



## Unilateral Spinal Anesthesia Management in Patient for Above-Knee Amputation Surgery

### Diz Üstü Amputasyonu Planlanan Hastada Unilateral Spinal Anestezi Yönetimi

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Dear Editor,

Rather than general anesthesia, regional anesthesia is a more preferred method in lower extremity surgeries. In geriatric patients, the presence of cardiac, respiratory, renal, and cerebral diseases increases the risk of preoperative and postoperative morbidity and mortality. Unilateral spinal anaesthesia has several advantages such as reducing cardiovascular side effects and, despite lower drug doses, providing strong blocks (1,2). Unilateral spinal anaesthesia is the method that effects hemodynamics the least in geriatric patients. In this letter, we aim to present a unilateral spinal anaesthesia application with fentanyl added low dose anaesthetics performed on an ASA IV E geriatric patient who was taken to the operation room for an above-knee amputation in emergency circumstances.

A 68 year old male patient was admitted to the emergency department with severe pain in the foot that had been increasing in the last two weeks. Peripheral angiography showed 100% stenosis in the right common iliac artery and the left femoral artery. In emergency conditions, we planned an above-the-knee amputation operation for limb ischemia. The preoperative evaluation told that the patient had chronic obstructive pulmonary disease (COPD) for the last 10 years, previous pulmonary tuberculosis, coronary artery disease, hypertension, and a smoking history of twenty-a-day for 30 years. In the physical examination, the patient had poor general health condition; he was conscious, cooperative, and concerned. Mouth opening and neck movements were normal but there were missing teeth. Lung sounds were bilaterally equal and rough with basilar rales. The arterial blood pressure (ABP) was 110/60 mmHg; the peak heart rate (PHR) was 82 beats/min and it was arrhythmic. The patient was on bronchodilator inhalers, diltiazem, pentoxifylline, and atorvastatin. The electrocardiogram (ECG) results displayed a right bundle branch block and atrial fibrillation while the echocardiography (ECHO) showed an ejection fraction of 35%, left ventricular systolic dysfunction, mild-to-moderate mitral and tricuspid deficiency. Assessed as ASA IV E and after securing intensive care unit conditions, the patient underwent the operation. The preoperative laboratory tests were within normal limits. The arterial blood gas

evaluation was pH: 7.38, pCO<sub>2</sub>: 45 mmHg, pO<sub>2</sub>: 68 mmHg, HCO<sub>3</sub>: 20 mmol/L, and SpO<sub>2</sub>: 89%. In the preoperative preparation room, 20G cannulation was performed in the back of the patient's hand. Prior to the spinal block, we administered 10 mL/kg of 0.9% saline infusion that would be effective for 30 minutes. Once in the operating room, we started the standard ECG, PHR, non-invasive arterial pressure (NIAP), and peripheral oxygen saturation (SpO<sub>2</sub>) monitoring. The patient was put in lateral decubitus position by keeping the operation area at the bottom. Puncture area was disinfected by 10% povidone-iodine antiseptic dissolver (Isosol ®) and covered with sterile perforated compress. Observing the coming of the clear cerebrospinal fluid (CSF) after puncturing through L3-4 into intrathecal range with a 22 G "Quincke" spinal needle in lateral decubitus position, we administered 5 mg of 0.5% bupivacaine (1ml) and fentanyl 10 mcg (1mL). After the injection of the drug, the patient was kept in lateral decubitus position for 15 minutes; then, once we were ensured that the spinal anaesthesia was achieved, we put the patient in the supine position. The patient's vital signs were stable and the operation was launched. With preoperative 4 lt/mins oxygen mask, SpO<sub>2</sub> was monitored over 96%. Due to a 700 ml blood loss, we implemented one unit of packed red blood cells. Hemodynamical parameters remained stable throughout the operation. After the seventy-five-minute surgery, the patient was taken to the postoperative recovery room. Having observed stable hemodynamical findings and sensory and motor block level regression, the patient was sent to the service without any complications.

It is known that regional anaesthesia is more advantageous compared to general anaesthesia in elderly patients with organ dysfunctions and systemic diseases (1). Due to having less postoperative complications and being supportive throughout analgesic therapy, unilateral spinal anaesthesia is often preferred in orthopaedic surgery as a technique of regional anaesthesia. Low doses of local anaesthetics used in unilateral spinal anaesthesia result in a more stable cardiovascular profile because of slow and limited diffusion (1,2). Donati et al., in their study to monitor

hemodynamic changes during unilateral spinal anaesthesia, has proved that unilateral spinal anaesthesia improves stability significantly in hemodynamic parameters (3). Various studies underline the superiority of unilateral spinal anaesthesia over bilateral spinal anaesthesia in patients with cardiovascular risks (1). In our case, although cardiovascular problems existed, we did not observe any hemodynamical issues during and after the application of unilateral spinal anaesthesia. COPD may increase the possibility of preoperative and postoperative respiratory problems during general anaesthesia. Airline bronchospasm may also occur during manipulation. A decrease in functional residual capacity and ciliary activity in the postoperative period results in lung macrophage dysfunction and risk of aspiration with increased upper airway reflex inhibition. In these patients, one may encounter ventilation/perfusion disturbances, pneumothorax, residual effects of anaesthesia, postoperative respiratory failure, and mechanical ventilation dependence (4). In medium and high grade COPD patients, high-level regional anaesthesia comes along with some disadvantages as far as pulmonary functions are concerned. The motor block that develops after high-level regional anaesthesia may bring about reduction in peak inspiratory and expiratory flow along well with inadequate spontaneous ventilation. Following the decrease in vital capacity, effective coughing and deterioration in ventilatory mechanical systems may arise. Because of these reasons, once

regional anaesthesia is decided as the application method, doctors should conduct blocking with lowest levels and avoid hypotension and anaemia (4). In our patient, we did not encounter any postoperative complications after the unilateral spinal anaesthesia.

To conclude we aimed to show that unilateral spinal anaesthesia conducted with low-dose local anaesthetics and fentanyl combination is a safe method that prevents possible preoperative and postoperative cardiac and respiratory issues in patients with poor general condition and high cardiac and respiratory risks and that it can be safely adapted as an anaesthesia option.

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