

Superficial and intermediate cervical plexus block for neck dissection in patients with high risk of general anaesthesia

Abstract

Background: Neck dissection is usually performed under general anaesthesia or general anaesthesia combined with regional blockade. Cervical plexus block as a sole anaesthesia for neck dissection has been rarely used. In patients with high risk of general anaesthesia however only regional blockade is being considered.

Objective: The objective of this study is to observe the intra operative and postoperative analgesic and anaesthetic effectiveness of unilateral superficial and intermediate cervical plexus block as an isolated technique of anaesthesia for unilateral neck dissection surgery as an alternative to conventional general anaesthesia.

Patients: We report three cases of unilateral neck dissection done under superficial and intermediate cervical plexus block in patients with high risk of general anaesthesia.

Conclusion: In all the three cases, cervical plexus block provided excellent surgical condition with good postoperative pain relief. Superficial and intermediate cervical plexus block can be considered as a sole anaesthesia technique for neck dissection in high risk patients for general anaesthesia, provide prolonged postoperative analgesia, reduce the requirements for opioid analgesics and also used for day care surgery.

Keywords: neck dissection; superficial cervical plexus block; intermediate cervical plexus block

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Ritesh Roy,¹ Saurajit Patnaik,² Rajesh Padhy,³ Garima Sarawgi⁴¹Department of Anaesthesiology, Hi-Tech Medical College & Hospital, India²Department of Surgery, Hi-Tech Medical College & Hospital, India³Department of ENT, Hi-Tech Medical College & Hospital, India⁴Department of Surgery (2nd yr PGT), Hi-Tech Medical College & Hospital, India

Correspondence: Ritesh Roy, Department of Anaesthesiology, Hi-Tech Medical College & Hospital, Address-Plot no-582, Jagannath Complex, Flat No-102, Sahid Nagar, Bhubaneswar, Odisha, India-751007, Tel 919437101886, Email drriteshroy@yahoo.com

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Introduction

Neck dissection involves surgical procedure for management of the cervical lymph nodes metastasis from head and neck cancer and is an important component in the overall treatment plan for patients with squamous cell carcinoma of head and neck.¹ This procedure is most commonly performed under general anaesthesia, with or without regional blockade. However in patients with a high risk for general anaesthesia, isolated usage of regional block is being increasingly considered.² We report three such cases where unilateral superficial and intermediate cervical plexus block were given to patients planned for unilateral neck node dissection, with general anaesthesia risk.

Patients

Case 1

A 56 year old male with hypertension, hypothyroidism, bronchial asthma and hoarseness of voice was posted for right neck dissection. Patient a known case of Carcinoma thyroid was planned for Total thyroidectomy with radical neck dissection at a tertiary hospital three years back. Immediately on induction of anaesthesia patient had severe anaphylaxis with hypotension, bronchospasm and was put on vasopressor support. The operation was cancelled and patient was on ventilator for six days. He recovered and was again posted for operation in same hospital after two months. Second operation course was eventful with hypotension on induction which was managed intra operatively. Operation was completed, but patient had a bad postoperative course and had to be on ventilator for two days. He recovered and was discharged. The patient presented to us with neck node recurrence and was planned for neck dissection. Patient was reluctant to be administered general anaesthesia due

to his bad general anaesthesia history. Anaesthesia summary and anaesthesia drugs which had caused anaphylaxis was not mentioned in the discharge, so we planned for superficial and intermediate cervical plexus block as a sole anaesthesia technique.

Case 2

A 84 year old male with COPD, CAD, hypertension and diabetes mellitus was posted for left huge cervical lymph node excision. Echocardiography showed global hypokinesia with ejection fraction of 25 percent.

Case 3

A 70 year old male operated for carcinoma maxilla was posted for excision of mass in the right side of neck. He had undergone Right maxillectomy with radical neck dissection six months back. On examination mouth opening was less than one finger breath. Patient had severe COPD with severe obstructive features in spirometry.

Anaesthesia technique

Intermediate cervical plexus block was performed by loss of resistance technique. With the patient in supine position and head turned away from the side to be blocked, a 22G stimuplex needle was inserted behind the posterior border of sternocleidomastoid muscle at the midpoint of mastoid process and clavicular head of the sternocleidomastoid muscle.³ As the needle entered the investing fascia of neck a loss of resistance was felt as a pop. At this point 10ml of 0.25% bupivacaine was injected after aspiration.

