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Case Report / Olgu Sunumu

Popliteal Sciatic Nerve Block in a Pregnant Patient in the Last Trimester

Gebe Bir Hastada Son Trimesterde Popliteal Siyatik Sinir Bloğu

İrfan Güngör[1], Tolga Tezer[1], Gülşah Gülsi Polat[1], Erdinç Esen[2], Berrin Günaydın[1], Kadir Kaya[1]
[1]*Department of Anaesthesiology and Reanimation, Gazi University Faculty of Medicine, Ankara, Turkey*
[2]*Department of Orthopedics and Traumatology, Gazi University Faculty of Medicine, Ankara, Turkey*

Abstract / Özet

Although regional anaesthesia is a commonly preferred anaesthesia technique for pregnant patients undergoing non-obstetric surgery, peripheral nerve blocks are relatively less administered. The use of popliteal sciatic nerve block for foot-ankle surgery has been presented for a nulliparous parturient at 32 weeks of gestation scheduled to undergo surgical exploration of an arterial pseudoaneurysm on her right plantar surface due to a penetrating stab injury. Since surgery did not require pneumatic tourniquet, the sciatic nerve was blocked via the popliteal approach with a single shot injection of 30 mL of 0.375% levobupivacaine. The operation and the anaesthesia course were uneventful. In conclusion, popliteal sciatic nerve block was successful and uneventful for a short foot surgery not requiring tourniquet application in a parturient in the last trimester.

Keywords: Non-obstetric surgery, pregnancy, anaesthesia, peripheral block

Her ne kadar rejyonal anestezi non-obstetrik cerrahi geçirecek gebelerde çoğunlukla tercih edilen anestezi tekniği olsa da periferik sinir blokları göreceli olarak daha az uygulanır. Sağ plantar yüzeyde kesici delici alet yaralanmasına bağlı gelişen arteriyal psödoanevrizma için ayak ve ayak bileği cerrahisi geçirecek 32 haftalık nullipar gebeye popliteal siyatik sinir bloğu yapılması planlandı. Pnömatik turnike gereksinimi olmayan bir cerrahi girişim olduğu için 30 mL %0,375 levobupivakain ile popliteal bölgede tek enjeksiyon ile siyatik sinir bloğu yapıldı. Ameliyat ve anestezi seyri sorunsuzdu. Sonuç olarak popliteal siyatik sinir bloğu son trimesterde bir gebede turnike uygulaması gerektirmeyen kısa süreli bir ayak ameliyatı için başarılı ve olaysız geçti.

Anahtar Kelimeler: Non-obstetrik cerrahi, gebelik, anestezi, periferik bloklar

Introduction

When a proper anaesthetic choice for a pregnant patient undergoing non-obstetric surgery is considered, drugs and techniques with the least side effects for the mother and foetus should be preferred (1). Although neuraxial blocks for non-obstetric surgery during pregnancy are most commonly performed, peripheral blocks may be considered occasionally. It has been reported that a supraclavicular brachial plexus block for carpal tunnel release was postponed because of the respiratory failure secondary to the procedure (2). There are limited reports with peripheral blocks for lower extremity procedures for pregnant patients. Therefore, we hereby report the anaesthetic management of a parturient in the last trimester scheduled to undergo surgical intervention not requiring tourniquet with popliteal sciatic nerve block for a penetrating stab injury in the lower extremity.

Case Presentation

A 29-year-old nulliparous woman at 32 weeks of gestation (height: 172 cm, weight: 75 kg) suffering from a neglected penetrating stab injury in her right plantar surface was admitted. A sharp penetrating object had been removed from the plantar surface without any further wound exploration in another medical centre. Three months after intervention, the patient was admitted to our institution because of a painful soft tissue mass on the plantar aspect of her right foot, which gradually grew

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Address for Correspondence/Yazışma Adresi: Dr. Berrin Günaydın, Gazi Üniversitesi Tıp Fakültesi, Anesteziyoloji ve Reanimasyon Anabilim Dalı, Ankara, Türkiye Phone: +90 312 202 53 18 E-mail: gunaydin@gazi.edu.tr

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over this period. A 5×5 cm painful soft tissue swelling with a fluctuant palpation was observed in the physical examination. Doppler imaging revealed a pseudoaneurysm in the artery of plantaris media, showing a full thickness rupture and a biphasic arterial flow pattern. Surgical exploration was planned upon consultation of the orthopaedist and traumatologist. Preoperative laboratory results and physical examination were unremarkable. The anaesthetic plan consisted of blocking the sciatic nerve in the popliteal region with a single shot injection. After obtaining written informed consent, the patient was admitted to the operating room for standard monitoring of the heart rate, blood pressure and peripheral oxygen saturation before performing the block. Then, the parturient was placed in the left lateral decubitus position where the operation side was uppermost with the knee flexed at a 90° angle. Supplemental oxygen was applied via a facemask. Popliteal sciatic nerve block was performed as described by Hadzic et al. (3). Landmarks were indicated through the popliteal crease and the tendons of the semitendinous and biceps femoris muscles that localize the midpoint between the tendons of the two muscles that was 7 cm above the popliteal fossa crease. After disinfection of the skin, 2 mL of lidocaine (1%) was infiltrated, a 21-gauge 70-mm short bevel needle (Vygon® France) connected to an injection line and a neurostimulator (Braun® Melsungen, Germany) was inserted 30° cranially to the skin until the tibial nerve was identified. Plantar flexion of the foot was observed at a depth of 5 cm, and the stimulating current was gradually decreased to 0.3 mA until the motor response disappeared. Subsequently, 30 mL of 0.375% levobupivacaine solution was slowly injected with careful intermittent aspirations. Evaluations of the sensory and motor block in the tibial and common peroneal nerves were checked 10 min after local anaesthetic injection. The operation started 30 min after the block. An aneurysm in the medial plantar branch of the posterior tibial artery was identified, which was located on the medial aspect of the abductor hallucis muscle following the drainage of the hematoma. After a 30-min long surgical intervention, the patient was transferred to the recovery room. Her pain score was 3 according to the verbal numeric scale, where 0 corresponding to no pain and 10 corresponding to worst pain imaginable. She did not request any analgesic medication until discharge from the hospital.

