

Research Article

Prognosis of Caesarean Section with or Without Externalization of the Uterus at the CHU Ignace Deen, Guinea

Ibrahima Koussy Bah^{1,*}, Elhadj Mamoudou Bah², Alhassane II Sow¹ ,
Boubacar Sidy Diallo¹, Alpha Ibrahima Baldé¹, Kabinet Camara¹,
Mamadou Dian Bah¹, Daniel William Athanase Leno², Abdourahamane Diallo¹,
Telly Sy¹

¹Gynecology-obstetrics Department, Ignace Deen National Hospital, Conakry, Guinea

²Gynecology-obstetrics Department, Donka National Hospital, Conakry, Guinea

Abstract

Introduction: Caesarean section is an obstetric surgical technique that is becoming more and more frequent, due to the constant quest to improve maternal-fetal health. **Objective:** The aim of this study was to evaluate maternal prognosis after caesarean section with or without uterine exteriorization during hysterorrhaphy. **Patients and Methods:** this was a prospective study with analytical aims lasting 6 months from July 1st to December 31, 2022 carried out in the gynecology-obstetrics department of the Ignace Deen national hospital of the CHU of Conakry, focusing on women who underwent cesarean section in the department with or without uterine exteriorization and agreed to participate in the study during the data collection period. **Results:** the mean age of the patients was 18.62 ± 6.16 years, with extremes of 15 and 44 years. The 21-25 age group was the most represented, at 29.60%. The majority were married (93.68%), not in school (40.07%) and nulliparous (33.75%). Obstetric evacuation was 31.05%. The uterus was exteriorized in 66.6% of cases. Caesarean section was urgent in 79.96% of cases. The average duration of the operation was 34.52 ± 10.47 minutes. The majority of caesarean sections were performed by residents (66.97%). Maternal prognosis was identical in both groups with regard to the following parameters: surgical site infection, thread release, length of hospital stay, postoperative parameters and maternal condition at discharge. On the other hand, intense postoperative pain was significantly associated with non-externalization of the uterus 45.52% versus 23.25% with a p-value=0.00. **Conclusion:** analysis of these two techniques for surgical closure of the uterus shows very little difference in the occurrence of postoperative complications. Intense pain was influenced by non-externalization of the uterus. This suggests that the choice of repair technique should be left to the obstetrician, pending contrary results from other studies.

Keywords

Caesarean Section, Uterus Exteriorization, Without Uterus Exteriorization, Hysterography, Guinea

*Corresponding author: ibrahima.koussy@gmail.com (Ibrahima Koussy Bah)

Received: 25 January 2025; **Accepted:** 10 February 2025; **Published:** 21 February 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. Introduction

Caesarean section is a surgical procedure involving the artificial delivery of a baby after surgical opening of the uterus, usually performed abdominally, but exceptionally vaginally [1]. It is one of the oldest and most frequently performed surgical procedures on women worldwide [2, 3].

Caesarean section is an obstetric surgical technique that is becoming increasingly common, due to the ongoing quest for improved maternal-fetal health [4]. In developed countries, Caesarean section is the most commonly performed surgical procedure. Its incidence is rising dramatically [5], from 12.1% in 2000 to 21.1% in 2015 [6].

It is associated with numerous complications linked not only to the surgical technique used, but also to post-operative management, the personnel involved and the equipment of the facilities concerned.

There is no defined standard surgical technique for this procedure, and the methods used vary according to the surgeon's experience [7, 8]. Two uterine repair techniques have been well described. The incision can be repaired intra-abdominally in the peritoneal cavity, or extra-abdominally by temporarily removing it from the abdomen [9]. For several years now, numerous studies have focused on the technique for repairing the uterus after fetal extraction, including uterine repair after externalization and in situ repair. The study by Donna Jokhan J and Hofmeyri GJ comparing extra-abdominal repair and in situ repair shows that there is no evidence to draw definitive conclusions on which method of uterine closure offers greater advantages [9].

A meta-analysis by Colin A et al, which also aimed to compare the two types of uterine repair, included 15 articles for possible inclusion in the meta-analysis [10].

In this meta-analysis, no significant differences in postoperative or intraoperative complications were demonstrated between the extra-abdominal externalization repair groups and the in-situ repair, and this study therefore concludes that both techniques are valid and show no difference in postoperative complications.

