

Bilateral axillary block: a case report

Abstract

Bilateral axillary block is rarely applied because of the risk for systemic local anesthetic toxicity, and mostly general anesthesia is preferred. The use of ultrasound provides easy visualization of the vascular and nervous structure, and enable decreasing the dose of local anesthesia used. In this report, we present our experience with bilateral axillary block in a patient operated due to bilateral carpal tunnel syndrome, but who we thought to have a high risk for general anesthesia.

Keywords: bilateral axillary block, ultrasonography, regional anesthesia

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Introduction

Brachial plexus can be blocked with interscalene, supraclavicular, infraclavicular and axillary approaches. The approach to be used may vary depending on the operation site, experience of the practitioner, and anatomy of the patient. Brachial plexus block is a regional anesthesia technique which can be used in forearm and hand surgery, intraoperative anesthesia and postoperative analgesia.¹⁻³ Various techniques are used in axillary plexus blockade. The use of peripheral nerve stimulation is termed as 'blind technique' and is not possible to visualize the target tissues with this technique.⁴⁻⁶ Blind technique may lead to complication due to repeating interventions.^{7,8}

The use of ultrasound in regional anesthesia is increasingly become widespread with the development of ultrasonographic (USG) technology and increased image quality. Nervous blockade with ultrasonography decreases complication risk by direct visualization of the block needle, lower-dose local anesthetic volume, and decreased risk of vascular and pleural puncture. Therefore the use of ultrasound in peripheral nervous blockade provide us numerous advantages.⁹

Bilateral axillary block is rarely applied because of the risk for systemic local anesthetic toxicity. Therefore, mostly general anesthesia is preferred in bilateral extremity operations. The use of ultrasound provides easy visualization of the vascular and nervous structure, and may be helpful in brachial plexus blockade by using lower doses of local anesthesia.¹⁰

In this case report, we present our experience on bilateral axillary block with low doses that we applied in a patients scheduled for bilateral upper extremity surgery, in the light of the literature.

Case report

Preoperative anesthetic evaluation of a 68years old, 78Kg weight and 172cm height male patient who was scheduled for bilateral carpal tunnel syndrome revealed that he had a history of previous coronary artery by-pass surgery, he was under follow-up for the diagnoses of hypertension (HT), heart failure (HF), chronic obstructive pulmonary disease (COPD) and was using antihypertensive and bronchodilator drugs. The patient was preoperatively consulted to thoracic diseases and cardiology departments. The department of cardiology reported ejection fraction of the patient as 45%, and an operation under general anesthesia would had a high risk for cardiac status. The department

of thoracic diseases stated that bronchodilator must be continued and general anesthesia would had a moderate risk for chest diseases. Preoperative risk of the patient was evaluated as 3 according to the American Society of Anesthesiologists (ASA). The patient rejected local anesthesia, and since general anesthesia would be risky due to the cardiac and pulmonary problems of the patient, we used bilateral axillary block.

The patients was informed about that he will undergo bilateral nervous block, and conversion to general anesthesia might be needed if the block is not sufficient. Standard monitoring of the patient was carried out with electrocardiography, noninvasive blood pressure, and pulse oximetry in the regional block application room. Oxygen supplement was provided. Intravenous (IV) access was obtained from the left foot region with a 18 G cannula.

In supine position, head of the patient was turned opposite to the region where the block will be induced. The arm which will be blocked was positioned, and following disinfection of the area with polyvinylpyrrolidone, a sterile US probe (Esaote LA435 linear probe, 10-18 Mhz, Floransa, Italy) was longitudinally inserted to the axillary region. Local anesthetic of 2mL was delivered with 22G nerve stimulation needle (Pajunk, Geisingen, Germany) and when the spread was observed, the remaining local anesthetic was delivered with intermittent aspiration. Local anesthetic was seen to be separated around the axillary artery (lateral, posterior, medial). A total drug volume of 20mL was administered for a single extremity with 7.5mL 2% lidocaine, 7.5mL 5% bupivacaine, and 5mL normal saline. The same process was applied in the opposite side in a similar way. Surgical anesthesia occurred in both sides within 10minutes after drug delivery. The patient did not develop any complication especially related to vascular puncture or local anesthetic and block applications. No any additional sedation or local anesthetic injection was needed during the surgery. The operation lasted around 40 minutes without any problem and pain feeling of the patient. No pain complaint was observed from the patient who was monitored postoperatively for 12hours.

