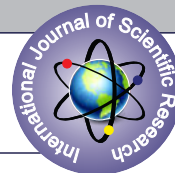


“A NEW ANATOMICAL LANDMARK GUIDED APPROACH TO DEEP SERRATUS ANTERIOR PLANE (SAP) BLOCK FOR PERIOPERATIVE ANALGESIA IN PATIENTS UNDERGOING BREAST SURGERIES UNDER GENERAL ANAESTHESIA : A CASE SERIES”



Anaesthesiology

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ABSTRACT

Introduction: Anatomical landmark guided deep SAP block was first described by Dr. Vadera et al in the year 2020. we described a new anatomical landmark guided deep SAP block technique and report a case series in patients undergoing breast surgery for perioperative analgesia. **Materials and Methods:** A total of 10 patients undergoing breast surgery were studied. They were administered new anatomical landmark guided deep SAP block after administration of general anaesthesia. Landmarks used were intersection point of horizontal line passing through the ipsilateral nipple and a vertical mid axillary line. A total 30ml of 0.25% Bupivacaine with 8mg dexamethasone was administered using 22G hypodermic needle. Outcomes assessed were intraoperative supplemental analgesics requirement, hemodynamic stability, postoperative visual analogue score in first 24hrs, total duration of analgesia, time required for first rescue analgesic, total dose of rescue analgesic required in first 24hrs, complications following block and time required to administer the block. **Discussion:** In 2020 Vadera et al. demonstrated that SAP block using anatomical landmark guided approach using 20-25ml of 0.25% Levobupivacaine provides analgesia involving ipsilateral T2-T6 dermatome lasting for 24hrs with decrease in requirement of other analgesics. We also reported similar findings. **Results:** No intraoperative supplemental analgesic was required. There was good intraoperative hemodynamic stability with minimum requirement of muscle relaxants. Postoperative visual analogue score was 0 in seven patients in first 24hrs and in remaining three patients the score was 2 in first 12hrs and 4 in next 12hrs. No complications were noted. Average time for performing the block was 8 mins. **Conclusion:** The new anatomical guided deep SAP block is a simple, safe, easy to learn, easy to administer and an effective analgesic technique for patients undergoing breast surgery specially in resource poor setting.

KEYWORDS

Serratus anterior plane(SAP) block, landmark approach, breast surgery.

INTRODUCTION

Innervation of mammary region consists of various nerves arising from brachial plexus, cervical plexus and cutaneous branches of thoracic spinal nerves T1- T7 (anterior and lateral cutaneous branches). Serratus Anterior plane (SAP) block is divided into superficial SAP block and deep SAP block. In superficial SAP block the local anaesthetic is injected in the fascial plane between Latissimus Dorsi and Serratus anterior muscle whereas in deep SAP block local anaesthetic is injected in the fascial plane between the Serratus Anterior muscle and the underlying ribs & external intercostal muscle. The need for the study arised because pectoral region has got a rich sensory innervation and landmark guided approach can be given without the use of ultrasound in resource poor settings. In patients having chronic pain a good post operative analgesia is always beneficial to surgical outcome and patient satisfaction and this block can prevent complications associated with more invasive blocks like thoracic epidural, paravertebral block leading to Pneumothorax, Hemothorax, Horner Syndrome etc.

AIM OF THE STUDY:

To assess the duration of post-operative analgesia by VAS score.

OBJECTIVES OF THE STUDY:

1. To assess the time required to give the block,
2. To assess the time required to give first dose of post- operative analgesic
3. To assess the intra-operative requirement of analgesia
4. To assess the intra-operative requirement of muscle relaxant.
5. To check for any complications associated with the block.

MATERIALS AND METHODS:

After taking proper written and informed consent a pilot study was conducted in a Tertiary care hospital which included a case series of total 10 cases posted for breast surgery under general anaesthesia. It was a type of observational study.

Inclusion Criteria:

Both male or female patients belonging to ASA grade I or II, with age

ranging from 18-45 years undergoing breast surgery with no known allergy to local anaesthetic were included in the study.

Exclusion Criteria:

Patients aged <18 years and >45 years, belonging to ASA grade III and IV, pregnant females, patients having coagulopathy and those having allergy to local anaesthetic were excluded.

