

## Fibroadenoma Excision under Thoracic Segmental Spinal Anaesthesia in Isolated Situs Inversus Totalis: A Case Report

Jyoti Deshpande, Merlin Elizabeth Jacob\*

Department of Anaesthesiology and Critical Care, Smt Kashibai Navale Medical College and General Hospital Narhe-Pune, MUHS University, Nashik, India.

### ARTICLE INFO

#### Article history:

Received 26 April 2022

Revised 17 May 2022

Accepted 31 May 2022

#### Keywords:

Dextrocardia;

Fibroadenoma;

Situs inversus totalis;

Thoracic segmental spinal

### ABSTRACT

Situs inversus totalis is a rare congenital positional anomaly with a predicted incidence of 1: 10,000 amongst the general population described by the transposition of the abdominal and thoracic visceral structures. Local infiltration of the breast is a common technique for fibroadenoma of small sizes. However, its efficacy, including duration of action as well as the extent, can be unreliable and surgeon dependent. Unless otherwise contraindicated, the regional technique of thoracic segmental spinal anesthesia has been proven to be a safe and effective method for even major surgeries including laparoscopic cholecystectomy, breast lumpectomy and abdominal surgeries. Multiple regional anesthetic techniques are available and should be used according to the requirement of the surgery as well as the skill and knowledge of the performing anesthetist. We discuss here, a case of fibroadenoma in a patient with isolated situs inversus totalis, operated under thoracic segmental spinal anesthesia.

**S**itus inversus totalis, a rare congenital positional anomaly with a predicted incidence of 1: 10,000 amongst the general population described by the transposition of the abdominal and thoracic visceral structures. During the embryological development, a 270° clockwise rotation instead of normal 270° anti-clockwise of the developing thoraco-abdominal organs results in mirror image positioning of the abdominal and thoracic viscera [1]. The apex of the heart is located on the right side of the thorax, the stomach, and the spleen on the right hypochondriac region in the abdomen and the large lobe of the liver and gallbladder on the left side. The left lung is tri-lobbed and the right lung bi-lobbed and blood vessels, nerves, lymphatics, and the intestines are also transposed [2]. It can present with various cardiac and non-cardiac anomalies. Ciliary abnormalities like Kartagener's syndrome are most commonly associated; cardiac anomalies include ventricular septal defects, transposition of great vessels, double outlet right ventricle; spleen malformations; spinal cord malformations like scoliosis,

meningomyelocele, tethered spinal cord, spina bifida; Goldenhar syndrome. However, this may also present as an isolated finding, without other organ involvement, as in the case discussed here.

Taking into account the myriad conditions associated and possible complications that can evolve with general anesthesia, regional anesthesia is usually preferred, whenever possible. It is a known fact that most anesthetists as part of practicing safe anesthesia do not prefer administering spinal above the termination of the conus medullaris, in fear of injury to the spinal cord. However, literature has proven it to be a safe and effective method for even major surgeries like laparoscopic cholecystectomy, breast cancer lumpectomy and abdominal cancer surgery [3-5]. The anesthetic implications of situs inversus totalis is seldom discussed, although of paramount importance.

The authors declare no conflicts of interest.

\*Corresponding author.

E-mail address: merlin.j176@gmail.com

Copyright © 2023 Tehran University of Medical Sciences. Published by Tehran University of Medical Sciences.



This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International license (<https://creativecommons.org/licenses/by-nc/4.0/>). Noncommercial uses of the work are permitted, provided the original work is properly cited.

## Case Report

A 22-year-old female patient, was posted for excision of fibroadenoma, measuring approximately 3x2cm in the lower medial quadrant of the left breast. During pre-anaesthetic check, on auscultation, the heart sounds were more prominent on the right side, raising suspicion of dextrocardia. Further, as a part of routine investigations, CXR and ECG were done wherein, the heart border was mirrored to right and gastric bubble was seen under the right diaphragm (Figure1) with right axis deviation, 'p' wave inversion in lead I and aVL and global 't' wave inversion which reverted to resemble a normal ECG on reversal of leads (Figure 2,3). 2D ECHO revealed mirroring of the heart to the right side with normal cardiac anatomy and USG abdomen showed transposition of all major abdominal organs. Other associated anomalies were also ruled out. Spine and airway assessment were normal and no abnormality was detected.

**Figure 1- Chest X-ray suggestive of dextrocardia**



In the preoperative area, informed consent for regional anesthesia was taken and NBM status was verified. The patient being anxious and apprehensive, demanded adequate regional anesthesia over local infiltration. After elaborate counseling and after re-confirming a normal spinal anatomy, the procedure of thoracic segmental spinal was also explained to the patient. Once the patient was in the OT, all ASA specific standard non-invasive monitors were attached. The ECG leads were placed over the right side. Her vitals were stable.

