

Post caesarean delivery pain control with bilateral ultrasound-guided transversus abdominis plane block using 18G intravenous cannula: a case report.

Osaheni Osayomwanbo,¹ Idehen O. Hanson,² Edomwonyi N. Philomena³

^{1,2,3} Department of Anaesthesiology
University of Benin Teaching Hospital Benin City,
Edo State, Nigeria.

¹Correspondence author: Osaheni Osayomwanbo
Email:osaheni44@gmail.com

Summary

In recent time ultrasound guided transversus abdominis plane block has become popular in the developing countries as option in post-operative pain management. Its use in multimodal setting spares the use of opioids and the associated side effects like sedation however; availability of materials could most time limits its routine use. We present a case of transversus abdominis plane block that was performed on a 36 year old female with American Society of Anaesthesiologist physical status classification II. She was a gravida 3 para 2 female with 2 previous Caesarean section. Transversus abdominis plane block (TAP) was administered with 18G intravenous cannula needle because our stock of regional anaesthetic needle was exhausted at the time we intended conducting the block. Her weight and height, were 63kg, 1.57 meters. Transversus abdominis plane block in a multimodal setting was planned for the patient at preoperative anaesthetic review. This was because the patient specifically did not want any form of sedation in the post-operative period. The Caesarean section was done under subarachnoid block. Immediately after the surgery, it was observed that our stock of regional anaesthetic needle was exhausted. Consultation with the patient was made and consent was obtained to use available alternative. A Size 18G intravenous cannula needle was considered as alternative. It was therefore use in place of regional anaesthetic needle to access the transversus abdominis plane under ultrasound guide. After confirming the correct needle placement, bilateral in plane transversus abdominis plane block was conducted using a total of 40mL of 0.25% plain bupivacaine.

The numerical pain score was consistently low in the post operative period. On a four point satisfaction scale, patient rated her satisfaction with post operative pain control as 4. There was no incidence of complication from the performance of transversus abdominis plane block. This observation shows that ultrasound guided transversus abdominis plane block can be done with regular intravenous cannula needle with minimal injury in the absence of regional anaesthesia needle.

Keywords: Post Caesarean pain management, transversus abdominis plane block (TAP), regional anaesthesia needle.

Introduction

The anterior abdominal wall is innervated by the ventral rami of the thoracolumbar nerves (T7- T12). These nerves pass through the transversus abdominis plane (TAP).The transversus abdominis plane lie between the internal oblique and the

transversus abdominis muscle. Transversus abdominis plane block has been shown to be effective in post operative pain control in a multimodal setting with significant opioid sparing. It is expected that in regions where there are challenges with opioid use and supply, TAP block in

combination with other analgesics could provide pain control especially in post caesarean delivery where early ambulation and bonding is an important consideration by the parturient and obstetricians. There are few reported incidences of complications from ultrasound guided TAP block.⁴

Ultrasound guided TAP block is often performed using regional anesthetics needle. These needles are expensive. Because of the cost implications less interest is shown in their purchase by hospital management and thus they may not be readily available in our environment. We present a case of TAP block performed on ASA II obstetric patients with two previous caesarean deliveries desirous of adequate post operative pain control devoid of sedation.

Case Report

A 36 year old ASA 11, gravida 3 para 2 with a history of two previous Caesarean section presented for elective Caesarean delivery in our facility. Her weight and height were 63kg, 1.57 meters. The estimated gestation age was 37weeks. There was no history of inter-current medical disorders. The two previous Caesarean sections were done under subarachnoid block with significant unsatisfactory post operative pain control using pentazocine, promethazine and diclofenac suppository combination.

