EAS Journal of Anaesthesiology and Critical Care
Abbreviated Key Title: EAS J Anesthesiol Crit Care
ISSN: 2663-094X (Print) & ISSN: 2663-676X (Online)
Published By East African Scholars Publisher, Kenya

OPEN ACCESS

Volume-8 | Issue-3 | May-Jun-2026 | DOI: https://doi.org/10.36349/easjacc.2026.v08i03.005

Original Research Article

Prospective, Comparative, and Randomized Study between the Quartz Block and the Transverse Abdomen Block for Postoperative Analgesia after Caesarean Section

Thiome C.O.L[1]*, Gaye I[1], Dieye C[1], Ndiaye A.F.K[1], Toure M.S[1], Niass E.T[1], Camara L[1], Faye A[1], Faye A.B[1], Diop G[1], Kandji I[1], Diallo IL[1], Diallo A[1], Diallo A.W[1], Thiam O[1], Diop F[1], Seye S.M[1], Sy M.A[1], Diagne S.A[1], Ndiaye A.P.N[1], Fall C[1], Faye B[1], Beye MD[1]

[1]Anesthesia and Intensive Care Unit, Abdou Aziz Sy Dabakh Hospital of Tivaouane

Article History
Received: 11.04.2026
Accepted: 01.06.2026
Published: 05.06.2026

Journal homepage:
https://www.easpublisher.com

Quick Response Code

Abstract: Cesarean section is the most common surgical procedure performed in hospitals worldwide. It can lead to persistent postoperative pain. Numerous analgesic techniques exist for the prevention and treatment of pain after a cesarean section. Transverse abdominal block (TAPB) and quadratus lumborum block (QLB) have proven effective. The aim of this study was to compare the analgesic effect of the TAP block versus the QLB after a cesarean section. This was a prospective, comparative, randomized, single-blind study conducted at the Abdou Aziz Sy Dabakh University Hospital in Tivaouane. All patients undergoing cesarean section under spinal anesthesia, excluding emergency cases, were included. At the end of the procedure, a TAP block and a QLB with bupivacaine were performed randomly under ultrasound guidance. Postoperative static and dynamic pain was assessed immediately postoperatively and at 1, 3, 6, 12, and 24 hours after surgery by a nurse unaware of the medication, using a numerical rating scale (NRS) from 0 to 10. Statistical analysis was performed using R software. Fisher's exact test was used to compare proportions, while Student's t-test was used to compare means. The mean ASA score was similar between the two groups. The duration of the block was significantly longer in the QLB group than in the TAP group, with a statistically significant difference ($p < 0.001$). The assessment of postoperative static and dynamic pain, measured using the NRS, did not show a statistically significant difference between the QLB and TAP groups at the different assessment time points. The TAP block and the quadratus lumborum (QLB) block significantly reduce postoperative pain intensity rating scales by avoiding the use of opioid analgesics. These results support the role of regional analgesia in postoperative pain management after cesarean section.

Keywords: Cesarean section, TAP block, Quadratus lumborum block, Pain.

INTRODUCTION

Cesarean section is the most common surgical procedure performed in hospitals worldwide [1]. It accounts for 20 to 21% of births in France [2]. In Senegal, we observed a progressive increase in the cesarean section rate, which rose from 12% in 1992 to 17.5% in 1996 and 25.2% in 2001 [3]. It can lead to persistent postoperative pain [4]. Indeed, pain after cesarean section is described as severe pain during the first 48 postoperative hours, equivalent to that of a hysterectomy by laparotomy [5]. Numerous analgesic techniques exist for the prevention and treatment of pain after a cesarean section. Besides oral or intravenous analgesics, there has recently been a resurgence in the use of regional anesthesia following cesarean section [6]. Transverse abdominal plane (TAPB) block and quadratus lumborum (QLB) block have been shown to be effective [7]. Transverse abdominal plane (TAP) block was first described by Rafi in 2001 and was designed to anesthetize the anterior rami of T6 to L1 as they pass through the space between the transversus abdominis and internal oblique muscles [8]. Quadratus lumborum block is a diffusion block in the posterior abdominal wall. The diffusion space is bounded anteriorly by the transversalis fascia and includes the quadratus lumborum, oblique, and transversus abdominis muscles. In recent years, numerous randomized controlled trials (RCTs) have been conducted to compare the effects of TAPB and QLB in

