CASE REPORT

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Thoracic epidural anesthesia for modified radical mastectomy in carcinoma of breast patient with chronic obstructive pulmonary disease: A case report

Balaji Narayan Asegaonkar, Sujata Rahul Zine, Unmesh Vidyadhar Takalkar, Umesh Kulkarni, Shilpa Balaji Asegaonkar, Pushpa Kodlikeri

ABSTRACT

Introduction: Modified radical mastectomy, the standard surgical procedure in the management of carcinoma of breast is routinely performed under general anesthesia. But the patients of chronic obstructive pulmonary disease with other comorbidities are at increased risk of perioperative morbidity and mortality especially because of pulmonary complications. We report successful perioperative management of modified radical mastectomy only with thoracic epidural

anesthesia in a diagnosed case of carcinoma of breast with hypertension, type 2 diabetes mellitus and severely compromised pulmonary function. **Case Report:** A 66-year-old female, a known case of chronic obstructive pulmonary disease since seven years with comorbidities (ASA grade III), presented with carcinoma of breast was scheduled for modified radical resection. Continuous thoracic epidural anesthesia was administered at T4-5 level. Local anesthetic titrated as per the demands of surgery and postoperative analgesia. Chronic obstructive pulmonary disease has been considered as independent risk factor for postoperative morbidity and mortality because of cardiopulmonary complications. But Thoracic epidural anesthesia, one of the regional anesthesia techniques, with use of low dose of local anesthetic helps preserving respiratory function. The procedure was well tolerated without cardiopulmonary complications which lead to prompt recovery with additional effect of prolonged postoperative analgesia. **Conclusion:** Thoracic epidural anesthesia provided not only hemodynamic, cardiopulmonary stability but also adequate anesthesia, analgesia and satisfaction to patient in postoperative phase. It proved to be an excellent anesthesia technique for modified radical mastectomy in patient with chronic obstructive pulmonary disease.

Keywords: Carcinoma of breast, Modified radical mastectomy, Thoracic epidural anesthesia, Chronic obstructive pulmonary disease (COPD)

Asegaonkar BN, Zine SR, Takalkar UV, Kulkarni U, Asegaonkar SB, Kodlikeri P. Thoracic epidural anesthesia for modified radical mastectomy in carcinoma of breast patient with chronic obstructive pulmonary disease: A

Balaji Narayan Asegaonkar¹, Sujata Rahul Zine², Unmesh Vidyadhar Takalkar³, Umesh Kulkarni⁴, Shilpa Balaji Asegaonkar⁵, Pushpa Kodlikeri⁶

Affiliations: ¹MD, D.N.B. Anesthesiology, Consultant Anesthesiologist Kodlikeri Memorials CIIGMA Institute of Medical Sciences Aurangabad, Maharashtra, India; ²M.B.B.S.D.A.F.C.P.S. Anesthesiology, Consultant Anesthesiologist Kodlikeri Memorials CIIGMA Institute of Medical Sciences Aurangabad, Maharashtra, India; ³MS, Surgery M.E.D.S, F.U.I.C.C. (Switzerland), MSSAT (USA), Cancer, Consultant Surgeon Kodlikeri Memorials CIIGMA Institute of Medical Sciences Aurangabad, Maharashtra, India; ⁴M.D. Biochemistry, Assistant Professor, Department of Biochemistry Government Medical College Aurangabad Maharashtra, India; ⁵M.S. Surgery, Consultant Surgeon Kodlikeri memorials CIIGMA Institute of Medical Sciences Aurangabad, Maharashtra, India; ⁶M.B.B.S, MIFEE, MIAHR, Consultant Gynecologist Kodlikeri memorials CIIGMA Institute of Medical Sciences Aurangabad, Maharashtra, India.

Corresponding Author: Dr. Balaji Narayan Asegaonkar, MD, D.N.B. Anesthesiology, C-13 Swarsangam Housing Society New Shrey Nagar, Aurangabad, Maharashtra, India - 431005; Ph: 919325078733; Fax: 912402359279; E-mail: b_asegaonkar@yahoo.com

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INTRODUCTION

Worldwide prevalence of carcinoma of the breast is increasing at an alarming rate and is a leading cause of cancer related mortality in women. In India, prevalence of carcinoma of breast varies from 12–31 cases per 100,000 women [1]. Modified radical mastectomy (MRM), the standard surgical procedure of choice remains the mainstay of management in these patients. Usually, MRM is performed under general anesthesia. But the patients of chronic obstructive pulmonary disease (COPD) with other comorbidities are at high risk of perioperative morbidity and mortality especially because of pulmonary complications under general anesthesia [2]. Several studies reported usefulness of cervical and thoracic epidural anesthesia for MRM in patients of carcinoma of breast [3, 4]. But these techniques are not routinely practiced. We report successful perioperative management with thoracic epidural anesthesia in a diagnosed case of carcinoma of breast with severely compromised pulmonary function due to COPD undergoing MRM.

