Near Fatal Complication of Spinal Anaesthesia: Recognition and Management

Spinal Anestezinin Ölümcül Komplikasyonu: Tanıma ve Yönetim

Nadia Nafasha Baharudin[1], Nurul Shahida Zahar[1], Esa Kamaruzaman [2], Ramesh Kumar[3]

[1]Department of General Surgery, Universiti Kebangsaan Malaysia Medical Centre, Malaysia
[2]Department of Anaesthesiology and Intensive Care, Universiti Kebangsaan Malaysia Medical Centre, Malaysia
[3]Neurosurgery unit, Department of General Surgery, Universiti Kebangsaan Malaysia Medical Centre, Malaysia

ABSTRACT

Intracranial subdural haemorrhage is one of the complications of spinal anaesthesia. It is a rare condition but extremely disastrous if not being treated promptly. It is usually mistaken with post spinal puncture headache. Hence, knowledge and awareness of this condition have to be instilled among clinicians to avoid life-threatening events.

Key Words: Spinal anaesthesia, Post spinal puncture headache, Subdural haemorrhage, caesarean section

Received: 06.13.2018 **Accepted:**10.03.2018

ÖZET

İntrakraniyal subdural hemoraji spinal anestezinin komplikasyonlarından biridir. Nadir görülen bir durumdur ancak hemen tedavi edilmezse son derece tehlikelidir. Genellikle post spinal ponksiyon baş ağrısı ile karıştırılır. Bu nedenle, yaşamı tehdit eden olaylardan kaçınmak için klinisyenler açısından bu durumun bilinmesi ve farkındalığı gerekmektedir.

Anahtar Sözcükler: Spinal anestezi, post spinal ponksiyon baş ağrısı, subdural hemoraji, sezaryen

Geliş Tarihi: 13.06.2018 **Kabul Tarihi:**03.10.2018

INTRODUCTION

Spinal anaesthesia, also called spinal block, subarachnoid block, intradural block and intrathecal block, is a form of regional anaesthesia. This technique is used to allow patients to undergo certain surgical procedures without pain and distress. Spinal anaesthesia is preferable for procedure such as caesarean section as it is safer and more beneficial compared to general anaesthesia (1). However, no surgical procedures are without side effects and complications. Post spinal puncture headache (PSPH) is a benign condition typically seen as a frequent complication post-spinal anaesthesia (2,3). Nevertheless, a subdural haemorrhage should be suspected if the headache becomes more severe and persistent (2,3). Early recognition of subdural bleeding is crucial to start an effective treatment (2,3). Negligence may result in fatal complications. We report on a case of left chronic subdural haemorrhage following spinal anaesthesia for caesarean section whose condition improved tremendously following surgical intervention.

CASE REPORT

A twenty eight year old female presented to the Emergency Department (ED) with a three week history of headaches. The headache started after an elective caesarean section for breech presentation of her second child. Surgery was uneventful. Spinal anaesthesia was used for the procedure. Standard spinal needle (Quincke) Spinocan 27G was used during procedure. Heavy marcaine 0.5% 2mls, Fentanyl 15mcg 0.3 mls and Morphine 0.1mg 0.1mls were administered intrathecally during the procedure.

She described the headache as constant in nature but varied in intensity for the past three weeks. She denied any history of chronic or acute headaches prior to the caesarean section. The headache worsened on the day of presentation to the emergency department. She also experienced multiple vomiting episodes and sudden blurring of vision. Prior to this, she also presented twice with headaches. She was only given symptomatic treatment for her headache.

Address for Correspondence / Yazışma Adresi: Nadia Nafasha Baharudin, MD Department of General Surgery, Universiti Kebangsaan Malaysia Medical Centre, Jalan Yaacob Latif, Bandar Tun Razak, 56000 Cheras, Kuala Lumpur, Malaysia E-mail: choc.paint@gmail.com

doi:http://dx.doi.org/10.12996/gmj.2019.18

She denied numbness, weakness and any episodes of fainting or loss of consciousness. She is a non-smoker. She does not consume alcohol, drugs or traditional medications. She denied history of recent travel. She has no history of bleeding disorders. She denied any history of domestic violence and described her antenatal period as uneventful.

Upon review, her Glascow Coma Scale was maximal. Blood pressure recorded was 146/89 mmHg, with a pulse rate of 50 beats per minute. There was no slurring of speech. She was able to follow instructions and answered all questions appropriately. Her physical examinations were normal.

