OLGU SUNUMU CASE REPORT

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A Rare Case Report on Cauda Equina Syndrome After Combined Spinal-Epidural Anesthesia

Kombine Spinal-Epidural Anestezi Sonrası Gelişen Nadir Görülen Kauda Ekuina Sendromu

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ABSTRACT One of the complications of neuraxial anesthesia is the relatively rare cauda equina syndrome (0.3-1.2/100,000). Cauda equina syndrome is characterized by perianal sensory loss, sphincter dysfunction, fecal incontinence, urinary retention and paraplegia. Combined spinal-epidural anesthesia was applied to a 54-year-old female patient who was scheduled for arthroplasty for knee prothesis implantation. After a single and uneventful puncture, 3 mL of 0.5% hyperbaric bupivacaine was injected into the subarachnoid space and epidural catheter was inserted. No medication was administered through the epidural catheter other than the test dose. The epidural catheter was removed on the 2nd postoperative day. After epidural catheter removal, the patient started to have urinary and fecal incontinence. Neurological examination and radiological imagings of the patient were normal. In this case; the postoperative findings of the patient who underwent combined spinal-epidural anesthesia, suggestive of cauda equina syndrome, and the approach to the patient are discussed.

Keywords: Cauda equina syndrome; regional anesthesia; anesthesia spinal; anesthesia epidural

ÖZET Nöroaksiyel anestezinin komplikasyonlarından biri de nispeten nadir görülen kauda ekuina sendromudur (0,3-1,2/100.000). Kauda ekuina sendromu; perianal duyu kaybı, sfinkter disfonksiyonu, fekal inkontinans, üriner retansiyon ve parapleji ile karakterizedir. Diz protezi yerleştirilmek üzere artroplasti ameliyatı planlanan 54 yaşındaki kadın hastaya, kombine spinal epidural anestezi uygulandı. Sorunsuz ve tek bir ponksiyondan sonra subaraknoid aralığa 3 mL %0,5 hiperbarik bupivakain enjekte edilerek epidural kateter yerleştirildi. Epidural kateterden test dozu dışında herhangi bir ilaç uygulanmadı. Epidural kateter postoperatif 2. günde çekildi. Epidural kateterin çıkarılmasıyla hastada üriner ve fekal inkontinans başladı. Hastanın nörolojik muayenesi ve radyolojik görüntülemeleri normaldi. Bu olguda; kombine spinal-epidural anestezi uygulanan ve kauda ekuina sendromu düşünülen hastanın postoperatif bulguları ve hastaya yaklaşım tartışıldı.

Anahtar Kelimeler: Kauda ekuina sendromu; rejyonel anestezi; spinal anestezi; epidural anestezi

Neuraxial anesthesia is a frequently used, safe, effective and cost-effective method of regional anesthesia.[1] It is also known that it reduces cardiopulmonary complications and postoperative mortality.[2] While its frequency is low, serious neurological complications can be seen after neuraxial anesthesia. In this case, the approach to the patient, who was followed up with the suspicion of cauda equina syndrome, with the findings that developed in the postoperative period after uneventful spinal-epidural anesthesia with 0.5% hyperbaric bupivacaine was evaluated.

CASE REPORT

Fifty four-year-old, 85 kg, 165 cm, (body mass index: 31.2 kg/m^2), American Society of Anesthesiologist physical status II female patient underwent arthroplasty owing to gonarthrosis. The patient had no known neurological pathology and had only hypertension and hypothyroidism. Vital

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signs, family and medical history, physical examination, and laboratory tests were unremarkable.

Electrocardiogram, pulse oximetry and non-invasive blood pressure monitoring were performed. Sedation was administered with 1 mg midazolam and 50 mcg fentanyl, and preparations were made for combined spinal-epidural anesthesia in sitting position. Prior to the procedure, the lumbar area was disinfected with 10% povidone iodine.

The procedure was performed with a single puncture using 18-gauge epidural needle from the L3-L4 interspace, afterward the subarachnoid space was accessed with the 27-gauge spinal needle of the combined set and 3 mL of 0.5% hyperbaric bupivacaine was injected to intratecal area without aspiration of blood. Then, the spinal needle was removed and the epidural catheter was smootly inserted 5 cm from the epidural needle into the epidural space. The catheter was fixed at 11 cm and the patient was placed in a supine position. Sensory and motor block examination was performed. The level of dermatome block was determined as T10 and the surgery was started. The operation was completed uneventfully and the surgical time was 180 minutes. During the intraoperative period, no medication was administered to the patient through the epidural catheter. At the end of the operation, the sensory and motor block began to gradually disappear. After the operation, 3 mL of prilocaine was administered through the epidural catheter as a test dose. No evidence of catheter misplacement was seen after test dose. Then the patient was sent to the service after being observed for a while.

