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Transverse Abdominis Plane Block And Rectus Sheath Block Medication Depots

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My opinion

Uncertainty exists related to the appropriate perioperativeÂ period to perform a transverse abdominis plane (TAP) block [1].Â This block could be performed preoperatively, after induction of anesthesia with or without tracheal intubation, before closure of the surgical incision, before emergence from anesthesia with or without tracheal extubation, or postoperatively.Â Additionally, should the TAP block be performed by the anesthesia team or the surgical team? The answer is that it depends; each combination of previously mentioned scenarios has advantages and disadvantages.Â The following discusses logistical reasons for choosing one perioperative period over another.

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Preoperatively performed preemptive TAP block in preoperative holding areas may have to accommodate the following:

- Ensuring adequate patient comfortÂ for preoperatively anxious and moving patient when performing TAP block
- Ensuring efficient performance of preoperative TAP blockÂ without delayingÂ scheduledÂ operating roomÂ entry times especially for first cases of the day
- Potentially adding colored dyes like methylene blue to local anestheticÂ toÂ timely identify ifÂ TAP medicationÂ depot is getting breachedÂ during surgicalÂ dissectionÂ

Preemptive TAP block performed post-induction of anesthesia in the operating rooms may have to accommodate the following:

- Ensuring efficient performance of preemptive TAP blockÂ in the operating room without delayingÂ surgicalÂ start time
- Potentially adding colored dyes like methylene blue to local anestheticÂ toÂ timely identify ifÂ TAP medicationÂ depot is getting breachedÂ during surgicalÂ dissection
- Dependence of surgical incision timing after TAP block to allow sufficient time of onset for local anesthetic to work preemptivelyÂ

TAP block performed before closureÂ of surgical incision may have to accommodate the following:

- Adding another surgical step leading to increased surgical timeÂ by delaying surgical end timeÂ

TAP block performed before emergenceÂ from anesthesiaÂ may have to accommodate the following:

- Adding anotherÂ step leading to increased operating room time after the surgery has endedÂ when team isÂ expecting quicker turnover of operating roomÂ

Postoperative TAP block performed inÂ post-anesthesia care unitsÂ may have to accommodate the following:

- Ensuring adequate patient comfortÂ when performing TAP block with postoperative patient moving around due to pain

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Further questions remain whether ultrasound-guided TAP block by anesthesia is more effective than surgical TAP block under direct vision of TAP [2]. It likely depends on the expertise and experience of those performing TAPÂ block although direct vision of TAP may be easier to master than ultrasound-guided vision. Additional logistic question arises regarding direct vision rectus sheath (RS) block being performed [3] under more exact direct vision as compared to laparoscopic TAP block with Doyleâ€™s bulge sign [4] or blindly performed surgical TAP block [5] based on a feeling of â€œgiveâ€• with blunt needle especially when muscles enclosing TAP are not being dissected as a part of surgical procedure irrespective of it being vertical midline or lateral or transverse or flank surgical incision. Another logistical question arises regarding the breaching of TAP depot being related to the time TAP medications being allowed to stay in place undisturbed before surgical dissection inadvertently breaches it, and similarly, preoperative RS block may be more prone to breaching of medication depot with vertical midline incisions unless RS block medication depot too follows the same timeline as TAP medication depot in terms of medication dissipation and systemic absorption [6]. Interestingly, it may be worth envisaging that breached depots ofÂ TAP and RS medications with or without accompanying coloring dyesÂ thence dissipating into to potentially color peritoneum and peritoneal cavity may potentially decrease the propensityÂ ofÂ developing

postoperative adhesions [7]. It will be only in due course of time that there may be a consideration to see whether medially created RS block medication depot spreads [8] laterally enough or whether laterallyÂ created TAP medication depot spreads medially enough unless TAP block covers abdominal wall nerves more proximally thus making the RS block redundant after TAP block while RS block covering abdominal wall nerved more distally warranting supplementation with TAP block [9] as long as total bupivacaine amounts do not cross the daily upper limit of 400mg among healthy adults.

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Simply stating with examples, whether performing ultrasound-guided bilateral TAP block or RS block in healthy adults, it may be prudent to use 30 ml of 0.25% bupivacaine on each side (150 mg bupivacaine total) or 30 ml of 0.5% bupivacaine (150 mg bupivacaine total) if performing only unilateral TAP block or RS block in healthy adults. Similarly, surgically performed bilateral TAP block in healthy adults may require 15 ml of 0.25% bupivacaine (150 mg bupivacaine total) in each of four quadrants (upper-right/lower-right/upper-left/lower-left)Â between directly visible internal oblique and transverse abdominis muscles at the lateral edges ofÂ transverseÂ surgical incision and surgically performed bilateral RS block in healthy adults may require up to 30 ml of 0.25% bupivacaineÂ (150 mg bupivacaine total) on each ofÂ two sidesÂ (right/left) betweenÂ directly visible rectusÂ muscle and posterior rectus sheathÂ at the level of umbilicusÂ and above arcuate line duringÂ verticalÂ surgical incision. Laparoscopic or robotic TAP block in healthy adults may require 30 ml of 0.25% bupivacaineÂ (150 mg bupivacaine total) on each ofÂ two sidesÂ (right/left) laterally between internal oblique and transverse abdominis to appear as Doyle'sÂ bulge during robotic laparoscopy. The question remains whether and when a top-up TAP or RS block can be performed with additional 150 mg bupivacaine total if preoperative or intraoperative TAP or RS block fails with 150 mg bupivacaine total with daily total of bupivacaine still remaining below 400 mg among healthy adults. Alternatively, toÂ enhance medication spread and analgesic coverage across the abdomen, ultrasound-guided bilateral TAP block plus bilateral RSÂ blockÂ may be considered, preferably in anesthetized healthy adults to avoidÂ four separate skin pokes-relatedÂ discomfort, with each of the four blocks' sites receiving 15 ml of 0.25% bupivacaine (150 mg bupivacaine total).

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Summarily, for perioperative analgesia, TAP and RS block medication depots may be created at various perioperative periods depending on logistics and choices.

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