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Dr. Ismail J Namazi
Professor and Ex HOD
Department of Anaesthesia Dr.
D.Y. Patil Hospital Kolhapur,
Maharashtra

Dr. Medha Mozumder
Department of Anaesthesia Dr.
D.Y. Patil Hospital Kolhapur,
Maharashtra

Dr. Ahmed Mubariz Uddin
Department of Anaesthesia Dr.
D.Y. Patil Hospital Kolhapur,
Maharashtra

Use of peripheral nerve blocks in lower limb surgery for a cardiac patient

Dr. Ismail J Namazi, Dr. Medha Mozumder and Dr. Ahmed Mubariz Uddin

Abstract

Patients with bifascicular bundle branch block or left bundle branch block (LBBB) can progress into a complete heart block and are at a risk of sudden peri-operative death. Hence while administering anesthesia, sudden hemodynamic changes such as hypotension or tachycardia are deleterious to such patients. This is where Peripheral Nerve Blocks (PNB) have become a valuable technique in providing anesthesia especially for limb surgeries. They provide good analgesia intra-operatively as well as post-operatively, are cost effective and are comfortable for the patient. They have been noted to be extremely useful in conduction defect patients. Here we report a patient with complete LBBB who underwent right tibia plating under femoral and anterior sciatic block.

Keywords: Peripheral nerve blocks, LBBB, lower limb surgery

Introduction

Patients with chronic bifascicular block or left bundle branch block are at a risk of progressing into complete heart block or even sudden death peri-operatively. Hence providing anaesthesia for such patients have always proved to be a challenge for the anesthetists. Central neuraxial blocks; the most common block given for lower limb surgeries, cause hypotension due to uncontrolled sympathetic blockade which is difficult to compensate for these patients. In general anesthesia, most of the inducing agents are cardio-depressive resulting in hemodynamic instability intra-operatively in such patients. Furthermore, handling of the airway in general anesthesia due to laryngoscopy and endotracheal intubation results in pressor response which can lead to tachycardia and arrhythmias. Hence this is where PNBs have proved to be a good alternative to central neuraxial blocks and general anesthesia. Thus, PNBs have been noted to be extremely useful in conduction defect patients who are undergoing lower limb surgeries, where sudden hemodynamic changes such as hypotension and tachycardia are to be avoided. They have also been noted to provide good analgesia intra-operatively as well as post-operatively; are cost effective; and allow early ambulation to the patients. (Pakhiwala B *et al*, 2015)^[1]
We are here to report a case of a patient with complete left bundle branch block who underwent right tibia plating under femoral block and anterior sciatic block.

Case Report

A 65 year old female was posted for right tibia plating. She was a Grade 1 Hypertensive patient for 7 years, on Tablet Hydrochlorothiazide 12.5 mg daily. She had no other medical illness. She had an episode of facial palsy 30 years back for which she was treated conservatively and recovered fully. She was a tobacco chewer for 40 years. Her Height was 158 cms, weight – 45 kgs, PR- 88/min, BP- 130/76 mm Hg.

Airway assessment - MPC II, all teeth present. Spine assessment – scoliosis present in the lumbar spine. Cardiovascular and respiratory systems were normal.

A basic workup investigation was done which were all within normal limits. Electrocardiogram revealed complete left bundle branch block while the Echocardiography

Correspondence

Dr. Ismail J Namazi
Professor and Ex HOD
Department of Anaesthesia Dr.
D.Y. Patil Hospital Kolhapur,
Maharashtra

study was normal except for mild diastolic dysfunction with left ventricular ejection fraction of 68%.

In view of her electrocardiogram changes and age, it was decided to undertake the operation under femoral and sciatic block. Patient was told to continue her anti- hypertensive medication on the day of surgery.

On the day of surgery, patient was attached to a multi-parameter monitor. Defibrillator and temporary pacemaker were kept ready. Her baseline pulse rate, blood pressure, spo2, respiratory rate, electrocardiogram and temperature were noted. An 18 gauge IV line was secured and a 500 ml Lactated Ringer's solution was started. Patient was pre-medicated with Inj. Ranitidine 1.25mg/kg, Inj Emset 0.1 mg/kg and Inj Midazolam 0.05 mg/kg. Patient was supplied oxygen through nasal prongs at 2 liters/min.

Femoral block and Sciatic block (Anterior Approach) were given using a 15 cm stimplex needle with the help of a nerve stimulator.

For Femoral Nerve Block				
Agent	Concentration	Volume	Onset	Duration
Lidocaine	2%	5 ml	10 min	4 hours
Bupivacaine	0.5%	5 ml	10 min	4 hours

For Sciatic Nerve Block (Anterior approach)				
Agent	Concentration	Volume	Onset	Duration
Lidocaine	2%	15 ml	14 min	4 hours
Bupivacaine	0.5%	10 ml	14 min	4 hours
Distilled Water		5 ml		
Tramadol	50 mg	1 ml		

After the onset of the action of the drugs, the patient was positioned for the surgery. Tourniquet was attached. The limb was prepared and draped. The tourniquet was inflated. The wound was cleaned and a plate was inserted and fixed, and the wound was sutured. Surgery lasted for 80 mins. All vital parameters were continuously monitored throughout the operation and remained within normal limits. Her MAP was maintained around 70 mm hg to 80 mm hg. She was infused with one 500 ml of RL and one 500 ml of DNS. For sedation, she was given Inj Fentanyl 1 mcg/kg. Total intra-operative blood loss was about 300 ml.