Numerous studies have therefore attempted to compare the two techniques, in order to determine which is the most favorable, but with no relevant conclusions [10].

The most acceptable surgical technique for the various stages of Caesarean section thus continues to be the subject of enormous debate in the scientific community.

This contradiction observed in the various studies, combined with the paucity of studies carried out in the African context, motivated us to carry out this study.

The aim of this study was to evaluate the maternal prognosis after caesarean section with or without uterine exteriorization during hysterorrhaphy.

2. Methodology

2.1. Type and Duration of Study

This was a prospective study with an analytical aim lasting 6 months from July 1st to December 31, 2022 carried out in the gynecology-obstetrics department of the Ignace Deen national hospital of Conakry University Hospital.

2.2. Study Population

The study focused on women who underwent caesarean section in the department with or without uterine exteriorization and agreed to participate in the study during the data collection period.

2.3. Sampling

We recruited pregnant women and parturients who met the inclusion criteria defined above.

Data were collected through interviews with pregnant women and parturients on admission, review of ANC diaries, clinical examination, verification of whether or not the uterus had been exteriorized during Caesarean section, and postoperative follow-up in search of maternal complications.

2.4. Data Entry and Analysis

Data were entered using Excel software from the 2016 office pack and analyzed using SPSS.26.0 software. Bivariate analysis enabled us to calculate the relative risk with a 95% confidence interval around it. The significance level was 5%, i.e., a p-value of less than 0.05.

2.5. Ethical Considerations

Authorization from the department head and informed consent from the participants were obtained, and confidentiality and anonymity were maintained. The results obtained will be used for scientific purposes only.

2.6. Difficulties

Lack of continuous follow-up of patients after discharge from hospital, except for those who returned to the department for dressings until the surgical wound had healed.

2.7. Limitations

Results can only be applied to the study site.

3. Results

During the study period, we recorded 554 caesarean sections, including 369 cases of uterine exteriorization, i.e., a

frequency of 67%.

Table 1. Socio-demographic characteristics of caesarean patients.

Variables	Number (n=554)	Percentage
Age (years)		
15-20	131	23,64
21-25	164	29,60
26-29	107	19,31
30-34	88	15,88
35 and over Mean: 18.62 years \pm 6.16	64 Extremes: 15 and 44	11,55
Marital status		
Single	35	6,32
Bride	519	93,68
Level of education		
Out of school	222	40,07
Primary	75	13,54
Secondary	163	29,42
Superior	94	16,97
Parity		
Nulliparous	187	33,75
Primipares	115	20,75
Paucipares	167	30,14
Multiparous	76	13,71
Large multiparous	9	1,63
Number of PNC		
0 PNC	28	5,05
1-2 PNC	41	7,40
≥ 3 PNC	485	87,55

Admission procedure:

In terms of mode of admission, 3 out of 10 patients (31.05%) were evacuated.

Type of transport used:

The most frequently used means of transport was public transport, with a frequency of 78.88%

Table 2. Caesarean section characteristics.

Cesarean section features	Number(n=554)	Percentage
Hysterography		
Non-externalization of the uterus	185	33,39
Externalization of the uterus	369	66,61

Cesarean section features	Number(n=554)	Percentage
Type of cesarean section		
Prophylactic	111	20,04
Emergency	443	79,96
Type of anesthesia		
General	550	99,28
Spinal anesthesia	4	0,72
Type of incision		
MSU	15	2,71
Transversal	539	97,29
Antibiotic therapy		
No	1	0,18
Yes	553	99,82
Type of antibiotic		
Ampicillin	518	93,50
Ceftriaxone	30	5,41
Metronidazole	6	1,08
Intervention time in minutes		
12-30	225	40,61
31-60	319	57,58
61 and over Mean: 34.52±10.47 mn	10 Extremes: 12 and 77 minutes	1,80
Processing time		
≤ 01h	352	63,53
1-2 hours	106	19,13
More than 2 hours	96	17,30
Qualification of the doctor who performed the cesarean section		
Gynecology-obstetrics	124	22,38
Resident	371	66,97
Physician acting as obstetrician-gynecologist	59	10,60

Table 3. Comparison of the two groups according to maternal prognosis.