METHODOLOGY:

Anatomical landmarks taken into consideration were intersection point of a vertical mid axillary line and a horizontal lines passing through nipples which coincides roughly with 4th rib in males and 4th or 5th rib in females. We used mid axillary line as landmark since Serratus anterior muscle lies more superficially in this region. All patients were kept NBM for 6 hours prior to surgery. After administration of general anaesthesia supine position was maintained, arm was abducted to 90° and landmarks were marked; after painting and draping, the rib under the land mark was palpated using thumb of the non dominant hand. A 22G hypodermic needle with drug loaded syringe connected to it was inserted perpendicular to the skin and parallel to the OT table till the rib was felt and the drug mixture containing total 30ml of 0.25% bupivacaine with 8 mg dexamethasone was injected after negative aspiration. Correct spread of drug was indicated by no resistance while injecting the drug, presence of back flow while disconnecting the syringe. Inj paracetamol 1gm I.V was administered as rescue analgesia if VAS score was >4.

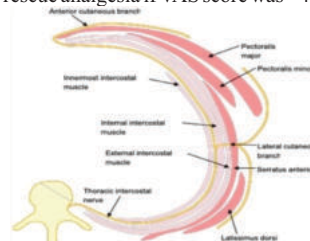


Fig 1. Axial cross-sectional illustration demonstrating the anatomy of the intercostal nerve and the surrounding structures.¹



Fig 2. Landmarks of New Landmark Guided Deep Serratus Anterior Plane Block

Black Vertical Line: Mid Axillary Line

Black Horizontal Line: Line passing through the Nipple

X : Intersection point of two lines which is site of needle entry

OBSERVATION AND RESULTS:

Intra-operative parameters like time required to administer the deep SAP block, hemodynamic parameters, intra-operative requirement of muscle relaxant, requirement of supplemental analgesia (if any) and post-operative parameters like 4 hourly VAS score, total duration of analgesic effect and time required to give rescue analgesic were noted.

Table 1: Mean VAS Score

Time (hours)	0-4	4-8	8-12	12-16	16-20	20-24
VAS score (mean)	0.2	0.2	0.6	1.2	1.2	1.2

The VAS score in 7 patients were 0 till the end of 24hrs however in 2 patients the VAS score was 2 for first 12hrs and 4 in next 12hrs and in the remaining 1 patient the VAS score was 2 from the beginning (in this patient lesion was in upper medial quadrant). Average time required to administer the block was 8mins, patient was hemodynamically stable throughout the surgery with less or no need for intra- operative supplemental analgesic, also less requirement of intra-operative muscle relaxant was observed (total 5mg of additional Atracurium was utilized for average 2hrs of surgery). Time required for first dose of rescue analgesic was 24hrs. No complications were observed while administering the block.

DISCUSSION:

In 2013 **Blanco et al²** first studied the effects of ultrasound guided SAP block for post-operative analgesia after thoracoscopic surgery comparing with local infiltration and they found that SAP block has advantages over local analgesia in thoracic surgery and may serve as a supplementary technique for thoracic analgesia.

Mayes et al³ first in 2016 did anatomical evaluation of SAP block 6 soft fixed embalmed cadavers at anatomy and clinical and skill center at New Castle university by injecting methylene blue dye and described spread of methylene blue across thoracic dermatome.

In year 2020 **Vadera H K et al⁴**, studied the SAP block by anatomical landmark guided technique using 20-25ml of 0.25% levobupivacaine and they observed that analgesia was demonstrated involving T2-T6 dermatome lasting for 24hrs and analgesic requirements were reduced. We also found similar results in our study.

CONCLUSION:

The new anatomical guided deep SAP block is simple, safe, easy to learn, easy to administer and an effective analgesic technique for patients undergoing breast surgery especially in resource limited settings.

Limtation:

it doesn't cover all the innervations of mammary region (anteromedial chest wall) and difficult to perform in awake and uncooperative patients. Our study has small sample size with no randomization so larger study is needed for further validation of our novel technique in comparison to PNS and USG guided.

REFERENCES:

1. Francesca Elwen, Neel Desai, Teresa Parras, Rafael Blanco, Javier Duran 2020 <https://resources.wfsahq.org/atotw/9317/>
2. Blanco R, Parras T, McDonnell JG, Prats Galino A. Serratus plane block: a novel ultrasound guided thoracic wall nerve block. *Anaesthesia*. 2013 Nov;68(11):1107-13.

3. Mayes J, Davison E, Panahi P, Patten D, Eljelani F, Womack J, Varma M. An anatomical evaluation of the serratus anterior plane block. *Anaesthesia*. 2016 Sep;71(9):1064-9.
4. Vadera H, Mistry T, Rathe B. Serratus anterior plane block: Anatomical landmark-guided technique. *Saudi Journal of Anaesthesia*. 2020;14(1):134-5.