Received: 22 March 2019 | Revised: 19 August 2019 | Accepted: 22 October 2019

DOI: 10.1002/ijgo.13013

CLINICAL ARTICLE

Obstetrics

WILEY | International Journal of Gynecology & Obstetrics | FIGO

French ambulatory cesarean: Mother and newborn safety

Kaouther Dimassi[1,2,*] | Olivier Ami[3] | Denis Fauck[4] | Benedicte Simon[5] | Luka Velemir[6] | Amel Triki[1,2]

[1]Obstetrics and Gynecology Department, Mongi Slim University Hospital, La Marsa, Tunisia

[2]Faculty of Medicine, University Tunis El Manar, Tunis, Tunisia

[3]Ramsay Générale de Santé, La Muette, Paris, France

[4]Ramsay Générale de Santé, Saint Lambert, La Garenne-Colombes, France

[5]Ramsay Générale de Santé, Les Franciscaines, Versailles, France

[6]Polyclinique Santa Maria, Nice, France

*Correspondence
Kaouther Dimassi, Residence les printemps 2, appart 18 bloc G, cité Taieb el mihiri, 2045, Tunisia.
Email: kaouther.dimassi@fmt.utm.tn

Abstract

Objective: To evaluate mother and newborn child safety after French ambulatory cesarean (FAUCS).

Methods: Prospective comparative cohort study in Tunisia (January–June 2018). Pregnant women indicated for primary or repeat cesarean at term underwent FAUCS or Misgav Ladach cesarean (MLC). Surgical outcomes, overall morbidity, and maternal autonomy during recovery were compared.

Results: Among 112 deliveries, 60 were performed by FAUCS and 52 by MLC. FAUCS was feasible in all cases; surgeons achieved a completely extraperitoneal approach in 39 (65.0%) cases. The main difficulty experienced was fetal extraction. Longer operative procedures were recorded in the FAUCS group; however, women in the FAUCS group reported lower pain scores (3 [2–5] vs 4 [3.7–5], $P<0.001$) and were more likely to decline analgesics (10 [17.0%] vs 0 [0%], $P<0.001$). They experienced greater autonomy during recovery (median [interquartile range] time to standing, 2 [1.0–2.5] vs 12.8 [8.9–17.9] hours, $P<0.001$; time to full meal, 4 [3–6[vs 26.5 [21–31] hours, $P<0.001$; effective time to hospital discharge, 1 [1, 2] vs 2 [2, 3] days; $P<0.001$).

Conclusion: Implementation of the FAUCS technique was safe and successful, and improved maternal condition after cesarean. These short-term results need long-term validation by randomized trials.

KEYWORDS

Birth; Cesarean; Early rehabilitation; Extraperitoneal; Maternal autonomy; Morbidity; Paramedian wall incision; Postoperative pain

1 | INTRODUCTION

Cesarean is one of the most commonly performed operations worldwide. Despite initiatives to counter the trend in increasing numbers of procedures, the rate of cesarean continues to rise.[1] Relative to vaginal delivery, cesarean has a higher incidence of morbidity, incurring substantial care and higher costs as measured by the mean length of the hospital stay, use of analgesics, and potential for complications.[2] Crucially, after delivery of their newborn, mothers have a need to return to "normal" function as quickly as possible. As a result, improving cesarean procedures has considerable importance in modern obstetrics.

Misgav Ladach cesarean (MLC) is one of the most widely used procedures for cesarean delivery.[3] It has been shown to be optimal in terms of its ability to reduce pelvic discomfort and pain, thereby improving quality of life.[4] However, its intraperitoneal surgical approach may potentially impede future fertility.

By contrast, the French ambulatory cesarean (FAUCS) technique is based on an innovative extraperitoneal approach that seems to provide a shorter recovery time, with hospital discharge reported as the day after surgery in 90% of cases.[5] This technique was introduced to the study unit in January 2018. The aim of the present study was therefore to assess the results of FAUCS implementation in terms of maternal and newborn safety.