Variables	Externalized uterus		Uterus not externalized		P-value
	Number (n=369)	N %	Number (n=185)	N %	
Complications					
Yes	63	17,07	32	17,30	0,94
No	306	82,93	153	82,70	
SSI					
Yes	14	3,79	10	5,41	0,37

Variables	Externalized uterus		Uterus not externalized		P-value
	Number (n=369)	N %	Number (n=185)	N %	
No	355	96,21	175	94,59	
Releasing wires					
Yes	1	0,27	2	1,08	0,25
No	368	99,73	183	98,92	
Post-operative fever					
Yes	36	9,76	17	9,19	0,83
No	333	90,24	168	90,81	
Endometritis					
Yes	4	1,08	0	0,00	0,30
No	365	98,92	185	100	
Anemia					
Yes	18	4,88	14	7,57	0,20
No	351	95,12	171	92,43	
Pain					
Low-Moderate	201	54,48	142	76,75	0,00
Intense	168	45,52	43	23,25	
Length of hospital stay in hours					
≤ 72 hours	320	86,72	163	88,10	0,64
Over 72 h	49	13,28	22	11,90	

Table 4. Comparison of the two groups according to Caesarean section characteristics.

Variables	Exteriorized uterus		Uterus not externalized		P-value
	Number (n=369)	N %	Number (n=185)	N %	
Intervention time in minutes					
≤ 30 minutes	146	39,56	79	42,70	0,47
More than 30 minutes	223	60,44	106	57,30	

Maternal prognosis

The results of our analysis show that only one patient, i.e. 0.54% of patients in the group whose uterus was not exteriorized, died, whereas no patient died in the other group, with no statistically significant difference between the two groups in the occurrence of maternal death ($P=0.33$).

4. Discussion

We conducted a comparative study involving two groups

of caesarean section patients, one group whose hysterorraphy was performed within the abdominal cavity and the second group whose hysterorraphy was performed after the uterus had been exteriorized.

In our study, we sought to compare the prognosis of caesarean section in the two types of uterine repair, and thus to determine whether complications are significantly more frequent in one of the two methods, or whether there are particular complications associated with one of the uterine repair methods.

In a bivariate analysis, 63 patients, or 17.07% of those in whom the uterus had been exteriorized, experienced complications, while those in whom the uterus had not been exteriorized (32 patients) had a morbidity rate of 17.30%; there was therefore no statistically significant difference in the occurrence of complications in the types of uterine repair ($P=0.94$).

In this study, we found that 3.79% of patients who had had their uterus exteriorized had a surgical site infection, compared with 10 patients (5.41%) in the group who had not had their uterus exteriorized during hysterorrhaphy. Statistically, our results show that there was no significant difference between the two groups in the occurrence of surgical site infection ($P=0.37$). These results are similar to those found in a study carried out by El-Khayat W et al. in Egypt between 2013 [11] with 7.2% of surgical site infection in the group of patients who underwent extra-abdominal hysterorrhaphy versus 8.8% in the group who underwent intra-abdominal repair of the uterus, nor was there any significant difference between the two groups regarding surgical site infection.

However, these results differ from those found by Lakshimi P et al. in their study carried out in India in 2016 [12], who found respectively 8% and 15% of patients who developed a surgical site infection in patients who benefited from uterine exteriorization and those who did not benefit from in situ repair. This discrepancy may be explained by differences in management and surgical conditions between hospitals.

In this work, we found that one Caesarean section was complicated by thread release in the group where the uterus was exteriorized, i.e. 0.27% of patients, and 2 patients in the group where the uterus was not exteriorized, i.e. 1.08%, with no statistically significant difference between these two groups concerning thread release ($P=0.25$).

Temperature is an important element in monitoring the postoperative period, and can be the telltale sign of several infectious pathologies. It is therefore important to determine whether its occurrence is linked to one of the surgical repair techniques of the uterus during Caesarean section, or whether its morbidity is linked to one of the two techniques in our study.

In this series, 36 patients, i.e. 9.76% of the group who had undergone uterine repair after uterine externalization, developed fever in the post-operative period, compared with 9.19% of patients who had not undergone uterine externalization. The difference observed was not significant between the two groups, with regard to the occurrence of fever in the post-operative period ($P=0.83$).

