
Journal of
Anesthesiology & Clinical Science
ISSN 2049-9752

HOAJ
Herbert Open Access Journals

Special Section | Regional Anesthesia | Case report Open Access

Peripheral nerve block to the lower extremity despite relative contraindication (two cases)

Müge Koşucu[1*], Ahmet Beşir[1] and Ahmet Eroğlu[2]
*Correspondence: mugekk73@hotmail.com
[1]Assistant professor and Doctor, Karadeniz Technical University Faculty of Medicine Department of Anesthesiology and Reanimation, 61080, Trabzon/TURKEY.
[2]Professor and Doctor, Karadeniz Technical University Faculty of Medicine Department of Anesthesiology and Reanimation, 61080, Trabzon/TURKEY.

Abstract

Peripheral nerve blocks can provide a number of advantages in high-risk patients and may sometimes be preferred despite relative contraindication. Our first case had relative contraindication due to being confused, with a Glasgow coma score of 10, and our second case due to the presence of bacteremia, and also the anti-platelet treatment he was receiving. In this case report we describe our experience with peripheral nerve block to the lower extremity in two high-risk patients with relative contraindication. Block with the classic Winnie approach (3-1) and anterior sciatic nerve block with the Meier method were applied in both cases, with lateral femoral cutaneous block being additionally performed in the second case. No complications were observed.

Keywords: Lower limb, peripheral nerve block, contraindication, patient with high risk

Introduction

Peripheral nerve blocks (PNBs) may be regarded as providing a number of advantages, especially in high-risk patients, compared to general anesthesia and central neuraxial blocks [1]. However, lower extremity blocks for the purpose of establishing surgical anesthesia are performed more rarely than upper extremity blocks. The fact that both lumbar and sacral plexuses need to be anesthetized is the most important limiting factor in establishing complete block in the lower extremity at the level of surgical anesthesia. Factors representing absolute contraindication for PNBs include patient refusal, infection at the site of injection and allergy to the local anesthetic used. Relative contraindications are patients being confused or heavily sedated, pre-existing neurological deficit in the distribution of the nerve block, coagulopathy and bacteremia in the setting of perineural catheter placement. However, despite the existence of relative contraindications, PNB can still be preferred in consideration of the harm-benefit relationship. We believed that PSB would be less risky, despite the existence of relative contraindication, in our confused first patient and in a second patient with bacteremia who was also receiving anti-platelet therapy. PNB was therefore performed accordingly. This report describes the conditions under which we reached this decision and our experience during the entire anesthesia procedure.

Case reports

Case 1 : An 80-year-old, 75-kg, male patient was brought to the emergency department following a traffic accident. His general condition was poor and he was confused. Light reflex was positive in both eyes and his Glasgow coma score was 13. Subdural hematoma and traumatic subarachnoid bleeding were determined in the right temporoparietal region at computerized brain tomography. Widespread pulmonary contusion and fractures in the left tibia, fibula and pelvis were revealed at direct imaging. Anamnesis taken from the family revealed a 20-year history of chronic obstructive pulmonary disease and a 10-year history of coronary artery disease. He had required mechanical ventilation support several times previously due to exacerbation of chronic obstructive pulmonary disease. The brain surgery department decided on medical treatment and observation. Urgent surgery by the orthopedic department was then scheduled for open reduction, internal fixation and median ligament repair. At examination immediately before surgery, the patient had a Glasgow coma score of 10. On the basis of existing diseases, his impaired general condition and contraindication for central neuraxial block, the patient was classified in the ASA IV risk group, and it was decided to perform PNB. Consent for anesthesia was obtained from a first-degree relative. Mean arterial pressure, heart rate and peripheral oxygen saturation were monitored. The first recorded peripheral saturation was 88. O_2 was given by mask at 4 l/min with no sedative or systemic analgesic. In order to perform the classic Winnie technique (3-1), the patient was placed in a supine position and the inguinal ligament joining the pubic tubercle and the spina iliaca anterior superior was identified, followed by the line of the femoral artery [2,3]. A 50-mm stimulant needle with 2 mA current was inserted 1.5-2 cm beneath the inguinal ligament and 1-1.5 cm from the lateral aspect of the femoral artery. Once quadriceps muscle contraction associated with femoral nerve stimulation and *"patellar twitch"* were observed,