Thus, respecting patient choices, we decided to administer thoracic segmental spinal anesthesia. Under all aseptic precautions, after painting and draping, local anesthesia with 1% lignocaine was given following which, thoracic spinal was given using 0.8ml of isobaric ropivacaine 0.75% with inj fentanyl 20mcg at T4-T5

level. Anesthetic blockade of segments T2 to T6 was obtained within 9 minutes of administration of the drug. She was sedated with inj midazolam 1mg IV after the anesthetic procedure, to relieve her anxiety. Plan B in case of failure of thoracic spinal was insertion of an appropriately sized supraglottic airway device.

The surgery lasted for 30mins and the duration of thoracic spinal anesthesia continued upto 4hours. Inj paracetamol 1gm IV was given as rescue analgesic.

**Figure 2- ECG with actual lead placement**



**Figure 3- ECG after reversal of leads**



## Discussion

A thorough preanesthetic checkup with multidisciplinary team effort to rule out cardiac, neurological, spinal and other deformities or anomalies is essential for safe anesthetic and surgical experience. The mid to lower thoracic portion of the spinal cord lies anteriorly, whereas the spinal cord and cauda equina are touching the dura mater posteriorly in the lumbar region, which is suggestive that there is greater depth of the posterior subarachnoid space and a minimum safe distance before the spinal needle contacts the spinal cord tissue, in the thoracic region [6]. Breasts are innervated

by the anteromedial and anterolateral branches of the thoracic intercostal nerves (T3-T5). Hence, segmental blockade involving T2 to T6 is sufficient for such cases. Supraclavicular nerves from the lower fibers of the cervical plexus also provide innervation to the upper and lateral portions of the breast. Fewer nerve roots are covered by anesthetic in the subarachnoid space in thoracic segmental spinal anesthesia, providing anesthesia in only the necessary dermatomes. Also, since there is less or no blockade of the lower extremities, a larger portion of the body does not experience venous dilation, which may compensate for adverse effects of blood pressure intraoperatively [4].

The advantages of thoracic segmental spinal anesthesia are multifold ranging from better hemodynamic stability, due to decreased drug dose and early mobilization postoperatively to improved patient safety and decreased PACU stay. It also ensures avoidance of polypharmacy.

Literature review suggests that the use of succinylcholine prolongs the duration of muscle relaxation due to decreased pseudocholinesterase levels. There are higher chances of inadvertent left endobronchial intubation due to the left main bronchus being in line with the trachea [7]. The association of Kartagener's syndrome causing increased secretions calls for adequate preoperative optimization with respect to difficult airway and possible pulmonary infection and hence pulmonary function testing, antibiotic prophylaxis, chest physiotherapy, incentive spirometry, bronchodilators, postural drainage of secretions and adequate suctioning may be required to avoid intraoperative as well as postoperative pulmonary complications [8].

If the need for a central venous catheterization arises, the left internal jugular vein should be preferred keeping in mind the inversion of great vessels [7]. In the unfortunate event of a cardiac arrhythmia or cardiac arrest, with utmost care and vigilance ensure to direct current with defibrillator pads on the right side. Successful resuscitation of such a patient requires the attending anesthesiologist to have thorough knowledge and complete understanding with the necessary skills [9].

Thus, general anesthesia was avoided, owing to its various adverse effects.

## Conclusion

We experienced successful management of fibroadenoma excision under thoracic segmental spinal anesthesia in isolated situs inversus totalis patient, where we wanted to avoid general anesthesia. Patient was satisfied with the anesthetic tech and had adequate analgesia in the post-operative period.

## References

- [1] Song JY, Rana N, Rottman CA. Laparoscopic appendicectomy in a female patient with situs inversus: Case report and literature review. *JSLs* 2004; 8:175-7.
- [2] Sharma S, Chaitanya KK, Suseelamm D. Situs Inversus Totalis (Dextroversion) –An Anatomical Study. *Anat Physiol* 2012; 2(5):112.
- [3] Hamad MA, El-Khattary OA. Laparoscopic cholecystectomy under spinal anesthesia with nitrous oxide pneumoperitoneum: a feasibility study. *Surg Endosc.* 2003; 17(9):1426-8.
- [4] Elakany MH, Abdelhamid SA. Segmental thoracic spinal has advantages over general anesthesia for breast cancer surgery. *Anesth Essays Res.* 2013; 7(3):390-5.
- [5] Ellakany MH. Thoracic spinal anesthesia is safe for patients undergoing abdominal cancer surgery. *Anesth Essays Res.* 2014; 8(2):223-8.
- [6] Shatri G, Singh A. Thoracic Segmental Spinal Anesthesia. [Updated 2022 Jan 25]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2022.
- [7] Thakuria R, Singh A. Situs Inversus Totalis and Anesthesia: Challenging aspects. *JCAO.* 2019; 3: 109.
- [8] Zariwala MA, Knowles MR, Omran H. Genetic defects in ciliary structure and function. *Annu Rev Physiol.* 2007; 69:423–50.
- [9] Bajwa SJ, Kulshrestha A, Kaur J, Gupta S, Singh A, Parmar SS. The challenging aspects and successful anaesthetic management in a case of situs inversus totalis. *Indian J Anaesth.* 2012; 56(3):295-297.