***Corresponding Author:** Thiome C.O.L
Anesthesia and Intensive Care Unit, Abdou Aziz Sy Dabakh Hospital of Tivaouane

postoperative analgesia [9]. However, it is not well established whether one of these blocks is superior in terms of analgesia in the context of cesarean section. The aim of this study was to compare the analgesic effect of TAP block versus QLB after a cesarean section.

MATERIALS AND METHODS

This was a prospective, comparative, randomized, single-blind study conducted at the Abdou Aziz Sy Dabakh Hospital Center in Tivaouane. All patients undergoing cesarean section under spinal anesthesia outside of emergency situations were included. At the end of the procedure, a TAP block and a QLB with bupivacaine were performed under ultrasound guidance in a randomized manner.

The TAP block was performed under ultrasound guidance. The external oblique, internal oblique, and transversus abdominis muscles were identified using a transverse probe. The entry point was on the mid-axillary line of the abdomen, and the needle was advanced perpendicular to the skin in the coronal plane to the intersection of the transversus abdominis and internal oblique muscles. After a negative aspiration test, the TAP block was performed by the slow injection of 20 ml of 0.25% bupivacaine bilaterally between the internal oblique and transversus abdominis muscles.

The QLB was performed by a trained practitioner. Patients were positioned supine with a bolster under their flank to expose the side to be blocked. The high-frequency ultrasound probe was then moved further laterally to the area where the fascias of the transversus and internal oblique muscles merge, exposing the thoracolumbar fascia and the quadratus lumborum muscle between its middle and anterior layers. The needle was inserted in the plane 1 cm from the edge of the probe in a posteromedial direction under ultrasound guidance. The targeted diffusion space was located between the quadratus lumborum muscle and the middle layer of the thoracolumbar fascia. Once the needle was visualized at this location, 20 ml of 0.25% bupivacaine were injected on each side after a negative aspiration test.

During the first 48 hours post-surgery, all patients received 1 g of paracetamol via 15-minute IV infusion at 6-hour intervals, 100 mg of ketoprofen IV, and 100 mg of tramadol at 8-hour intervals. The first dose of medication was administered 30 minutes before the end of surgery. Postoperative static and dynamic pain was assessed immediately postoperatively and at 1, 3, 6, 12, and 24 hours post-surgery by a nurse unaware of the medication, using a numerical rating scale (NRS) from 0 to 10. The epidemiological variables studied were anthropomorphic characteristics, ASA class, static and dynamic NRS scores, duration of motor block, duration of surgery, duration of analgesia, data concerning spinal anesthesia, and duration of surgery and motor block. Statistical analysis was performed using R software. Fisher's exact test was used to compare proportions, while Student's t-test was used to compare means. Tables and graphs were created using Excel 2016. Results were considered significant for a p-value less than 0.05. We obtained approval from the ethics committee, the hospital's Director General, and the heads of the various departments where this study was conducted.

RESULTS

The demographic and intraoperative characteristics of the patients were generally comparable between the two groups. The mean ASA score was similar between the two groups (2.06 ± 0.24 vs. 2.11 ± 0.32; p = 0.419). The mean duration of surgery was comparable between the QLB group (31.3 ± 10.6 minutes) and the TAP group (32.8 ± 11.0 minutes), with no significant difference (p = 0.563). In contrast, the duration of the block procedure was significantly longer in the QLB group (7.91 ± 1.76 minutes) than in the TAP group (5.50 ± 1.25 minutes), with a statistically significant difference (p < 0.001). Table I shows the distribution of patients according to age, ASA class, duration of surgery, and duration of the block procedure.

