Thoracic Segmental Spinal Anesthesia as a Primary Anesthetic for Gynecomastia Excision- Case report

Aparnna Baburaj[1,2], Khaise Hareed[3], Ellen Safadi[2], Aishwarya[2]

[1] Research Scholar, Srinivas Institute of Allied Health Science, Karanataka, India

[2]Faculty of College of Health Sciences, Gulf Medical University, UAE

[3]Department of Cardiac Anesthesia, Mohammed bin Khalifa Al Khalifa Cardiac Centre, Bahrain

DOI: 10.29322/IJSRP.15.11.2025.p16732
https://dx.doi.org/10.29322/IJSRP.15.11.2025.p16732

Paper Received Date: 26th October 2025
Paper Acceptance Date: 25th November 2025
Paper Publication Date: 2nd December 2025

Abstract- Gynecomastia excision is commonly performed under general anesthesia, but thoracic segmental spinal anesthesia (TSSA) offers a focused thoracic block that can avoid airway instrumentation and reduce opioid exposure. An 18-year-old man American Society of Anesthesiologists I (ASA I) with unilateral left gynecomastia chose regional anesthesia, unilateral TSSA without an erector spinae plane block produced a rapid-onset unilateral sensory block on the operative side within 6 minutes while preserving motor function in the lower limbs and contralateral upper limb, with comfort maintained using dexmedetomidine sedation at 0.5 µg/kg/h. The 90-minute excision proceeded without supplemental anesthesia or airway intervention, hemodynamics remained within approximately 10% of baseline without vasopressors, and pain scores were 0-2/10 in the Post anesthesia care unit (PACU) and ≤3/10 during the first 24 hours, with the first analgesic requested at about 4 hours. There were no episodes of postoperative nausea or vomiting, urinary retention, neurologic symptoms, or respiratory events, and the patient was discharged on postoperative day one with high satisfaction. These observations indicate that, in specific patients and skilled practitioners, unilateral TSSA can function as an effective sole anesthetic for gynecomastia excision, offering targeted anesthesia, cardiovascular stability, and expedited recovery.

Index Terms- gynecomastia, thoracic segmental spinal anesthesia, ropivacaine, regional anesthesia, dexmedetomidine.

I. INTRODUCTION

Gynecomastia is a benign enlargement of male breast tissue that can persist despite reassurance and, for some patients, cause enough discomfort or distress to warrant surgical removal [1-2]. Regional anaesthetic strategies, most notably thoracic segmental spinal anaesthesia (TSSA) and erector spinae plane (ESP) blocks have gained traction in breast surgery because they avoid airway instrumentation, can limit perioperative opioid exposure, and often preserve cardiovascular stability[3,4]. However, reports of unilateral TSSA used as the sole anaesthetic for gynecomastia excision in adolescents and young adults are scarce, making detailed descriptions of technique and outcomes particularly valuable for clinicians considering this approach [5-7].

II. CASE PRESENTATION

Patient information: An 18-year-old man Body Mass Index (BMI) 22 kg/m² presented with longstanding left-sided gynecomastia that had become a source of psychosocial distress, and he elected to proceed with excision. He reported no medical or surgical comorbidities, no endocrine symptoms, and no family history suggestive of endocrine disease. Exercise tolerance was good, exceeding 4 metabolic equivalent (4 METs), baseline vitals were a heart rate of 74 beats per minute, a blood pressure of 110/80 mmHg, a respiratory rate of 14 breaths per minute, and peripheral oxygen saturation (SpO2) 99% on room air. Airway examination was done. He had a mouth opening of >3 finger breadths, the Mallampati classification was grade I, and the cervical mobility was normal. The

patient was ASA Physical Status I. After a structured conversation about anesthetic options, he declined general anesthesia, shaped in part by witnessing a peer's difficult recovery, and chose a regional technique aligned with his preferences.

Preoperative evaluation: Preoperative evaluation, including Electrocardiogram (ECG), chest radiograph, and routine laboratory studies (Complete Blood Count (CBC), Liver Function Test (LFT), Renal Function Test (RFT)), was unremarkable and acceptable for proceeding with anesthesia, as detailed in Table 1-3. In the preoperative assessment, both the chest radiograph and the 12-lead electrocardiogram were normal; therefore, images are not included. The risks, benefits, and alternatives of thoracic segmental spinal anesthesia were discussed in clear terms, including uncommon but important risks such as neurological injury, high spinal block, hypotension, bradycardia, and post-dural puncture headache, as well as the possibility of block failure requiring conversion to general anesthesia. He provided written informed consent for the anesthetic plan and for publication of de-identified clinical information after a thorough discussion of the risks and benefits.

