This article has been accepted for publication and undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record.

Please cite this article as https://doi.org/10.4097/kja.20067
Title: Is Mid-transverse process to pleura (MTP) block a better technique for obese patients undergoing modified radical mastectomy?

Running Title: Is MTP block a better technique for obese patients?

Authors:
1. Rashmi Syal, MD, Senior Resident, Department of Anaesthesiology & Critical Care, All India Institute of Medical Sciences, Jodhpur, India
2. Rakesh Kumar, MD, Associate Professor, Department of Anaesthesiology & Critical Care, All India Institute of Medical Sciences, Jodhpur, India
3. Swati Chhabra, MD, Associate Professor, Department of Anaesthesiology & Critical Care, All India Institute of Medical Sciences, Jodhpur, India
4. Mussavvir Agha, MBBS, Junior Resident, Department of Anaesthesiology & Critical Care, All India Institute of Medical Sciences, Jodhpur, India

Corresponding Author
Swati Chhabra
Department of Anaesthesiology & Critical Care, OT block, 3rd floor OPD complex, AIIMS Jodhpur, India
swati_virgo83@yahoo.co.in
+917340033034

Previous presentation in conferences: None

Conflict of interest:
No potential conflict of interest relevant to this article was reported

Funding: None

Acknowledgments: None
IRB number: Not Applicable

Clinical trial registration number: not applicable
Is mid-transverse process to pleura (MTP) block a better technique for obese patients undergoing modified radical mastectomy?

- Letter to the Editor -

Sir,

Obesity in surgical patients presents numerous challenges to the anaesthesiologists. Difficult airway, associated co-morbidities, postoperative pulmonary and thromboembolic complications are just a few difficulties encountered. Combining regional block techniques with general anesthesia helps in overcoming many of the problems by reducing opioid requirements, decreasing incidence of postoperative nausea/vomiting and thus allowing early ambulation [1]. Regional blocks are quite popular and efficacious in the management of pain associated with breast surgeries and form an important component of multimodal pain management. Amongst them, thoracic epidural (TE) and thoracic paravertebral block (TPVB) are most commonly used but they may be associated with complications like accidental dural puncture, epidural abscess/hematoma, spinal cord injury, pneumothorax etc. Moreover, these techniques might be technically difficult in obese patients even with ultrasound guidance. In the quest of safer techniques, novel blocks or alternative approaches to existing techniques are devised to render patients pain free with minimum inherent risk. One such approach of paravertebral block has recently been described as “Mid-transverse process to pleura” (MTP) block [2].

A 64-year-old morbidly obese female patient weighing 100 kg (BMI- 41.66) was posted for modified radical mastectomy. She was also a known case of hypertension, type II diabetes mellitus and obstructive sleep apnoea. In the block room, the patient was premedicated with IV midazolam 1 mg and fentanyl 50 mcg. In the sitting position and under sterile conditions, T4 spine was palpated and a high-frequency linear ultrasound probe (LOGIQe, GE Healthcare, China) was placed
longitudinally about 2.5 cm lateral to midline. After skin infiltration with local anesthetic, a 100 mm short bevel echogenic needle (Contiplex, B BRAUN Melsungen, Germany) was inserted in-plane, in cranial to caudal direction. The desired end point for the needle tip was the mid-point between the posterior border of the transverse process and the pleura (Fig. 1A). A titrated bolus of 20 ml of 0.5% ropivacaine was injected at the target site after confirming the spread with 2 ml of normal saline (Fig. 1B). Thereafter, a 20 G catheter was threaded through the needle with the catheter tip about 3 cm beyond the needle tip. Sensory mapping with the cold swab and 26 G needle pinprick over the anterior chest wall and lateral chest wall revealed a dermatomal block from T1 to T7 after 30 minutes of the block. General anesthesia was administered as per institutional protocol. Intraoperatively, 0.5% ropivacaine infusion was maintained @ 8 ml/hr. The haemodynamic parameters were stable throughout the surgical procedure with no further requirement of opioids after 150 mcg of fentanyl given at induction of anaesthesia. Postoperatively analgesia was maintained with intravenous paracetamol 1 g every 8 hourly and infusion of 0.2% of ropivacaine at the rate of 8 ml/h during the post-operative period till 72 hours. The patient required an additional rescue analgesic requirement in the third postoperative hour which was managed with injection diclofenac 75 mg. Overall postoperatively, her VAS at rest and on movement remained in the ranges 2-3/10 and 3-4/10 respectively with analgesia maintained with ropivacaine 0.2% infusion, paracetamol (1 g, 8 hourly) and single rescue dose of diclofenac as mentioned before. Patient was very much satisfied, able to ambulate and free of pain and nausea/vomiting.

Reduced opioid requirement, decreased incidence of postoperative nausea & vomiting, early ambulation and better recovery profile make the regional nerve blocks all the more important for multimodal pain management. With an increased use of ultrasound in regional anesthesia, the current trend is to go more peripheral, look for more specific target according to the desired outcome and thus the fascial or plane blocks are gaining popularity. Recently described fascial
blocks for thoracic surgeries include ESP block, retro-laminar block, intercostal para-spinal block and MTP block. MTP block is the most recent one amongst these and was described by Costache et al. [2] in which drug is deposited midway between the transverse process to pleura. They postulated that local anesthetic deposited at this point may reach the paravertebral space through several possible mechanisms like medially through the gap between the superior costotransverse ligament (SCTL) and vertebral bodies, through fenestrations in SCTL and laterally through the internal intercostal membrane [2]. Syal et al. [3] described the role of this novel technique in a patient with multiple rib fractures with excellent pain relief while Bhoi et al. [4] reported this block in three patients posted for modified radical mastectomy with favourable result. The morbidly obese patient in our case was managed safely and successfully with multimodal analgesia with MTP block. Postoperatively, continuous infusion of 0.2% ropivacaine the analgesic requirements to a great extent. Only paracetamol was used as an adjunct and a single rescue dose of diclofenac was required. A reduced opioid requirement was advantageous since there was no postoperative nausea/vomiting, excessive sedation, respiratory depression, constipation etc. All this helped the patient in early ambulation and an early recovery. The advantage of MTP block over the conventional TPVB is that visualization of SCTL is not required which might be difficult in obese patients. The second advantage is that the target point of a needle is much superficial and far away from structures like pleura, neurovascular bundles making this novel block much safer.

We conclude that MTP block is a safe option in obese patients scheduled for breast surgery although well designed controlled studies are warranted for knowing the statistical significance.
References


Fig. 1. (A) Schematic line diagram representing the needle position in mid-transverse process to pleura (MTP) block, (B) Ultrasound image of the MTP block with the transducer placed in a parasagittal orientation and an in-plane needle insertion. SCTL; superior costotransverse ligament, TP; transverse process, * denote the site for local anesthetic infiltration for MTP block.