International Journal of Anesthesiology Research
www.anesthesiologyjournal.in
Online ISSN: 2664-8857, Print ISSN: 2664-8849
Received: 15-04-2022, Accepted: 29-04-2022, Published: 16-05-2022 Volume 4, Issue 1, 2022, Page No. 11-13
DOI: https://doi.org/10.33545/26648849.2022.v4.i1a.23

Breast surgery under thoracic spinal anesthesia-A case report

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Abstract
Background: Breast surgery is mostly done under general anesthesia, although regional anesthesia in the form of peripheral nerve blocks and epidural anesthesia has also been used. The aim is to present this case in which mid-thoracic segmental spinal anesthesia was used for excision of the breast tumor.
Method: A 28 years old ASA grade I female patient was given mid-thoracic segmental spinal anesthesia for excision of phylloid tumour of the breast. Adequate analgesia was achieved from T2-T12. One episode of bradycardia was treated with Atropine injection.
Result: Adequate analgesia, stable hemodynamics, no nausea or vomiting, less analgesic requirement, early ambulation, cost effective and high patient satisfaction level.

Keywords: thoracic spinal, segmental spinal, breast surgery, regional anesthesia

Introduction

Breast surgery is frequently done under general anesthesia. Although regional blocks are also gaining popularity for breast surgeries but spinal anesthesia at thoracic region is rarely used due to fear of complications. In this case mid-thoracic segmental spinal anesthesia was used for excision of the breast lump as the patient had refused to undergo surgery under general anesthesia.

Fig 1: Dural puncture at T5-T6 –CSF flowing out freely

Case description

A 28 years old, ASA grade I, thin built female patient was taken for excision of phylloid tumor of the right breast. The patient had apprehensions regarding general anesthesia and had requested for an awake procedure. Thus, after discussing with the surgeon and after taking an informed consent, the procedure was planned to be done under thoracic segmental spinal anesthesia. The patient's preoperative biochemical investigations did not show any abnormality. The patient was preloaded with 800ml of IV fluids. An antibiotic was given after a test dose and Pantoprazole 40 mg injection was also given pre-operatively. The patient was then made to lie in the

left lateral decubitus position. After cleaning and draping a 25G cut point spinal needle was introduced at T5-T6 inter-space by midline approach and advanced slowly. After getting the free flow of CSF, 1 ml of Bupivacaine (heavy) with 15 microgram Fentanyl was injected after aspiration test. The patient was made supine and kept in a 20 degree head up position. After five minutes the level of anesthesia was checked. Adequate analgesia was achieved from T2-T12 after 10 minutes. Parameters noted were heart rate, blood pressure, SPO2, respiratory rate, ECG. Patient discomfort level was also noted. After 15 minutes of onset of block, the patient had bradycardia (HR- 52/min), for which Injection Atropine 0.6mg was given. Patient responded to it. Oxygen supplementation was given using nasal cannula @2L/min. throughout the surgery the patient was awake and comfortable. No sedation was given. No additional analgesic was required as axillary clearance was not to be done. Surgery was completed in one hour forty minutes. The first analgesia in the post-operative period was given after about three hours on complaining slight discomfort following which she was put on oral analgesics. No nausea or vomiting in the intra-op or post-operative period was noted. The patient was started orally with liquids after three hours and mobilized early. The patient could be discharged within 24 hours of surgery. General sense of well-being and patient satisfaction level was high as the patient could undergo awake, painless surgery. The procedure and hospitalization was found to be cost effective.