Table 1: Complete blood count

Parameter	Result	Reference range
White blood cell count	7.53	3.50–9.50
Neutrophils percentage	45.4	40.0–75.0
Neutrophils absolute count	3.42	1.80–6.30
Lymphocytes percentage	41.2	20.0–50.0
Lymphocytes absolute count	3.10	1.10–3.20
Monocytes percentage	6.9	3.0–10.0
Monocytes absolute count	0.52	0.10–0.60
Eosinophils percentage	4.6	0.4–8.0
Eosinophils absolute count	0.48	0.02–0.52
Basophils percentage	0.1	0.0–1.0
Basophils absolute count	0.01	0.00–0.02
Red blood cell count	5.49	4.30–5.80
Hemoglobin	11.6	13.0–17.5
Hematocrit	37.9	40.0–50.0
Mean corpuscular volume	67.9	82.0–100.0
Mean corpuscular hemoglobin	21.0	27.0–34.0
Mean corpuscular hemoglobin concentration	31.0	31.6–35.4
Red cell distribution width (CV)	17.0	11.0–16.0
Red cell distribution width (SD)	41.3	35.0–56.0
Platelet count	248	125–350
Mean platelet volume	9.2	6.5–12.0
Platelet distribution width	10.1	9.0–17.0
Plateletcrit	0.228	0.108–0.282
Platelet large cell ratio	21	11.0–45.0
Platelet large cell count	52	30–90

Table 2: Coagulation timings

Test	Result	Reference range
Bleeding time	1 min	1–6 min
Clotting time	6 min	5–10 min

Table 3. Intraoperative hemodynamics and anesthetic course

Test	Result/Observed value
HIV	Negative
HBsAg	Negative
HCV card	Negative
Urine Colour	Pale yellow
Reaction (pH)	Acidic
Albumin	Nil
Sugar	Nil
Pus cells	2–4 /HPF
RBCs	0–1 /HPF
Epithelial cells	Few /HPF
Crystals	Nil
Casts	Nil

Monitoring and preparation: For the anesthetic, standard ASA monitors were applied for ECG, non-invasive blood pressure, and pulse oximetry, and baseline values were documented: heart rate 80/min, blood pressure 116/64 mmHg, and oxygen saturation 99%. Supplemental oxygen was provided via nasal cannula at 2-3 L/min for comfort and reserve. A 18-gauge peripheral IV cannula was sited, and Ringer's lactate was started at 80 mL/h in accordance with our regional anesthesia protocol.

Block performance: The patient was in the left lateral position, and the thoracic region was prepared with chlorhexidine and draped. Using a sterile marker, the spinous processes were marked, and the Fourth thoracic vertebral (T4) interspace was identified. Using a midline approach at the Fourth thoracic vertebral – Fifth thoracic vertebral (T4-T5) interspace, a 27-gauge Quincke spinal needle with introducer was advanced under surface landmark guidance. Cerebrospinal fluid was obtained on the first pass at a depth of 5 cm without paresthesia or blood, confirming subarachnoid placement. A commercial preparation of 0.75% Hyperbaric ropivacaine with 8% glucose (1.0 mL, 7.5 mg) was injected slowly over ~20 seconds after gentle aspiration. Immediately after injection, the patient remained positioned in the left lateral decubitus for 20 minutes to encourage spread to cover the surgical field, then the patient was asked to lie supine.

Block assessment and sedation: Pinprick testing demonstrated a left-sided T2-T6 sensory block within 6 minutes, with contralateral sparing and preserved lower limb motor function. Sedation was maintained with dexmedetomidine at 0.5 µg/kg/h (no loading dose), titrated to a Ramsay score of 2-3. No bradycardia or hypotension occurred, and no anticholinergics or vasopressors were required.

Intraoperative course: The surgical procedure lasted 90 minutes. Hemodynamic remained within approximately 10% of baseline throughout, oxygen saturation was stable on nasal oxygen and estimated blood loss was minimal. No supplemental local anesthetic was required, and there was no need to convert to general anesthesia or intervene on the airway (Table 4).

Table 4- Intraoperative hemodynamics and anesthetic course

Parameter	Baseline	15 min	30 min	45 min	60 min	75 min	End of surgery	Notes
Heart rate (beats/min)	[72–78]	[70–76]	[68–74]	[68–74]	[70–76]	[70–78]	[72–80]	No bradycardia: no anticholinergics used
Mean Arterial Pressure (MAP) (mmHg)	[82–90]	[80–88]	[78–86]	[78–86]	[80–88]	[80–90]	[82–92]	Within ±10% of baseline, no vasopressors
SpO_2 (%) on nasal O_2 2–3 L/min	99	99	99	99	99	99	99	No airway intervention needed
Sedation (Ramsay)	2	2–3	2–3	2–3	2–3	2–3	2	Dexmedetomidine 0.5 µg/kg/h, no bolus
Fluids (crystalloid, mL) cumulative	0	200	400	500	700	800	900	No blood products; EBL minimal
Estimated blood loss (mL)	—	—	—	—	—	—	[20–50]	Surgeon-reported
Block level (pinprick)	—	T2–T6 (L)	T2–T6 (L)	T2–T6 (L)	T2–T6 (L)	T2–T6 (L)	T2–T6 (L)	Unilateral, lower-limb motor preserved
Additional anesthetics	—	None	None	None	None	None	None	No conversion to GA