doi: 10.7243/2049-9752-2-29

and when "*patellar twitch*" was seen to persist when the current was reduced to 0.5 mA, 30 ml 0.5% ropivacaine was administered gradually with the negative aspiration test. Subsequently, in order to perform the Meier technique, the iliaca anterior superior, pubic tubercle and trochanter major were indicated without changing the patient's position [4,5]. The line joining the pubic tubercle and the iliaca anterior superior was regarded as the inguinal ligament. A second line passing from the trochanter major was drawn parallel to this. The uppermost line was divided into three equal parts and a line drawn from where the middle 2/3 joined the second line. This point was determined as our entry point, and a 150-mm stimulant needle was inserted at 80-90 degrees. Initial current was 2 mA. Once dorsal flexion response from the peroneal, or plantar flexion response from the tibial section of the peroneal part of the sciatic nerve was observed to persist with a current of 0.5 mA, the negative aspiration test was performed and 35 ml 0.5% ropivacaine given. At the 20th min after block, sufficient motor and sensory block developed to permit the surgical procedure, and the operation began. The patient felt no pain throughout the 85-min operation. Vital signs remained stable and no complication was observed. The patient was transferred to the brain surgery department intensive care unit without complications, with stable vital signs and breathing spontaneously. Motor block disappeared on the 8th hour after surgery and sensory block on the 10th hour. No analgesic was required for the first 10 hours.

Case 2 : Detailed tests were requested due to multiple comorbidities in a 77-year-old, 70-kg male patient, scheduled for surgery due to open fracture of the left tibia. The patient had a history of coronary artery disease. At electrocardiography, there was widespread T negativity in lead II and III derivations and ischemia findings in the inferior wall at myocardial perfusion scintigraphy. Ejection fraction at echocardiography was 30%. Following acute myocardial infarction he received acetylsalicylic acid 300 mg 1x1, clopidogrel 75 mg 1x1 and beloc 50 mg 1x1. The drugs were not stopped or interrupted for the first month. At analysis of the patient's coagulation profile, prothrombin time was 46 s, partial thromboplastin time 47 s and thrombocyte number 150,000 ml^{-1}. The patient was also on a dialysis program due to chronic renal failure. His dialysis values were BUN: 67 mg/dl^{-1}, creatinine: 4.71 mg/dl^{-1}, Na: 145 mEq/L^{-1}, K: 4.4 mEq/L^{-1}, Ca: 8.8 mg/dl^{-1}, Hb. 10.7 g/dl^{-1}, Htc: 33.1% L/L^{-1}, and thrombocyte: 254,000 ml^{-1}. The patient had acute bacteremia. Paresis was observed in the right lower extremity due to cerebrovascular event four years previously. The patient was classified as ASA risk group 4, and we decided to perform PNB. Consent to anesthesia was obtained from first-degree relatives. Mean arterial pressure, heart rate and peripheral oxygen saturation were monitored, and 4 l/min O_2 began being administered by mask. In order to adopt the classic Winnie (3-1) approach, the patient was placed in the supine position and the inguinal ligament joining the pubic tubercle and iliaca anterior superior and the line of the femoral artery were identified [2,3]. A stimulating needle with a 2 mA current was inserted 1.5-2 cm beneath the inguinal ligament and 1-1.5 cm from the lateral aspect of the femoral artery. When quadriceps muscle contraction associated with stimulation of the femoral nerve and "*patellar twitch*" were observed, and once "*patellar twitch*" persisted when the current was lowered to 0.5 mA, 25 ml 0.5% was gradually administered with the negative aspiration test. For lateral femoral cutaneous block, we entered an average of 1-1.5 cm inferior to the spina iliaca anterior superior and 1-1.5 cm from the medial aspect, and 10 ml 0.5% ropivacaine was given following description of paresthesia [3,4]. Subsequently, in order to perform anterior sciatic nerve block using Meier's method, the spina iliaca anterior superior, pubic tubercle and trochanter major were marked without changing the patient's position [4,5]. The line joining the pubic tubercle and iliaca anterior superior was taken as the ligamentum inguinale. A second line was drawn parallel to this passing from the trochanter major. The upper line was divided into three equal sections, and a line was drawn from where the medial and middle 2/3 joined to the second line. This point was determined as our point of entry. A 150-mm stimulating needle was inserted at 80-90 degrees. Initial current was 2 mA. When dorsal or plantar flexion response involving the peroneal or tibial section of the sciatic nerve was seen to continue with a current of 0.5 mA, 25 ml 0.5% ropivacaine was given with the negative aspiration test. Full sensory block took place at the 15th min and full motor block at the 22nd min, and the operation then started. Vital findings were stable throughout the perioperative period. Surgery lasted 140 min, and no complication was encountered. Motor block disappeared at the 12th hour post-surgically and sensory block at the 18th hour. "Informed case report consent" was obtained from relatives of both patients before discharge.