2 | MATERIALS AND METHODS

The present prospective comparative cohort study was conducted among pregnant women who delivered by cesarean at Mongi Slim University Hospital, La Marsa, Tunisia, between January 15 and June 1, 2018. The study was approved by the local hospital ethics committee, and written consent was obtained from all women. All data were collected in compliance with Tunisian laws regarding personal data.

In December 2017, one of the local surgeons (KD) travelled to France for 1 week to train with the Parisian team who developed FAUCS and observe the necessary organizational aspects. Subsequently, on January 12, 2018, a French team (obstetricians, anesthetist, midwife, and nurse) came to the Obstetrics and Gynecology Department of Mongi Slim University Hospital to train local surgeons and all staff in the overall management of women undergoing FAUCS.

During the study period, women with a singleton pregnancy and an indication for a planned primary or repeat cesarean at term were eligible for the study. There were no restrictions regarding the number of previous cesareans, fetal presentation, or fetal weight. All usual indications for a scheduled cesarean were accepted. The exclusion criteria were less than 37 gestational weeks, fetal pathology (intrauterine growth restriction,[6] malformation, or genetic disorder), prenatal risk of placenta accreta,[7] and presence of an adnexal mass or myoma in the lower uterine segment.

At their final prenatal visit, women who met the inclusion criteria were invited to participate in the study. Those providing written informed consent were consecutively included on a preliminary participant list managed by an investigator who was not involved in patient care. Before group allocation, women who were initially recruited but who underwent emergency surgery before the scheduled date were excluded.

Group allocation was determined on day of the scheduled delivery. Assignment to the MLC or FAUCS group was based on the qualification of the surgeon in charge: all departmental surgeons were experienced in MLC, but only two began the learning curve of FAUCS during the study period. Participants, nurses involved in patient care, and the investigators were blind to the allocated cesarean technique and informed only at discharge.

The MLC technique was performed as described in 1999.[4] The MLC spinal anesthesia protocol included 500 mL of isotonic crystalloid solution for vascular filling, 7–10 mg of bupivacaine (depending on patient height), 100 μg of morphine, and 10 μg of sufentanil. Bladder catheterization was systematically performed by using a 16- or 18-F catheter prior to skin incision.

The FAUCS spinal anesthesia protocol included no vascular filling, no morphine, 7–10 mg of bupivacaine (depending on height), and 10 μg of sufentanil. Bladder catheterization was performed only on the surgeon's request. The FAUCS surgical technique is detailed in Supplementary Video S1.

In both groups, blood loss was visually estimated and recorded by the anesthesiologist present at delivery.[8] After the cesarean, analgesics were administered by nursing staff, depending on patient request and a visual analogue scale (VAS) assessment of pain.[9] VAS assessment was carried out every 6 hours for 24 hours.

The first standing after surgery was proposed to all women every hour on the first postoperative day. In cases where a bladder catheter was inserted, it was removed as soon as the woman was able to walk alone. In all cases, normal oral food intake was initiated as soon as gas passage had occurred and the participant felt hungry.

All women were evaluated for maternal autonomy by the end of the first day. If there were no complications and if she felt autonomous and pain free, the woman was discharged 24 hours after surgery. In other cases, a second evaluation of maternal autonomy was performed the next day.

Study outcomes were grouped into three categories: surgery, overall morbidity, and maternal autonomy during recovery, and continuous and categoric variables were compared between the FAUCS and LMC groups.

All data analyses were conducted in RStudio version 3.5.1 (The R Foundation, Vienna, Austria). Unequal variance *t* tests were used for all continuous variables; the distribution of each variable was evaluated for normality by the Shapiro-Wilk test, and those that were not normally distributed were log-transformed. Continuous variables for FAUCS versus MLC were visualized by smoothed kernel density plots, which were viewed on a log scale where applicable.

Asymptotic generalized Pearson χ^2test was used for categoric variables. For one categoric variable with ordinal values, the Cochran-Armitage test was used. Categoric relationships were visualized by spine plots, which are similar to compound bar charts but the bar width is set to the proportion of each horizontal category. A *P* value of less than 0.05 was considered statistically significant.

