

CASE REPORT

REGIONAL ANESTHESIA

Regional anesthesia for foot surgery in a patient with high-grade B-cell lymphoma

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Abstract

Cancer is a global health issue. Approximately 40% of the world population faces cancer at some point of their lives. Even though various cancer treatment modalities, such as chemotherapy, radiotherapy or surgery, have been improved during the recent past, they still can cause many undesirable side effects. In order to administer a good and safe anesthesia in these patients, the acute and chronic side effects of the cancer treatment must be well understood by the anesthesiologist. Regional anesthesia has been thought to have a positive effect on the postoperative healing by decreasing the stress response to surgery. Some studies even show beneficial effects of regional anesthesia in oncological cases. We present a report of spinal anesthesia in a patient with high-grade B-cell lymphoma, scheduled for amputation of necrotic toes of feet.

Key words: Regional anesthesia; Lymphoma; Cancer; Chemotherapy; Radiotherapy

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1. Introduction

Cancer is a global health issue, and the number of victims of metastatic disease are on a rise. Perhaps approximately 40% of the world population is expected to face cancer at some point of their lives. Even though cancer treatment methods, such as chemotherapy, radiotherapy or surgery have been improving rapidly, they might also produce many side effects of their own. The acute and chronic side effects of the patient's cancer treatment must be well known to the attending anesthesiologist, especially the drug reactions and altered drug metabolism must be kept in mind. Regional anesthesia has a positive effect on increasing the post operative healing by decreasing the stress response to surgery. Some studies show beneficial results in oncological cases when operated

upon under regional anesthesia. We chose spinal anesthesia for a patient with high-grade B-cell lymphoma, who needed amputation of multiple toes due to gangrene.

2. Case report

An 18 year old female patient was planned to be operated for amputation of bilateral fingers and toes due to necrosis. The patient was diagnosed to be suffering from high-grade B-cell lymphoma a year back after she developed right gluteal pain. During the chemotherapy sessions, she had to be admitted to ICU because of the septic shock that presented with fever, hypotension, loss of consciousness and she had to be put on inotropes. There is no exact information about the duration of the septic shock, but perhaps it took

almost one month for her to recover fully, as was evident from her file. During her time in ICU, she started to have necrotic lesions of her finger tips and toes. Inj. perlinganit and dextran therapy were started. She also had a cardiac arrest and needed to be resuscitated for 17 min.

She was followed with mechanical ventilation while being intubated. There was no detailed information about how many days the septic shock lasted in the patient's file. It was the preference of the patient's clinical doctor not to do the necrotic tissue excision while the patient was intubated and on ventilation. The hematologist confirmed that she was no longer in sepsis so we decided to choose spinal block for the surgery.

She was discharged to the hematology clinic after her general condition improved and she regained consciousness. The patient was assessed by the anesthesiologist pre-operatively for the excision of the necrotic areas. PET-CT showed wide-spread metastasis. Pre-operative consultation by the pulmonologist was requested because of the patient's symptoms of cough and expectoration. Regional anesthesia was suggested by the pulmonologist.

The vital signs of the patient on the operating table were recorded as; NIBP 174/106 mmHg, pulse 150/min, sinus tachycardia, and SpO₂ 93%. Orthopedic surgeon planned to amputate the right foot metatarsals and left toes, so we planned to administer spinal anesthesia. The patient was informed about the spinal anesthesia and after her approval, 7.5 mg heavy bupivacaine was given through the 25 G Quincke spinal needle in the sitting position. After maintaining anesthesia to T12 level, the operation was started. In. midazolam 1 mg and fentanyl 50 µg IV were administered for sedation. Oxygen was given at 4 L/min through a nasal cannula. Arterial BP was well-maintained with the sedation and spinal anesthesia. After the amputations by the orthopedic surgeon were finished, the plastic surgery team was called in to amputate the fingers. Ultrasound assisted left axillary block was performed with 6 ml bupivacaine 0.5% + 6 ml prilocaine 2% + 8 ml normal saline (a total of 20 ml) by block needle. Amputation of the left 4 distal phalanges was done by the plastic surgery team. During this time, patient started to feel pain in her feet because of the wearing off the effect of spinal

anesthesia. To relieve her pain 10 mg ketamine and 10 mg of propofol were given intravenously.

At this time, the plastic surgery team planned to amputate 3 distal phalanges of the right hand because of the necrotic fingertips. This time ultrasound assisted right axillary block with 6 ml bupivacaine 0.5% + 6 ml prilocaine 2% + 8 ml normal saline (total 20 ml) was done by block needle. The total time taken by the three surgeries was 4 hours. The patient was transferred to the post-operative care unit with stable hemodynamic parameters.

3. Discussion

Epidural and spinal anesthesia reduce the stress response to the surgery and prevent the suppression of immunity. Patient is protected from postoperative infections and tumor metastasis that are caused by immune suppression by surgery and general anesthesia.¹ Chemotherapeutic agents show their effects by targeting rapidly proliferating cancer cells. This also causes negative effects on normally reproducing cells of the body. Toxicities of these drugs damage the organism in long and short terms. Cardiac, pulmonary, hepatic, gastrointestinal, neurologic systems and the bone marrow, are all effected.² Regional anesthesia and analgesia are usually selected in surgical oncology as far as possible. Regional anesthesia reduces the surgery induced proinflammatory response and periodically increases the release of cytokines IL-4 and IL-10. Local anesthetics can induce the activity of natural killer cells which are important in tumor cell response. Intravenous and inhalation anesthetics ruin the B cell function and induce their apoptosis.³ They may worsen the prognosis by increasing the levels of hypoxia-induced factor (HIF-1 alpha) which induces angiogenesis.⁴ Volatile anesthetics are associated with immune modulation. They may cause cancer spread by; decreasing natural killer (NK) cell activity, intervention of lymphocyte antigen activity, induction of lymphocyte apoptosis and some direct effects on tumor cells. Nitrogen protoxide, xenon, high concentrated oxygen may have these effects. There are studies that show volatile agents like sevoflurane, isoflurane can show immune modulation.⁵ Surgery itself causes early hyperinflammatory response followed by anti-inflammatory state and shift to the T

helper type 2 side on T helper type 1/ T helper type 2 balance. All of these cause suppression of cellular immunity. Bacteremia and septicemia are generally thought to be relative or absolute contraindications for central neuraxial (CNA) blocks. Postulated mechanisms for hematogenous infection of the central nervous system (CNS) caused by subarachnoid or epidural puncture might be an accidental vessel puncture, a change of pressure in the subarachnoid space, and the induction of a "locus minoris resistentiae." Infectious complications of diagnostic lumbar puncture, spinal or epidural anesthesia are very rare.⁵ We also thought about epidural anesthesia, but we preferred spinal anesthesia as the starting time of surgery would be longer with epidural anesthesia.

In the light of all of this information, we applied central and peripheral blocks with sedation to our patient with lymphoma. We aimed to reduce the negative effects on the immune system. Cancer is a leading global health issue and in order to maintain the best peri-operative care, mutual trust and collaboration by the anesthetist, the operating surgeon and the oncologist is mandatory.⁶

4. Conflict of interest

None declared by the authors.

5. Authors' contribution

All authors took part in the conduct of this case as well as the preparation of the manuscript.

6. References

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