Case Report

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Segmental Thoracic Spinal Anaesthesia for Modified Radical Mastectomy in a Bronchiectasis Patient

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Abstract

General anaesthesia is the gold standard technique for breast cancer surgery but risks of general anaesthesia outweigh the benefits particularly in patients with known cardio pulmonary disorders. Here we discussed a patient with known bronchiectasis undergone mastectomy with axillary lymphnode dissection under thoracic spinal block at mid thoracic level without any intra and post operative complications

Keywords: Mastectomy; Thoracic Spinal Anaesthesia; Bronchiectasis.

Introduction

Bronchiectasis is characterized by chronic infection of lungs results in dilatation and scarring of bronchioles leads to accumulation of infected mucus in dilated bronchioles. Surgical patients with bronchiectasis are more prone for perioperative complications. Anaesthetic management in these patients presents a definitive risk of intraoperative and postoperative complications such as bronchospasm, laryngospasm, and prolonged mechanical ventilation [1]. Regional anaesthesia techniques are gaining importance in patients with known Cardiopulmonary disorders. There is growing trend for regional anaesthesia techniques in the field of anaesthesia for breast surgery also i.e thoracic epidural, multiple intercostal blocks, intra pleural block, paravertebral block, pectoral blocks and segmental thoracic spinal anaesthesia. There is no gold standard regional anaesthesia techniques for breast surgery. Most of these blocks are suitable for localised breast surgeries i.e. not involving axilla. General anaesthesia either with endotracheal intubation or supraglottic airway is the ideal anaesthetic technique for majority of brest surgeries. Regional anaesthesia indicated only when general anaesthesia is undesirable to the patient .

Literatures on mastectomy in respiratory pathology patients are limited. Hereby, we report a case of a old female with known case of bronchiectasis, developed breast cancer and thus underwent modified radical mastectomy which was done under thoracic spinal anaesthesia at mid thoracic level with axillary block

Case Report

59 years old female patient came with complaints of lump in breast since 2 years. Initially it was small, gradually increase in size over 18 months. But there is sudden increase in growth in the recent past and diagnosed to have ductal cell carcinoma of Breast. Patient was known case of bronchiectasis since 6 years. Patient complaining of chronic productive cough and mild to moderate amount of sputum production daily, mild haemoptysis. Symptoms aggravates during winter season. She is used to admit in hospitals for the same 3-4 times per year due to exacerbation of symptoms. Patient denies any chest pain, palpitations. Grade 2 dyspnoea present. History of Pulmonary tuberculosis 20 years back, took ATT for 6 months. She does not have any other coexisting diseases present. On examination, patient had moderate built , severe pallor and clubbing present. Airway adequate. Room air saturation was 93%, bilateral coarse basal crepetations present. Hb 8.3 gm per dl, WBC count 16200. ECG shows sinus rhythm, and T inversions in T1-T6. We asked for Echo cardiography to rule out corpulmonale and any

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PAH but it was negative for both and EF was 52%.Chest roentgenogram showing fibrotic changes in bilateral mid and lower lung fields .HRCT suggestive of fibrotic changes in left apico posterior segments and Right upper and middle lobes. Base line blood gases shows pH 7.31, $PaCO_2$ 52 and PO_2 79 on room air . Pre operatively two units of pack cell transfusion given .48 hours prior to the surgery antibiotics and bronchodilators started. Patients was explained about the options of anaesthesia for the surgery and also about the possible complications associated with general anaesthesia and advantage of regional anaesthesia in view of her present condition .The patient agreed for regional anaesthesia .After discussing with the surgeon, Segmental thoracic Spinal anaesthesia was planned.Patient was premedicated with Tablet Alprazolam 0.5 mg Per oral at night and the morning of surgery .Patient also received tablet pantoprazole 40mg with metoclopramide 10mg on the night before surgery and morning of surgery.

