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Case Report

Continuous Supraclavicular Brachial Plexus Block for a Case with Severe Aortic Stenosis: Case Report

Namratha K.R.[1], Suresh Kumar N.[2], Ankitha S[3]

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ABSTRACT

Regional anaesthesia is often used as a technique of choice for managing both intraoperative surgical procedure and postoperative analgesia in patients with upper extremity injuries. For providing extended pain relief continuous peripheral nerve block (CPNB) is an appropriate anaesthetic technique. The use of CPNB allows rapid establishment of analgesia sufficient for surgical interventions and provides excellent pain control while decreasing the need for opioids and other pain medications after operation.[1] We report a successful use of ultrasound-guided supraclavicular CPNB in a case of accidental cut injury to right forearm for intra-op surgical procedure and postop analgesia. This case demonstrates the utility of ultrasound-guided CPNB in anaesthetic management of traumatic injuries in which general anesthesia can be precarious due to severe cardiac pathology. We report a case of 30-year-old male with accidental cut injury to middle 1/3rd of right forearm who underwent wound exploration and artery/nerve/tendon repair. During pre-anaesthetic evaluation, he was found to have 'pulsus parvus et tardes' and an ejection systolic murmur in aortic and pulmonary areas. Clinically, however, the patient appeared stable with MET score of >4 and gave no history fatigue, shortness of breath or chest discomfort. He was not previously evaluated for any cardiac disorders. The 2D echo done, revealed severe aortic stenosis. Cardiologist was consulted regarding the same, who opined that the patient carries high risk for perioperative adverse cardiac events. Pre-operative VAS as described by the patient was[5]. Before performing the anaesthetic procedure, patient was sedated with injection Midazolam 2mg and injection Fentanyl 30mcg. Under strict aseptic precautions, skin infiltrated with Inj Lignocaine 2%. Under ultrasound guidance using the in-plane technique, the tip of an 18G tuohy's needle was positioned at the brachial plexus and a catheter was sited. After negative aspiration, 20ml of Inj Bupivacaine 0.5% was injected. Adequate motor and sensory block was achieved

Author's Affiliation:

[1] Junior Resident, Department of Anaesthesiology, Sri Devaraj Urs Medical College, Kolar, Karnataka 563101, India.
[2] Professor and HOD, Department of Anaesthesiology, Sri Devaraj Urs Medical College, Kolar, Karnataka 563101, India.
[3] Assistant Professor, Department of Anaesthesiology, Sri Devaraj Urs Medical College, Kolar, Karnataka 563101, India.

Corresponding Author:

Suresh Kumar N., Professor and HOD department of Anaesthesiology, SDUMC, , Kolar, Karnataka 563101, India.
E-mail: drskumar6@gmail.com

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after 15 minutes with VAS, now reduced to, 0. Intra-op, after 4hrs of initial local anaesthetic dose patient complained of pain, top-up of Inj Bupivacaine 0.5%, 5cc was administered. A 5-lead ECG was used for continuous cardiac monitoring for optimal identification of adverse cardiac events. NIBP was used to monitor intra-op BP, and since, significant fluid/blood loss was not anticipated in this case, an arterial line wasn't sited. The surgical procedure was 5 hours long. Vitals were stable throughout. The catheter was removed in the immediately after completion of the procedure before shifting the patient to PACU (post anaesthesia care unit). The patient was monitored in PACU and discharged with an Aldrete score of 9 and VAS of 1. Post-op analgesic effect lasted for 5 hours, after which rescue analgesia (Inj Diclofenac 75mg, slow IV) was administered.

KEYWORDS

• Continuous Peripheral Nerve Block • Aortic Stenosis • Post-op analgesic

KEY MESSAGES

Any stenotic lesion is a fixed output challenge for the anaesthesiologist where any extremes of tachy or bradycardia, changes in the systemic vascular changes can lead to major adverse cardiovascular event, therefore we chose regional anaesthesia, so as to avoid the ill-effects of general anaesthesia in this case.

INTRODUCTION

Regional anaesthesia is often used as a technique of choice for managing both intraoperative surgical procedure and postoperative analgesia in patients with upper extremity injuries. For providing extended pain relief continuous peripheral nerve block (CPNB) is an appropriate anaesthetic technique. The use of CPNB allows rapid establishment of analgesia sufficient for surgical interventions and provides excellent pain control while decreasing the need for opioids and other pain medications after operation.[2] We report a successful use of ultrasound-guided supraclavicular CPNB in a case of accidental cut injury to right forearm for intra-op surgical procedure and postop analgesia. This case demonstrates the utility of ultrasound-guided CPNB in anaesthetic management of traumatic injuries in which general anesthesia can be precarious due to severe cardiac pathology.

