

# Regional anesthesia for a patient with severe kyphoscoliosis in percutaneous nephrolithotomy surgery

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## ÖZET

### İleri derecede kifoskolyozlu hastada perkutan nefrolitotomi operasyonu için rejyonel anestezi

Kifoskolyoz hem trakeal entübasyon hem rejyonel anesteziye zorluklara neden olabilen ilerleyici bir hastalıktır. Bu makalede ciddi torakolomber kifoskolyozu olan bir hastada perkutan nefrolitotomi operasyonu için kombine spinal epidural anestezi deneyimimizi sunduk.

**Anahtar Kelimeler:** *rejyonel anestezi, perkutan nefrolitotomi, kifoskolyoz*

## SUMMARY

*Kyphoscoliosis is a progressive disease may cause difficulties with both tracheal intubation and regional anesthesia. This report describes the combined spinal epidural anesthesia experience for percutaneous nephrolithotomy that performed in a patient with severe thoracolumbar kyphoscoliosis.*

**Key words:** *regional anesthesia, percutaneous nephrolithotomy, kyphoscoliosis.*

## Introduction

Scoliosis is a deformity of the spine resulting in a lateral curvature of the spine. Patients with scoliosis present unusual challenges for the administration of anesthesia during surgical procedures. The most common problems are airway management and respiratory problems (1). Regional anesthesia might also be difficult in this type of patients. We report a case of successful combined spinal epidural anesthesia in a patient with severe kyphoscoliosis.

## Case Report

A 150 cm, 62 kg, 51-year-old man with S-shaped curvature of the thoracolumbar spine and kidney stones was scheduled for percutaneous nephrolithotomy. The patient was alert and cooperative. He had kyphotic deformity, scoliosis and pectus carinatum (Fig 1,2). His neck movements including extension were restricted. His airway was assessed as Mallampati class III. The patient had a medical history of chronic restrictive pulmonary disease and asthma with irregular treatment. There was a diffuse infiltration in the right lung on the chest roentgenogram. Spirometry revealed a severe restrictive pattern with a forced expiratory volume 1 (FEV1) %21 and functional vital capacity (FVC) %24. Routh laboratory tests were normal. Combined spinal epidural anesthesia was considered the best option for percutaneous nephrolithotomy operation. The patient was informed about anesthesia and his written consent was taken. When he was shifted to the operating room, venous access was secured with an 18 G cannula. Continuous ECG, noninvasive blood pressure and pulse oximetry were established. Furthermore, supplemental oxygen 2 L/min was given via face mask to the patient. Airway, circulatory and ventilatory support preparations were done due to risk of high spinal anesthesia. On admission, he had a pulse rate of 105/min, blood pressure 143/77 mmHg, and SpO2 %89. He was preloaded 10 ml/kg 0.09% NaCl, and midazolam i.v. 1mg was given intravenously for sedation. The patient was then placed in the sitting position and the spinal vertebral interspace between L2-L3 was accessed in the second attempt. Intrathecally, %0.5 hyperbaric bupivacaine 10 mg (2 mL) was administered and the epidural catheter was placed.

After sensory blockade was confirmed by loss of sensation to pinprick below the T4 dermatome, the patient was placed in the prone position.

500 ml colloid and 1000 ml Ringer's lactate infusions were done during the operation and the patient's vital signs remained within normal limits. During the operation, which lasted 165 minutes, no complications were observed and

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he did not need epidural anesthesia. After surgery, he was monitored until sensory block decreased T10 dermatome, and discharged from the recovery unit to the department of urology. Patient-controlled analgesia via epidural catheter for pain control was achieved. He did not develop a post-dural puncture headache and had an uncomplicated recovery phase with good analgesia. He was discharged on day 6 after operation.



## Discussion

Scoliosis may be idiopathic, congenital, traumatic, neuromuscular or mesenchymal disorders. Idiopathic scoliosis is the most common type causes restrictive lung disease which decreases vital capacity, tidal volume, functional residual capacity and increased respiratory rate (2). Pulmonary function tests should be done. Respiratory insufficiency and the limitation of chest expansion increase the complications. Severe scoliosis is also associated with changed anatomy of the airway causing difficulty in intubation, problem during extubation and patients may require postoperative ventilation. If there is patient's preference or difficulty in performing regional block, general anesthesia is indicated.

Neuroaxis blocks are technically difficult because of obliteration of the interspinous spaces and impossibility to position the patient. Hereby, patient's co-operation and adequate time for the procedure provide better chance of success. For all that, successful outcomes with spinal, epidural or combined spinal epidural anesthetics have been reported in patients with scoliosis. The chance of success spinal anesthesia is higher than epidural anesthesia. Because the cerebrospinal fluid (CSF) provides a clear indication of successful needle placement(3). There are reports using spinal epidural and continuous spinal anesthesia (CSA) for patients with kyphoscoliosis (4,5). Smith and et al. showed that epidural, spinal and continuous spinal techniques can be used for scoliotic women for labour and operative delivery (5).

In one case with severe kyphoscoliosis, adequate surgical anesthesia was obtained adding isobaric bupivacaine to hyperbaric bupivacaine at CSA (1). We preferred the combined spinal epidural anesthesia for additional anesthesia and postoperative analgesia.

The most common technique for spinal anesthesia is injection of hyperbaric anesthetic solution via midline approach in the lateral decubitus position. Hyperbaric solutions produce safe and consistent spinal blocks (6,7). Ozyurt described an asymmetric block in a patient with severe scoliosis; the patient had inadequate, unilateral spinal block with hyperbaric solution, but satisfactory spinal block was obtained with hypobaric bupivacaine (1). We used hyperbaric bupivacaine via midline approach in the sitting position. We obtained symmetrical sensory and motor blockade of adequate duration.

In conclusion, there is not single anesthesia regimen that can be recommended for risky patient with kyphoscoliosis. This case demonstrates that spinal anesthesia and epidural analgesia can be successful even in cases of severe kyphoscoliosis.

## Conflict of interest statement

The authors have no conflicts of interest to declare.

## References

- 1- Ozyurt G, Mogol EB, Bilgin H, Tokat O. Spinal Anesthesia in a Patient with Severe Thoracolumbar Kyphoscoliosis. *Tohoku J. Exp. Med.* 2005; 207, 239-242.
- 2- Kulharni AH, Ambaresha M. Scoliosis and anaesthetic considerations. *Indian J Anaesth.* 2007;51:486-95.
- 3- Veliath DG, Sharma R, Ranjan R, Kumar CP R, Ramachandran TR. Parturient with kyphoscoliosis (operated) for cesarean section. *J Anaesthesiol Clin Pharmacol.* 2012; 28(1): 124-126.
- 4- Moran DH, Johnson MD. Continuous Spinal Anesthesia With Combined Hyperbaric and Isobaric Bupivacaine in a Patient With Scoliosis. *Anesth Analg.* 1990;70:4457
- 5- Smith PS, Wilson RC, Robinson AP, Lyons GR. Regional blockade for delivery in women with scoliosis or previous spinal surgery. *International Journal of Obstetric Anesthesia.* (2003) 12, 17-22.
- 6- Kardash K, King BW, Datta S. Spinal anaesthesia for caesarean section after Harrington instrumentation. *Can J Anaesth* 1993; 40: 667-669.
- 7 - Sakura S. Factors influencing the level of spinal anesthesia: (I). Characteristics of anesthetic solutions. *Masui.* 2000 Jan;49(1):18-25. (abstract)