3 | RESULTS

Overall, 112 deliveries by cesarean were included in the study, of which 60 were performed by FAUCS and 52 by MLC. Table 1 summarizes the main differences between the two surgical techniques. There was no difference between the FAUCS and MLC groups in epidemiologic or obstetric characteristics (Table 2).

The technique was feasible in all cases in the FAUCS group. Surgeons succeeded in achieving a completely extraperitoneal approach in 39 (65.0%) cases. In the other 21 cases, a small peritoneal breach was noted. Access to the uterus was described as difficult in 3 (5.0%) cases (Fig. 1). For the first 20 FAUCS procedures, the surgeon needed to place a clamped bladder catheter, which was removed immediately at the end of the surgery (Fig. 1).

The distribution of outcomes in the two groups is shown in Figure 2, and the values are summarized in Table 3. Despite the longer procedure times in the FAUCS group, there was no difference in maternal blood loss between the two techniques. Fetal delivery time was longer in the FAUCS group (3 vs 1 minute, $P<0.001$). The FAUCS approach more often necessitated the use of instruments for

TABLE 1 Main differences between the FAUCS and MLC procedures.

Step	FAUCS	MLC
Skin incision	Low transversal, arciform, 2 cm above the pubis	Transversal 3 cm below the inter-iliac line joining the two anteroposterior iliac spines
Fascia incision	Vertical paramedian	Horizontal at the same level as the skin incision
Approach to lower uterine segment	Left paravesical extraperitoneal	Transperitoneal
Fetal extraction	Use of forceps or spatulas highly recommended	Use of forceps or spatulas only in cases of difficulty
Uterine closure	Sparse suture	One-layer continuous suture

Abbreviations: FAUCS, French ambulatory cesarean; MLC, Misgav Ladach cesarean.

fetal extraction, whereas no MLC procedure required no instruments. However, the use of manual expression on the uterine fundus to extract the fetus was required in fewer FAUCS cases (3/60 [5.0%] vs 41/52 [78.8%], $P<0.001$).

There was no difference between the FAUCS and MLC groups in neonatal outcomes (median Apgar score at 5 minutes, $10^{9,10}$ vs $9^{9,10}$). The frequency of surgery-related events did not differ between the two techniques (Table 3). There were no cases of secondary infection or readmission in either group.

The most frequent FAUCS complications were due to difficulties in approaching the uterus from the extraperitoneal space, leading to a bladder trauma in two (3.3%) cases. In both groups, maternal hemorrhage was mainly related to accidental injury to the uterine pedicle. In one case in the FAUCS group, hemorrhage was related to tearing of the urachus at its origin during fetal extraction for a woman undergoing a cesarean procedure for the third time.

Women who underwent the FAUCS procedure experienced less pain (Table 3). The FAUCS procedure required no morphine and resulted in less postoperative anesthesia-related morbidity. After surgery, women in the FAUCS group were more likely to forego analgesics (10 [17%] vs 0 (0%) in MLC group, $P<0.001$), whereas those in the MLC group frequently used oral and intravenous or rectal analgesics (Table 3). The mean hospital stay was significantly shorter after FAUCS than after MLC ($P<0.001$) (Table 3).

Regarding maternal autonomy, the time to first standing was more than three times shorter in the FAUCS group (3.8 hours) than in the MLC group (13.6 hours) ($P<0.001$), with similar degrees of assistance required between the two groups (Table 4 and Fig. 2). Although they got up much sooner, women in the FAUCS group experienced significantly less pain without additional dizziness. Postoperative feelings of wellbeing were enhanced by earlier ingestion of the first full meal, which occurred an average of 20 hours sooner for the FAUCS group (4 hours) than for the MLC group (27 hours) ($P<0.001$). The postoperative time to first spontaneous urination and the gastrointestinal transit recovery time were also shorter after FAUCS than after MLC (both $P<0.001$). Lastly, a higher proportion of women who underwent the FAUCS procedure reported that they felt like an active participant in the delivery (Table 4).

