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Dr. Shreya Panda
KLE Prabhakar Kore Hospital, Nehru Nagar, Belagavi, Karnataka, India

Vandana Gogate
KLE Prabhakar Kore Hospital, Nehru Nagar, Belagavi, Karnataka, India

Mahantesh S Mudakangoudar
KLE Prabhakar Kore Hospital, Nehru Nagar, Belagavi, Karnataka, India

Corresponding Author:
Dr. Shreya Panda
KLE Prabhakar Kore Hospital, Nehru Nagar, Belagavi, Karnataka, India

Peripheral nerve block as a sole anesthetic technique in a patient with a recent history of coronary stenting: A Case Report

Shreya Panda, Vandana Gogate and Mahantesh S Mudakangoudar

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Abstract
Anesthesiologists often encounter patients who have recently undergone coronary artery stent implantation and are receiving dual antiplatelet therapy. Performing non-cardiac surgeries or invasive procedures shortly after stent placement heightens the risk of stent thrombosis, particularly if the intervention occurs soon after the procedure. This situation presents a clinical dilemma: whether to discontinue antiplatelet therapy to reduce bleeding risk or to maintain it to prevent perioperative stent thrombosis. An individualized management strategy is essential, incorporating the following key considerations: (i) assess patient history and stent details, including the date of stent placement, the type of stent (e.g., bare-metal or drug-eluting), and any procedural complication encountered (ii) evaluate stent-related risks(iii)collaborative decision making approach -decisions regarding surgical timing and adjustments to antiplatelet therapy, including continuation, modification, or temporary discontinuation, should be made through a multidisciplinary discussion. This collaborative and individualized approach is essential for optimizing patient safety and surgical outcomes. [1]

Keywords: Coronary artery stent implantation, dual antiplatelet therapy, peripheral nerve block, drug-eluting stents, stent thrombosis

Introduction
Lower limb amputation due to diabetes or peripheral vascular disease is associated with a high rate of post-operative morbidity and mortality especially due to associated co-morbidities and elderly age.
The incidence of coronary artery disease is increasing due to various factors such as a sedentary lifestyle, stress, associated co-morbidities, etc. A large proportion of these patients undergo angioplasty with coronary stenting. Elective surgery following coronary artery stenting is deferred as per AHA guidelines. Surgery requires discontinuation of dual antiplatelet, anti-thrombotic therapy which is commonly started in these patients. This is associated with the risk of stent thrombosis leading to MACE (Major adverse cardiac event). According to the recent AHA guidelines, elective non cardiac surgery must be delayed for 14 days if only balloon angioplasty is done with no coronary stent placement, for 30 days if a bare metal stent is placed, for 12 months if a drug-eluting stent is placed. However, for a time-sensitive indication for surgery, it can be delayed up to 3 months. The guidelines suggest that non cardiac surgery should not be performed if the drug-eluting stent placement is within a month.
This case emphasizes the complex perioperative management of a high-risk patient with a recent coronary intervention.

Case Report
A 54-year-old male with hypertension, diabetes mellitus, chronic kidney disease, and ischemic heart disease presented for left-below-knee amputation. He had a prior left forefoot amputation 4 months ago. The patient also underwent PTCA with the insertion of three drug-eluting stents one month ago.
The patient was on Tab. Bisoprolol 2.5 mg OD and Tab. Dapagliflozin and Metformin (10 mg/500 mg) BD. Following PTCA, he was started on dual antiplatelet medication, which included Tab. Ticagrelor 90 mg BD, Tab. Ecosprin 75 mg OD, Tab. Apixaban 2.5 mg BD, Tab.

Ezetimbe and Atorvastatin (20mg/10mg) OD and Tab. Torsemide and Spironolactone 10mg BD.

Investigations revealed hemoglobin 9.8 g/dl, serum creatinine 1.37, serum potassium 4.06, PT (INR) 1.5, and APPT (INR) 1.27. The cardiologist advised to stop Tab. Apixaban, to discontinue Tab. Ecosprin and Tab. Ticagrelor 3 days before surgery and to start Inj. Heparin (UFH) 4000 units S/C four times a day. Inj. Heparin was advised to be stopped 6 hours before surgery. The patient was advised to restart Tab. Ecosprin and Tab. Ticagrelor 24 hours post-surgery. Echocardiography showed an EF of 35% with akinesia of the anterior wall, anteroseptum, apical septum, and apex. Hypokinesia of inferior wall, apicolateral segment. The apical septum and apex thinned out. Normal PA pressure with no pericardial effusion. LV clot measuring 1.2 x 1 cm was present. Class III cardiac risk was given. The patient was advised fluid restriction of 1 liter/day with a salt-restricted diet.