Discussion

Peripheral nervous blockade is an anesthetic method usually preferred in the upper extremity surgery.¹¹ Brachial plexus blockage is a method used to provide intraoperative anesthesia and postoperative analgesia in the forearm and hand surgery. Brachial plexus can be

blocked with interscalene, supraclavicular, infraclavicular and axillary approaches.¹⁻³ The approach to be used may vary depending on the operation site, experience of the practitioner, and anatomy of the patient. Although brachial plexus blockage is commonly used as unilateral approach, its bilateral use is extremely rare, and usually in form of case reports or very small series.¹⁻³ Anesthetists do not prefer bilateral block application, because it is time consuming, requires additional invasive intervention in the patient, delivery of high dose local anesthetic carries toxicity risk, and low dose administration has failure risk. Franko et al.,³ stated that they completed the operation without complications by performing supraclavicular block from one side and axillary block from the other side utilizing a nerve stimulator. Maurer et al.,¹ reported that safe surgical anesthesia was achieved using 350mg ropivacaine with interscalene block from one side and supraclavicular block from the other side.¹ In our case, the patient rejected local anesthesia, and since general anesthesia had high risk we used bilateral axillary block.

Nerve stimulation with needle has been a standard method in blockage applications for about 30years. Peripheral nervous stimulation is named as “blind” technique, because it is impossible to visualize the needle and targeted tissues. In this technique distance to the nerve can be estimated according to muscle contractions innervated by the nerve.⁴⁻⁶ In recent year, USG guided nerve block have been commonly used. The use of USG provide synchronous visualization of the needle, structures that must be spared such as the pleura and vessels, and the distribution of local anesthetic during the injection. In addition, lower needle movements compared to the nerve stimulation patient comfort and acceptability of the procedure.^{6,12} In our patient also we used US guided injection technique both in order to decrease the dose local anesthetic, and minimize block failure.

Conclusion

We think that axillary block can be safely applied as bilateral, because the use of US provides easy visualization of the vascular and nervous structures, and enables significant reduction of local anesthetic doses.

Acknowledgments

None.

Conflicts of interest

The author declares there is no conflict of interest

References

1. Maurer K, Ekatodramis G, Rentsch K, et al. Interscalene and infraclavicular block for bilateral distal radius fracture. *Anesth Analg.* 2002;94(2):450–452.
2. Sandhu NS, Maharlouei B, Patel B, et al. Simultaneous bilateral infraclavicular brachial plexus blocks with low-dose lidocaine using ultrasound guidance. *Anesthesiology.* 2006;104(1):199–201.
3. Franco CD, Salahuddin Z, Razad A. Bilateral brachial plexus block. *Anesth Analg.* 2004;98(2):518–520.
4. Perlas A, Niazi A, McCartney C, et al. The sensitivity of motor response to nerve stimulation and paresthesia for nerve localization as evaluated by ultrasound. *Reg Anesth Pain Med.* 2006;31(5):445–450.
5. Sauter AR, Dodgson MS, Stubhaug A, et al. Ultrasound controlled nerve stimulation in the elbow region: high currents and short distances needed to obtain motor responses. *Acta Anaesthesiol Scand.* 2007;51(7):942–948.
6. Tsai TP, Vuckovic I, Dilberovic F, et al. Intensity of the stimulating current may not be a reliable indicator of intraneurral needle placement. *Reg Anesth Pain Med.* 2008;33(3):207–210.
7. Fanelli G, Casati A, Garancini P, et al. Nerve stimulator and multiple injection technique for upper and lower limb blockade: failure rate, patient acceptance, and neurologic complications. Study Group on Regional Anesthesia. *Anesth Analg.* 1999;88(4):847–852.
8. Brown DL, Bridenbaugh LD. *The upper extremity somatic block.* In: Cousins MJ, Bridenbaugh PO, Editors. Neural blockade. Philadelphia: Lippincott–Raven.1998:345–370.
9. Casati A, Danelli G, Baciarello M, et al. A prospective, randomized comparison between ultrasound and nerve stimulation guidance for multiple injection axillary brachial plexus block. *Anesthesiology.* 2007;106(5):992–996.
10. Sandhu NS, Capan LM. Ultrasound-guided infraclavicular brachial plexus block. *Br J Anaesth.* 2002;89(2):254–259.
11. Klein SM, Evans H, Nielsen K, et al. Peripheral nerve block technique for ambulatory surgery. *Anesth Analg.* 2005;101(6):1663–1676.
12. Koscielniak–Nielsen ZJ, Rasmussen H, Hesselbjerg L, et al. Infraclavicular block causes less discomfort than axillary block in ambulatory patients. *Acta Anaesthesiol Scand.* 2005;49(7):1030–1034.