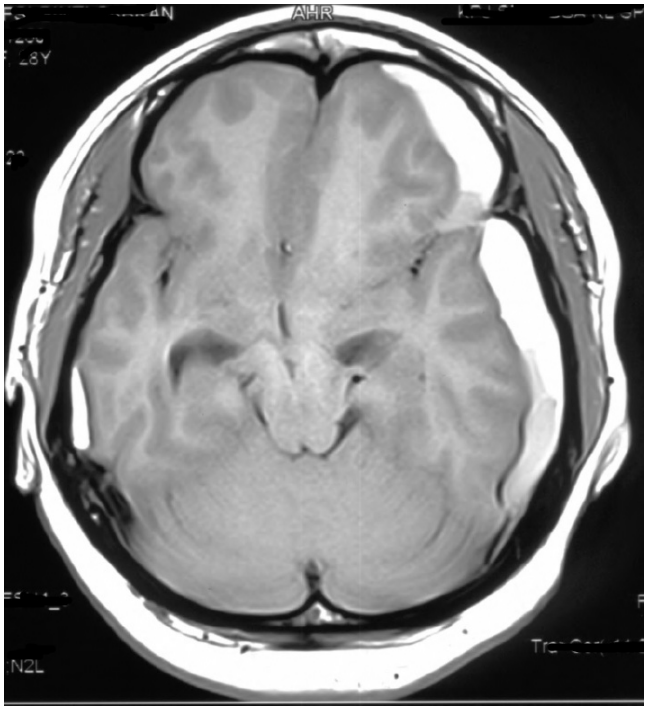

Figure 1: Axial view of preoperative MRI image showed left massive subdural haemorrhage with midline shift and small right parietal subdural haemorrhage.

Her symptoms resolved immediately post procedure. She no longer experienced vomiting and headache. Repeated eye assessments showed normal finding. CT brain done post burr hole procedure showed minimal subdural haemorrhage, minimal midline shift and no extension of contralateral subdural haemorrhage (Figure 2 and 3). Overall, post op care was uneventful. Patient was discharged home six days after surgery. Patient was followed up on the second week, first and fourth month for neurological and imaging assessment. Subsequent CTs showed resolution of hematoma (Figure 4 and 5).

Neurological examination showed no sign of cranial nerve dysfunction, motor weakness or ataxia. There were no sensory deficits to light touch, pain, position, and vibration sense. Deep tendon reflexes were normoactive and symmetric. There were no pathologic reflexes such as Babinski's sign and ankle clonus. Eye assessment done by ophthalmologist however revealed left sided homonymous hemianopia without papilledema.

Blood investigation done showed no evidence of coagulopathy. MRI brain showed a left massive subdural haemorrhage with midline shift and a small right parietal subdural haemorrhage (Figure 1). She underwent burr hole surgery and evacuation of subdural hematoma.

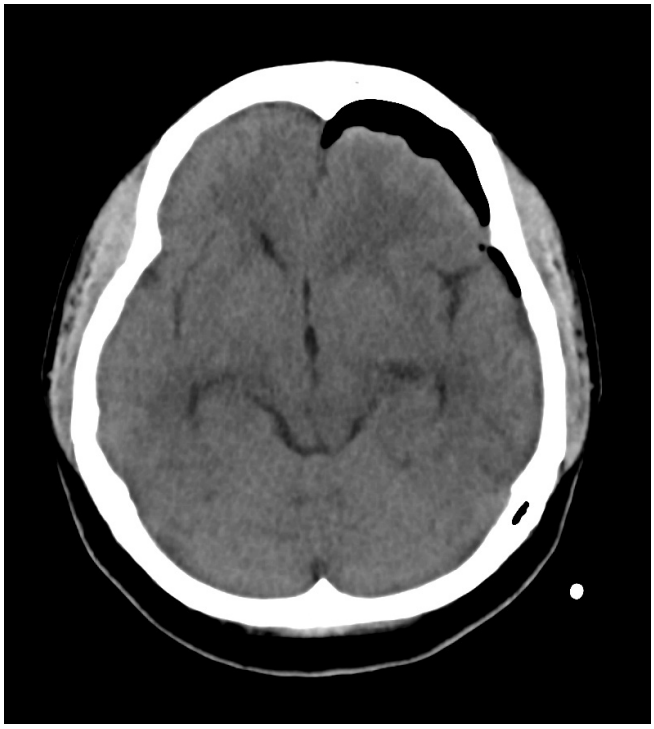

Figure 2: An axial cut CT image day one post surgery showed minimal subdural effusion at left fronto-temporo-parietal region. Midline shift to the right measuring 4.5mm