Figure 1: Intraoperative excision of left-sided gynecomastia under regional anesthesia, showing subareolar incision and glandular tissue dissection

Postoperative course: Sensory blockade regressed over roughly 4 hours. Analgesia consisted of intravenous paracetamol 1 g every 6 hours, with intravenous tramadol 50 mg available as needed. Pain scores were 0-1/10 on arrival to the post-anesthesia care unit and remained ≤3/10 during the first 24 hours; the first request for analgesia occurred at approximately 4 hours (Table 5). There were no episodes of postoperative nausea or vomiting, urinary retention, pruritus, post-dural puncture headache, new neurologic symptoms, or readmission. The patient ambulated on the day of surgery and was discharged on postoperative day one, reporting a positive anesthetic experience.

Table 5: Postoperative analgesia and recovery outcomes (0–24 h)

Time post-op	Pain-score (0–10)	Analgesia given	Adverse events	Notes
PACU arrival (0 h)	0–2	None	None	Sensory block present, motor intact
1 h	0–1	None	None	Comfortable, hemodynamically stable
2 h	1	None	None	—
4 h	2–3	Paracetamol 1 g Intravenous (IV)	None	First analgesic request at ~4 h
8 h	2–3	Paracetamol 1 g IV	None	No nausea/vomiting
16 h	2–3	Paracetamol 1 g IV	None	No urinary retention/pruritus
24 h	1–2	Paracetamol 1 g IV, Tramadol 50 mg IV pro re nata (PRN) (total 0–100 mg/24 h)	None	Ambulating,tolerating diet

Patient perspective: The patient wished to avoid airway instrumentation and inhalational agents after witnessing a peer's adverse experience and expressed satisfaction with the comfort and speed of recovery.

Timeline:
During surgery: The Duration of the surgery was about 90-minutes and the patient was hemodynamically stable with no supplemental anesthesia.
PACU (0h): The Pain score was 0-2/10, and all the vital signs were stable.
First 24 hours: Pain ≤3/10, first analgesia at ~4h, and patient ambulated on the same day.

III. DISCUSSION

Rationale and novelty: In a young adult who declined general anesthesia, a low dose of hyperbaric ropivacaine administered via a mid-thoracic segmental spinal produced reliable, side-selective anesthesia for gynecomastia excision. The profile observed rapid onset, focused thoracic coverage, and minimal hemodynamic disturbance mirrors prior thoracic spinal experiences in breast surgery and illustrating that adjuncts like erector spinae plane block is not always required when surgical dissection is limited.

Technique and dosing: Delivering 7.5 mg of 0.75% Hyperbaric ropivacaine with 8% glucose at the T4-T5 interspace in the left lateral position yielded T2-T6 coverage on the operative side with preserved motor function. Detailing the interspace, needle gauge, baricity and preparation, slow injection, and positioning improves reproducibility and addresses common concerns about controlling cephalad spread and maintaining a segmental distribution. These parameters are consistent with doses and levels reported for breast procedures using thoracic spinal techniques.

Safety considerations: Subarachnoid injection at mid-thoracic levels requires deliberate needle control given the relative proximity of the cord. Practical safeguards include use of a fine-gauge needle, slow and gradual introduction of the needle, aspiration with free cerebrospinal fluid without blood or paresthesia, slow incremental injection, and lateral positioning to bias spread toward the operative side. In this case, intraoperative heart rate and mean arterial pressure remained within roughly 10% of baseline, and recovery was uneventful, findings that support feasibility when patient selection, monitoring, and operator expertise are aligned. A brief anatomic note at these levels, the dural-cord relationship and limited injectate volume reinforce the importance of precise technique to minimize risk.
Sedation and hemodynamics: Dexmedetomidine at 0.5 µg/kg/h gave a pleasant, cooperative level of sedation (Ramsay 2-3) without causing slow heart rate, low blood pressure, or requiring any vasoactive or anticholinergic drugs. This complements a segmental block by preserving spontaneous ventilation and obviating airway instrumentation.
Analgesia strategy: Although ESP blocks can broaden postoperative analgesia after breast surgery, the segmental thoracic block alone was sufficient for this unilateral, limited dissection. ESP may be reserved for more extensive tissue handling, anticipated drain discomfort, or posterior thoracic pain, balancing added procedural time against potential analgesic gains. In the present case, low pain scores and a first analgesic request at about four hours suggest that TSSA alone met perioperative needs.