Discussion

General anesthesia is the most preferred anesthesia for breast surgery although regional anesthesia techniques offer advantages like good post-op pain relief, less incidence of nausea vomiting, reduced surgical stress etc. Regional anesthesia is especially beneficial in patients with respiratory ailments like COPD due to non-interference with the airways. Regional anesthesia in the form of peripheral nerve blocks like Paravertebral block, PEC blocks, Intercostal block etc. has been used for breast surgeries. There can be few disadvantages of the abovementioned blocks like multiple pricks, patchy effect, pneumothorax, requiring injection of large volume of drug etc. Central neuraxial block like thoracic or cervical epidural block has also been used but both the procedures require more technical expertise for performing the block. Also, a wide bore needle used for the epidural blocks can cause a wider rent in case of accidental dural puncture with the possibility of causing more trauma to the cord. In this case mid-thoracic segmental spinal anesthesia was used to overcome the disadvantages of the other modalities as mentioned. Literature search revealed studies on thoracic segmental spinal anesthesia. Zundert AA et all performed a feasibility study of 20 healthy patients for laparoscopic cholecystectomy under thoracic spinal anesthesia successfully **[1, 10].** Elakany et all in their comparative study of 40 patients of breast cancer surgery found thoracic segmental spinal anesthesia to have advantages as compared to GA **[2]**. Mohmoud AA et all performed a feasibility study of thoracic segmental spinal anesthesia for minor breast surgeries in 25 patients successfully and the results showed good hemodynamic stability **[3].** Spinal anesthesia at the thoracic level is not used very frequently mostly due to fear of complication like direct trauma to the spinal cord with neurological consequences. A study of MRI of thoracic spine done by Imbelloni et al found that the dura to spinal cord distance was significantly greater in the mid thoracic region (T5-7.75mm) as compared to the upper (T2-5.19mm) and lower thoracic (T10-5.88mm) levels thereby increasing the safety margin at the mid thoracic level [4]. Study of MRI by Lee at all showed similar results in supine, lateral and sitting head down positions [5]. In relation to the dura, the spinal cord is much anteriorly placed in the thoracic region thereby allowing greater safety margin for the needle advancement and drug placement in the thoracic region as compared to the cervical and lumbar region where it is more posteriorly placed. At T5-T6 level the needle entry is at an angle of 45 degrees due to sharp angulation of the spinous process which further increases the distance between the posterior surface of the cord and the needle tip providing better safety margin to the cord from trauma. Patients can experience paresthesia when nerve roots are touched by the needle tip, but there are supportive studies to show that it is mostly transient and without any neurological consequences. There is an important study by Imbelloni et all from point of view of comparing incidence of paresthesia by thoracic and lumbar approach of spinal anesthesia. Of 300 patients wherein, for elective surgery low thoracic spinal block (T10-T11) was performed comparing pencil tip and cut point needles, paresthesia was experienced by 20 patients (6.6%) by cutting tip and 8.67% by pencil tip needle. Experience of paresthesia was about 12% with lumbar puncture when calculated for the sample size which was almost double the incidence as compared to thoracic spinal block **[6]**. No neurological complication was noted in a 30 days follow up of these patients. Also there is fear of other complications like total spinal anesthesia, the chances of which are minimal because the volume of anesthetic solution used is very low, which is injected to the close proximity of the nerves to be blocked thereby causing an effective anesthesia in the required segments. Also due to the natural concavity of the thoracic spine the drug tends to get settled at the lowest point of concavity i.e. T5-T6 level, especially if hyperbaric Bupivacaine is used. Also the spread of the drug is easier to control by table tilt. Hyperbaric Bupivacaine was used in our case also. Another concern is of cardio-respiratory depression. Blockade of the cardio-accelerator fibres from T1-T4 can cause bradycardia. Bradycardia was observed in our case which was corrected by medication, however there was no hypotension. Hypotension can be there which is due to parasympathetic over-activity accompanied by veno-dilatation. With use of very less volume of the drug, hypotension is less profound as there is limited sympathetic blockade and the lower limbs are spared from the block. Hypotension can be avoided by adequate preloading and vasopressors can also be used. Although respiratory effects can be there due to decrease in vital capacity owing to blockade of the respiratory muscles but they are not significant clinically because the diaphragm remains unaffected. The diaphragm is innervated by the