In the operation theatre, after initiating the standard monitoring, operating table was adjusted to 15 degree propped up position. Under aseptic precautions, in sitting position, subarachnoid block was given at T5-T6 level by using 27 gauze Quincke Babcock needle. After piercing the ligamentum flavum, we removed the stylette and further advances the needle and look for free flow CSF . 1 ml of 0.5% hyperbaric bupivacaine with 20 mcg fentanyl given and patient made to lie supine slowly. As soon as CSF flow seen, we started co loading of Ringer lactate fluid @ 20 ml per kg by using pressurized giving set at the maximum possible rate. Height of the block was adjusted by controlling the table remote. We could achieved sensory from T1-T7 but C8 spared, which is required for axillary dissection of breast tissue. Patient had motor power in the lower limbs. Decision made to give USG guided axillary block by using tourniquet. For this block, Patient arm to be blocked abducted and the elbow flexed to 90 degrees. Head of the patient is turned away from the side to be blocked. Under aseptic precautions, sterile suction Cather used as a tourniquet applied over the arm more proximally (Figure1). USG guided axillary block given by using 5 cm short bevel stimuplex block needle. Median, ulnar, and radial nerves blocked with 6 ml of local anaesthetic solution respectively. Followed by musculocutaneous nerve blocked by using 4 ml of local anaesthetic solution. Care taken to avoid Intra vascular placement of the needle by intermittent loosening of the tourniquet during aspiration. Intercostobrachial nerve blocked by using 10 ml of local anaesthetic solution. At the end of the procedure, patient was asked to adduct the arm with tourniquet insitu, so that drug will remain in a closed compartment which is formed between humeral head and tourniquet . Tourniquet was removed after 10 mins (Figure2) .We observed dense block over the axillary region. We proceed with the MRM with axillary lymphnode dissection without any complications .Duration of surgery was 11/2 hour. The same extent of block was present at the end of surgery without lower limb weakness. We did not give even any sedation intraoperatively. Patient was comfortable throughout the intra operative period and there were no major hemodynamic or respiratory changes observed. Patient shifted to ICU for further monitoring.

Fig. 1: Initial position of the arm with tourniquet insitu.

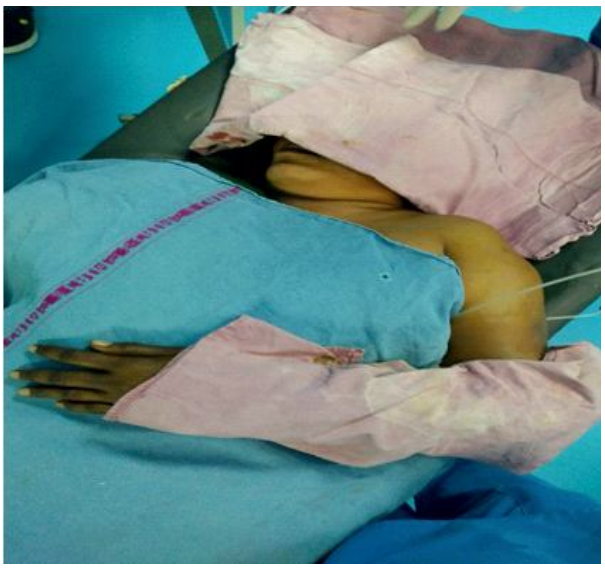

Fig. 2: Final position of the arm after tourniquet removal

Discussion

Preoperative evaluation of pulmonary and cardiovascular systems is essential for preparing an anesthesia plan in patients with bronchiectasis and other respiratory disorders. MRM is usually performed under general anaesthesia alone or in combination with regional anaesthesia. Many blocks are performed for localised breast lesions where axilla is not involved. When administering regional anaesthesia for breast surgery, a risk-benefit ratio should be undertaken based on the individual patient's needs. Regional anaesthesia techniques offers several advantages including attenuation of the surgical stress response, provides excellent postoperative analgesia, reduction in PONV and earlier mobilisation. The risks associated with regional anaesthetic techniques in fit patients undergoing minor surgical procedures probably outweigh their benefits but intermediate complexity surgeries i.e. mastectomy and axillary dissection usually benefit from regional anaesthesia in terms of the quality of early recoveryand discharge. However, its influence on longer-term outcome is needs to be further evaluated.

Several regional anaesthesia techniques has been tried in breast surgeries with promising results All these have several advantages and limitations. Paravertebral block is associated with multiple injections, risk of pneumothorax, epidural or intrathecal spread of Local anaesthestic solution [2]. Thoracic epidural require expertisation and technically difficult and also associated with hypotension, urinary retention, PDPH and rarely epidural hematoma. Intrapleural block requires larger volumes of local anaesthetic to get anaesthesia but risk of pneumothorax, risk of retention of secretions, respiratory muscle dysfunction and LRTI. Intercostal nerve blocks requires multiple inecjections and also associated with risk of incomplete block and greater risk of pnemothorax. PEC blocks associated with risk of intra vascular injection, pleural injury and risk of brachial plexus block However, regional anaesthesia including central neuraxial block proved that it eliminate the need for airway manipulation and was associated with 50% Reduction in PPC s [3,4,5]. Recent evidences favours use of regional anaesthesia in these patients to reduce post operative pulmonary complications .