CASE REPORT

A 66-year-old female presented to our center with a chief complaint of a lump in breast gradually increasing in size over last four months. On clinical examination, a hard lump of size 4x4 cm, with irregular surface, not fixed to skin with enlarged axillary lymph nodes were noticed. Fine needle aspiration cytology revealed presence of malignant cells and patient was scheduled for MRM.

Patient was a known case of COPD since last seven years. She had episodes of exaggeration and remission once or twice in a year. She required admission twice in last two years for COPD. During preoperative evaluation, anesthesiologists found that because of compromised respiratory status patient is at high risk for the procedure to be done under general anesthesia. On clinical examination, she was afebrile with pulse rate 110/minute, respiratory rate 24/minute with SpO₂ 92% in lying down position and 94–96% on pulse oxymetry in sitting position. Bilateral coarse crept were present. Her hemoglobin was 16 g/dL suggesting chronic hypoxia. Her other laboratory investigations blood glucose levels, liver, renal and thyroid parameters were within normal limit. Patient was a known case of hypertension since

three years and type 2 diabetes mellitus since four years maintained on oral medication. Her HbA_{1c} was 7.5% suggesting moderate glycemic control. Chest radiograph showed changes of chronic bronchitis with hyperlucency (Figure 1). On auscultation, ejection systolic murmur was present in aortic area. She was referred to cardiologist for detail cardiological examination and pulmonologist for evaluation of pulmonary function. Echocardiography evaluation in cardiology clinic revealed aortic and mitral sclerosis with mild mitral regurgitation and mild pulmonary hypertension (PASP 26 mmHg).

Pulmonary evaluation revealed severe obstructive airway disease with following results of pulmonary function tests (PFT) as given in Table 1. This indicates severe airway obstructive disease. There is increased residual volume that means increased air trapping. With such compromised pulmonary status, COPD, hypertension, diabetes mellitus and pulmonary hypertension patient was accepted as grade III as per ASA (American Society of Anesthesiologists) and posted for MRM under thoracic epidural anesthesia. General anesthesia was relatively contraindicated so as to avoid postoperative ventilatory support and complications. Meanwhile we tried to optimize patient's respiratory status for five days by round the clock nebulisation with steam, N-acetyl cysteine, deep breathing exercises, maintaining adequate hydration.

Patient was explained about the procedure and technique of the anesthesia and high risk informed consent was obtained. Intravenous access was taken with 18 G angiocath on opposite upper limb. Monitoring started with pulse oxymetry, noninvasive blood pressure and five-lead electrocardiograms.

Anesthesia technique: In sitting position, with all aseptic precautions entry point marked at T4-5 level. Local anesthetic agent 2% xylocaine was injected with number 26 hypodermic needle. Epidural space was identified by using loss of resistance with saline technique. Then 18 G B Braun epidural catheter was inserted 4 cm into epidural space through Touhy needle in cephalad direction. Epidural catheter was fixed and 3 mL test dose of xylocaine with 2% adrenalin was given. Patient was monitored for vital signs for three minutes to rule out intravenous placement. The initial titrated dose of 7 mL of 0.75% ropivacaine and 1 mL fentanyl (50 microgram) injected through catheter which resulted in

Table 1: Pulmonary function tests of patient

Parameters	Measured volume	% Predicted volume
FEV ₁	1.17	44.6
FVC	2.60	74.9
Residual volume	2.93	112
FEV ₁ :FVC	45	

bilateral anesthesia of thoracic wall in the area from C6 to T7 level in next 15 minutes. After achieving adequate sensory block and analgesia patient was handed over to surgeon for MRM. At the time of axillary node clearance, ketamine 25 mg, fentanyl 50 mg and midazolam 1 mg were administered. Injection ondansetron 4 mg was given intravenously to avoid nausea and vomiting. During surgical procedure surgeon appreciated apparently less blood loss and relatively dry surgical field (Figure 2). We deliberately avoided oxygen supplementation to maintain patient's hypoxic drive. All airway control equipment kept ready for emergency. Surgery lasted for 80 minutes without evidence of any untoward events and throughout the procedure patient was hemodynamically stable (Figure 3). Then patient was shifted to surgical intensive care unit with continuous monitoring for vital parameters. Postoperative analgesia was managed with epidural infusion of 0.125% bupivacaine 6 mL/h till next 24 hours. Patient continued to receive nebulization and chest physiotherapy in postoperative period comfortably as she was pain free.