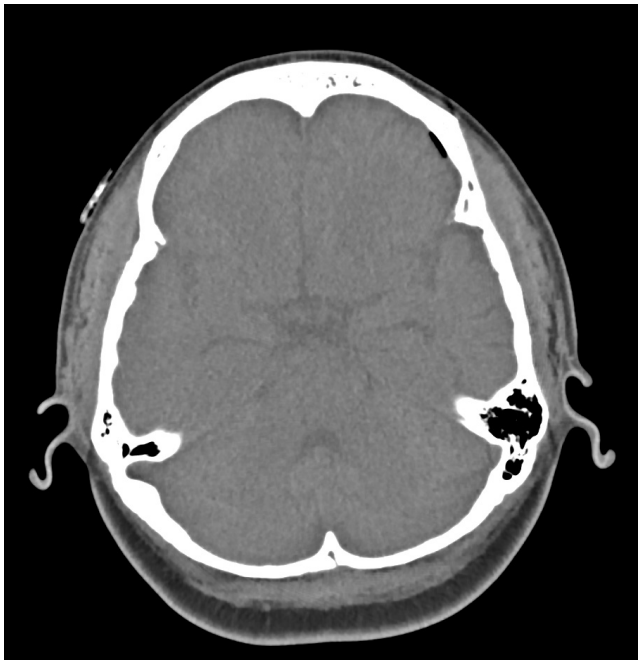

Figure 3: An axial cut CT image day five-post surgery showed resolving bilateral cerebral hemisphere subdural bleed.

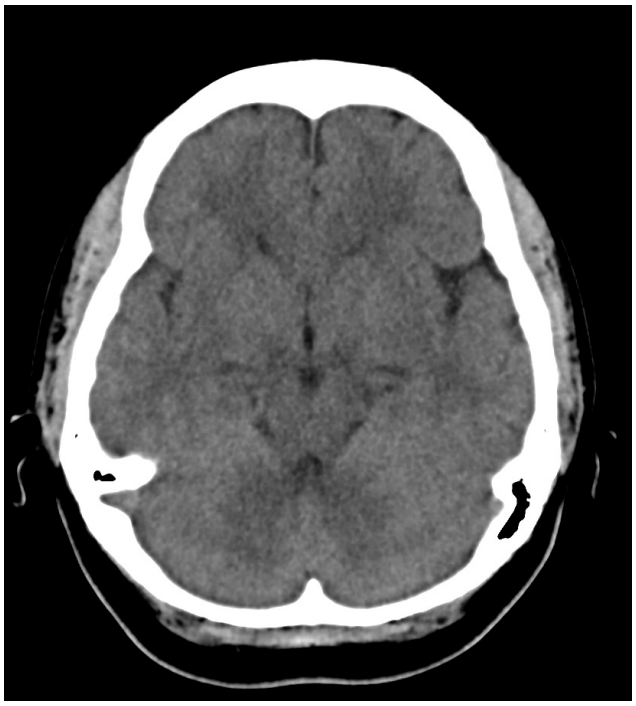

Figure 4: An axial cut CT image one-month post burr hole showed resolution of hematoma

