



# A Catastrophic Neurologic Complication Following Spinal Anaesthesia: Intracerebral Haematoma

## Spinal Anestezi Sonrası Katastrofik Nörolojik Komplikasyon: İntraserebral Hematom

Serbülent Gökhan Beyaz<sup>1</sup>, Tolga Ergönerç<sup>2</sup>, Fikret Bayar<sup>2</sup>, Ali Fuat Erdem<sup>1</sup>

<sup>1</sup>Department of Anaesthesiology, Faculty of Medicine, Sakarya University, Sakarya, Turkey

<sup>2</sup>Department of Anaesthesiology, Sakarya University Training and Research Hospital, Sakarya, Turkey

Intracerebral haematoma following spinal anaesthesia is a very uncommon neurologic complication and the mechanism of intracerebral haematoma following dural puncture is not known. An 87-year-old man, who did not have any neurologic or coagulation disorder, received spinal anaesthesia for transurethral prostatectomy. Approximately 2.5 hours after spinal injection, he developed headache, slurred speech and somnolence, and brain CT revealed intracerebral haematoma. The patient was admitted to the intensive care unit and was intubated and connected to mechanical ventilator. The patient died on the 6<sup>th</sup> postoperative day. It should be kept in mind that irreversible brain damage can develop in neurological disorders that develop soon after spinal anaesthesia and that these should be promptly evaluated radiologically.

**Key Words:** Spinal anaesthesia, dural puncture, intracerebral haematoma

Spinal anestezi sonrası intraserebral hematom çok nadir görülen bir nörolojik komplikasyondur ve dura ponksiyonu sonrasında oluşan intraserebral hematomun mekanizması bilinmemektedir. Herhangi bir nörolojik ve koagülasyon bozukluğu olmayan ve transüretral prostatektomi planlanan 87 yaşındaki erkek hastaya spinal anestezi uygulandı. Spinal enjeksiyondan yaklaşık 2,5 saat sonra baş ağrısı, konuşmada bozulma ve somnolans gelişen hastanın beyin CT'de intraserebral hematom tespit edildi. Yoğun bakım ünitesinde entübe edilerek mekanik ventilasyona bağlandı. Hasta postoperatif 6. gün öldü. Spinal anestezi sonrası erken dönemde gelişen nörolojik bozuklukta geri dönüşsüz beyin hasarının gelişebileceği akla gelmeli ve zaman kaybetmeden radyolojik olarak araştırılmalıdır.

**Anahtar Kelimeler:** Spinal anestezi, dura delinmesi, intraserebral hematom

## Introduction

Neurological complications following spinal or epidural blocks have increasingly been reported in recent years. Neurological complications that can occur following spinal anaesthesia include headache, hearing loss, epidural, subdural or subarachnoid haemorrhage, epidural abscess, and intracranial hypotension (1-4). Among these complications, intracranial haemorrhage is a relatively uncommon but fatal complication (4). In the current case, we present development of intracerebral haematoma following spinal anaesthesia, which culminated with mortality.

## Case Report

The patient was an 87-year-old man who had a history of hypertension for 10 years and chronic obstructive pulmonary disease for 8 years. He underwent transurethral prostatectomy surgery under spinal anaesthesia. He had no history of known cerebrovascular disease, head trauma or headache. Physical examination and neurologic evaluation of the patient were not significant. Blood tests including coagulation were within reference ranges.

Oral antihypertensive medication was continued in the preoperative period. After cannulation of a peripheral vein, 500 mL of 0.9% isotonic saline was infused within 30 minutes in the premedication room. The patient was transferred to the operation room and routine monitoring was conducted. The patient's non-invasive arterial blood pressure was 137/83 mmHg, pulse was 84/minute and SpO<sub>2</sub> was 93%. While the patient was in the sitting position a 25-gauge spinal needle with a Quinche tip was introduced on the first attempt into the L4-L5 space, under sterile conditions. After observing a clear CSF drip, 10 mg of hyperbaric bupivacaine 0.5% was injected. Sensorial blockage was at the T9 dermatome. The haemodynamic parameters of the patient were stable throughout surgery. The surgical procedure lasted for 52 minutes and was completed without complications.