Discussion

Since PNBs have fewer hemodynamic effects they can represent an alternative to general anesthesia or central neuraxial blocks in cases of high risk due to comorbidity problems. In the presence of relative contraindication in such situations, PSBs may be performed in the light of very careful analysis bearing in mind the profit and loss equation.

Our first case was of advanced age, with multi-trauma, and with no possibility of central neuraxial block due to traumatic subarachnoid hemorrhage and subdural hematoma with increased intra-cranial pressure. PNB was relatively contraindicated due to confusion. "Patient refusal" is the most important absolute contraindication for PNBs [1]. Our patient was unable to give informed consent. In addition, the patient needs to be cooperative during the procedure and must remain immobile. Cooperation is even more important for paresthesia-based PNBs performed without use of a nerve stimulator or ultrasound. We used a nerve stimulator. It is important to bear in mind that injecting under

doi: 10.7243/2049-9752-2-29

a stimulating response below 0.2 or even below 0.5 mA in some cases can indicate intraneural needle placement and a risk for neurological injury. Use of ultrasound, either alone or in concert with nerve stimulation, is also acceptable in order to visualize nerve structures and local anesthetic spread. Due to the history of advanced chronic obstructive pulmonary disease and coronary artery disease in this case, we wished to avoid anesthesia-associated hemodynamic changes during surgery and possible subsequent respiratory difficulties in this patient. We informed first-degree relatives concerning potential associated with the management of these types of anesthesia. Once they had provided informed consent, we elected to establish surgical anesthesia conditions with PNBs to the lower extremity instead of general anesthesia. Blocks were performed by an experienced anesthetist.

Our second case was a trauma patient of advanced age who had experienced acute myocardial infarction 10 days previously, was using acetylsalicylic acid and thrombocyte aggregation inhibitor, was determined to have acute bacteremia, and had comorbid problems such as kidney failure and cerebrovascular event. Since the fracture was open and compound, we decided not to delay surgery. However, due to the history of acute myocardial infarction, ejection fraction evaluated at 30% and chronic kidney failure, fluid restriction and his being on an alternate day dialysis program, we elected to use PNB as the anesthesia technique. The patient's neurological deficit was not a problem since this was on the opposite side of the leg. However, the use of drugs that affect the patient's coagulation profile and the presence of acute bacteremia situations should be carefully evaluated in terms of relative contraindications. While indicating that installation of a continuous catheter in the presence of bacteremia can lead to septic colonization around the foreign body, studies also state that this risk does not apply in the "single-shot" technique and that this cannot be regarded as a contraindication [1,6]. Coagulation therapy is constantly being updated with the entry into use of new drugs and PNB applications. Low-dose unfractionated heparin, low molecular weight heparin and acetylsalicylic acid are not regarded as definite contraindications for PNB if coagulation disorder is not confirmed. Psoas compartment block is the most risky procedure in patients receiving anti-coagulant therapy. Nonetheless, permanent nerve damage has not been reported in psoas compartment block [7,8]. However, coagulation tests before PNB are absolutely advised in patients receiving anticoagulant therapy or with known coagulation disorder [1]. The PT value and thrombocyte number in our second case were at "safe procedure values" (PT below 45 s, thrombocyte number 50,000-500,000), while PTT duration met the criteria for PNB "after careful analysis" (46-50 s) [1]. The recommendation under these conditions is for the decision whether or not to perform PNB to be taken by an experienced anesthetist in the light of the profit/loss calculation [1,5]. Block must be performed personally by an experienced practitioner. Throughout the perioperative procedure, monitoring conditions permitting immediate recognition of hematoma and associated nerve compression syndrome and intervention must be established, and it must be borne in mind that block itself can delay neural findings. Meier described femoral nerve and distal sciatic nerve block as relatively safe techniques in the lower extremity [1]. Nerve stimulator use is essential in block, and should even be performed together with ultrasound, depending on level of experience [9]. We performed PNB in the light of the means available to us, bearing in all these rules and precautions in mind.