Limitations and Implications:

As a single case, generalizability is constrained, and outcomes may depend on operator experience and institutional monitoring capacity. Comparative work against general anesthesia, paravertebral techniques, and combined TSSA-ESP strategies would delineate relative benefits, including effects on recovery profiles, opioid use, and patient satisfaction. For centres with regional expertise, a carefully titrated thoracic segmental spinal can be a pragmatic option for selected gynecomastia excisions.

Ethics:

The patient gave written consent for the anesthetic procedure and for this case report, with all identifying details removed. Care followed the hospital's guidelines and accepted ethical standards. The authors declare no funding and no conflicts of interest.

IV. CONCLUSION

Unilateral TSSA with low-dose hyperbaric ropivacaine at a midthoracic interspace provided effective anesthesia and a smooth recovery for gynecomastia excision in a young adult who declined general anesthesia. When applied in carefully selected patients and delivered by experienced clinicians with

appropriate monitoring, this approach is a feasible alternative to general anesthesia.

Acknowledgements

The authors thank the patient for providing written informed consent for publication and MKH Orphanage Hospital, Tirurangadi, for institutional support, no external funding was received for this work. The authors also acknowledge Dr Nabeel and the late Dr Abdurahman Ambadi for surgical care, Dr Mohammed Afsal, Head of Anesthesia, for departmental support, Dr P. Abdussammad, Chief Medical Officer and Medical Superintendent, for administrative facilitation and M. K. Bava, General Secretary, MKH Hospital, for institutional coordination.

REFERENCES

1. Paul A, Borkar A. Anaesthetic management for mastectomy in a male with unilateral gynecomastia: The utilization of thoracic segmental spinal anaesthesia and erector spinae plane block. Cureus. 2023;15(10):e47502. doi:10.7759/cureus.47502

2. Elakany MH, Abdelhamid SA. Segmental thoracic spinal has advantages over general anesthesia for breast cancer surgery. Anesth Essays Res. 2013;7(3):390–395. doi:10.4103/0259-1162.123263

3. Mahmoud AH, Hussein HA, Girgis KK, Kamal AM, Nafady HA. The novel use of spinal anesthesia at the mid-thoracic level: A feasibility study. Egypt J Cardiothorac Anesth. 2014;8:21–26.

4. Ullah MM, Kamal MM, Begum SA, Hassan AFU, Islam MJ, Khan MS. Effectiveness of segmental thoracic spinal anaesthesia in breast surgery: An observational study. J Shaheed Suhrawardy Med Coll. 2024;14(2):47–52. Available from: **https://www.banglajol.info/index.php/JSSMC/article/view/73178**

5. Deshpande N, Agarwal K, Hatgaonkar R, Paliwal N. Efficacy of thoracic segmental spinal anesthesia along with unilateral erector spinae block in patients undergoing unilateral modified radical mastectomy and axillary dissection: A novel multicentric study. Asian J Pharm Clin Res. 2023;16(6):158–163. Available from: **https://journals.innovareacademics.in/index.php/ajpcr/article/view/48397**

6. Abdelraheem TM, Naguib TM, Elkeblawy AM. Thoracic interfacial plane block versus thoracic paravertebral block for anesthesia in gynecomastia surgery: A randomized controlled trial. Bali J Anesthesiol. 2023;7(1):32–38. doi:10.4103/bjoa.bjoa_271_22

7. Jadon A. Nerve stimulator-guided thoracic paravertebral block for gynecomastia surgery. Indian J Anaesth. 2012;56(3):298–300. doi:10.4103/0019-5049.98782

8. Arora G. Breast surgery under thoracic spinal anesthesia: A case report. Int J Anesthesiol Res. 2022;4(1):11–13. doi:10.33545/26648849.2022.v4.i1a.23

9. Hamdi T, Mastari ES, Lubis AP, Ghozali I, Kemalasari N, Harahap AT. Effectiveness and safety of thoracic segmental spinal anesthesia for breast surgery: A systematic review and meta-analysis. Narra J. 2025;5(1):e1630. Available from: **https://narraj.org/main/article/view/1630**

AUTHORS

First Author – Aparnna Baburaj Research Scholar, Srinivas Institute of Allied Health Science, Karanataka, India, Faculty of College of Health Sciences, Gulf Medical University, UAE aparnnababuraj@gmail.com

Second Author – Dr Ellen Safadi, Faculty of College of Health Sciences, Gulf Medical University, UAE

dr.ellen@gmu.ac.ae

Third author- Aishwarya, Faculty of College of Health Sciences, Gulf Medical University, UAE aishwarya@gmu.ac.ae

Correspondence Author – Dr Khaise Hareed, Department of Cardiac Anesthesia, Mohammed bin Khalifa Al Khalifa Cardiac Centre, Bahrain, drkhaisehareed@gmail.com