phrenic nerve arising from C3-5 roots which are not blocked. Any sign of respiratory distress was not observed in our case as the upper level of block in our patient extended only upto T2 level. A study by Zundert et all, where thoracic spinal anesthesia was used for laproscopic cholecystectomy in patients with severe obstructive lung disease did not show any adverse respiratory event [7]. Eeshwar Rao et all also used thoracic segmental spinal anesthesia for a case of radical mastectomy having severe bronchiectasis without any complication (8). Although in that case axillary block was given to extend the level of anesthesia block as axillary dissection was required. Studies have shown that surgery in patients with respiratory ailments performed under regional anesthesia has better outcome and reduced respiratory complications in the post-op period as compared to general anesthesia [9]. Advantages of regional anesthesia like less analgesic requirement, less incidence of nausea and vomiting makes the patient ready for early ambulation and is therefore cost effective. A systematic review and meta-analysis of RCTs was conducted by Xian-Xue-Whan et al to evaluate the postoperative events between spinal anesthesia and general anesthesia in patients undergoing laparoscopic cholecystectomy. The parameters compared were- two hourly VAS score and vomiting within twenty four hours. Their findings were - Spinal anesthesia may be associated with less postoperative pain and PONV compared with general anesthesia [11]. These advantages were observed in our patient also. The sparing of blockade of the lower limbs adds to high patient satisfaction. The limitations in this case was that the block was not performed under ultrasound guidance due to unavailability of USG machine. Use of ultrasound guided blocks increase the safety of the block. With single shot spinal anesthesia there is difficulty in prolonging anesthesia, but a supplemental peripheral or local block can also be given. A continuous spinal or epidural catheter can be helpful for prolongation of anesthesia if required. However the scope of this anesthesia modality has to be studied in much wider patient base before it can be used for breast surgeries routinely.

Conclusion

In this case, thoracic segmental spinal anesthesia was found to be a viable option for breast surgery.

No funding and no conflict of interest.

References

1. Van Zundert AA, Stultiens G, Jakimowicz JJ, Peek D, van der Ham WG, Korsten HH, Wildsmith JA. Laparoscopic cholecystectomy under segmental thoracic spinal anaesthesia: a feasibility study. Br J Anaesth,2007:98(5):682-6. doi: 10.1093/bja/aem058. Epub 2007 Mar 19. PMID: 17371777.
2. Mohamed Hamdy Elakany, Sherif Ahmed Abdelhamid. Segmental thoracic spinal has advantages over general anesthesia for breast cancer surgery; Anesth Essays Res. 2013 Sep-Dec; 7(3): 390–395. doi: 10.4103/0259-1162.123263
3. Mahmoud AA, Hussein HA, Girgis K, Kamal AM, Nafady HA. The novel use of spinal anesthesia at the mid-thoracic level: a feasibility study. Egypt J Cardiothorac Anesth,2014:8:21-6
4. Imbelloni LE, Quirici MB, Ferraz Filho JR, Cordeiro JA, Ganem EM. The anatomy of the thoracic spinal canal investigated with magnetic resonance imaging. Anesth Analg,2010:110:1494-5.
5. Lee RA, Van Zundert AA, Botha CP, Lataster LM, Van Zundert TC, et al. The anatomy of the thoracic spinal canal in different postures: A magnetic resonance imaging investigation. RegAnesth Pain Med,2010:35:364-369.
6. Imbelloni LE, Pitombo PF, Ganem EM. The incidence of paresthesia and neurologic complications after lower spinal thoracic puncture with cut needle compared to pencil point needle. Study in 300 patients. J Anesth Clinic Res,2010:1:106.
7. Van Zundert AA, Stultients G, Jakimowicz JJ, Van den Borne BE, van der Ham WG, et al. Segmental spinal anaesthesia for cholecystectomy in a patient with severe lung disease. Br J Anaesth,2006:96:464-466.
8. Eeshwar Rao Madishetti, Syed Ali Aasim, Ravindar Bethi. Segmental Thoracic Spinal Anaesthesia for Modified Radical Mastectomy in a Bronchiectasis Patient. Indian Journal of Anaesthesia and Analgesia Volume 4 Number 2, April - June 2017 (Part–2) DOI: http://dx.doi.org/10.21088/ijaa.2349.8471.4217.31
9. Van Lier F, van der geest PJ, Hoeks SE et al. Epidural analgesia is associated with improved health outcomes of surgical patients with chronic obstructive pulmonary disease. Anaesthesiology,2011:115:315-21.
10. Klein SM, Bergh A, Steele SM, Georgiade GS, Greengrass RA. Thoracic paravertebral block for breast surgery. Anesth Analg,2000:90:1402-1405
11. Wang XX, Zhou Q, Pan DB, Deng HW, Zhou AG, Guo HJ, Huang FR. Comparison of Postoperative Events between Spinal Anesthesia and General Anesthesia in Laparoscopic Cholecystectomy: A Systemic Review and Meta-Analysis of Randomized Controlled Trials. Biomed Res Int,2016:2016:9480539. doi: 10.1155/2016/9480539. Epub 2016 Jul 25. PMID: 27525282; PMCID: PMC4976158.