4 | DISCUSSION

To our knowledge, the present study is the first prospective comparative study to evaluate outcomes after implementation of FAUCS in terms of mother and newborn safety. Indeed, the impact of FAUCS on morbidity has previously been described only in a retrospective non-comparative study.[5]

Implementation of the FAUCS technique in the study department was found to be safe and successful. Although the operative procedures were longer in the FAUCS group, there was no significant negative impact on maternal (blood loss, diverse complications) or neonatal (Apgar score) outcomes.

The main difficulty experienced during the learning period involved fetal extraction (Fig. 1). The FAUCS approach necessitated

TABLE 2 Comparison of epidemiologic and obstetric characteristics between the two groups.[a]

Variables	FAUCS	MLC	*P* value
Age, y	32.73 ± 5.50	32.06 ± 5.60	0.52
Height, m	163.0 ± 6.15	161 ± 6.26	0.10
Weight, kg	85.06 ± 11.99	80 ± 15.23	0.08
BMI	32.08 ± 4.43	31 ± 4.88	0.18
Parity	2.0 ± 0.87	2.0± 0.97	0.20
Birthweight, g	3471.83 ± 656.5	3477.12 ± 429.39	0.95
Previous cesarean	1.00 ± 1.00	0.00 ± 00	0.17

Abbreviations: BMI, body mass index (calculated as weight in kilograms divided by the square of height in meters); FAUCS, French ambulatory cesarean; MLC, Misgav Ladach cesarean.
[a]Values are given as mean ± SD.

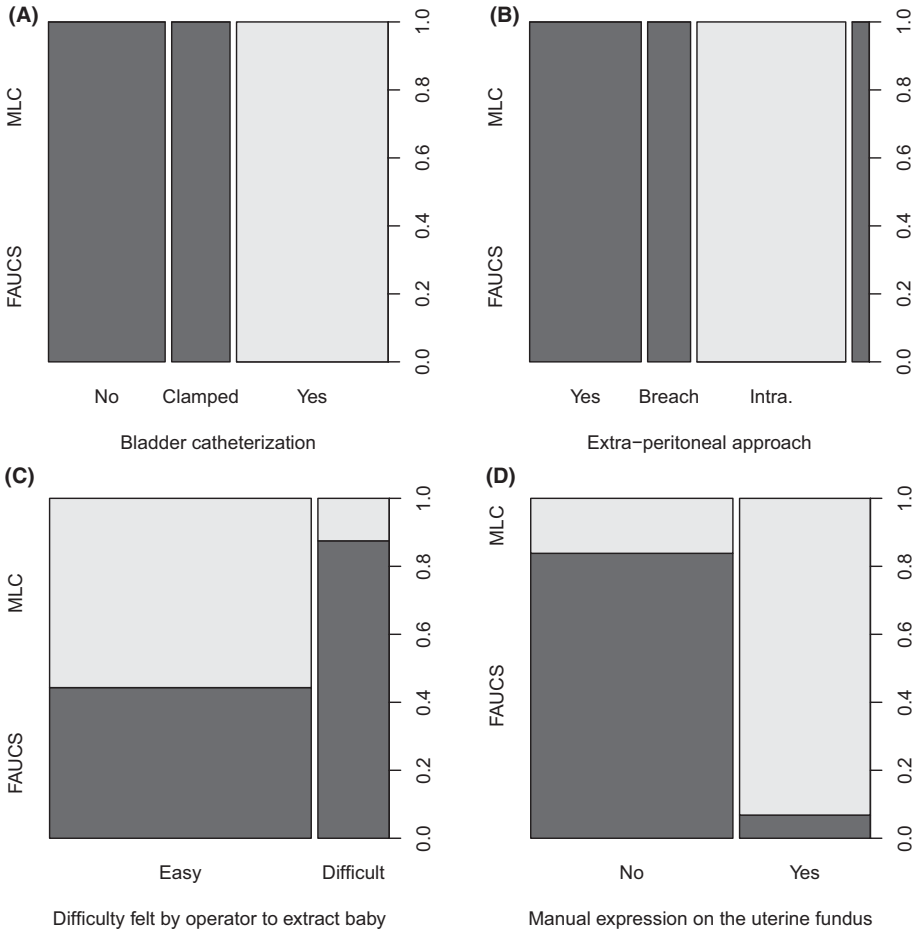

FIGURE 1 Spine plots of cross-tabulation between the cesarean method and difficulties experienced by surgeons. (A) Bladder catheterization. (B) Dissection of the uterus. (C) Extraperitoneal approach. (D) Extraction of neonate. Spine plots are an extension of histograms and are applied here to show the proportion of pairs of cross-classified categoric variables. The area of each rectangular tile is proportional to the frequency in the cells of a contingency table. In panel D, for example, most responses were "easy," with an approximately even split between FAUCS (dark gray) and MLC (light gray). For those cases classified as "hard", however, the vast majority of cases were FAUCS not MLC.

