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10-2020

Four-Quadrant TAP Block and Multimodal Pharmacology: The “Way to Go” to Debulk a Large Uterine Sarcoma in a Patient Requiring Immediate Postoperative Anticoagulation

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Recommended Citation

D'Souza S. Four-Quadrant TAP Block and Multimodal Pharmacology: The “Way to Go” to Debulk a Large Uterine Sarcoma in a Patient Requiring Immediate Postoperative Anticoagulation. The American Society of Anesthesiologists (ASA) Virtual Meeting, Oct 2020.

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Introduction

We here describe the reasons for failure of the classical transversus abdominis plane (TAP) block and how to modify it to achieve success. We also describe a multimodal pharmacological approach in the patient.

Case Description

The failure of a correctly-performed classical TAP block is due to the resistance to blockade of the lateral cutaneous branches of the intercostal nerves, and inadequate cephalic spread leading to block failure in the upper dermatomes. To resolve such failures, we performed a four-quadrant TAP block using 60 cc of 0.2% bupivacaine along with a multimodal pharmacological approach (hydromorphone, ketamine and dexmedetomidine infusion) in a patient presenting for debulking of a large uterine sarcomatous tumor. The patient had complete pain relief for 12 hours and thereafter her pain was effectively managed with hydromorphone PCA.

Concepts for TAP Block Success

1. Local anesthetic diffuses laterally to block the lateral cutaneous branch
2. The cephalic spread blocks the upper segments
3. Successful spread depends on injecting a large volume of the local anesthetic solution

Why is adding epinephrine not useful in a TAP block?

The abdominal wall is low in vascularity. Adding epinephrine to the local anesthetic isn't useful for identification of intravascular injection and usually does not prolong the block.

The reasons for failure of classical TAP blocks ¹

- ✓ Failure to spread laterally to block lateral cutaneous nerve
- ✓ Failure of cephalic spread to block upper dermatomes.

Failure may be due to: Injection of inadequate volumes; injection not performing laterally; injection point too low

The technique of Four Quadrant TAP block ¹

- ✓ Bilateral injection: Select an injection point as high and as laterally as possible. (This blocks the lateral cutaneous branch and enables cephalic spread)
- ✓ Second injection should be as high as first and closer to midline, to block the higher dermatomes which the classical approach may have missed

Multimodal Analgesia

Normal multimodal pharmacological approach for perioperative analgesia ^{2,3}

1. Opiates	2.. Acetaminophen
3. NSAIDs	4. Lidocaine infusion
5. Magnesium	6. Ketamine
7. Dexmedetomidine	8. Gabapentin

Our Multimodal Approach

1. Four-quadrant TAP	2. Opiates
3. Ketamine	4. Dexmedetomidine
5. Post-op patient-controlled analgesia with hydromorphone	

CONCLUSION

We successfully provided effective analgesia using a four quadrant TAP block and a multimodal pharmacological approach. This enabled early resumption by patient of anticoagulant therapy to prevent deep vein thrombosis.

Nerve supply of the anterior abdominal wall

- T7-T11 Intercostal nerves (thoracoabdominal nerve)
- T12 subcostal nerve
- L1 Iliinguinal nerve
- L1 Ileoinguinal nerve

Layers of the abdominal wall

- External oblique muscle
- Internal oblique muscle
- Transversus abdominis muscle
- Peritoneum

For a correctly performed bilateral TAP block, the local anesthetic solution should be deposited between the external oblique, internal oblique and transversus abdominis muscles.