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Ultrasound-Guided Erector Spinae Plane Block as Primary Anaesthetic Technique for Toilet Mastectomy in a Patient of Compromised Cardiorespiratory Status: A Case Report

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Abstract

Globally breast cancer is the most prevalent malignancy affecting women. In advanced cases, patients may present with large, ulcerated and necrotic tumours leading to pain, infection and severe physical stress. Surgical intervention in the form of toilet mastectomy is one of the best palliative measures. We report a case of a 40 year old female with locally advanced carcinoma (CA) of the right breast along with lung and bony metastasis, presenting with chronic obstructive pulmonary disease (COPD) and respiratory distress, planned for toilet mastectomy as palliative treatment. A regional anaesthetic technique was selected due to her impaired pulmonary function and the elevated risks with general anaesthesia (GA). Ultrasound-guided Erector Spinae Plane block (ESPB) was employed as the sole anaesthetic technique, ensuring adequate surgical anaesthesia and postoperative analgesia. This case highlights the successful use of ESPB as the primary anaesthetic technique in a high-risk breast cancer patient who is unfit for general anaesthesia.

Keywords: Breast cancer, Lung and Bony metastasis, Toilet mastectomy, Erector Spinae Plane block.

Introduction

Breast CA is the leading malignancy affecting women worldwide. It can develop at any age, but in India, its incidence starts increasing in the early thirties and reaches its highest rates between the ages of 50-64 years [1]. In advanced cases, patients may present with large, ulcerated, and necrotic tumours leading to pain, infection and severe physical distress. Although retrospective evidence indicates that patients who underwent surgery had better results, the impact of primary tumour excision in this group of patients is yet unknown [2, 3]. Surgical intervention, in the form of toilet mastectomy, is one of the best palliative measures. However, patients with extensive metastatic disease and compromised pulmonary function may not tolerate general anaesthesia (GA). Regional Anaesthesia (RA) techniques, such as, interfacial plane blocks like Erector Spinae Plane block (ESPB), provide an alternative anaesthetic approach, ensuring patient safety while allowing effective surgical intervention. Here we present a case of advanced breast CA with metastasis in a female who successfully underwent toilet mastectomy under ESPB, as the sole anaesthetic technique.

Case Presentation

A 40-year-old female with locally advanced CA of the right breast along with lung and bony metastasis was scheduled for toilet mastectomy for palliative relief. She presented with a massive, fungating, stony hard, ulcerated and malodorous tumour of approximately size 35×30×25 centimeters (cms) which is shown in Fig.1. Additionally, she had COPD with significant wheezing and respiratory distress, posing a challenge for GA and surgical management. She was classified as ASA class 4 and considered unfit for GA. Due to her compromised pulmonary function, and the elevated risks with GA, a regional approach was selected.

Her baseline investigations were unremarkable except for an elevated TLC of 22,000/cubic mm. The chest radiography demonstrated hyperlucency with flattened diaphragms, consistent with COPD changes. In addition, multiple nodular opacities were observed suggestive of pulmonary metastasis.

Her CECT scan of the chest revealed bilateral lungs are mild hyperinflated with areas of air trapping -suggestive of COPD changes. Multiple heterogenous enhancing varying sizes soft nodules seen in bilateral lung fields, many of them are pleural based and shows nodular thickening - suggestive of lung metastases. Multiple varying sizes lytic and sclerotic lesions are seen in visualized vertebral bodies and ribs- likely bony metastases.

Preoperatively, the patient was nebulized with salbutamol and budesonide to optimize her condition. An informed written consent was taken. In the operating room, a multi-channel monitor was attached to the patient. Baseline vitals were recorded as follows: HR=108 beats/min BP= 138/80 mmHg, SPO_2 = 88% on RA. O_2 @6 L/min started via facemask. After that her SPO_2 was 96 % on O_2 @ 6 L/min. A 20 G intravenous (IV) cannula was inserted in the left hand for IV fluid administration. As the patient's lungs were compromised, an ultrasound guided unilateral ESP block was selected as the sole anaesthetic technique. After sedating the patient with injection

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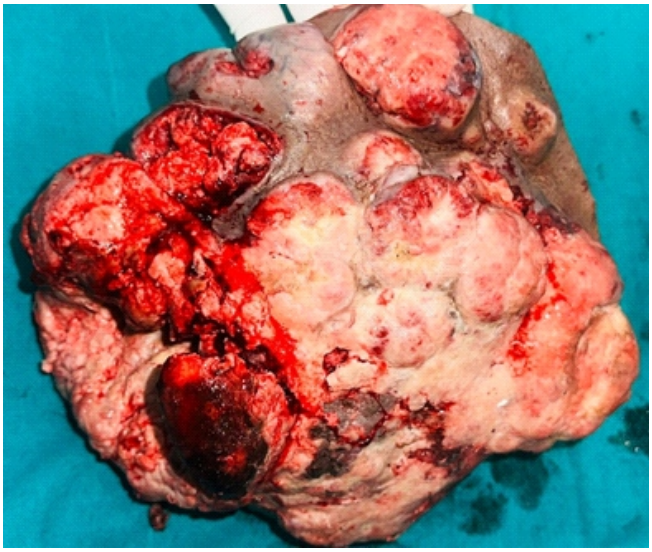

Figure 1: Massive, fungating, ulcerated tumour of approx. size 35×30×25 cms.