Discussion

In this case report, we present a successful and safe anaesthetic management of a pseudoaneurysm secondary to a penetrating injury requiring surgery in the last trimester of a pregnant patient. The literature reveals that 0.5%–2% of the pregnancies are complicated because of either urgent or elective non-obstetrical surgical procedures, which may be directly or indirectly related to pregnancy (1, 4, 5). The main objectives in the choice of the anaesthetic technique should be the preservation of maternal haemodynamic stability, uteroplasental blood flow and the avoidance of maternal and foetal hypoxia throughout the non-obstetric surgery (1, 6). The choice of anaesthesia is generally based on the abovementioned prerequisites by site and nature of surgical procedure planned, and if acceptable, by the patients' preferences (1). We have considered performing regional anesthesia because of the operation type. After informing our patient about the neuraxial and peripheral block, the peripheral nerve block was performed rather than a neuraxial block upon the patient's request. Although general anaesthesia is definitely the first choice for urgent operations and cardiovascular or neurosurgical surgeries for pregnant women, regional techniques may offer many advantages if applicable because nearly all of the general anaesthetic drugs have the potential to pass through the placenta by passive diffusion. Fortunately, none of these drugs have been shown to be teratogenic, and no association has been found between the surgery during the early pregnancy and congenital anomalies in the newborns in a study of 287 women who underwent surgery during the first and second trimesters (7, 8). The optimal timing for elective non-obstetric surgery during pregnancy is the second trimester, when the risk of preterm contractions, spontaneous abortions and teratogenity are reduced (2, 9-11). However, our case was in the third trimester, and the surgery was neither completely urgent nor elective. Additionally, patients undergoing surgery during the third trimester are at a risk for the early induction of labour (12).

When possible, a local or regional anaesthetic technique may be preferable (9). Therefore, neuraxial anaesthesia is commonly preferred because of providing excellent intraoperative and postoperative analgesia, thereby depressing neuroendocrine responses adequately and creating less maternal and foetal respiratory depression, although sympathetic block resulting in hypotension may lead to a decreased uteroplacental blood flow unless it is prevented or treated promptly. Moreover, supine hypotension syndrome, which is markedly observed particularly after the second trimester, may contribute to the consequences of sympathetic block (9, 12).

Popliteal sciatic nerve block is generally performed in the prone position if the classical or intertendinous approach is used, but we performed block via the intertendinous approach in the lateral decubitus position because our patient was pregnant. Subsequently, the parturient was turned to the supine position to provide aortocaval decompression by tilting the operating table to the left throughout the operation for preventing supine hypotension syndrome due to pregnancy.

To the best to our knowledge, despite the widespread use of neuraxial anaesthesia for mostly elective non-obstetric surgical procedures in pregnant women, only few cases of peripheral nerve blocks have been presented (12, 13). Therefore, we have reported our successful and safe management of popliteal sciatic nerve block in the lateral decubitus position in a pregnant patient for a semi-elective short surgical intervention in the lower extremity with a relatively low dose of levobupivacaine.

According to the American College of Obstetricians and Gynecologists (ACOG) Committee Opinion on obstetric anaes-

thesia, no data supported to make specific recommendations for non-obstetric surgery and anaesthesia. It has been stated that the decision to use foetal monitoring should be individualized and if used, gestational age, type of surgery and facilities available may be considered (10). Based on these data, instead of continuous foetal monitoring during such a short procedure, the foetal heart rate was evaluated by Doppler before and after the surgery with a team approach comprising an obstetrician, anaesthesiologist and surgeon.

Pharmacodynamics of local anaesthetics is one of the important concerns during pregnancy. In particular, decreased maternal albumin levels result in an increased maternal unbound free fraction of local anaesthetics, which passes through the placenta to the foetus (2). Because of the lower foetal protein binding capacity than the mother, the foetus cannot control the blood levels of the drugs efficiently and potential toxic reactions may occur (2). Therefore, because of the necessity of using almost all the drugs at a minimum effective dose in pregnant patients (14), we have currently used 30 mL of 0.375% levobupivacaine, which is the minimal effective volume for the blockade of the sciatic nerve in the popliteal region as described (15). Although that dose was less than the clinically recommended doses of 2–3 mg kg^{-1}, we achieved adequately satisfactory anaesthesia without side effects. This can be explained by both relatively avascularity of the popliteal fossa (16) and a low dose requirement of pregnant patients (17).

In summary, the general principals of the anaesthetic management of pregnant patients scheduled to undergo surgery non-related to pregnancy have been presented. Specific key points regarding the choice of the anaesthetic technique and the objectives of the anaesthetic management as well as with the physiological and pharmacological changes of pregnancy have been addressed (18).

Conclusion

The sciatic nerve block via a popliteal approach with a single shot injection of 30 mL of 0.375% levobupivacaine can be recommended for a lower extremity surgery not requiring tourniquet application in a pregnant patient in the last trimester.

Informed Consent: Written informed consent was obtained from patient who participated in this case.

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