For Superficial cervical plexus block the same needle was withdrawn back and entered subcutaneously and directed towards

the mastoid and then towards the sternal notch and 10ml of 0.25% bupivacaine was injected. Block was assessed after 20min. All patients were sedated with 1.5mg midazolam. All surgery lasted for around 45 min. The intraoperative course was uneventful. All the patients were discharged on the same day.

Discussion

Cervical plexus anaesthesia was developed early in twentieth century. In 1914, Heidenhein described the lateral approach for cervical plexus block which formed the basis of techniques of anaesthetizing the cervical plexus.^{2,4} The cervical plexus is formed by the anterior rami of upper four cervical nerves, lies just lateral to the tips of transverse process of cervical vertebrae, in a plane just behind the sternocleidomastoid muscle. The four cutaneous branches, receiving roots from C2-4, emerges from the posterior border of SCM approximately at its midpoint and supplies the skin over anterolateral neck.^{3,5} The block is performed either in the deep plane or the subcutaneous plane or both.

Superficial and deep cervical plexus block can be used to provide anaesthesia for a variety of surgical procedures including superficial surgeries of neck (neck lymph node dissection) and shoulder, thyroid surgery, carotid endarterectomy, where awake neurologic monitoring is a simple and reliable method of neurologic assessment.⁶ The 'superficial' block incorporates a variety of procedures. The simplest is a subcutaneous infiltration of local anaesthetic along the midpoint of posterior border of sternocleidomastoid muscle by either the surgeon or the anaesthetist.^{2,7} An 'intermediate' block is one where the injecting needle pierces the investing layer of deep cervical fascia of the neck, deep to the subcutaneous layer, but superficial to the deep cervical fascia (prevertebral fascia).^{2,6,7} It is also possible to use a 'combined block', consisting of a deep injection and a superficial or intermediate injection.⁶

This process has its own complications, infections a common one. Hematoma formation is a risk associated with this procedure. The risk is greater in anticoagulated patients, so these were not included in our study.² Gentle and steady pressure for five minutes was sufficient when any vein or artery was inadvertently punctured. Blockade of the phrenic nerve does not occur after superficial cervical plexus block, but is common with deep cervical plexus block.⁴ Bilateral deep cervical block may create severe respiratory insufficiency due to diaphragmatic palsy and therefore is not recommended. Central nervous system toxicity is the most serious consequence of cervical plexus block. This complication occurs because of the rich vascularity of the neck, including the vertebral and carotid artery vessels, and is usually caused by inadvertent intravascular injection of local anaesthetic rather than absorption.^{2,4,7} Frequent careful aspiration must be done while injecting the local anaesthetic.

The General Anesthetic versus Local Anesthetic (GALA) study tested the hypothesis that local anesthesia is safer than general anesthesia in a large population undergoing carotid endarterectomy.⁷ Many local anesthetic techniques, including superficial cervical plexus block, are relatively low risk procedures.^{6,7}

Usually the method of regional anaesthesia is used as an adjunct to general anaesthesia or associated with sedation, this helps to lighten the level of general anaesthesia required, provide prolonged postoperative

analgesia & reduce requirement of regional anaesthesia.^{1,4,5,7} However the latest literature and the outcome data from vascular surgery and neurosurgery literature shows that regional block may have better outcome in such surgeries, especially carotid endarterectomy.⁷

The newer techniques available for better and reliable outcome is 'Ultrasound guided selective cervical block',⁸ in which with the aid of ultrasonic probe it is possible to localise the exact location of the cervical plexus, even to the extent of individual nerve root so as to block the individual cervical plexus nerve root.

Conclusion

General anaesthesia is the most common technique that has been used for radical neck dissection as it provides comfort to the patients. In all the three cases, cervical plexus block was an excellent option due to general anaesthesia risk and also it provided excellent surgical condition with good postoperative pain relief. To conclude, Superficial and intermediate cervical plexus block can be considered as a sole anaesthesia technique for neck dissection in high risk patients and also for day care surgery.

Conflicts of Interest

The authors do not have any Conflict of interests.

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