the use of instruments for fetal extraction in some cases, whereas none of the MLC procedures required instruments. In addition, fetal delivery time was longer in the FAUCS group (3 vs 1 minute, $P<0.001$). Neonatal outcomes might have been better assessed by an evaluation of neonatal acid–base balance; however, it seems that there is no significant impact of fetal delivery time on any of the measurable neonatal parameters.[10,11]

During the study period, two bladder injuries occurred during the first 10 FAUCS procedures implemented. A previous retrospective study of more than 3441 procedures reported 11 (0.30%) cases of bladder injury, mainly occurring during the training period of the surgeons.[5] Bladder injuries during cesarean are not specific to the extraperitoneal approach and have an overall incidence of 0.44%.[12] All these authors agree on their benign character.

In the present study, there was no need for intraperitoneal conversion in any of the FAUCS procedures, and the surgeons succeeded in a completely extraperitoneal approach in 65% of the cases. Considering false peritoneal routes or peritoneal breaches they are not proper complications. Extraperitoneal surgery is reported to be successful in 75% of cases, of which approximately 25% include repairable peritoneal breaches.[13–15]

As compared with MLC, women who underwent the FAUCS procedure experienced less pain and greater autonomy during recovery. FAUCS resulted in less postoperative anesthesia-related morbidity. The women were able to stand immediately after motor block removal and were able to walk normally. They were able to eat a normal meal and experienced no paralytic ileus. Furthermore, women in the FAUCS group did not experience morphine-induced sphincter spasm[16] and therefore did not require a urinary catheter. They were able to take a shower and care for their newborn on the day of delivery, similar to women who deliver vaginally.

Given the lower morbidity associated with this technique, FAUCS has a much lower surgical impact as compared with MLC. The improvements in the women's experience of cesarean delivery seem to be facilitated by the surgical technique itself. Among the elements that might explain this, we pinpoint three surgical issues.

First, in MLC extraction of the uterus from the abdomen to facilitate suturing is impossible without opening the peritoneum, and