Different findings were reported by authors in other countries in 2016 [13]: 7.69% fever in patients whose uterus had been exteriorized versus 23.08% in patients with in situ uterine repair.

These results also differ from those found by Donna Jacobs-J et al [9], with lower febrile morbidity in patients with extra-abdominal repair.

In the study by Lakshmi P et al. in India in 2016 [12], a 7%

incidence of fever was reported in patients in the extra-abdominal repair group versus 16% in those receiving in situ repair. The difference observed was statistically significant, with a p-value of $p=0.046$.

Endometritis is a frequent complication in the postoperative aftermath of Caesarean section, so it's important to determine whether this complication is linked to one of the surgical techniques for uterine repair (uterine exteriorization or in situ repair). The results of our study show no statistically significant difference in terms of the occurrence of postoperative complications of endometritis.

Our results are similar to those found by Coutinho IC et al. in 2007 in Brazil [14], who found 1.7% postoperative complications such as endometritis in patients whose uterus was exteriorized for hysterorrhaphy, versus 2.1% in patients in the in-situ repair group. The results of a study by El-Khayat W et al. in Cairo, Egypt [11] showed 1.8% endometritis with uterine externalization versus 2.2% in patients whose uterus was repaired without externalization. The difference observed was not significant. An observation identical to ours was recorded in work carried out in India [15].

Anemia is also a frequent complication in the post-operative period of Caesarean section due to the intraoperative bleeding that occurs during this surgical procedure. We therefore sought to evaluate the occurrence of this element in the post-operative period and to determine whether its occurrence is related to one of the two uterine repair methods described in our study.

The occurrence of anemia postoperatively was not associated with whether or not the uterus was exteriorized during hysterorrhaphy, and the difference was not significant.

This result differs from those found by Ezechi O. C et al. in Nigeria in 2005, where they found a much higher rate of post-partum anemia in the group where the uterus was not exteriorized, with a significant statistical difference $P=0.028$ [16].

Pain is a frequent occurrence in the postoperative period, so it is important to assess pain intensity in the patients who took part in our study, in order to determine whether a specific level of pain is related to one of the uterine repair techniques. The results of our study show that 23.25% of patients in the non-externalization group experienced severe pain, while 45.52% of patients in the externalization group had severe pain, with a statistically significant difference between the two groups ($P=0.00$).

These results are similar to those of the study by Yaqub U et al. in Pakistan [17], who found that the frequency of moderate to severe pain within 06 hours of surgery was higher in women with externalized repair (23.0%) than in those with in situ repair (32.4%) ($p=0.025$).

However, these results differ from those found by El-Khayat W et al. in a study carried out in Cairo, Egypt, in 2013 [11], who found that 33% of patients whose uterus had been exteriorized had moderate or severe pain, and 23% of patients whose uterus had been repaired had moderate or

severe pain; in this study, pain was less intense during in situ repair.

These results corroborate those reported in a study by Nafisi S et al. in Iran [18], who found that visceral pain was higher during the first two nights in the externalization group.

With regard to procedure duration, the results of our study show that the average procedure duration for all patients in the study was 34.52 minutes, with extremes of 12 and 77 minutes.

In bivariate analysis, our results show that 106 patients whose uterus was not externalized (57.30%) had a procedure time of over 30 minutes, while in the group where the uterus was externalized, 60.44% had a procedure time of over 30 minutes, with a non-significant difference between the two groups ($p=0.47$).

Humera et al [19] in 2009 made an identical finding, reporting 38% of caesarean sections with an operating time of between 26 and 35 minutes in caesareans with uterine exteriorization during hysterorrhaphy, versus 40% with an operating time of between 36 and 45 minutes in the opposite group. The difference was not significant.

Similar results were reported by Armed P et al. in Pakistan in 2010 [20], with a mean operative time of 32.78 minutes in patients whose uterus was exteriorized, and a mean operative time of 36.38 minutes in patients who underwent intra-abdominal uterine repair. An identical conclusion was reported by Thangamani et al. in India between [21].

