 29 G needles<sup>7</sup>. In vitro studies have emphasized the importance of small needle diameter in reducing the rate of transdural CSF leakage<sup>8</sup>.

Subdural hematomas are rare, but serious complication of dural puncture. The presumed mechanism for the development of an intracranial hematoma is the loss of cerebrospinal fluid (CSF) with low CSF pressure, leading to

traction and tearing of the intracranial subdural veins<sup>9</sup>. Excessive leakage of CSF through the dural puncture (>250 ml) may cause caudal displacement of the intracranial structures, which may result in subdural hematoma formation<sup>10</sup>. Cerebral atrophy, cerebral aneurysm, arteriovenous malformations, pregnancy, dehydration, anticoagulant use, and excessive CSF leakage associated with multiple dural punctures and large dural holes are thought to be contributing factors in the pathogenesis of subdural haematomas<sup>11</sup>. We did not find any etiological factors related to subdural hemorrhage like head trauma, coagulopathy, any medication, systemic disease or dehydration. Factors like cough, straining and hiccough that cause physiological increase in venous pressure were eliminated.

Pavlin et al. reported 2 cases of subdural hematoma, requiring surgical decompression<sup>12</sup>.

The true incidence of subdural hematoma formation following lumbar puncture remains obscure, as most of these patients are probably managed without investigation. Subdural hygroma or hematomas complicating lumbar puncture may resolve spontaneously<sup>13</sup> or with conservative measures<sup>11</sup>.

The management of subdural hematoma can be conservative or surgical; the decision depends on the size of the hematoma and patient's symptoms. Surgical evacuation is usually recommended for hematomas greater than 10mm with altered mental status and greater than 5mm midline shift<sup>14</sup>.

A CT scan of the skull usually leads to the correct diagnosis. However, a 7–21-day-old intracranial hematoma may have the same radiological density as the brain, so magnetic resonance imaging (MRI) or CT scan with contrast may be more reliable<sup>15</sup>. Thus, MRI was chosen to exclude subdural hematoma on the 21st postoperative day.

Consequently, when a patient complains of severe, prolonged headache, unrelieved by conservative treatment after spinal anesthesia, the possibility of subdural hematoma should be considered. Especially long-lasting headaches with no neurologic deficits after epidural and/or

spinal applications, subdural hematoma should be taken into account and close observation of the patients' neurological evaluations should be done.

In addition, subdural hematoma should be showed urgently either with CT or MRI. An early diagnosis of the hematoma may allow medical treatment of subdural hematoma; that surgical evacuation may be avoided.

## References

1. Acharya, R., Chabra, S.S., Ratra, M., Sehgal, A.D.: Cranial subdural haematoma after spinal anaesthesia. *Br J Anaesthesia* 2001; 86: 893-895.
2. Zeidan A, Farhat O, Maaliki H, Baraka A. Does postduralpuncture headache left untreated lead to subdural hematoma? Case report and review of the literature. *Int J Obstet Anesth* 2006;15:50-8.
3. Alemohammad S, Bouzarth WF. Intracranial subdural hematoma following lumbar myelography. *J Neurosurg* 1980;52:256-258.
4. Mokri B. Headaches caused by decreased intracranial pressure: diagnosis and management. *Curr Opin Neurol* 2003; 16:319-326.
5. Macon, M.E., Armstrong, L., Brown, E.M.: Subdural hematoma following spinal anesthesia. *Anesthesiology* 1990; 72: 380-381.
6. Rocchi R, Lombardi C, Marradi I, Di Paolo M, Cerase A. Intracranial and intraspinal hemorrhage following spinal anesthesia. *Neurol Sci.* 2009 Oct;30(5):393-6.
7. Flaaten H, Rodt SA, Vamnes J et al. Post-dural puncture headaches: a comparison between 26 and 29 G needles in young patients. *Anaesthesia* 1989; 44:147-149
8. Ready LB, Cuplin S, Haschke RH, et al. Spinal needle determinants of rate of transdural fluid leak. *Anesthesia Analgesia* 1989;69:457.
9. Loo CC, Dahlgren G, Irestedt L. Neurological complications in obstetric regional anaesthesia. *Int J Obstet Anesth* 2000; 9:99-124.
10. Gass H, Goldstein AS, Ruskin R, Leopold NA. Chronic postmyelogram headache. Isotopic demonstration of dural leak and surgical cure. *Arch Neurol* 1971; 25:168-170.
11. Van den Berg JSP, Sijbrandij SE, Meijer AH, Oostdijk AHJ. Subdural hygroma: A rare complication of spinal anesthesia. *Anesth Analg* 2002;94:1625-1627.
12. Pavlin DJ, McDonald JS, Child B et al. Acute subdural hematoma - an unusual sequela to lumbar puncture. *Anesthesiology* 1979; 51:338-340.
13. Verdu MT, Martinez-Lage JF, Alonso B, Sanchez-Ortega, J.L.; Garcia-Candel, A.: Non-surgical management of intracranial subdural hematoma complicating spinal anesthesia. *Neurocirugía* 2007; 18: 40-43.
14. Bullock MR, Chesnut R, Ghajar J, Gordon D, Hartl R, Newell DW. Surgical management of acute subdural hematomas. *Neurosurgery* 2006; 58: 16-24.
15. Bjarnhall M, Ekseth K, Bostrom S, Vegfors M. Intracranial subdural haematoma: a rare complication following spinal anaesthesia. *Acta Anaesthesiol Scand* 1996; 40:1249-1251.

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