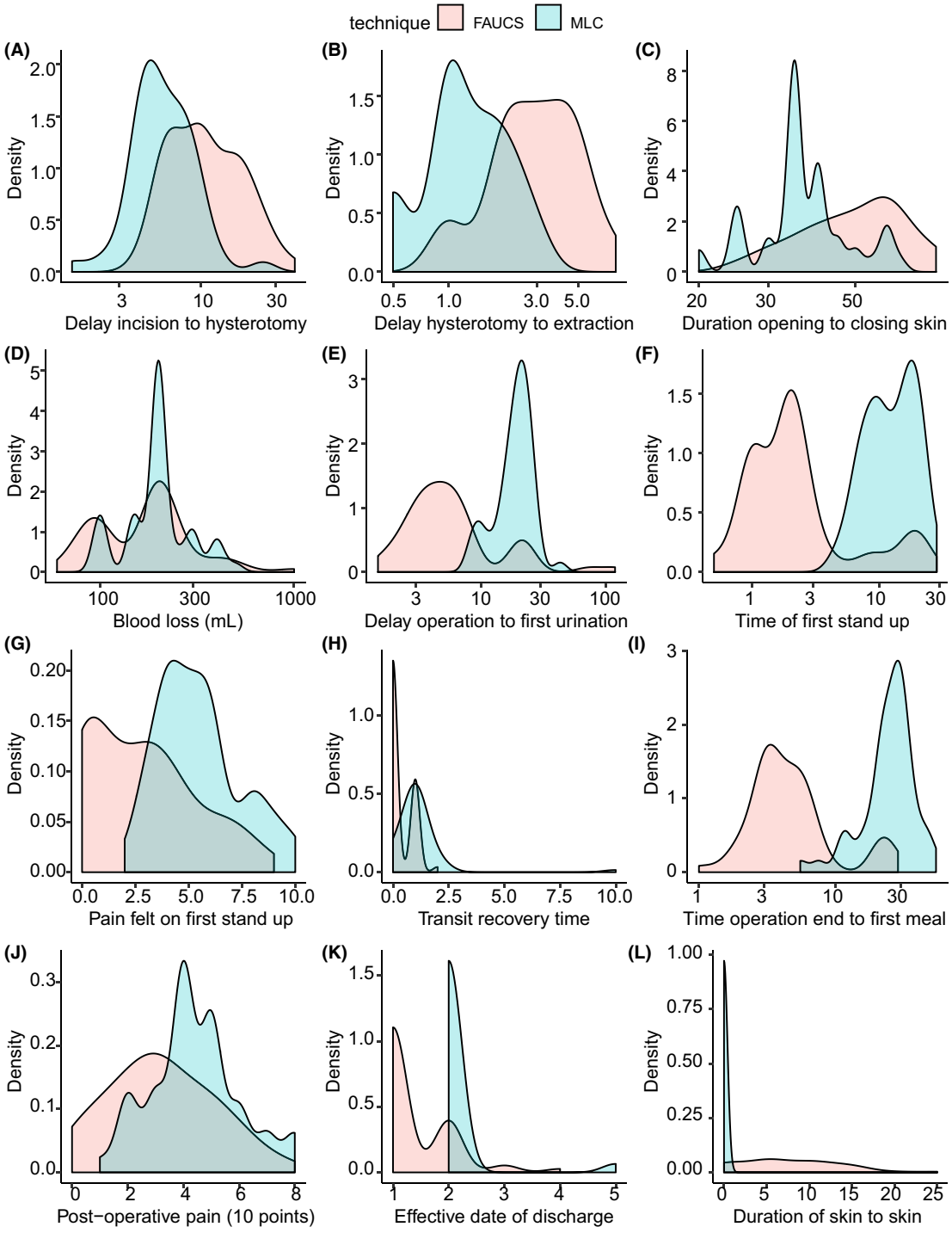

FIGURE 2 Comparison of smoothed kernel density plots of continuous outcome variables between FAUCS and MLC. (A) Interval between incision and hysterotomy. (B) Interval between hysterotomy and extraction. (C) Interval between opening and closing skin. (D) Blood loss. (E) Interval between surgery and first urination. (F) Interval between surgery and first standing. (G) Pain felt on first standing. (H) Transit recovery time. (I) Interval between surgery and first meal. (J) Postoperative pain. (K) Postoperative day of discharge. (L) Duration of skin to skin contact. In general, a density plot visualizes the distribution of data over a continuous interval; it is a variation of a histogram that uses kernel smoothing to plot values, allowing for smoother distributions by smoothing out the noise. For example, panel F shows the density plots of time to first standing on a log scale. The distribution of MLC values began at 3 h, whereas most women undergoing FAUCS were standing before 3 h.

TABLE 3 Comparison of outcomes between the two groups.[a]

Group	FAUCS (n=60)	MLC (n=52)	*P* value
Surgery			
Skin incision to hysterotomy, min	10.00 (6.95–16.25)	5.00 (4–7.62)	<0.001
Hysterotomy to fetal extraction, min	3.00 (2.00–4.12)	1.00 (1.00–2.00)	
Total duration of surgery, min	50 (40–60)	35 (30–40)	<0.001
Instrumental fetal extraction			<0.001
Forceps	44 (73)	0	
Spatula	3 (5)	0	
Manual pressure on uterine fundus during extraction	3 (5)	41 (79)	<0.001
Overall morbidity			
Blood loss, mL			0.550
Mean	199 ± 143	213 ± 87	
Range	60–1000	100–500	
Complications			0.282
Maternal hemorrhage	4 (7)	2 (4)	
Bladder injury	2 (3)	0 (0)	
None	49 (82)	49 (94)	
First day postoperative pain, VAS	3 (2–5)	4.0 (3.7–5)	<0.001
Postoperative analgesic prescription			<0.001
None	10 (17)	0	
Rectal	41 (68)	18 (35)	
Per os	4 (7)	0	
Per os and rectal	1 (2)	9 (17)	
Anticoagulants (heparin prescription)	15 (25)	52 (100)	<0.001
Time to transit recovery, d	0 (0–1)	1 (1–1)	<0.001
Effective time to hospital discharge, d	1 (1–2)	2 (2–3)	<0.001