With regard to length of hospital stay, the results of our study show that only 49 patients in the externalization group, i.e. 13.28%, were hospitalized for more than 72 hours, compared with 22 patients in the group where the uterus was not externalized, i.e. 11.90%. There was no statistically significant difference between the two groups in length of hospital stay ($P=0.64$).

This finding is similar to those reported in the study by El-Khayat W et al [11], with no significant difference between the two groups, with a mean hospital stay of 2.1 ± 0.1 days for the extra-abdominal repair group and 2.11 ± 0.2 days for the in situ uterine repair group.

However, these results differ from those found by Das D et al. in India [15] in 2013, who found that the hospital stay was longer in the intra-abdominal repair group than in the extra-abdominal repair group, this difference being statistically significant ($p=0.001$). This difference could be explained by the fact that in our study site the average hospital stay for caesarean sections is 2 days in the majority of cases due to insufficient space and the large influx of obstetric emergencies from the capital's outlying facilities, as since 2015, Ignace Deen Maternity Hospital has been the only level 3 hospital receiving the most serious obstetric emergencies.

With regard to maternal condition, the results of our analysis show that there was no significant difference in terms of post-Caesarean prognosis between the two hysterorrhaphy

techniques ($P=0.33$). We recorded one case of maternal death in the uterine exteriorization group (0.54%), and no maternal deaths in the second group.

Regarding the qualification of the health worker who performed the Caesarean section, this study showed that there was no statistically significant difference in the occurrence of postoperative complications based on this parameter ($p=2.46$).

This could be explained by compliance with instructions, mastery of the teachings received from masters by doctors specializing in the field, and good monitoring of patients in the postoperative period.

Conclusion: analysis of these two techniques for surgical closure of the uterus shows very little difference in the occurrence of postoperative complications. Intense pain was influenced by non-externalization of the uterus. This suggests that the choice of repair technique should be left to the obstetrician, pending contrary results from other studies.

Abbreviations

MSU	Median Subumbilical
PNC	Prenatal Consultation
SSI	Surgical Site Infection

Author Contributions

Bah IK (design, analysis and manuscript writing), Bah EM (manuscript review), Sow AII (analysis and manuscript writing), Diallo BS (Surgery), Baldé AI (data collection), Camara K (data collection), Bah MD (data collection), Leno DWA (manuscript review), Diallo A (manuscript review), Sy T (manuscript review).

Conflicts of Interest

The authors declare no conflict of interest related to this work.

References

- [1] Merger R., Levy J., Melchior J. *Obstétrique et pathologies gynécologiques*. Précis d'obstétrique 6ème édition; Masson, Paris. 2001: 533- 542.
- [2] Rothe C, Schlaich C, Thompson S. Health care associated infection in sub-saharan Africa. *J Hosp Infect*. 2013; 85(4): 257-67. <https://doi.org/10.1016/j.jhin.2013.09.008>
- [3] Mpogoro FJ, Mshana SE, Mirambo MM, Kidenga BR, Gomodoko B, Imirzalioglu C. Incidence and predictors of surgical site infections following caesarean section at BUGANDO medical centre, Tanzania. *Antimicrob Resist Infect Control*. 2014; 3: 25.
- [4] <http://www.who.int/reproductivehealth> : déclaration de l'OMS sur les taux de césarienne; WHO/RHR/15.02; 2014: 1.