Figure 2: Spontaneously breathing patient undergoing toilet mastectomy under ESPB.

midazolam 1 mg and injection Ketamine25 mgs, patient was placed in the lateral decubitus position with right side superiorly and using a high frequency linear ultrasound probe, T2 and T5 transverse process were identified. Under strict aseptic precautions and following local infiltration with 2% lignocaine, a total of 30 ml of drug solution was administered using stylet of 18 G cannula under direct visualisation. The drug solution was prepared with 28 mL of injection ropivacaine 0.5% (140 mg),2 mL of injection dexamethasone (8 mg) making a total volume of 30 ml. The injection was administered in two separate aliquots of 15 ml each into two different spaces that is, T2 and T5, ensuring negative aspiration for blood before each injection.

Following administration of the block, the patient was placed in the supine position for the procedure and sedation was started with injection dexmedetomidine @ 0.2 mcg/kg/hr. Sensory blockade was achieved in 30 minutes and was assessed using a pinprick test followed by an instrumental check to ensure its effectiveness. A satisfactory block from T1 to T7 was achieved, with no hemodynamic response to the surgical incision. The surgery proceeded uneventfully, with stable vitals maintained throughout (Fig. 2). The surgery lasted for 1 hour.

Postoperatively, the patient was shifted to the recovery room for monitoring before being shifted to the postoperative ward. Pain assessment using visual analogue scale (VAS) demonstrated adequate analgesia, with a VAS score of less than 3 and a sensory blockade from T1 to T7 lasting approximately 24 hours. No additional opioids were required. The patient remained hemodynamically stable, and no complications or adverse effects related to the block were observed during recovery.

Discussion

The management of advanced breast CA in patients with significant comorbidities such as COPD presents unique anaesthetic and surgical challenges. In our case, the use of an ultrasound- guided ESPB as the primary anaesthetic technique for toilet mastectomy effectively eliminating the need for GA, airway manipulation and mechanical ventilation, thereby minimizing perioperative pulmonary risks.

ESPB is a widely used interfacial plane block, originally introduced for managing thoracic neuropathic pain [4]. The erector spinae fascia extends from the nuchal fascia superiorly to the sacrum inferiorly, allowing local anaesthetics to spread across multiple spinal levels, providing broad analgesic coverage [5]. ESPB has been successfully utilized for postoperative pain relief in thoracotomies and more recently in mastectomies. Although previous research has consistently demonstrated its efficacy as an analgesic approach, no proven study currently supports its role as a primary anaesthetic technique.

In our case, axillary manipulation was not performed by the surgeon preventing additional pain stimuli. Although alternative regional techniques such as intercostal and paravertebral blocks are effective techniques for pain management, their use entails a possible risk of pleural puncture leading to serious complications like pneumothorax and are technically difficult to perform [6, 7, 8]. Similarly, thoracic epidural anaesthesia has been successfully used for mastectomies as reported by Ravi et al., but was not deemed suitable in our case due to patient's brittle condition and metastatic bone disease [9].

Ono et al. concluded that a combined paravertebral block with GA may be preferred anaesthetic approach for patients undergoing major breast cancer surgery [10]. Additionally, cervical epidural anaesthesia has been successfully utilized for modified radical mastectomy (MRM). However, it is not recommended in patients with compromised pulmonary function or poor cardiovascular reserve, as it may exacerbate respiratory or hemodynamic instability. Furthermore, cervical epidural poses a risk of phrenic nerve paralysis, which could further impair respiratory function [11].

In this particular case, the patient's severe respiratory compromise rendered her unfit for GA. The decision to employ an ESPB provided a safe and effective anaesthetic alternative, facilitating the successful completion of the toilet mastectomy without perioperative complications. This outcome emphasizes the potential of the ESPB as a primary anaesthetic technique in high-risk surgical patients, particularly those with contraindications to GA.

Conclusion

The ESPB offers a promising regional anaesthesia option for patients undergoing breast surgery, especially when GA poses significant risks. Its simplicity, safety, and efficacy make it a valuable tool in the anaesthetic management of high-risk patients, contributing to improved surgical outcomes and patient safety.

Declaration of patient consent: The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his/her consent for his/her images and other clinical information to be reported in the Journal. The patient understands that his/her name and initials will not be published, and due efforts will be made to conceal his/her identity, but anonymity cannot be guaranteed.

Conflict of interest: Nil **Source of support:** None

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