Abbreviations: FAUCS, French ambulatory cesarean; MLC, Misgav Ladach cesarean; VAS, visual analogue scale.
[a]Values are given as median (interquartile range) or number (percentage) unless stated otherwise.

uterine extraction from the abdomen constitutes an evisceration. Traction on the uterosacral pedicles and ligaments can have harmful consequences, with possible occult retroperitoneal hemorrhage and increased pain.[13] Second, opening of the peritoneum in MLC exposes the abdominal cavity to blood, amniotic fluid, and vernix, all of which are irritants that can cause intense associated pain. Several studies, including two randomized prospective studies, have confirmed the value of not opening the peritoneum.[14,15,17] Third, transverse opening of the fascia of the rectus abdominis muscle is known to be more painful than vertical opening during surgery.[18]

The short-term results of the present study can be logically extrapolated to the long term. Indeed, the extraperitoneal route has less risk of digestive occlusion and adhesions, and less impact on subsequent fertility. Nevertheless, further randomized trials should evaluate mid- and long-term outcomes, specifically comparing the frequency of cesarean scar defects between the two procedures.

The limitations of the FAUCS approach lie mainly in the difficulties in learning the technique and its performance in routine cesarean. Correct surgical mastery is likely to be achievable by most obstetricians who have been trained in classical cesarean, while elective cesarean is the most favorable clinical situation for this modification of practice.

The present study has some limitations. First, there was no randomization; instead, group allocation was based on the qualification of the surgeon working on the due date. Second, the difference in anesthesia protocols between the two groups led to systematic use of bladder catherization in the MLC group versus none in the FAUCS group. Third, the study was a preliminary evaluation to assess the safety of implementing the FAUCS procedure. Future trials must be conducted after the learning curve to fully evaluate the short- and long-term outcomes of FAUCS.

In conclusion, implementation of the FAUCS technique was found to be safe and successful. Despite the longer operative procedures in the FAUCS group, there was no significant negative impact on mothers or neonates. Rather, the FAUCS procedure improved maternal condition during recovery after cesarean. The present short-term results need further mid- and long-term validation by randomized trials.

TABLE 4 Comparison of maternal condition during recovery between the two group.[a]

Condition	FAUCS	MLC	*P* value
Impression of being actively involved in delivery			<0.001
No	3 (5)	47 (90)	
Yes	57 (95)	1 (2)	
Not applicable (general anesthesia)	0 (0)	4 (8)	
End of surgery to first spontaneous urination, h	5 (3.37–7.25)	19.88 (15.5–23)	<0.001
Time to first standing, h	2 (1–2.5)	12.75 (8.87–17.87)	<0.001
Pain felt during the first stand up, VAS	3 (0.75–4)	5 (4–6)	<0.001
Time to first full meal, h	4 (3–6)	26.5 (21–31)	<0.001
Needed help carrying newborn on first day			0.006
No	53 (88)	35 (67)	
Yes	2 (3)	12 (23)	
Not applicable: neonate in pediatric department	5 (8)	5 (10)	

Abbreviation: FAUCS, French ambulatory cesarean; MLC, Misgav Ladach cesarean; VAS, visual analogue scale.
[a]Values are given as median (interquartile range) or number (percentage).

AUTHOR CONTRIBUTIONS

All authors were actively involved in implementing the surgery in the study unit. All authors have made substantial contributions to the concept/design, analysis/interpretation of data, and in drafting and revising the manuscript. All authors have approved the final version of the manuscript.