Approximately 90 minutes after the end of surgery, the patient developed a severe headache, lisping speech, loss of motor functions in the right extremities, and somnolence. A brain tomography was performed, and revealed an intracerebral haematoma measuring 4.5x5 cm in the left temporoparietal region (Figure 1). The neurosurgery department was consulted, and surgical intervention was not considered because of the patient's Glasgow Coma Score of 3 (E<sub>1</sub>V<sub>1</sub>M<sub>1</sub>), advanced age, and the large size and deep location of the haematoma. Blood

**Address for Correspondence/Yazışma Adresi:** Dr. Serbülent Gökhan Beyaz, Department of Anaesthesiology, Faculty of Medicine, Sakarya University, 54290 Sakarya, Turkey Phone: +90 532 287 94 90 E-mail: sgbeyaz@gmail.com

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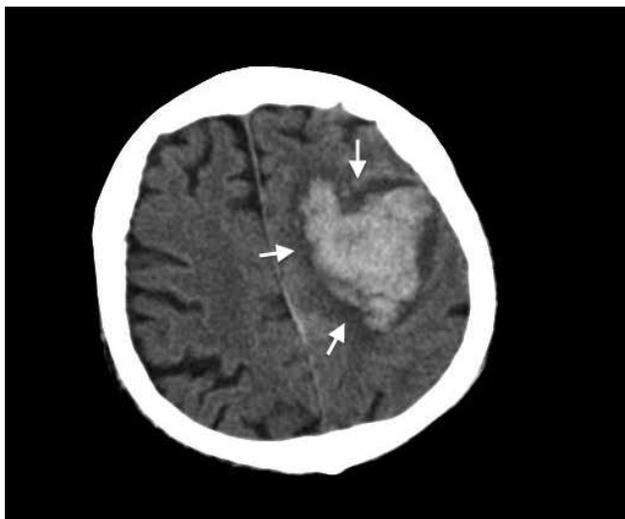


Figure 1. CT image of intracerebral hematoma. The white arrow marks the homogenous hyperdense lesion sized 4.5x5 cm in the left temporoparietal region, which is located in dept and causes a moderate degree shift

pressure values were normal during the postoperative period. The patient was admitted to the intensive care unit, and mechanically ventilated. He died on postoperative day 6.

## Discussion

Intracranial haemorrhage following spinal anaesthesia is a rare complication. Among intracranial haemorrhages, the most common type is subdural haematoma. Bleeding within the ventricles and/or subarachnoid spaces is extremely uncommon and it is usually associated with an intracranial aneurysm (5). Although intracerebral haematoma is rare, a few cases have been reported (2, 4, 6). Moen et al. (1) did not report any intracerebral haematoma cases despite five subdural haematoma cases following neuroaxial blocks performed in the period from 1990 to 1999 (1,260,000 spinal, and 450,000 epidural blocks). None of these patients had coagulation disorders and no death was reported among these cases.

Subdural haematoma may occur after lumbar puncture in patients with cerebral aneurysm or brain tumours and in those having a recent cerebrovascular accident. Lumbar puncture leads to a rapid decrease in intracranial pressure due to the leakage of cerebrospinal fluid from the puncture site, and intracranial hypotension occurs. This intracranial hypotension may immediately cause caudal shifting of the brain and traction of the arachnoid mater and/or venous structures (7, 8). This situation may result in rupture of the fragile vasculature and intracranial haemorrhage. Thirty-five patients developing intracranial subdural hematoma following spinal anaesthesia were reviewed by and it was found that 15 of these patients did not have any contributing factors such as pregnancy, multiple dura punctures, the use of anticoagulants, intracranial vascular disorders, or brain atrophy (8).

The exact mechanism of intracerebral haematoma occurring after spinal anaesthesia is not known. In fact, it is difficult to determine a causal relation in very rare events. The patient presented here, despite his advanced age, did not have any neurological abnormalities, e.g. headache, confusion, dementia, lateralization signs, or non-traumatic risk factors (such as treatment with anticoagulant agents, coagulation disorders, hepatic failure, sepsis, renal dialysis, the use of NSAID and herbal drugs with anti-platelet activity, or cirrhosis).

In the patient presented here, the potential causes of bleeding were not identified on brain tomography since the haemorrhage was extensive and involved a large area. As it was inoperable, craniotomy was not performed, and would not have revealed the cause even if it had been performed. Craniotomy was unable to demonstrate any potential causes of intracerebral haemorrhage (aneurysm, AV malformation, etc.) in a case developing intracerebral haemorrhage following caesarean surgery under spinal anaesthesiology (9). Although it is difficult to determine an exact mechanism, these events may be encountered even if there is no risk factor (2, 5).

## Conclusion

Anaesthesiologists must be aware of the neurological complications following spinal block; we believe that any complaint of non-specific headache should be assessed and its differential diagnosis promptly performed.

## Conflict of Interest

No conflict of interest was declared by the authors.

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## Author Contributions

Concept - S.G.B.; Design - S.G.B., B.A.; Supervision - T.E., F.B.; Funding - S.G.B.; Data Collection and/or Processing - S.G.B., T.E., F.B., A.F.E.; Analysis and/or Interpretation - S.G.B.; Literature Review - S.G.B., A.F.E.; Writer - S.G.B.; Critical Review - T.E.

## Çıkar Çatışması

Yazarlar herhangi bir çıkar çatışması bildirmemişlerdir.

**Hakem değerlendirmesi:** Dış bağımsız.

## Yazar Katkıları

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