The full blood count (FBC), electrolyte, urea, creatinine, and urinalysis result at preoperative review were normal. The general and systemic examinations were essentially normal. Patient requested for post operative pain control with minimal sedation to allow for early ambulation, room-in and bonding. This required the selection of effective multimodal pain

control technique. Ultrasound guided TAP block in combination with rectal diclofenac 100mg 12 hourly, IV paracetamol 1g 8 hourly and tramadol 100mg for break through pain on demand was planned for the post operative pain control. Preoperative anesthesia was achieved with intrathecal 12mg of 0.5% hyperbaric bupivacaine. Patient had a Pfannenstiel incision. Surgery lasted two hours. At the end of surgery the post spinal block height was L12. The regional anaesthetic needle scheduled for the TAP block was not readily available therefore a bilateral lateral ultrasound-guided TAP block was done with 18G IV cannula. The 20mL syringe containing local anaesthetic (LA) solution was connected to the IV line extension (B/Braun original perfusor®-Leitung) that was attached to the 18G IV cannula. While the patient was in supine position Sonoace R® linear ultrasound probe was position on the lateral abdominal wall between the costal margin and the iliac crest. The ultrasound probe, oriented in a longitudinal axis was moved forward and downward until a clear image of the abdominal muscle layers was obtained. Using the in-plane needling technique the 18G cannula was advanced into the clearly visualized transversus abdominis plane. Under direct vision, 20mL of a 0.25% of plain bupivacaine was injected into the transversus abdominis plane. The same procedure was conducted on the contralateral side of the abdominal wall. A total of 40mL of 0.25% plain bupivacaine was thus injected into transversus abdominis plane (20mL on each side of the abdominal wall). After each injection of 5mL of local anaesthetic solution, test aspiration was done to exclude intravascular migration of the needle tip.

Successful location and injection of local anaesthetic solution was further confirmed by the presence of Kayak sign. Patient was transferred to the ward after 45 minutes of monitoring in the recovery room.

The numerical pain rating score (NPS) at rest, done four hourly (done at 4,8,12 and 24 hour) in the postoperative period were: 3, 4,3,2. On a 4 point likert scale (dissatisfied, mildly satisfied, moderately satisfied, and fully satisfied) patient rated satisfaction with pain control as 4. Patient did not request for break through pain analgesic. There was no report of sedation, no incidence of LA toxicity neither were there incidence of complication due to TAP block.

Discussion

This case presentation shows that effective ultrasound guided TAP block can be done using IV cannula with IV extension tubing. Correct location of transversus abdominis plane was evidenced by Kayak sign, low postoperative pain score and a high satisfaction score. Patient did not also request for additional analgesics for pain control in the postoperative period.

The method of confirming successful position of our IV needle within transversus abdominis plane agrees with that of Khedke *etal.*,⁶Iyere and coworkers. The location of the IV needle within the TAP was confirmed by real time visualization of the needle tip within the transversus abdominis plane and by the spread of the local anaesthetic solution within the transversus abdominis plane (presence of kayak sign)⁶. Iyere *etal*⁸ did a continuous ultrasound guided transversus abdominis plane block using 16G intravenous cannula. The study aimed at comparing the analgesic efficacy of TAP

block to that of epidural analgesia. Although the primary focus was different from ours, it nevertheless shows that IV cannula can be improvised for the performance of transversus abdominis plane block.

The low pain score at rest agreed with results from other studies that used regional anaesthesia needle in the performance of TAP block. This observation further buttresses the idea that a successful TAP block could be achieved with 18G IV cannula. Similar to our findings, patients in Carney and co-workers⁹ study did not request for additional analgesia for pain management in the post operative period after the conduct of a successful TAP block in a multimodal setting. Thirdly, although the high satisfaction expressed by the patient could be related to the difference in expected pain and actual pain experience it nevertheless; underscore the success in location of TAP using IV cannula without complications.

