10.5005/jp-journals-10046-0055

CASE REPORT

Single Injection Combined Femoral Sciatic Nerve Block in Lower Limb Orthopedic Surgery in a High-risk Patient

[1]Peeyush Shivhare, [2]Mayank Chansoria, [3]Amit Vyas, [4]Arti Dalal

ABSTRACT

We report a case of a 50-year-old male diagnosed with fracture tibia shaft posted for open reduction internal fixation (tibial interlocking). His comorbidities included diabetes mellitus (DM), hypertension, ischemic heart disease (IHD), and chronic obstructive pulmonary disease (COPD). The surgery was successfully completed under regional anesthesia with single injection combined sciatic femoral nerve block using peripheral nerve stimulator (PNS). Regional techniques like peripheral nerve block are preferred modalities to avoid undue complication of general anesthesia and to provide adequate postoperative analgesia. It provides good intraoperative conditions with adequate postoperative analgesia with least hemodynamic alterations in high-risk cases, especially IHD.

Keywords: Combined sciatic femoral nerve block, Postoperative analgesia, Tibial interlocking.

How to cite this article: Shivhare P, Chansoria M, Vyas A, Dalal A. Single Injection Combined Femoral Sciatic Nerve Block in Lower Limb Orthopedic Surgery in a High-risk Patient. J Recent Adv Pain 2016;2(3):109-111.

Source of support: Nil

Conflict of interest: None

INTRODUCTION

Peripheral nerve blocks (PNBs) are ideally suited for lower limb surgeries because of peripheral location of surgical site and the potential to block pain pathways at multiple levels. In contrast to another anesthesia technique, such as general or spinal, properly conducted PNBs avoid hemodynamic instability, postoperative pain management, and assure a timely discharge of the patient.[1]

Peripheral nerve blocks have been extensively used in patients with poly trauma posted for emergency surgery and for the patient with critical comorbidities who cannot tolerate even the slightest alteration of hemodynamic status.

Single-injection technique has several advantages that it can be performed in supine position, with less pain and patient discomfort, and less incidence of neurological complications by avoiding puncture at multiple site.

[1,3,4]Postgraduate Resident, [2]Associate Professor

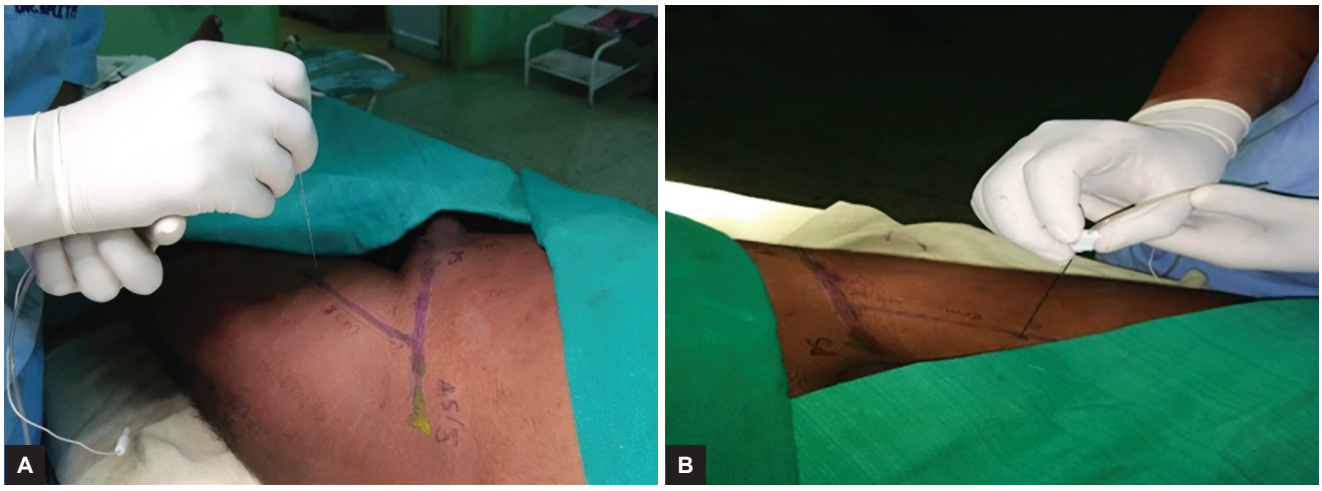
[1-4]Department of Anesthesiology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh, India

Corresponding Author: Mayank Chansoria, Associate Professor, Department of Anesthesiology, Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh India, e-mail: mayankchansoria@gmail.com

CASE REPORT

We report a case of a 50-year-old diabetic, hypertensive male with fracture tibia shaft, scheduled for open reduction and internal fixation tibial interlocking. His comorbidity included chronic obstructive pulmonary disease (COPD), ischemic heart disease (IHD) with dyspnea grade-III New York Heart Association Classification with inferolateral wall ischemia on electrocardiogram (ECG). His two-dimensional (2D) echocardiogram revealed ejection fraction 45%, grade I diastolic dysfunction, and minimal pericardial effusion. His physical score was assessed to be American Society of Anesthesiology Classification-III.