Table I: Distribution of patients according to age, ASA class, duration of surgery, duration of block procedure, and history of previous cesarean section in the QLB2 and TAP groups

Variables	QLB2 (n=35)	TAP (n= 36)	p -value
Age	27.3 (5.42)	25.2 (4.71)	0.079
ASA	2.06 (0.24)	2.11 (0.32)	0.419
Surgery duration	31.3 (10.6)	32.8 (11.0)	0.563
Time required to complete the block	7.91 (1.76)	5.50 (1.25)	<0.001
Previous Cesarean section			0.06
Yes	24 (57.14%)	18 (42.85%)	
No	11 (37.93%)	18 (62.18%)	

The assessment of static postoperative pain, measured using the numerical rating scale (NRS), did not show a statistically significant difference between the QLB and TAP groups at the different assessment times.

Thus, the intensity of static postoperative pain was generally low and comparable between the two regional analgesia techniques. Table II illustrates the evolution of the mean static NRS scores for the TAP and QLB2 groups.

Table II: Evolution of average static EN scores at maternity for the TAP and QLB groups

Features	QLB	TAP	p -value
EN H1 static Mean ± Standard deviation	0.17 (0.51)	0.33 (0.83)	0.325
EN H3 static Mean ± Standard deviation	1.20 (0.47)	1.28 (0.45)	0.482
EN H6 static Mean ± Standard deviation	1.20 (0.41)	1.14 (0.35)	0.500
EN H12 static Mean ± Standard deviation	1.14 (0.43)	1.08 (0.37)	0.534
24-hour static EN H24	0.03 (0.17)	0.08 (0.28)	0.321

The assessment of dynamic postoperative pain, performed using the numerical rating scale (NRS), revealed no statistically significant difference between the QLB and TAP groups at the different assessment times.

Overall, the intensity of dynamic postoperative pain was moderate and comparable between the two locoregional analgesia techniques.

The evolution of the average scores of the dynamic EN of the TAP and QLB groups is represented in Table III.

Table III: Evolution of average dynamic EN scores at maternity for the TAP and QLB groups

Features	QLB	TAP	p -value
EN H1 Dynamic Mean ± Standard deviation	0.29 (0.83)	0.53 (1.28)	0.345
EN H3 Dynamic Mean ± Standard deviation	2.17 (0.51)	2.28 (0.51)	0.386
EN H6 Dynamic Mean ± Standard deviation	2.03 (0.38)	2.19 (0.40)	0.079
EN H12 Dynamic Mean ± Standard deviation	2.03 (0.45)	2.00 (0.41)	0.782
24/7 Dynamic	1.03 (0.17)	1.11 (0.40)	0.259

Overall, the evolution of static pain was similar between the TAP and QLB blocks, with low scores throughout the follow-up period, suggesting comparable analgesic efficacy of both techniques in managing postoperative pain. Figure 1 shows the evolution of the static pain score (Numerical Rating Scale) during the first 24 postoperative hours in the TAP and QLB groups.