The use of intravenous cannula needle for ultrasound guided transversus abdominis plane block is unexpected because both needles are rigid and are made from steel alloy that could reflect sound waves. However, the graded regional anaesthetic needles have various lengths which give them advantage over IVcannula needle. Longer needle is required in obese patients with more adipose tissues. In this case report our patient was not obese. Another useful feature of some sheathed blunt regional anaesthetic needles is the presences of two extensions. One of the extensions connects to a port for injecting the local anaesthetic solution. The second extension tubing connects to a peripheral nerve stimulator. There are also regional anaesthetic needles without these features. Intravenous cannula does not have these features at all; their tips are not blunt. This

could be a disadvantage when using IV cannula for TAP block. Although most of these regional anaesthetic needles have blunt tip compared to IVcannula that are design to cut through the skin IV cannula needles can be blunted by rubbing the tip over drug ample edge.

These differences could affect the overall performance of the IV needle in accessing TAP and thus the choice of needle to use in the performance of ultrasound guided TAP block. Although these similarities and differences should be considered when choosing a needle to use for TAP block, in the final analysis it is the cost, situation and availability that could determine the needle of choice. Nevertheless, evidence from this case report suggests that intravenous cannula can be used safely for TAP block. It should be considered when regional anaesthesia needle are not available.

References

1. Abdallah FW, Chan VW, Brull R. Transversus abdominis plane block: a systemic review. *Reg Anesth Pain Med* 2012; 37(3):193 - 209
2. Bhattacharjee S, Ray M, Ghose T, Maitra S, Layek A. Analgesic efficacy of transversus abdominal plane block in providing effective perioperative analgesia in patients undergoing total abdominal hysterectomy: A randomized controlled trial. *J Anaesthesiol Clin Pharmacol*. 2014; 30(3): 391 – 396.
3. Ripolles J, Mezquita MS, Abad A, Calvo J. Analgesic efficacy of ultrasound-guided blockade of the transversus abdominis plane – a systematic review. *Rev Bras Anesthesiol* 2015; 65(4) 255 – 280
4. McDonnell JG, Curley G, Carney J, Benton A, Costello J, Maharaj CH, et al. The analgesic efficacy of transversus abdominis plane block after cesarean delivery: A randomized controlled trial. *Anesth Analg*. 2008; 106(1):186–91
5. Baaj MJ, Alsatli AR, Majaj AH, Babay AZ TK. Efficacy of ultrasound-guided transversus abdominis plane (TAB) block for post-caesarean section delivery analgesia - A double-blind placebo-controlled trials. *Middle East J Anesthesiol*. 2010; 20(6):821–5.
6. Khedker SM, Bhalerao MP, Yemul-Golhar RS, Kelkar VK. Ultrasound guided -ilioinguinal and iliohypogastric nerve block, a comparison with conventional technique: An observational study. *Saudi J Anaesth* 2015; 9: 293-297.
7. Ige OA, Bolaji BO, Kolawole K. Opioid – Sparing effect of bupivacaine wound infiltration after lower abdominal operations. *J West Afr Coll Surg* 2011; 1(3):62 – 82
8. Iyere SS, Bavishi H, Venkataran M, Kaur N. Comparison of epidural analgesia with transversus abdominis plane analgesia for postoperative pain relief in patients undergoing lower abdominal surgery; A prospective randomized study. *Anesth Essays Res*. 2017; 11(3):670-675
9. McDonnell JG, O'Donnell B, Curley G, Heffernan A, Power C, Laffey

- JG. The analgesic efficacy of transversus abdominis plane block after abdominal surgery: a *prospective randomized trial* *Anesth Analg* 2007;104:193 - 197
10. Carney J, Finnerty O, Rauf J, Curley G, McDonnell GJ, Laffey GJ. Ipsilateral transversus abdominis plane block provides effective analgesia after appendectomy in children: A randomized controlled trial. *Anesth Analg* 2010; 111(4):998 - 1003.
 11. Carney J, McDonnell GJ, Ochanna A, Bhinder R, Laffey GJ. The transversus abdominis plane block provides effective postoperative analgesia in patients undergoing total abdominal hysterectomy. *Anesth Analg* 2008; 107(6):2056 - 2060
 12. Fung D. Measuring patient satisfactions with anaesthesia care: A review of current methodology. *Anesth Analg* 1998;84(5):1089-1098.