On the day of surgery, after confirming NBM status and written informed consent, two 20G IV cannulas were secured in the right and left upper limbs. After checking RBS, normal saline was started on the right-hand cannula. Under sterile aseptic precautions, and under USG and peripheral nerve stimulator guidance, femoral and sciatic nerve block was performed, 30ml equivocal mixture of 0.5% levobupivacaine+2% lignocaine+8mg dexamethasone + 25 mcg fentanyl was prepared. For sciatic nerve block, the patient was placed in the lateral decubitus position with the limb to be operated facing upwards. The sciatic nerve was identified using a curvilinear probe via sub gluteal approach. The nerve was confirmed using a peripheral nerve stimulator to reduce the possibility of a failed or patchy block. 15 ml of the above mixture was injected perineurally in and around the nerve after careful negative aspiration. For the femoral nerve block, the patient was placed in the supine position and the initial scanning was done at the inguinal crease to locate the vein, artery, and nerve (medial to lateral). Under aseptic precautions, the nerve was blocked using 10 ml of the above mixture.

Fig 1: Ultrasound-guided identification of the sciatic nerve using a curvilinear probe via the sub-gluteal approach. The nerve is visualized before administering the local anesthetic mixture

Fig 2: Ultrasound-guided femoral nerve block at the inguinal crease. The anatomical structures, including the femoral nerve, artery, and vein, are identified before injection

The patient was stable intraoperatively. The patient was transfused with one pint of PCV intraoperatively. Post-operative analgesia was achieved using Inj. Paracetamol 15mg/kg.

Fig 3: Intraoperative monitoring of the patient, demonstrating stable hemodynamics during the procedure under peripheral nerve block anesthesia

Discussion

Although the choice of anesthetic technique does not affect mortality after amputation, intraoperative hypotension, vasopressor use, and post-operative ICU admission rates were found to be lower following regional anesthesia. Advantages of regional anesthesia over general anesthesia include attenuation of physiological response to stress with a lower level of circulating catecholamines and cortisol[3], providing sympathetic blockade resulting in peripheral vasodilatation and increased blood flow, decreased hypercoagulability, fewer pulmonary complications[4], reduced requirement of blood transfusion, reduced risk of arterial or venous thrombosis, reduced length of stay in the intensive care unit [5, 6], reduced incidence of postoperative mechanical ventilation [8, 9, 10].

However, regional anesthesia can be challenging in patients with coronary stenting and who are on anti-platelet therapy. Central neuraxial blockade may have to be deferred in such

patients due to the risk of epidural hematoma. Our patient was on Apixaban and Ticagrelor. ASRA guidelines recommend Apixaban to be stopped 72 hours and Ticagrelor to be stopped 5-7 days before performing central neuraxial block. Our patient was posted for emergency surgery and hence was started on heparin after stopping these drugs as per the cardiologist advise. Keeping these factors in mind, we decided on peripheral nerve blocks as the sole anesthetic technique. With the availability of ultrasound machine in the OT, peripheral nerve blocks under USG guidance can be instituted with minimum risk of vascular complications. We also used the peripheral nerve stimulator to increase the success rate of the block.

Interruption of dual anti-platelet therapy in the hypercoagulable and pro-inflammatory state can promote coronary stent thrombosis while continuation of anti-platelet therapy increases surgical bleeding. Presence of co-morbidities like diabetes, hemoglobin <10 g/dl, LVEF <40%, and GFR <60% may also indicate high thrombotic risk. All the above risk factors were present in our patient.

The patient's recent coronary stenting compounded the perioperative risk. A multidisciplinary strategy ensured safe management. Regional anesthesia minimized cardiac strain compared to general anesthesia, aligning with evidence suggesting reduced morbidity in patients with compromised cardiac function.

The timing of heparin cessation and antiplatelet therapy modification was based on cardiology guidance to balance thrombotic and bleeding risks. Stopping dual antiplatelet therapy 2-3 days before surgery and resuming it 24 hours postoperatively mitigated the risk of stent thrombosis while minimizing bleeding complications.

Conclusion

This case highlights the necessity of individualized, multidisciplinary perioperative planning in patients with recent coronary interventions. Regional anesthesia ensured stable intraoperative hemodynamics. Close collaboration with cardiology for antiplatelet and anticoagulation management contributed to a favorable outcome, demonstrating the importance of tailored strategies for high-risk patients undergoing major non-cardiac surgery.

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