CASE REPORT

We report a case of 30-year-old male with accidental cut injury to middle 1/3rd of right forearm who underwent wound exploration and artery/nerve/tendon repair. During pre-anaesthetic evaluation, he was found to have 'pulsus parvus et tardes' and an ejection systolic murmur in aortic and pulmonary areas. Clinically, however, the patient appeared stable with MET score of >4 and gave no history fatigue, shortness of breath or chest discomfort. He was not previously evaluated for any cardiac disorders. The 2D echo done, revealed severe aortic stenosis. Cardiologist was consulted regarding the same, who opined that the patient carries high risk for perioperative adverse cardiac events. Pre-operative VAS as described by the patient was[5]. Before performing the anaesthetic procedure, patient was sedated with injection Midazolam 2 mg and injection Fentanyl 30mcg. Under strict aseptic precautions, skin infiltrated with Inj Lignocaine 2%. Under ultrasound guidance using the in-plane technique, the tip of an 18G tuohy's needle was positioned at the brachial plexus and a catheter was sited. After negative aspiration, 20ml of Inj Bupivacaine 0.5% was injected. Adequate motor and sensory block was achieved after 15 minutes with VAS, now reduced to, 0. Intra-op, after 4 hrs of initial local anaesthetic dose patient complained of pain, top-up of Inj Bupivacaine 0.5%, 5cc was administered. A 5-lead ECG was used for continuous cardiac monitoring for optimal identification of adverse cardiac events. NIBP was used to monitor intra-op BP, and since, significant fluid/blood loss was not anticipated in this case, an arterial line wasn't sited. The

surgical procedure was 5 hours long. Vitals were stable throughout. The catheter was removed in the immediately after completion of the procedure before shifting the patient to PACU (post anaesthesia care unit). The patient was monitored in PACU and discharged with an Aldrete score of 9 and VAS of 1. Post-op analgesic effect lasted for 5 hours, after which rescue analgesia (Inj Diclofenac 75mg, slow IV) was administered.

DISCUSSION

The choice of anesthetic techniques and agents is based on requirements for accomplishing the surgical procedure, as well as hemodynamic goals for aortic stenosis. Adequate analgesia can avoid sympathetic responses that result in tachycardia and hypertension. With the advent of plastic needles, and Winnie's concept of perivascular sheath containing brachial plexus, continuous anaesthesia is easy to achieve.[2] In this case, combining CPNB with sedation provided excellent analgesia to avoid pain-induced hemodynamic responses.3 The surgical procedure was anticipated to be long, hence general anaesthesia could have been implemented. Then, appropriate induction agents and doses should be selected, so as, to reduce the likelihood of hypotension, while establishing anesthetic depth adequate to minimize sympathetic stimulation and avoid tachycardia during laryngoscopy and endotracheal intubation.[3] However, hemodynamic stability with induction agents like Propofol, which can cause hypotension and Ketamine, which can cause tachycardia, would not have been achieved in this case. With the non-availability of the induction agent etomidate, which is typically selected to maintain hemodynamic stability in cases with moderate-severe AS, peripheral nerve block was opted. In general, regurgitant valvular disease is improved symptomatically by peripheral vasodilation and worsened by peripheral vasoconstriction, neuraxial block therefore tend to be well tolerated cardiovascularly and are ideal for preventing a worsening in regurgitant fraction as a result of peripheral vasoconstriction caused by pain and anxiety.4 The documented benefits (of CPNBs) strongly depend on the analgesic quality and include decreasing baseline/dynamic pain, reducing additional analgesic requirements, decrease of postoperative joint inflammation and inflammatory markers, sleep disturbances and opioid-related side effects, increase of patient satisfaction and ambulation/functioning improvement, an accelerated resumption of passive joint range-of-motion, reducing time until discharge readiness, decrease in blood loss/blood transfusions, potential reduction of the incidence of postsurgical chronic pain and reduction of costs.[5] Evidence deriving from randomized controlled trials suggests that in some situations there are also prolonged benefits of regional anaesthesia after catheter removal in addition to the immediate postoperative effects.[5] The study conducted by Tai YH et.al reports that AS patients undergoing general anesthesia had higher risks of pneumonia, acute renal failure, and septicemia after surgery.[6]

Fig. 1: Continuous catheter in-situ

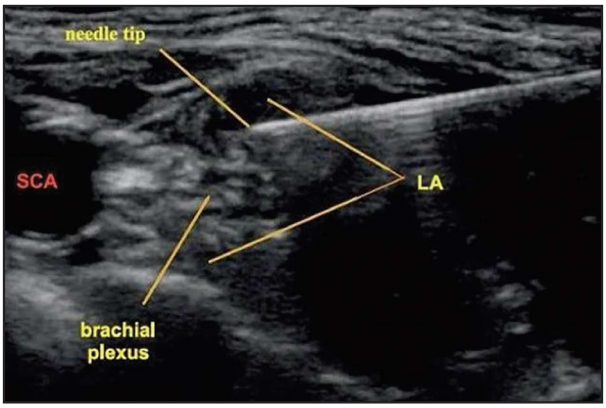

Fig. 2: Ultrasonic image of the block

CONCLUSION

Patients with severe AS likely have an increased risk of major adverse cardiovascular event (MACE) and intraoperative mortality. The mechanism by which this occurs is thought to be due to hypotension, tachycardia from

anaesthetic agents and surgical stress leading to injurious hemodynamics. MACE is avoided by subjecting the patient to CPNB.

Conflict of Interest: none

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