- [5] Brennan DJ, Robson MS, Murphy M, et al. Comparative analysis of international cesarean delivery rates using 10-group classification identifies significant variation in spontaneous labor. *Am J Obstet Gynecol.* 2009; 201(3): 308. e1-8. <https://doi.org/10.1016/j.ajog.2009.06.021>
- [6] Boerma T, Ronsmans C, Melesse DY, et al. Global epidemiology of use of and disparities in caesarean sections. *Lancet.* 2018; 392: 1341–8. [https://doi.org/10.1016/S0140-6736\(18\)31928-7](https://doi.org/10.1016/S0140-6736(18)31928-7)
- [7] Berghella V, Baxter JK, Chauhan SP. Evidence-based surgery for cesarean delivery. *Am J Obstet Gynecol.* 2005; 193: 1607–17. <https://doi.org/10.1016/j.ajog.2005.03.063>
- [8] Tully L, Gates S, Brocklehurst P, et al. Surgical techniques used during cesarean section operations: results of a national survey of practice in the UK. *Eur J Obstet Gynecol Reprod Biol.* 2002; 102: 120–6. [https://doi.org/10.1016/s0301-2115\(01\)00589-9](https://doi.org/10.1016/s0301-2115(01)00589-9)
- [9] Jacobs-Jokhan D, Hofmeyr G. Extra-abdominal versus intra-abdominal repair of the uterine incision at caesarean section. *Cochrane Database Syst Rev.* 2004; 2004(4): CD000085. <https://doi.org/10.1002/14651858>
- [10] Colin A Walsh, Stewart R Walsh. Extraabdominal v/s intraabdominal uterine repair at caesarean delivery: a meta-analysis. *American Journal of Obstetrics and Gynaecology.* 2009; 200(6): 625e1-625e8. <https://doi.org/10.1016/j.ajog.2009.01.009>
- [11] El-Khayat W, Elsharkawi M, Hassan A. A randomized controlled trial of uterine exteriorization versus in situ repair of the uterine incision during cesarean delivery. *International Journal of Gynecology and Obstetrics.* 2014; 12(2): 163-166. <https://doi.org/10.1016/j.ijgo.2014.05.004> Epub 19 juin 2014.
- [12] Priya LP, Reddi R, Lopamudra B. Comparative study of uterine repair during caesarean section: exteriorization repair versus in-situ repair. *International Journal of Reproduction, Contraception, Obstetrics and Gynecology.* 2017; 6(4): 1426-1429. <https://doi.org/10.18203/2320-1770.ijrcog20171403>
- [13] Deepali Jain, Mukhram Devanda, Narendra Mahavar, Ajay Sharma, Sandhya Choudhary, Meenakshi Samriya, Comparative Study between Exteriorization of Uterus during Caesarean Section versus Intra Peritoneal or In-Situ Repair. *JMSCR.* 2017; 05(07): 25077-25082. <https://dx.doi.org/10.18535/jmscr/v5i7.128>
- [14] Coutinho IC, Ronios de Amorin MM, Katz L, Bandeira de Feraç AA. Uterine exteriorisation compared with in situ repair at caesarean delivery: a randomized controlled trial. *Jr of Obstet Gynecol.* 2008; 112(1): 183. <https://doi.org/10.1097/AOG.0b013e31816521e2>
- [15] Das D, Mahli D, Biswas D. Comparative Study of Uterine Repair during Caesarean Section-Intra-Abdominal Vs Exteriorisation of Uterus. *IOSR Journal of Dental and Medical Sciences (IOSR-JDMS).* 2015; 14(1): 5-08.
- [16] Ezechi OC, Kalu BK, Njokanma FO, Mwokoro CA, Okeke GC, Uterine incision closure at caesarean section: a randomised comparative study of intra peritoneal closure and closure after temporary exteriorisation. *West Afr J Med.* 2005; 24(1): 41-3. <https://doi.org/10.4314/wajm.v24i1.28161>
- [17] Yaqub U, Noreen S. Extra abdominal versus intra-abdominal uterine repair: A randomized control trial. *Pakistan Journal of Medical and Health Sciences.* 2012; - (2): 470-471. <https://doi.org/10.36283/PJMD9-1/014>
- [18] Nafisi S. Influence of uterine exteriorisation versus insitu repair on post caesarean maternal pain: a randomized trial. *Int J Obstet Anesth.* 2007; 16(2): 135-8. <https://doi.org/10.1016/j.ijoa.2006.10.009>
- [19] Humera Nasir, Rashda Imran, Irum Naz, Nadia Saif. Uterine exteriorization compared with in situ repair at caesarean delivery. *Journal of Rawalpindi Medical college (JPMC).* 2011; 15; (2): 110-112.
- [20] Zafar B, Armed P, Shehzad F, Naseem A, Safdar C. Comparison of Options for Uterine Repair, comparaison of options for uterine repair at cesarean delivery, *Forces Med J.* 2016; 66(4): 570-73.
- [21] Thangamani, S. Deepapriya. Comparative study between uterine exteriorization and in situ repair at cesarean section. *Indian journal of research.* 2017; 6: 79-96. <https://doi.org/10.36106/paripex>