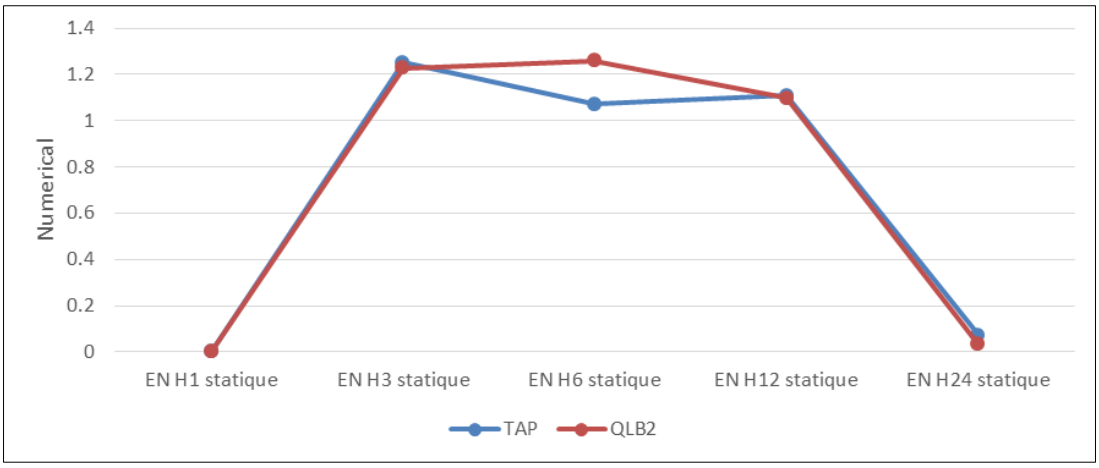

Figure 1: Evolution of the static EN value at the maternity ward for the TAP and QLB2 groups

Overall, the evolution of dynamic pain showed a similar trend between the TAP and QLB2 blocks, with peak intensity around H3, followed by a gradual decrease. These results suggest comparable analgesic efficacy of both techniques for controlling postoperative dynamic pain. Figure 2 shows the evolution of the dynamic pain score (Numerical Rating Scale) during the first 24 postoperative hours in the TAP and QLB2 groups.

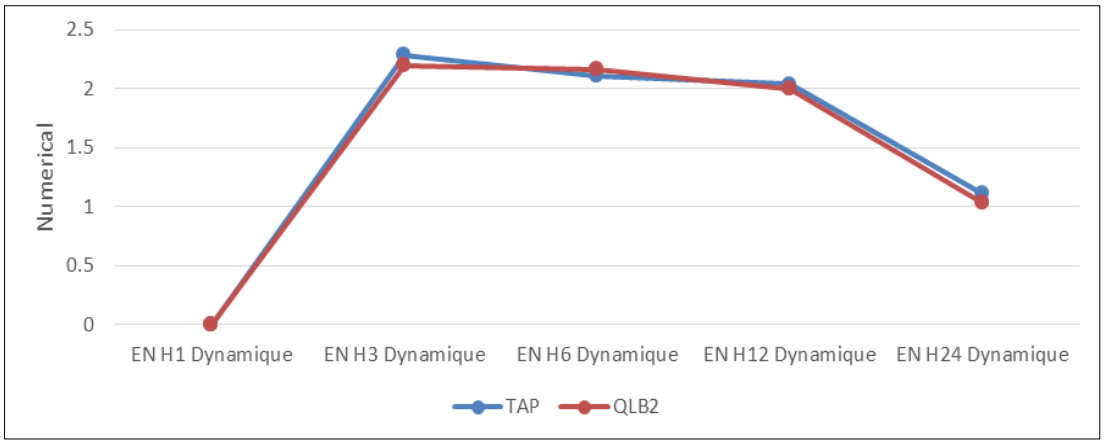

Figure 2: Evolution of the dynamic EN value at maternity for the TAP and QLB2 groups

DISCUSSION

Postoperative pain management remains a common practice worldwide [10]. It is a key factor in assessing the quality of postoperative care. It relies on multimodal analgesia. This concept is all the more important as side effects must be minimized so that the mother can care for her newborn as quickly as possible, all under optimal conditions.

The therapeutic options for managing this pain include the Transversus Abdominis Plane block (TAP block) [11]. This block anesthetizes the nerves of the anterior abdominal wall (T9-L1 territory) by infiltrating a local anesthetic solution into the transverse plane [12]. A single injection of local anesthetic provides satisfactory but transient analgesia, not covering the first 24 hours, which are often the most painful. It is described as a successful adjunctive procedure for postoperative analgesia, although it can have some complications: block failure, abdominal organ injury, nerve damage, vascular injury, and so on [13].