CONFLICTS OF INTEREST

The authors have no conflicts of interest.

REFERENCES

1. Şahin N, Genc M, Turan GA, Kasap E, Güçlü S. A comparison of 2 cesarean section methods, modified Misgav-Ladach and Pfannenstiel-Kerr: A randomized controlled study. *Adv Clin Exp Med*. 2018;27:357–361.
2. Corso E, Hind D, Beever D, et al. Enhanced recovery after elective caesarean: A rapid review of clinical protocols, and an umbrella review of systematic reviews. *BMC Pregnancy Childbirth*. 2017;17:91.
3. Holmgren G, Sjöholm L, Stark M. The Misgav Ladach method for cesarean section: Method description. *Acta Obstet Gynecol Scand*. 1999;78:615–621.
4. Gizzo S, Andrisani A, Noventa M, et al. Caesarean section: Could different transverse abdominal incision techniques influence postpartum pain and subsequent quality of life? A systematic review *PLoS ONE*. 2015;10:e0114190.
5. Ami O, Fauck M, Simon B, et al. The French Ambulatory Cesarean Section: Technique and interest. *Int J Gynecol Clin Pract*. 2017;4:1–6.
6. Gordijn SJ, Beune IM, Thilaganathan B, et al. Consensus definition of fetal growth restriction: A Delphi procedure [Internet]. *Ultrasound Obstet Gynecol*. 2016; 48:333–339.
7. Jauniaux E, Bhide A. Prenatal ultrasound diagnosis and outcome of placenta previa accreta after cesarean delivery: A systematic review and meta-analysis. *Am J ObstetGynecol*. 2017;217:27–36.
8. Stafford I, Dildy GA, Clark SL, Belfort MA. Visually estimated and calculated blood loss in vaginal and cesarean delivery. *Am J Obstet Gynecol*. 2008;199:519.
9. Myles PS, Troedel S, Boquest M, Reeves M. The pain visual analog scale: Is it linear or nonlinear? *Anesth Analg*. 1999;89:1517–1520.
10. The correlation between the duration of fetal extraction during elective cesarean section and low Apgar score. http://medicaljournalofcairouniversity.net/home2/index.php/2014-10-22-23-17-20/vol-80-march-2012/974-the-correlation-between-the-duration-of-fetal-extraction-during-elective-cesarean-section-and-low-apgar-score. Accessed August 19, 2019.
11. Maayan-Metzger A, Schushan-Eisen I, Todris L, Etchin A, Kuint J. The effect of time intervals on neonatal outcome in elective cesarean delivery at term under regional anesthesia. *Int J Gynecol Obstet*. 2010;111:224–228.
12. S BD, J C. Extraperitoneal versus transperitoneal cesarean section in surgical morbidity in a tertiary care centre. *Int J Reprod Contracept Obstet Gynecol*. 2017;6:3397–3399.
13. Coutinho IC, Ramos dAM, Katz L, Bandeira dFA. Uterine exteriorization compared with in situ repair at cesarean delivery: A randomized controlled trial. *Obstet Gynecol*. 2008;111:639–647.
14. Hanson HB. Current use of the extraperitoneal cesarean section: A decade of experience. *Am J Obstet Gynecol*. 1984;149:31–34.
15. Tappauf C, Schest E, Reif P, Lang U, Tamussino K, Schoell W. Extraperitoneal versus transperitoneal cesarean section: A prospective randomized comparison of surgical morbidity. *Am J Obstet Gynecol*. 2013;209:338.
16. Elsamra SE, Ellsworth P. Effects of analgesic and anesthetic medications on lower urinary tract function. *Urol Nurs*. 2012;32:8.
17. Yapca OE, Topdagi YE, Al RA. Fetus delivery time in extraperitoneal versus transperitoneal cesarean section: A randomized trial. *J Matern Fetal Neonatal Med*. 2018;13:1–7.
18. Guillou PJ, Hall TJ, Donaldson DR, Broughton AC, Brennan TG. Vertical abdominal incisions–a choice? *Br J Surg*. 1980;67:395–399.

SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Video S1. FAUCS surgical technique.