At the end of surgery, patient was shifted to ICU for observations of vital parameters with advice for oxygen supplementation via nasal prongs, Inj Tramadol 100 mg to be given in infusion on complaint of pain. Her ICU stay was uneventful and she was shifted to the ward on POD 2.

Discussion

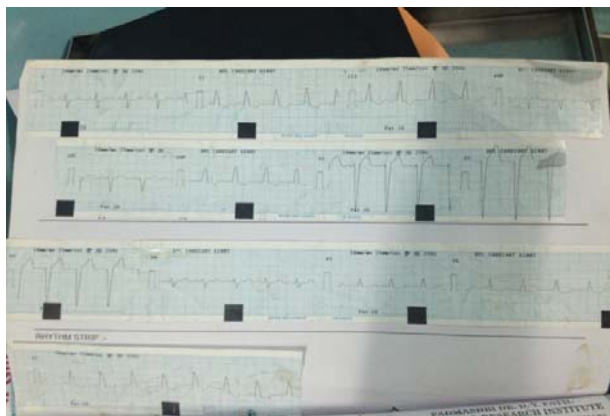
The primary concern in patients with bifascicular block or a complete left bundle branch block is the increased risk of progression to complete heart block and cardiac arrest. Also, patients with LBBB do not tolerate the stress of peri-operative non-cardiac complications very well. (Dorman T *et al*) In general anaesthesia, most of the inducing agents have a depressing effect on the cardiovascular system which are to be strictly avoided in patients with conduction defects. Also inhalational agents such as halothane and sevoflurane have been known to cause arrhythmias. In central neuraxial anesthesia, sympathetic blockade causes hypotension which for conduction defect patients become difficult to compensate during the operation.

Therefore in such patients, peripheral nerve blocks such have proved to be a valuable method to provide anesthesia. As sciatic-femoral nerve block results in a limited sympathetic

blockade, its attractiveness also lies in its potential ability to minimize hemodynamic disturbance and improve regional blood flow to the desired limb. (Chia N *et al*, 2002) [5] They have also been noted to provide good analgesia intra-operatively as well as post- operatively, and allow early ambulation of the patients. (Pakhiwala B *et al*, 2015) [1]

Conclusion

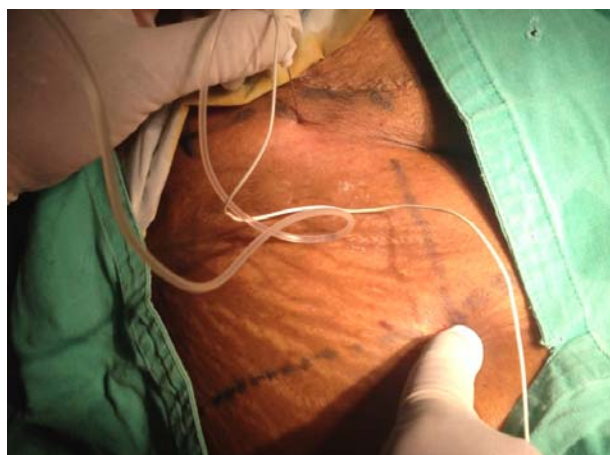
PNBs can be a good alternative to general anesthesia and central neuraxial anesthesia in high risk cardiac patients where the later methods can prove to be deleterious for the patients.



Patient's Electrocardiogram showing LBBB



Patient painted and draped with markings



Femoral Block Given using a stimplex needle and nerve stimulator



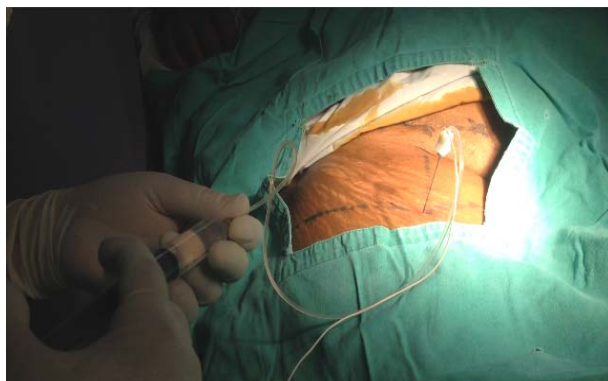
For Femoral block- eliciting the contraction of the quadriceps muscle with the help of nerve stimulator



Sciatic Block By The Anterior Approach – using a stimplex needle and nerve stimulator



For Sciatic Block - Eliciting foot eversion and inversion as response using nerve stimulator



Injecting of drug

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