QLB is also used for postoperative analgesia in cesarean sections. The analgesic effect of QLB has been evaluated for the following surgical procedures: cesarean delivery, gynecological surgery, general abdominal and urological surgery, and orthopedic surgery [14]. It reduces opioid consumption in oral morphine equivalents during the first 24 postoperative hours compared to cesarean delivery without an anesthetic block or with a placebo [15].

In our single-blind randomized study comparing TAP block to anterior QLB in patients who had undergone cesarean section, no significant difference was identified.

Our results are similar to those of Michal Borys *et al*., in a randomized, double-blind, controlled trial conducted in two hospitals involving 105 patients. Pain threshold and morphine consumption were lower in the QLB and TAP groups, and no significant difference was found between the TAP and QLB groups [16].

Some authors have demonstrated that QLB block provides intense analgesia due to its effect on both the abdominal wall and visceral structures, resulting in a decrease in morphine requirements during the first 48 hours with minimal pain scores [17]. This dual effect on the abdominal wall and visceral structures appears to make it a more attractive option for choosing abdominal wall block techniques.

Some studies have also reported superior analgesic efficacy of the TAP block compared to the QLB block in patients undergoing cesarean section [18].

In contrast to these single-center trials, our data synthesis demonstrated similar static (Table 2 and Figure 1) and dynamic (Table 3 and Figure 2) analgesic results when QLB and TAP blocks were used under the same conditions.

The clinical data we analyzed suggest similar mechanisms of action for both blocks. In particular, blockade of the ilioinguinal, iliohypogastric, and lateral cutaneous branches of the thoracoabdominal nerves may be involved. Visceral analgesia could be achieved distally along the nerve pathway by a TAP block, but more proximally, at the level of the lumbar plexus and the paravertebral space, by a QLB block [19].

CONCLUSION

The TAP block and the quadratus lumborum (QLB) block are two regional anesthesia techniques used to reduce pain after abdominal surgery, particularly after cesarean section. They significantly reduce postoperative pain intensity rating scales by avoiding the use of opioid analgesics. There is no difference between the two techniques regarding static and dynamic postoperative pain. These results support the role of regional analgesia in managing postoperative pain after cesarean section.