In view of his cardiac status, related comorbidity, and compromised mobility, single injection combined femoral sciatic nerve block was planned for the proposed surgery. Anesthetic procedure was explained and written informed consent was taken. Nil per oral hours were confirmed and monitors were connected to the patient. Intravenous (IV) access was established with 18 gauze IV cannula and in the supine position, anatomical landmarks were marked. With the patient in supine and the lower extremity in the neutral position, a line was drawn between the inferior border of the anterior/superior iliac spine and the superior angle of the pubic symphysis tubercle. From this anterior/superior iliac spine-pubic symphysis, a perpendicular dissector line was drawn in the middle and extended 8 cm caudal to define the site of introduction of the needle (Figs 1A and B).[2] During sterile condition, a 15 cm insulated b-beveled simplex needle B-Braun connected to a Stimuplex-Dig nerve stimulator (B-Braun) was introduced perpendicularly to the skin after subcutaneous local anesthesia with 1 mL 2% lidocaine. The nerve stimulator was initially setup to deliver a current of 1.0 mA. At a depth of 3 to 5 cm, movement of the patellar was observed. Patellar movement represents the motor response to the stimulation of the femoral nerve. The current was gradually decreased until twitch were still seen or felt at 0.3 to 0.5 mA, and after aspiration for blood 18 mL of 0.5% ropivacaine[3] is slowly injected. Afterwards the needle was further introduced 8 to 10 cm deeper; we got patellar flexion and inversion of foot and



Figs 1A and B: Single injection combined femoral sciatic nerve block

flexion of toe which is sign of sciatic nerve stimulation. Afterwards, 27 mL of 0.5% ropivacaine[3] is injected.

The surgery lasted for 2 hours and intensity of sensory and motor block was assessed every 5 minutes up to 45 minutes intraoperatively and every hour after surgery until sensory and motor function regained. Visual analog scale score was recorded every 4 hours after operation and it was less than 3 up to 24 hours. Hemodynamic parameters were maintained throughout surgery without any complication.

DISCUSSION

Single injection combined femoral sciatic nerve block is advantageous over general anesthesia and spinal anesthesia in tibial interlocking, as patient was with multiple comorbidity and compromised mobility.

Single injection combined femoral sciatic nerve block technique is effective for blocking the femoral and sciatic nerve. The administration of 0.5% ropivacaine in single injection combined femoral sciatic nerve block has been successful in providing adequate anesthesia and analgesia for orthopedic lower limb surgery. Anterior combined approach (sciatic and femoral) via a single skin injection site was described by Pandin et al,[4] later on modified by Beck.[5] Chelly and Delauney[2] have recently done modification of the Beck's anterior approach to femoral sciatic nerve block using simplified landmark, which significantly facilitated nerve localization. Single injection combined femoral sciatic nerve block also provides better hemodynamic stability, reduces blood loss, and has got superior postoperative pain control over general and spinal anesthesia. Although it is an invasive procedure, recent reviews have showed it is safe technique. Our patient being a case of IHD and COPD needed a technique with minimal hemodynamic alterations and avoidance of patient mobility; therefore, single injection combined femoral sciatic nerve block was chosen over general and spinal anesthesia owing to its superior safety profile. We have used nerve stimulator-guided single-level technique that provide more patient comfort and lowers the need for sedation during the procedure, thereby improves the patient satisfaction than multi-level injection technique. Nerve stimulation has increased the safety and reliability of the block, and hence may contribute to its ever-increasing applications in operative as well as nonoperative pain interventions. Single injection combined sciatic femoral nerve block, also preferred over general anesthesia for patients with underlying disease, offers reliable anesthesia and stable hemodynamic response and provides rapid recovery with preserved respiratory functions.

Single injection combined femoral sciatic nerve block decreased both patient discomfort and incidence of neurological complication by avoiding puncture at multiple site, offered less pain, and better intraoperative analgesia.[6] According to a recent meta-analysis, single injection combined femoral sciatic nerve block is highly safe and efficacious technique and provides anesthesia and postoperative analgesia during orthopedic lower limb surgery in patients with underlying disease and compromised mobility. It is easy to learn and has got high success rate and incidence of hemodynamic instability during surgery is decreased.

Thus considering the nature of cardiac and respiratory involvement of our patient, our choice of single injection combined femoral sciatic nerve block was a good option for orthopedic lower limb surgery in high-risk patient. In recent days, ultrasound-guided technique has been employed for further safe administration of this block. Thus, single injection combined femoral sciatic nerve block may be safe and efficacious technique which provides good hemodynamic stability during intraoperative surgery.

REFERENCES

1. Chug F, Mezei G. What are the factors causing prolonged stay after ambulatory? Anesthesiology 1998;89:A3.
2. Chelly JE, Delauney L. A new anterior approach to the sciatic nerve block. Anesthesiology 1999 Dec;91(6):1655-1660.
3. Casati A, Fanelli G, Borghi B, Torri G. Ropivacain or 2% mepivacaine for lower limb peripheral nerve blocks. Study Group on Orthopedic Anesthesia of the Italian Society of Anesthesia, Analgesia, and Intensive Care. Anesthesiology 1999 Apr;90(4):1047-1052.
4. Pandin P, Vancutsem N, Salengros JC, Huybrechts I, Vandesteene A. The anterior combined approach via single skin injection site allow lower limb anaesthesia in supine patients. Can J Anesth 2003 Oct;50(8):801-804.
5. Beck GP. Anterior approach to sciatic nerve block. Anesthesiology 1963 Mar-Apr;24:222-224.
6. Faneli G, Casati A, Garancini P, Tori G. Nerve stimulator and multiple injection technique for upper and lower limb blockade: failure rate, patient acceptance, and neurologic complication. Study Group on Regional Anesthesia. Anesth Analg 1999 Apr;88(4):847-852.