

Thoracic Spinal Anesthesia for Rotator Cuff Tear Surgery: Case Report

Torakal Spinal Anestezi ile Rotator Kaf Yırtığı Cerrahisi: Olgu Sunumu

¹ Ubeydullah ASLAN^a, ² Nezir YILMAZ^b, ³ Yunus BOZOK^b

^aAdıyaman Training and Research Hospital, Clinic of Anesthesiology and Reanimation, Adıyaman, Türkiye

^bAdıyaman University Faculty of Medicine, Department of Anesthesiology and Reanimation, Adıyaman, Türkiye

ABSTRACT In this case report, we describe the use of thoracic spinal anesthesia in a 53-year-old male patient with a difficult airway and contraindications for an interscalene block, scheduled for rotator cuff tear surgery. The patient, with a medical history of Type 2 diabetes mellitus and hypertension, was assessed preoperatively and found to have a difficult airway and an ipsilateral neck infection. Given these concerns, spinal anesthesia was chosen. A 25-gauge pencil-point needle was inserted at the T2-3 interspinal space. Mild hypotension occurred perioperatively but was effectively managed with ephedrine. The perioperative and early postoperative periods were uneventful, with no further complications. While thoracic spinal anesthesia carries inherent risks, it can serve as a viable alternative when performed by skilled practitioners, especially in cases where other anesthesia techniques are deemed risky or contraindicated.

Keywords: Spinal anesthesia; rotator cuff tear arthropathy; regional anesthesia

ÖZET Bu vaka raporunda, zor hava yolu ve interskalen blok için kontrendike bir durumu olan 53 yaşında erkek bir hastada, rotator manşet yırtığı nedeniyle yapılan cerrahi işlemde torasik spinal anestezi deneyimimizi sunuyoruz. Tip 2 diabetes mellitus ve hipertansiyon öyküsü bulunan hastanın preoperatif değerlendirmesi sırasında zor hava yolu ve ipsilateral boyun enfeksiyonu tespit edilmiştir. Bu bulgular ışığında, cerrahinin spinal anestezi altında yapılmasına karar verilmiştir. Spinal anestezi, T2-3 interspinal aralıkta 25-gauge kalem ucu iğne ile uygulanmıştır. Postoperatif dönemde hafif hipotansiyon gelişmiş, ancak efedrin ile etkili bir şekilde tedavi edilmiştir. Perioperatif ve erken postoperatif dönem komplikasyonsuz geçmiştir. Torasik spinal anestezi bazı riskler taşısa da, diğer anestezi yöntemlerinin riskli veya kontrendike olduğu durumlarda deneyimli hekimler tarafından uygulandığında umut verici bir alternatif olarak öne çıkmaktadır.

Anahtar Kelimeler: Spinal anestezi; rotator manşet yırtığı; rejyonel anestezi

Shoulder surgeries are commonly performed under general anesthesia; however, the superiority in pain control, reduced opioid consumption, and elimination of complications associated with general anesthesia have made regional anesthesia techniques a safer option.¹ In shoulder surgeries, especially in patient groups where general anesthesia be risky, regional anesthesia techniques such as ultrasound-guided single-shot interscalene block or combinations of upper extremity peripheral nerve

blocks are frequently implemented. Additionally, cervical epidural anesthesia has been successfully utilized.² Alongside the mentioned techniques, thoracic segmental spinal anesthesia can achieve anesthetic effects in dermatomes compatible with the surgery using significantly lower doses of local anesthetics.³ In this case, we aimed to present our experience of administering thoracic spinal anesthesia for anesthesia purposes in a patient undergoing surgery due to a rotator cuff tear.

Correspondence: Nezir YILMAZ

Adıyaman University Faculty of Medicine, Department of Anesthesiology and Reanimation, Adıyaman, Türkiye

E-mail: yilmaznezir@hotmail.com



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CASE REPORT

A 53-year-old male patient, 175 cm in height and weighing 83 kg, admitted to the orthopedics clinic with right shoulder pain. As a result of the physical examination and imaging evaluation made by the orthopedics clinic, a rotator cuff tear in the right shoulder was diagnosed, and surgery was planned. Written informed consent was obtained from the patient for publication of this case report.

In our preoperative anesthesia evaluation, the patient, who presented with severe pain and restricted shoulder joint mobility, was found to be under follow-up for Type 2 diabetes mellitus and hypertension. Airway examination indicated Mallampati score of 4 and restricted mouth opening (<3 cm). Laboratory values showed Glucose: 193 mg/dL, sodium: 132 mEq/L, and hemoglobin bA1c (HbA1c): 9.3%, with other values within normal limits. The American Society of Anesthesiologists physical status was determined as 3. Notes on potential difficult intubation and ventilation were added to the anesthesia assessment form, and necessary preparations were recommended. Once preparations were completed, the patient was taken to the operating room for elective repair of the right shoulder rotator cuff tear.

Preoperative vital signs, under standard monitoring (ECG, non-invasive blood pressure, pulse oximetry), were as follows: Heart rate: 63 bpm, arterial blood pressure: 132/63 millimeters of mercury (mmHg), peripheral oxygen saturation (SpO₂): 98%. The patient was scheduled for an interscalene block; however, during the pre-procedural examination, erythema and increased warmth were observed in the planned injection site. These clinical signs raised concerns for a potential skin infection. Consequently, the decision was made to forgo the interscalene block to mitigate the risk of exacerbating the infection or causing further complications.