REFERENCES

1. Blanco R. Tap block under ultrasound guidance: the description of a “no pops” technique. 271. Reg

Anesth Pain Med. 2007. Regional Anesthesia and Pain Medicine. 2007;
2. Carline L, McLeod GA, Lamb C. A cadaver study comparing spread of dye and nerve involvement after three different quadratus lumborum blocks. British Journal of Anaesthesia. Sept 2016;117(3): 387 94.
3. Cissé CT, Ngom PM, Guissé A, Faye EO, Moreau JC. Reflections on the evolution of cesarean section rates in an African setting: the example of the Dakar University Hospital between 1992 and 2001. Gynecol Obstet Fertil. 2004: 210-7.
4. Elsharkawy H, El- Boghdadly K, Kolli S, Esa WAS, DeGrande S, Soliman LM, *et al.,* Injectate spread following anterior sub-costal and posterior approaches to the quadratus lumborum block: A comparative cadaveric study. European Journal of Anaesthesiology. Sep 2017;34(9): 587 95.
5. Vilain A. The perinatal situation in France in 2010 - First results of the national survey. Drees 2011; 775: 1-8.
6. Tamura T, Kitamura K, Shibata Y, Yokota S, Ito S, Nishiwaki K. Ultrasound-guided quadratus lumborum type 2 block without dissemination into the paravertebral space. ASA 2016 [abs tracts.com].
7. Patel SD, Sharawi N, Sultan P. Local anesthesia techniques for post-cesarean analgesia. International Journal of Obstetric Anesthesia 2019; 40: 62–77.
8. Weibel S, Neubert K, Jelting Y, et al. Incidence and severity of chronic pain after cesarean section: systematic review with meta-analysis. European Journal of Anaesthesiology 2016; 33: 853–65. 11. Landau R, Bollag L, Ortner C. Chronic pain after childbirth. International Journal of Obstetric Anesthesia 2013; 22: 133–45.
9. J. Golmard, V. Faitot, and H. Keïta-Meyer, "Postoperative analgesia after cesarean section," in 41st National Conference of the French Society of Perinatal Medicine (Grenoble, October 12–14, 2011), Paris: Springer, 2011, pp. 31–44. doi: 10.1007/978-28178-0257-2_3
10. Mahama F, Ninnoni JPK. Assessment and management of postoperative pain among nurses at a resource-limited teaching hospital in Ghana. Nursing Practice 2019; 2019:9091467.
11. Tsai HC, Yoshida T, Chuang TY, Yang SF, Chang CC, Yao HY, et al. Transversus Abdominis Plane Block: An Updated Review of Anatomy and Techniques. BioMed Res Int 2017; 2017: 8284-96.
12. Sammos, G., Rn, C., & Chey, W.R. (2015). Use of transverse abdominal plane (TAP) blocks for pain management in elderly surgical patients. AORN Journal, 102, 493–497. https://doi.org/10.1016/j.aorn.2015.09.003
13. Baeriswyl M, Zeiter F, Piubellini D, Kirkham KR, Albrecht E. Analgesic efficacy of transverse abdominal block compared to epidural analgesia: a systematic review with meta-analysis. Médecine. 2018;97(26): e11261.
14. Mieszkowski MM, Mayzner -Zawadzka E, Tuyakov B, et al. Evaluation of the effectiveness of the quadratus lumborum block type I using ropivacaine in postoperative analgesia after a cesarean section- a controlled clinical study. Ginekol Pol 2018; 89(2): 89—96.
15. Uppal V, Retter S, Kehoe E, McKeen DM. Quadratus lumborum block for postoperative analgesia: a systematic review and meta-analysis. Can J Anaesth J Can Anesth. Nov 2020;67(11):1557 75.
16. Borys M, Zamaro A, Horeczy B, Gęszka E, Janiak M, Węgrzyn P, et al. Quadratus lumborum and transversus abdominis plane blocks and their impact on acute and chronic pain in patients after cesarean section: a randomized controlled study. Int J Environ Res Public Health. 2021;18(7):3500.
17. Mænchen N, Hansen CK, Dam M, Borglum J. Ultrasound guided Transmuscular Quadratus Lumborum (TQL) Block for Pain Management after Cesarean. Int J Anesthetic Anesthesiol 2016; 3(2): 048.
18. Verma K, Malawat A, Jethava D, Jethava D. Comparison of transverse abdominal block and quadratus lumborum block for post-cesarean analgesia: a randomized clinical trial. Indian Journal of Anaesthesia 2019; 63: 820–6.
19. Chin KJ, McDonnell JG, Carvalho B, Sharkey A, Pawa A, Gadsden J. Essentials of our current understanding: abdominal wall blocks. Regional Anesthesia and Pain Medicine 2017; 42: 51.

Cite this article: Thiome C.O.L, Gaye I, Dieye C, Ndiaye A.F.K, Toure M.S, Niass E.T, Camara L, Faye A, Faye A.B, Diop G, Kandji I, Diallo IL, Diallo A, Diallo A.W, Thiam O, Diop F, Seye S.M, Sy M.A, Diagne S.A, Ndiaye A.P.N, Fall C, Faye B, Beye MD (2026). Prospective, Comparative, and Randomized Study between the Quartz Block and the Transverse Abdomen Block for Postoperative Analgesia after Caesarean Section. *EAS J Anesthesiol Crit Care, 8*(3), 156-160.