DISCUSSION

Thoracic epidural anesthesia has been established as a cornerstone in the perioperative management for

Figure 2: Dry surgical field

Figure 3: Intraoperative vital parameters.

Figure 1: Chest X-ray showing changes of chronic bronchitis.

thoracic, abdominal and lower limb surgeries with maximum clinical benefits of speedy recovery, effective analgesia and improved outcome [5]. However, it is practiced less frequently. The COPD has been considered as an independent risk factor for postoperative morbidity and mortality because of cardiopulmonary complications. From anesthesiologist point of view, general anesthetic agents, opioids, muscle relaxants and mechanical ventilation interfere with respiratory function. This combined effect of general anesthesia in supine position leads to instant fall in lung volumes with atelectasis in dependent part of lungs [2]. These patients are difficult to wean from ventilator and may require postoperative prolonged ventilation. So in our case of COPD with hypertension, T2DM and pulmonary hypertension, we planned the procedure using a sole anesthetic technique of TEA which provided safe and excellent analgesia

with improved surgical conditions. The procedure was well tolerated without cardiopulmonary complications which lead to prompt recovery with additional effect of prolonged postoperative analgesia.

Thoracic epidural anesthesia, one of the regional anesthesia techniques, with use of low dose of local anesthetic helps to preserve respiratory function. O'Connor et al. reported successful anesthetic management for bilateral mammoplasty with TEA in a Klippel–Feil syndrome with difficult airway [6]. In a study among Thai women researchers observed TEA combined with brachial plexus block an alternative safe anesthetic technique for MRM provided effective anesthesia and postoperative analgesia than general anesthesia [7]. Ashok Jadon highlighted utility of cervical epidural analgesia in managing a complex case of carcinoma of breast with chronic regional pain syndrome [8]. A recent meta-analysis about pulmonary effects of TEA showed decline in postoperative pulmonary complication like pneumonia due to earlier ambulation, reduced opioids consumption and improved compliance of patient for chest physiotherapy [9]. Some retrospective studies reported improved survival with reduced prevalence of tumor recurrence after TEA or paravertebral block in cancer patients [10, 11].

Successful use of high TEA avoids tracheal intubation hence also minimizes postoperative pulmonary complications [12]. With TEA using high concentrations of local anesthetics (lidocaine 2%, bupivacaine 0.5%) paralysis of the intercostal and abdominal wall muscles are responsible for 10–20% decrease in inspiratory and expiratory capacity without affecting the hypoxic pulmonary vasoconstriction [13]. Diaphragmatic function remains unimpeded as far as the neuraxial blockade remains below the cervical emergence of phrenic nerves (C3–C5). So, it is extremely important to watch level of epidural block because if level reaches above C6, Horner's syndrome may develop. If level goes up to C4, patient's voluntary efforts of respiration stop and might require ventilatory support. Site of puncture decides the cephalad extension of block. But the higher the placement site, the lesser is cephalad spread and more caudal spread [14], hence we selected site T4–5.

Even though we performed present surgery using technique of TEA, we always have to assess risk and benefit ratio. Common complication of this technique is dural puncture, neurological injury and epidural hematoma. With maximum precautions and experienced hand dural puncture is rare while the incidence of neurological injury is 0.01–0.001% [15].

CONCLUSION

Compared to general anesthesia, regional anesthesia such as thoracic epidural anesthesia offers better option for modified radical mastectomy with severely compromised pulmonary functions. Another distinct

advantage of the technique is good quality postoperative analgesia which enhances patient's compliance for chest physiotherapy and hence speedy recovery.

Author Contributions

Balaji Narayan Asegaonkar – Anesthetic management of the patient, Analysis and interpretation of data, drafting and critical revision of article and final approval of manuscript.

Sujata Rahul Zine – Anesthetic management of the patient, drafting and critical revision of article and final approval of manuscript.

Unmesh Vidyadhar Takalkar – Diagnosis and surgical Management of case, critical revision of article, final approval of manuscript.

Unmesh Kulkarni – surgical Management of case, critical revision of article, final approval of manuscript.

Shilpa Balaji Asegaonkar – Acquisition of data, Analysis and interpretation of data, drafting and critical revision of article and final approval of manuscript.

Pushpa Kodlikeri – Concerned with perioperative management of the patient, drafting and critical revision of article and final approval of manuscript.

Guarantor

The corresponding author is the guarantor of submission.

Conflict of Interest

Authors declare no conflict of interest.

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