Comparison of two different techniques of serratus anterior plane block: A clinical experience

Madam,

Blanco et al. in 2013 described ultrasound-guided serratus anterior plane (SAP) block as an alternative to other regional anesthetic techniques in patients undergoing breast surgeries identifying two potential spaces: superficial and deep to serratus anterior (SA) muscle at the level of fifth rib in mid-axillary line.\(^1\) However, Fajardo et al. gave preference to the deeper block, between the SA and external intercostal muscles.\(^2\) Recently, we started this block at our hospital in nonreconstructive breast surgeries.

Medical records of 20 patients who underwent breast surgery and received SAP block under ultrasound guidance either above or beneath the SA muscle in a period of 3 months were reviewed. All patients were American Society of Anesthesiologists Grade I and II, aging 26–68 years, and mean weight of 53.3 kg.

After induction of general anesthesia and supraglottic device placement, block was performed in supine position with slight tilting to contralateral side. A linear high frequency (6–13 Hz) probe (Sonosite M-Turbo, Sonosite Inc., Bothell, WA, USA) was placed over the mid-axillary line in a transverse plane overlying the forth to fifth rib. The latissimus dorsi (superficial and posterior), teres major (superior), and SA (deep and inferior) muscles were identified overlying the fifth rib. In an in-plane approach, and in anterior to posterior direction, 22 Gz echogenic block needle was inserted until the tip was placed above
SA muscle or deep to it over the rib [Figure 1]. Thirty milliliters of 0.375% ropivacaine was deposited after negative aspiration.

SAP block deep to SA had been given in 10 patients of modified radical mastectomies (MRM) and two wide local excisions (WLE). Superficial SAP block had been given in six patients of MRM and two of simple mastectomy (SM). One of 8 patients in the superficial group and four of 12 patients in the deep group required rescue fentanyl intraoperatively. All five patients were undergoing MRM. Postoperatively intravenous paracetamol 1 g was administered 6 hourly and injection diclofenac 75 mg 12 hourly. Injection fentanyl 25 mcg intravenous was administered for rescue analgesia if numeric rating scale (NRS) >4. Median time to first rescue analgesia in superficial group was 5 h and 4 h in deep group. Average postoperative fentanyl consumption in 24 h was 125 mcg in superficial group and 150 mcg in deep group. None of the patients of SM or WLE required rescue analgesic. Median NRS score was <4 in both groups during 24 h period of monitoring. None of the patients had any intraoperative or postoperative complication. One patient had technical difficulty in deep block due to excessive axillary fat.

Regional anesthesia use in breast surgery is getting more popular nowadays, because it reduces opioid consumption, both in intraoperative and postoperative period. Previously intercostal block and paravertebral block had been successfully used for postoperative analgesia in breast surgery. However, risk of pneumothorax, hypotension, central neuraxial block, opposite side spread, and requirement of more expertise favors SAP block, which is more superficial, peripheral, and safe.\(^1\) In the current series, we reviewed both techniques of either above or below the SAP. We found less opioid consumption in superficial group. However, the median NRS score in postoperative period was similar in both groups with minimal fentanyl consumption. In deep group also, there was no intraoperative fentanyl requirement in eight patients. The results can be well explained by Daga et al. cadaveric study, where they deposited the water-air contrast below the SA muscle belly and found caudal spread of contrast up to subcostal margin. Cephalad spread was up to 3\(^{rd}\) intercostal space in 71\%,\(^1\) Blanco et al. found wider dermatome spread from T2 to T9 in superficial group.\(^1\) We found similar corroborative result of better pain control in superficial group. Another advantage may be because of blockade of long thoracic and thoracodorsal nerve which lies in superficial plane of SA.\(^1\)

Thick axillary fat in obese patient may cause difficulty in imaging as well as needling, as observed in one patient. In such case, depositing the drug below SA using rib as the end point is safer.\(^4\) The analgesic requirement may differ depending on the extensiveness of different types of breast surgeries and also different demography. The small group of patients with different breast surgeries cannot conclude a definite advantage of one technique over the other. Assessment of paresthesia and numbness can better delineate the dermatome spread difference rather than opioid consumption. Further randomized controlled trials with larger sample size are required to compare the efficacy of the two different approaches to SAP block and also to find any advantage in specific type of breast surgery.

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**Conflicts of interest**

There are no conflicts of interest.

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### Table 1: Comparison of mortality predictors between survivors and nonsurvivors

| Mortality predictor | Survivors | Nonsurvivors | P    |
|---------------------|-----------|--------------|------|
| SOFA score (preoperative) | 2±2       | 5±3          | 0.029|
| SOFA score (first postoperative day) | 2±2       | 6±4          | 0.001|
| IL‑10 (preoperative) (pg/ml) | 108.3±181 | 78±96        | 0.650|
| IL‑10 (second postoperative day) (pg/ml) | 40±96     | 23±17        | 0.674|
| Procalcitonin (preoperative) (pg/ml) | 2764±1881 | 3716±2138   | 0.202|
| Procalcitonin (second postoperative day) (pg/ml) | 1150±1230 | 2549±1482   | 0.014|
| Procalcitonin (fourth postoperative day) (pg/ml) | 832±980   | 1847±1028   | 0.022|

Values are mean±SD

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