Thomas Jonnesco described the use of spinal anesthesia for surgeries in the skull, head, neck, and the thorax. The punctures were performed between the 1st and the 2nd thoracic vertebrae, which resulted in good analgesia for the head, neck, and upper limbs [10].

Zundert AA et all performed thoracic spinal anaesthesia (TSA) for lap cholecystectomy in patient with severe obstructive lung disease without any difficulty. Then, they performed a feasibility in healthy patients submitted to laparoscopic cholecystectomy and stated that thoracic spinal anaesthesia is one of the safer alternative to GA particularly in the management of patients with major medical problems [11,12].

Imbelloni LE et al investigated the anatomy of thoracic spine and postulated that the space between the dura mater and spinal cord in the thoracic region measured with MRI was 5.19 mm at T2, 7.75 mm at T5, and 5.88 mm at T10. The angle of entry between T5 and T6 (almost 50°) elongated the distance from the tip of the needle to the posterior surface of the cord [6]. This position increases the distance to a point that allows needle advancement without touching the cord. This is the reason we selected the T5-T6 interspace for the administration of spinal anesthesia and this can be an explanation for the low incidence of neurologic complications during accidental perforation of the dura mater in an attempt to perform a thoracic epidural block [7,8,9].

Encouraged by recent experiences on Segmental thoracic spinal anaesthesia, we did our case with thoracic spinal anaesthesia successfully without any complications. Ours is a case of brochiectasis ,where general anaesthesia results in further intra operative and post operative complications. So we decided to provide regional anaesthesia. We expect more hypotension and bradycardia but it was not happened in our case because of co loading of fluid in the intraoperative period [13]. Even though RA is safe alternative to GA but are not devoid of risk. Careful pre operative preparation and precautions made it safer alternative. But Regular use of this technique discouraged until large number of patients have to be studied and risk benefit ration yet to be assessed. Care must be taken not to injuring the spinal cord. In our case we removed the stelytte after piercing the ligamentum flavum [15]. Use of USG further increases the safety in performing this block. In our case we did axillary dissection by using axillary block by using tourniquet. With this, axillary region is compltely blocked and surgery was progressed uneventful.

There is limited data in the literature regarding the use of hyperbaric bupivacaine for thoracic spinal anaesthesia. Imbelloni et all performed the lap cholecystectomy by using the reduced dose of hyperbaric bupivacaine. Ours case is similar to

imbelloni et all study in using hyperbaric bupivacaine instead of isobaric bupivacaine. Since it is hyperbaric bupivacaine, we could control the height of the block by using the table remote control. Maximum height of the block achieved in our case was T1. Axillary sparing was present. Axilla blocked by using ultrasound guided axillary block with torniquette method. Major oncern with thoracic spinal anaesthesia is that the higher level of block in thoracic segments can affect ventilation adversely. However, diaphragm remains unaffected in this procedure as it is innervated from the cervical level (C3, 4,5) and using of low dose bupivacaine preserves the coughing ability of the patient [11,14]. Lower level of the block achieved was T7 in our patient and it preserves the motor power in lower limbs,this yields heighest satisfaction to the patienet [12]. This explains the differential blockade property of bupivacaine. This effect of bupivacaine [11,12], and adequate co loading of fluid bolus causes minimal hypotension

Here we discribed a novel technique in performing axllary barchial plexus block by using tourniquet. Even though it blocks all cords of brachial plexus, success rate in blocking the lower cords (i.e C8/T1) will be high with this technique which was required for axillary dissection . We routinely perform this block in our institute without any patchy / failure of block compared to conventional axillary block. Appropriate counselling of the Patient helped us a lot for performing this procedure. Further studies needed to explore the efficacy of this type of block.

Many studies have shown that breast surgery is associated with a high incidence (30–40%) of postoperative nausea and vomiting (PONV) [2,16]. Regional anaesthesia techniques are usually asscociated with lower incidence of PONV [17]. Mohammed et al reported very low incidence of PONV in the thoracic spinal group when compared general anaesthesia group in patients undergoing breast surgery [15]. We did not observe any PONV in our case, this may be due to prophylactic anti emetic therapy patient received pre operatively.

Conclusion

From our study, we conclude that thoracic spinal anaesthesia is one of the safer alternative to general anaesthesia in patients undergoing MRM and other localized breast surgeries. It can provide safe, reliable and effective anesthesia for selected patients who can not tolerate general anaesthesia. It provides stable cardiovascular status, reduction in blood loss and prolonged postoperative analgesia.

In conclusion our decision to perform thoracic spinal anaesthesia with axillary block in a modified way, may provide additional advantage to patients, in a selective subgroup.

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