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Neuraxial Block in A Post-Hemorrhagic Stroke Pregnant Patient

Hemorajik İnme Sonrası Gebe Bir Hastada Nöroaksiyel Blok

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ABSTRACT

The selection of anesthetic methods for labor and delivery in individuals with elevated intracranial pressure relies on careful consideration of the risks and benefits. While neuraxial analgesia and anesthesia are favored for healthy individuals, they might not be suitable for individuals with intracranial lesions or a heightened risk of bleeding. Neuraxial block in post-stroke patients raises a concerning question about its safety due to the risk of herniation. The risk of perioperative major vascular events and mortality between general anesthesia and regional anesthesia in post-stroke patients is comparable. However, the neuraxial block shows benefits regarding airway manipulation and lower risk of thromboembolism. A successful and safe neuraxial anesthesia in a pregnant patient with a history of hemorrhagic stroke was presented in this case report.
Keywords: Post-stroke; neuraxial anesthesia; pregnancy; neuroanesthesia.

ÖZ

Kafa içi basıncı yüksek olan bireylerde doğum sancısı ve doğum için anestezi yöntemlerinin seçimi, risklerin ve faydaların dikkatli bir şekilde değerlendirilmesine dayanır. Nöroaksiyel analjezi ve anestezi sağlıklı bireyler için tercih edilirken intrakranial lezyonları olan veya kanama riski yüksek olan kişiler için uygun olmayabilir. İnme sonrası hastalarda nöroaksiyel blok, fıtıklaşma riski nedeniyle güvenliği konusunda endişe verici bir soru ortaya çıkarmaktadır. İnme sonrası hastalarda genel anestezi ile bölgesel anestezi arasında perioperatif majör vasküler olay ve mortalite riski karşılaştırılabilir. Bununla birlikte, nöroaksiyel blok, hava yolu manipülasyonu ve daha düşük tromboembolizm riski açısından faydalar göstermektedir. Bu vaka raporunda hemorajik inme öyküsü olan gebe bir hastada başarılı ve güvenli nöroaksiyel anestezi sunulmuştur.
Anahtar kelimeler: İnme sonrası; nöroaksiyel anestezi; gebelik; nöroanestezi.

INTRODUCTION

When considering anesthesia management in a post-stroke patient several factors need to be considered to ensure patient safety and optimize outcomes, especially in a special case such as pregnant patients. This equilibrium can be upset by pathologic changes in brain tissue, cerebrospinal fluid, or cerebral blood volume, which may lead to significantly elevated intracranial pressure (ICP), brain tissue shifts, or rupture of intracranial vascular lesions (1). Neuraxial block can cause brain herniation in patients with increased ICP which leads to worse outcomes. This case report aimed to present a successful and safe neuraxial anesthesia in a pregnant patient with a history of hemorrhagic stroke.

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CASE REPORT

Twenty-five years old female came into labor in the 33rd week of her second pregnancy with twins. She was admitted two weeks prior with an intracranial hemorrhage volume of 16 ml in the right parietooccipital lobe due to arteriovenous malformation rupture and discharged seven days later (Figure 1). Patient symptoms included moderate headache, vomiting, with no loss of consciousness, neurological deficits, and seizure was reported.

No sequelae symptoms were reported by the patient and the patient was not on any medication. The patient was able to do daily physical activity normally. The patient's weight was 70 kg and height was 165 cm with a BMI of 25.7 kg/m^2. The rest of the physical examination and laboratory examination were unremarkable. The computed tomography (CT) scan was not done due to patient refusal due to fetal radiation exposure, and magnetic resonance imaging (MRI) was not able to be done because the patient was already in labor.

The patient's optic nerve sheath diameter (ONSD) was measured in the morning before surgery and the result was within normal limits (Figure 2). The recent MRI was initially planned to be done, but the patient was then premedicated with paracetamol IV 1000 mg, ondansetron 4 mg, and midazolam 2 mg IV. Neuraxial anesthesia with 10 mg of bupivacaine hyperbaric 0.5% was done at L 2-3 level using a 29G spinal needle. A pinprick test was done and showed analgesia at the T8 dermatome level. No hypotension after spinal was observed and hemodynamic was stable during one hour of surgery.

No neurological symptoms were reported by the patient postoperatively. The patient was admitted to the ICU for postoperative monitoring for 24 hours before discharge to the ward (Figure 3). During the thirty-day follow-up, the patient had no complaints of neurological symptoms and was able to do her normal activity.