Due to the anticipated difficult airway and contraindicated situation for interscalene block, thoracic spinal anesthesia was planned. The patient was positioned seated, and the area was cleaned in adherence to aseptic protocols. At the T2-3 level, a 25G pencil-point spinal needle was used to enter the subarachnoid space and cerebrospinal fluid flow observed.

Spinal anesthesia was administered with 5 mg isobaric bupivacaine (Buvicaine 0.5%, 5 mg/ml Polifarma) and 25 micrograms fentanyl (Talinat 0,5 mg/10 mL, Vem İlaç, Türkiye) (figure 1). Sensory block was confirmed in the C4-T4 with a pin-prick test, and the patient was positioned in the beach-chair position, with the operation approved to begin (figure 2). No sedative medication was administered during the perioperative period. The patient experienced hypotension twice and received 2 doses of 10 mg ephedrine. The operation lasted 2 hours, with no complications. Postoperatively, the patient was transferred to the post-anesthesia care unit (PACU) for monitoring. Standard monitoring showed: pulse; 65



FIGURE 1: Spinal anesthesia that has been applied.



FIGURE 2: Intraoperative condition of the patient.

bpm, arterial blood pressure; 129/57 mmHg, SpO₂: 98%. The visual analog scale score was 0-1. The patient regained motor function at 1 hour postoperatively and sensory function at 2 hours. The patient was then transferred to the orthopedics clinic.

DISCUSSION

Shoulder surgeries are significant procedures associated with severe pain, and regional anesthesia techniques can be used both in combination with general anesthesia to prevent postoperative pain and as standalone anesthesia methods. Among regional anesthesia techniques, interscalene block is the most commonly used technique.² Alongside its ease of application and effectiveness, interscalene block carries potential complications including phrenic nerve dysfunction, peripheral nerve injury, Horner syndrome, cervical cord injury, systemic toxicity from local anesthetics, cases of cardiac arrest, and severe hypotension.⁴ In our case, mild hypotension was observed early in the post-spinal anesthesia period. It was managed with two administrations of vasopressors. Temporary phrenic nerve and diaphragm dysfunction are recognized complications of interscalene block, with reported cases of permanent diaphragm paralysis.⁵ There were no respiratory complications observed following the spinal anesthesia administered in our case.

Cervical epidural anesthesia is a regional anesthesia technique that can be used for shoulder surgeries, but there are limited applications documented in the literature. In cervical epidural anesthesia procedures, nerve injury, hemodynamic instability, and respiratory dysfunction have been reported.⁶

Thoracic spinal anesthesia, a technique involving anesthesia administration to the thoracic region of the spine, has garnered interest in various surgical procedures due to its potential advantages and specific considerations. Studies have investigated the use of thoracic spinal anesthesia in different surgeries such as laparoscopic cholecystectomy, excision of lipomas on the back, breast cancer surgery, and abdominal cancer surgery, emphasizing its efficacy and benefits.⁷ Furthermore, thoracic spinal anesthesia has been investigated as an alternative to general anes-

thesia in various surgical scenarios, including laparoscopic cholecystectomy, cesarean section in severe preeclampsia, and major abdominal surgeries in high-risk elderly patients. Studies have demonstrated that thoracic spinal anesthesia can provide manageable hemodynamics, minimal postoperative complications, adequate sensory block, hemodynamic stability, and high patient satisfaction, making it a suitable option for these procedures.⁸⁻¹⁰

Although thoracic segmental spinal anesthesia has several benefits, its use is limited by certain concerns. The main issues include the hemodynamic depressive effects of thoracic sympathectomy and the potential neurological risks associated with the spinal needle's mechanical impact. However, research indicates that these hemodynamic effects are generally mild, and complications like hypotension and bradycardia can be effectively controlled with vasoactive agents.¹¹ Additionally, Imbelloni et al. found that the incidence of paresthesia in thoracic spinal anesthesia was comparable to that in lumbar spinal anesthesia, with no observed neurological sequelae.¹² In our case, we applied thoracic spinal anesthesia at the T2-3 level for shoulder surgery. This represents our experience of performing thoracic spinal anesthesia at a higher level.

As a result, although thoracic spinal anesthesia carries potential risks, it emerges as a promising alternative technique when administered by experienced practitioners in situations where other anesthesia options are risky or contraindicated. Its ability to provide adequate anesthesia, better pain control, early sensory recovery, shorter hospital stays, and a lower incidence of serious postoperative complications makes it a valuable option to consider in surgical practice.

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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 mem-

bers of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Design:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Control/Supervision:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Data**

Collection and/or Processing: Ubeydullah Aslan, Yunus Bozok; **Analysis and/or Interpretation:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Literature Review:** Nezir Yılmaz, Yunus Bozok; **Writing the Article:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Critical Review:** Nezir Yılmaz, Ubeydullah Aslan; **References and Fundings:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok; **Materials:** Ubeydullah Aslan, Nezir Yılmaz, Yunus Bozok.

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