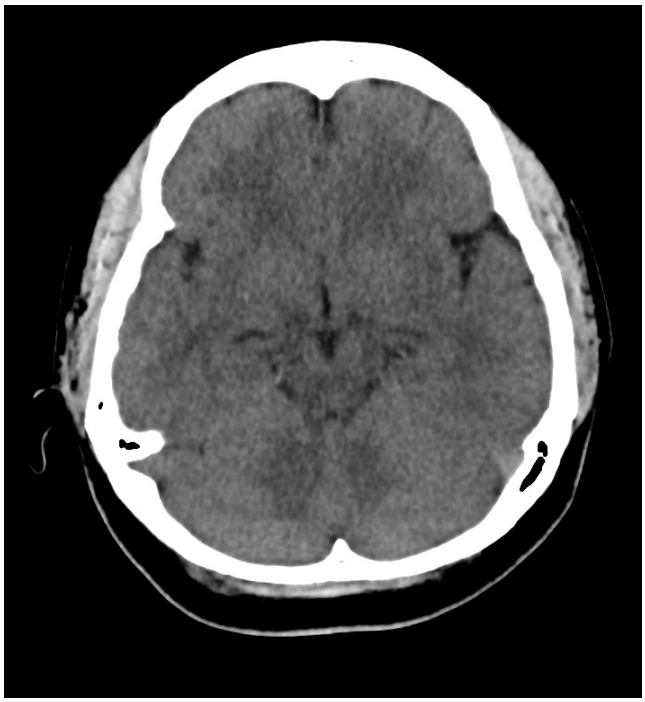

Figure 5: An axial cut CT image 4 months post burr hole procedure showed resolution of hematoma

DISCUSSION

A study conducted by D.K Turnbull et al showed incidence of post spinal puncture headache after spinal anesthesia varies from <2% - 40%(1,4). A more recent study conducted in 2013 concluded incidence of 17.3% post spinal puncture headache after spinal anesthesia (5). It also appears that arachnoid puncture is more linked to the resulting headache than dural puncture (5). In obstetric population, PSPH is a well-known complication of spinal anesthesia with a reported incidence of 1-2%(6).

PSPH is manifested by the postural character of the dull pain in a frontal-occipital distribution which is worsened by sitting up and standing (5,6). Any maneuvers such as coughing, sneezing, straining, or ocular compression exacerbated her symptoms (5). PSPH is known to be caused by excessive cerebrospinal fluid (CSF) leakage, it is thought to be caused by a downward displacement of intracranial structures that causes cerebral hypotension and stretches the intracranial pain sensitive structures (2).

The arterial and venous vasodilatation takes place following the activation of adenosine receptors as a result of decreased CSF volume. This subsequently produces clinical symptoms of headache (3). The manifestation of signs and symptoms depends on the rate of CSF leakage (5). PSPH usually develops within seven days of spinal anaesthesia and disappears within fourteen days (5). It rarely lasts longer than a fortnight, with 80% to 85% of the cases being of less than five days duration (5). PSPH is responsive to analgesics, bed rest and fluid replacement. Cerebral vasoconstrictor drugs, for example caffeine, is preferable in this condition (6).

Intracranial subdural hematoma may mimic and be confused with PSPH. PSPH that are unresponsive to ordinary PSPH treatments are considered as warning signs and should trigger suspicion to search for a cerebral lesion. An incidence of 1 in 500,000 was reported for intracranial SDH following spinal anesthesia for caesarean section (7). A case series with a total of 1.5 million patients reported hemorrhagic complications following spinal anesthesia occurred in 1 : 220,000 (8).Studies showed, interval between dural puncture and recognition of a chronic hematoma is approximately two to four weeks (3).Our patient was having headache for three weeks following spinal anesthesia for caesarean section.

In the formation of intracranial subdural hemorhage after spinal anesthesia, intracranial pressure is decreased allowing caudal movement of the brain, with traction on the arachnoid matter and dural veins. This causes tearing to the blood vessels and could result in blood extravasations and formation of subdural hematomas (2).

Zeidan et al. stated that intracranial subdural hematoma grows due to leakage of CSF from the hole created by spinal needle, hence the size of the needle and degree of dural tear have a positive relation to the lesion (9). CSF loss over 200ml per day can be suspected in the case of using a large needle diameter and multiple attempts at inserting the needle (2). Susceptibility of our pregnant patient to postdural puncture cerebral SDH might be attributed to the multiple attempts of spinal anaesthesia during labor. Amorim et al. and Zeidan et al. reviewed 35 and 25 cases of cerebral SDH following spinal anaesthesia respectively, and concluded that risk factors for intracranial SDH includes pregnancy, dehydration, multiple dural punctures, large dural hole, use of anticoagulants, cerebral vascular abnormalities, and brain atrophy (9,10).

Due to haemostatic imbalance, differences in elasticity of the dural, and possibly gender-based differences in cranial morphology, cerebral SDH may take place more frequently in pregnant patients in comparison to other patients (2). The brain-vascular disease has a higher incidence in pregnancy for several reasons, such as fluid overload, which can result in hypertension, high levels of oestrogen with known prothrombotic effect and endotheliopatia related to preeclampsia (6).