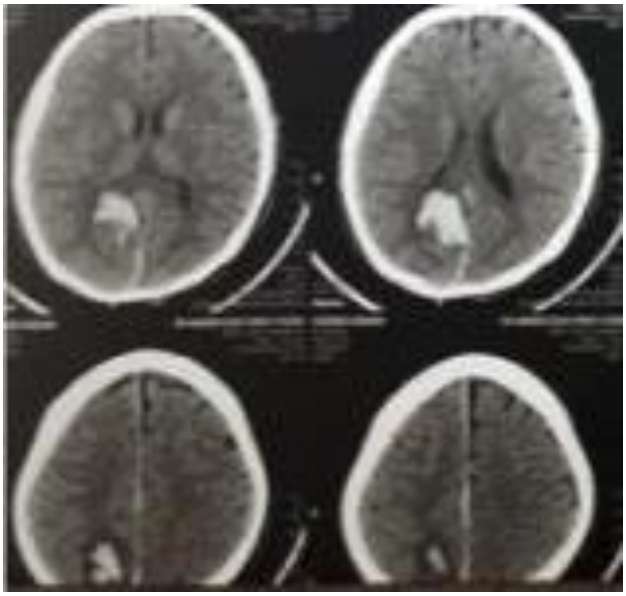

Figure 1. Computed tomography scan of two weeks before

Figure 2. Optic nerve sheath diameter of 6 mm

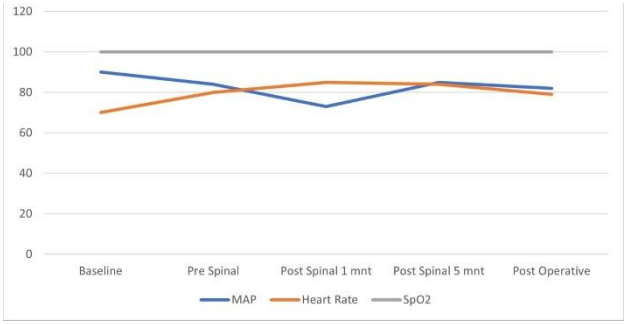

Figure 3. Postoperative monitoring in the intensive care unit

DISCUSSION

Timing of the Surgery and Anesthesia

In general, it is recommended to wait for a minimum of three to six months after an acute stroke before performing surgery and anesthesia, due to the impairment of autoregulation. The perioperative major vascular event and mortality rate are higher in patients within nine months post-stroke than in non-stroke patients. The highest perioperative major vascular event is higher within days 3-14 post-stroke (2). In this patient, the onset was right at 14 days and the patient was in an emergency situation because she was in labor and manual vaginal delivery can increase ICP during delivery, which outdone the risk of the surgery (3).

Anesthesia Consideration

Neuraxial block in patients with a history of neurological diseases was dilemmatic. There's a high risk of brain herniation in patients with high ICP. However, several studies have shown the benefits of neuraxial anesthesia compared to general anesthesia, especially in patients with a history of cerebrovascular diseases, such as minimal pulmonary complication and lower risk of DVT and pulmonary embolism. The dysphagia and diminished cough reflex in stroke patients and the muscle paralysis and sedation from general anesthesia (2,4,5). After throughout neurological examination, the patient showed no symptoms of increased ICP and we measured the ONSD before the spinal to help us exclude the high ICP. ONSD is a fast and non-invasive method for detecting elevated ICP. Several studies and meta-analyses have shown

consistent results that ONSD is a reliable examination. In one of the studies done by Kerscher et al. (4), it was found that the sensitivity of ONSD in detecting increased ICP was higher than funduscopy (92% vs 46%), but funduscopy is more specific for high ICP (86.4% vs 100%) in comparison to the ONSD.

The recent imaging, if possible, is preferably done to confirm the patient's current state. The patient's stroke was two weeks from the onset and showed full recovery, which lowers the risk of herniation. Ten mg dose of spinal is enough to reach T8 level block due to abdominal compression to the epidural space and a high level of progesterone increases a pregnant patient's sensitivity to local anesthesia. To reduce the risk of multiple punctures and big punctures in the dura, spinal was done by the chief resident of anesthesia using a 29G needle. The surgery was also done by the chief resident of obstetrics and gynecology to minimize the duration of the cesarean section.

Neurological Examination

A comprehensive neurological assessment is necessary before considering neuraxial anesthesia in post-stroke patients. This assessment should include a detailed evaluation of motor and sensory function, coordination, cognition, and any other neurological deficits. The presence of significant residual deficits or ongoing neurological deterioration may influence the decision to proceed with neuraxial anesthesia (5,6).

In the case in which high ICP and neurological symptoms can be excluded with stable hemodynamics, neuraxial anesthesia is a safe choice in post-hemorrhagic stroke patients.

Informed Consent: Written informed consent was obtained from the patient for publication and accompanying images.

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