In conclusion, even in the presence of relative contraindication, PNB may be needed in some high-risk patients as an alternative to general or central neuraxial anesthesia after careful profit/loss analysis.

Competing interests
The author declare that he has no competing interests.

Authors' contributions

Authors' contributions	MK	AB	AE
Research concept and design	✓	--	--
Collection and/or assembly of data	✓	✓	--
Data analysis and interpretation	✓	--	✓
Writing the article	✓	✓	--
Critical revision of the article	✓	--	--
Final approval of article	✓	✓	✓

Acknowledgement
Authors thanks to Oguz Ofluoglu for his support of computer software.

Publication history
Editor: Andra D. DiStefano, University of Maryland School of Medicine, USA.
Received: 10-Jun-2013 Revised: 06-Jul-2013
Re-Revised: 16-Sep-2013 Accepted: 26-Sep-2013
Published: 08-Oct-2013

References

1. Meier G and Buettner J: **General Contraindications to Peripheral Nerve Blocks**. In Meier G and Buettner J (**Eds**), Peripheral Regional Anesthesia 2006; 222-223.
2. Winnie AP, Ramamurthy S and Durrani Z. **The inguinal paravascular technic of lumbar plexus anesthesia: the "3-in-1 block"**. *Anesth Analg.* 1973; **52**:989-96. | Article | PubMed
3. Yüksel BE, Kaya M, Özalp G, et al. **A comparison of continuous femoral analgesia and single dose sciatic nerve block added to continuous femoral analgesia for total knee arthroplasty**. *Türkiye Klinikleri J Anest Reanim* 2008; **6**:75-81.
4. Saracoglu F, Ayhan B, Aycan İÖ, et al. **A comparison of continuous sciatic nerve block and patient controlled analgesia with morphine for postoperative analgesia in children undergoing mayor foot surgery**. *Türkiye Klinikleri J Med Sci.* 2010; **30**:1820-6.
5. Hadzic and Vloka JD : Lower extremity blocks. In Hadzic and Vloka JD (Eds), **Peripheral Nerve Blocks**. Principles and Practice. First **ed**. New York, Mc Graw-Hill, 2004; 208-266. | Book
6. Hempel V. **[Interscalene block and infections of the shoulder]**. *Anaesthesist.* 1998; **47**:940. | PubMed

7. Rotzinger M, Neuburger M and Kaiser H. **[Inadvertant epidural placement of a psoas compartment catheter. Case report of a rare complication]**. *Anaesthesist.* 2004; **53**:1069-72. | Article | PubMed
8. Al-Nasser B and Palacios JL. **Femoral nerve injury complicating continuous psoas compartment block**. *Reg Anesth Pain Med.* 2004; **29**:361-3. | Article | PubMed
9. Ota J, Hara K. **Ultrasound-guided sciatic nerve block**. Shimane University Faculty of Medicine, Izumo, 2008; 693-8501.

Citation:
Koşucu M, Beşir A and Eroğlu A. **Peripheral nerve block to the lower extremity despite relative contraindication (two cases)**. *J Anesthesiol Clin Sci.* 2013; **2**:29.
http://dx.doi.org/10.7243/2049-9752-2-29