Two hours after the end of the operation, the patient's sensory and motor block completely disappeared and there were no neurological findings. Epidural patient-controlled analgesia (PCA) was planned for postoperative analgesia, but it was learned that the patient did not use the PCA device. On postoperative day 2, epidural catheter was removed. On the same day, the patient had suprapubic pain with overflow urinary incontinence and fecal incontinence. Physical and neurological examination of the patient was normal. There were no sensory and motor deficit in the lower extremities and no perianal hypoesthesia. Her vibration sense was normal and anal reflex was positive. The patient was consulted to neurology, neurosurgery and urology clinics. Cervical, thoracic, lumbar magnetic resonance imaging (MRI) and computed tomography, as well as brain MRI and electromyography (EMG) examinations were performed. All the radiological imaging and blood tests were within normal limits. Complete urine analysis and urine culture were unremarkable. With recommendation of the neurology clinic, methylprednisolone 60 mg and tolterodine 4 mg were administered on postoperative day 6. On postoperative day 8, her fecal incontinence completely regressed, but her overflow urinary incontinence persisted. Clean intermittent catheterization (CIC) was started at the recommendation of the urology clinic on the postoperative day 10. Methylprednisolone treatment was continued for ten days. On the postoperative day 20, urodynamics was performed and secondary nerve damage was considered. It was planned to continue CIC. On postoperative day 21, the patient was discharged with the recommendation of EMG control in 1 month. Second EMG results were also normal. The CIC was terminated approximately 90 days after discharge. It was planned to continue to follow-up the patient, whose anticholinergic treatment was arranged by the urology clinic.

The patient gave permission for these features of the case to be published, informed consent was obtained and the patient's identity was preserved.

DISCUSSION

Although rare, neuraxial anesthesia has many known severe complications. The incidence of permanent neurological damage due to neuraxial anesthesia is difficult to determine, and its frequency has been reported as 0.3 to 1.2 per 100,000.[2] Cauda equina syndrome is characterized by varying degrees of anesthesia or hypoesthesia in the perianal region, sphincter dysfunction, fecal incontinence, urinary retention, and paraplegia.[3] This damage to nerve roots following neuraxial blockade may occur as a result of compression, inflammation, stretching due to abnormal

position (mostly in the lithotomy position), direct or indirect trauma, and spinal ischemia or neurotoxicity of local anesthetics.[4]

In our case, it was thought that spinal or epidural hematoma might have developed, since the symptoms started immediately after removal of the epidural catheter. However, there was no evidence of hematoma, abscess or spinal stenosis that would lead to compression in the MRI examinations of the patient. Also, arachnoiditis might be considered in the differential diagnosis of cauda equina syndrome. Clinically, neurological symptoms are accompanied by pain, and can be diagnosed radiologically.[5] However, regarding this case, no appearance of arachnoiditis was detected in radiological examinations.

Even though, cauda equina syndrome was considered in terms of the diagnosis, given the course of the patient's symptoms, it was concluded that there was not enough data to make such diagnosis. The absence of any other symptoms in addition to bladder dysfunction and fecal incontinence in the patient's clinical course considered partial S2-S4 involvement. Presence of urinary and/or anal sphincter dysfunction is considered essential in the diagnosis of cauda equina syndrome.[6,7] General opinion about cauda equina syndrome is that symptoms occur with the onset of urinary and/or anal function disorders.[7-9] Therefore, cauda equina syndrome could not be excluded for this case.

We thought that neurotoxicity might be the condition that could explain etiology of this case. Several studies suggest that neurological complications are most commonly associated with intrathecal lidocaine, and lidocaine is a local anesthetic that is generally considered responsible for neurotoxicity.[10] Furthermore, even though laboratory findings suggest that lidocaine, mepivacaine, and ropivacaine may have greater neurotoxicity potential than bupivacaine, a few cases of cauda equina syndrome associated with intrathecal hyperbaric bupivacaine injection have also been reported.[11,12]

In conclusion, with this case report, it was aimed to emphasize that neurological complications may develop even in a single-shot and uneventfully spinal-epidural anesthesia using a routine dose of 0.5% hyperbaric bupivacaine in a patient who did not have any previous spinal pathology. Even though the cause of this complication is not clear, it may be due to the combination of spinal needle and/or epidural catheterization or the neurotoxic properties of hyperbaric bupivacaine. Early detection of complications that may occur after neuraxial anesthesia, differential diagnosis, performing necessary examinations, evaluating and arranging treatment with related clinics are important to minimize the risk of causing permanent damage.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Meltem Bektaş;* ***Design:*** *Ayşe Ceren Doğanözü;* ***Control/Supervision:*** *Hülya Başar;* ***Data Collection and/or Processing:*** *Eyüp Kıymaz;* ***Writing the Article:*** *Ayşe Ceren Doğanözü;* ***Critical Review:*** *Hülya Başar.*

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