Intracranial subdural hematoma after spinal anaesthesia is reported to occur more frequently on the left side, however the reason behind this is unknown (11). The hematoma may involve the frontal, parietal, and temporal regions, alone or in combination, and although more frequently unilateral, it is not unusual to be observed as bilateral intracranial involvement (3).

Acute subdural hematomas are well recognized by a cranial CT scan, whereas for suspected chronic intracranial lesions, MRI are preferred as effective neuroimaging techniques since with time, hematoma and surrounding brain tissue show similar radiographic density (3).

The treatment of subdural hematoma may be surgical or conservative (2). Conservative management is recommended for small size hematomas, minimal to mild neurological manifestations without mass effect (2,3). This approach however, requires a close neurological and neuroradiological follow-up to recognize a potential worsening as early as possible. A recent literature has shown that 80% of patients with SDH following spinal anaesthesia required surgery and mortality rate was 20% (12). Surgical decompression is considered the treatment of choice for patient with marked sign and symptom of raised intracranial pressure (1,2,3). Our patient had signs and symptoms of raised intracranial pressure. Imaging revealed bilateral SDH with midline shift and surgical procedure was deemed appropriate.

CONCLUSION

In conclusion, the possibility of SDH should be considered in patients initially diagnosed with PSPH following regional anaesthesia unrelieved by conservative measures. Early detection and diagnosis is crucial to ensure the commencement of appropriate management and measures to avoid grave prognosis.

Conflict of interest
No conflict of interest was declared by the authors.

REFERENCES

1. Eldemrdash A, Elsharkawy M, Shams G, Ismail K. Chronic Subdural Hematoma Complicated Spinal Anesthesia: Report and Pilot Study of Five Surgically Treated Cases. J Anesth Clin Res 2017;8: 795.
2. Moradi M, Shami S, Farhadifar F, Nesseri K. Cerebral subdural hematoma following spinal anesthesia: report of two cases. Case Reports Med 2012; 2012:1-4.
3. Schweiger, V., Zanconato, G., Lonati, G., Baggio, S., Gottin, L., Polati, E. Intracranial subdural hematoma after spinal anesthesia for cesarean section. Case Rep Obstet Gynecol. 2013; 2013:253408
4. Turnbull DK, Shepherd DB. Postdural puncture headache: pathogenesis, prevention and treatment. Br J Anaesth. 2003; 91:718–29.
5. Jabbari A, Alijanpour E, Mir M, Bani hashem N, Rabiea SM, Rupani MA. Post spinal puncture headache, an old problem and new concepts: review of articles about predisposing factors. Caspian Journal of Internal Medicine. 2013;4:595-602.
6. Soraya Saleh Gargari, Maasoumeh Saleh, Samaneh Esmaeili Cerebral subdural hematoma following spinal anesthesia&58; A Case report. International Journal of Medical Research and Health Sciences, 2016;5:170-74
7. Scott DB, Hibbard BM. Serious non-fatal complications associated with extradural block in obstetric practice. Br J Anaesth 1990;64: 537-41.
8. R. Rocchi, C. Lombardi, I. Marradi, M. di Paolo, and A. Cerase, “Intracranial and intraspinal hemorrhage following spinal anesthesia,” Neurological Sciences, 2009;30:393–6.
9. Zeidan, O. Farhat, H. Maaliki, and A. Baraka, “Does postdural puncture headache left untreated lead to subdural hematoma? Case report and review of the literature,” International Journal of Obstetric Anesthesia, 2006; 15:50–8.
10. J. A. Amorim, D. S. Rem ´ıgio, O. Damazio Filho et al., “Cerebral ´ subdural hematoma post-spinal anesthesia: report of two cases and review of 33 cases in the literature,” Revista Brasileira de Anestesiologia, 2010;60:620–9.
11. Zeidan and A. Baraka, “Is bilateral cerebral subdural hematoma more frequent after epidural anesthesia than spinal anesthesia?” Anesthesiology, 2006; 105: 1277–8
12. Kesavapisharady, Krishnakumar & Chatterjee, Nilay & Shrivastava, Adesh & Davis, Josemine & Nair, Suresh. Sub-Dural hematoma following spinal anesthesia treated with epidural blood patch and burr-hole evacuation. Middle East journal of anaesthesiology. 2013; 22:117-20.