



Research Article

Comparative Study of the Conventional Dressing and Absence of Dressing on the Caesarean Section Wound at The Nianankoro Fomba Hospital's Maternity Ward of Segou

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Summary

Objectives: The objectives of this work were to study the evolution of the post-caesarean wounds with or without dressing then to compare the costs of these two methods at Nianankoro Fomba Hospital in Segou.

Materials and methods: It is the result of a double-blind randomized prospective cohort study held in the gynecology and obstetrics department in the regional hospital of Segou, from November 20, 2015 to May 20, 2016 or 7 months. For the sampling, we set the

healing rate of caesarean wounds with dressing at 94%. By setting the alpha risk at 5% and beta at 20%, and assuming a maximum efficiency of 10% as the difference between the two methods (with dressing and without dressing), we opted for the non-inferiority sample calculation technique for the "without dressing" compared to the "with dressing". Indeed 140 participants were needed in each group with an estimate rate of loss of sight at 10%, thus 154 patients were needed per therapeutic case. Finally, 308 participants were selected for this study. The consenting Altemeier class I and II patients have been included to this study. The data were entered on Word, Excel and analyzed on Epi info and SPSS. The Chi 2 test or Fisher's exact test (for numbers < to 5) and the Relative Risk (RR) with its 95% confidence interval were also calculated; p was considered significant if <0.05.

Results: Univariate analysis of infectious risk factors did not show any statistical difference between the two groups: 34.4% of patients evacuated in the "no dressing" group and 44.2 % in the "dressing" one (p = 0.212), 7.1 % of the RPM in the "with dressing" and 9.1% in the group of "without dressing" (P = 0.53 1). The average age of our patients was 26-23 years with extremes of 15 years and 45 years. C-sections were performed urgently in 83.1% of the "bandage" group and 83.8% of the "without bandage" one (P: 0.878). According to Joël Cohen the skin incision was the most common surgical technique with 96.4% in both groups. The overall infection rate was 2.6%. In the "with dressing" group, the infection rate was 1.9% against 3.2% in the "without dressing" one, with P: 0.723. We did not record deep suppuration in both groups. Only three (3) wounds were infected among all the RPM cases: One (1) in the "with dressing" group and 2 wounds in the "without dressing" one. The average duration of antibiotic therapy was 8.40 days and could be extended in cases of infection. The average healing time was 12.77 days in the group of «with dressing» and 12.49 in the group of «without dressing» with P: 0.151. The cost of the dressing has been reduced of 2650 FCFA for the group of "without dressing".

Conclusion: The presence or absence of dressing on the operative wounds has no influence on the incidence of postoperative wound infection. On the other hand, the absence of dressing on the wounds minimizes the cost of the dressing.

Keywords: Caesarean section without dressing; Cost; Surgical site infection

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Introduction

Caesarean section performs artificial delivery after surgical opening of the anterior abdominal wall and uterus [1]. It is the most widespread obstetric intervention in the world [2]. The operative wound that it causes may experience an unfavorable evolution. Surgical site infections occupy the second position among nosocomial infections with a prevalence of 15 to 20%. Its incidence is estimated between 2-5% of the operated zone. They are responsible not only for lethality (2-4%) but also for an extension of the hospital stay from about three to twenty days, causing additional costs [3-6]. In hospital practice, the most common way is to cover the wound with a conventional dressing after suturing to prevent infection of the surgical site. But this technique does not require the opinion of everyone, namely Thomeret who advocates a total removal of the dressing postoperatively [3,4,7].

Since the advent of free caesarean section in our country, practices that tend to lower its cost are being sought. The absence of dressing on the surgical wound is an opportunity for its financial advantage especially in poor countries, but is it applicable in our working conditions? Previous studies in other countries (Switzerland, Togo, Ivory Coast etc..) and also in Mali (Sikasso and Bamako) have shown that there is no difference between the evolution of the two strategies (with dressing and lack of dressing). But considering the climatic and socio-demographic changes from one area to another, including the hygiene and working conditions we undertook a prospective cohort study to evaluate the evolution of the post-caesarean wound with or without dressing in order to determine risk factors for surgical site infection; and compare the costs of these two methods.

Materials and Methods

This was a randomized, double-blind prospective cohort study that took place in the Gynecology-Obstetrics Department at Regional Hospital of Segou from 20 November 2015 to 20 May 2016, or 7 months. The study targeted population included all patients who delivered by caesarean section either urgently or on a scheduled basis in the maternity of Nianankoro Fomba Hospital of Ségou during the study period. For sampling, we set the healing rate of caesarean section wound dressing at 94% [5] to calculate the size. By setting the alpha risk at 5% and beta at 20%, and assuming a maximum efficiency difference of 10% between the two methods (with dressing and without dressing). We opted for the non-inferiority technique to calculate sample of the “without dressing” compared to the “with dressing” ones. In fact, 140 participants were needed for each group. With an estimate rate of loss of sight of 10%, 154 patients were needed per therapeutic group. Consenting Altemeier class I and II patients were included in the study and were excluded from the study at any case of non-compliance with the given instructions, so were patients who were lost to follow-up. After obtaining the voluntary consent of the patient or the consent of the legal guardian, they were finally assigned to one of the therapeutic group of the study randomly according to their order of inclusion and the randomization list. The evolution of wounds was monitored until healing phase. The studied variables were: age, occupation, level of education, personal history, type of procedure, type of incision, class of infection, duration of intervention, type of suture, dressing, antibiotic therapy, infectious score, operated site, type of infection, dressing cost. The progress of the study was done as follows:

The common protocol to both groups of patients

For scheduled Caesareans, a pre-operative check-up is requested including fasting blood glucose, blood type, creatine, blood count and blood count. For emergency cesarean sections, a minimum assessment is required, namely the blood group and the hemoglobin level. We adopted a preoperative protocol for patient preparation. This was an antiseptic protocol that was practiced in five (5) times between maternity and the operating room.

- 1st step: Washing, conducted a wide washing the operated area with simple liquid soap MADAR
- 2nd step: Rinse, we used plain water to rinse.
- 3rd step: Drying, it was carried out in the majority of cases with a dry and sterile compress
- 4th step: Antisepsis itself: it is the usual protocol of whitewashing with polyvidone iodine dermal 10% (Betadine)

- 5th step: Drying, we let it to dry for two (2) to three (3) minutes before the incision

The cutaneous suture was made with absorbable (vicryl type) or non-absorbable thread (nylon type) by single stitch or Blair Donati stitches for vertical and transverse incisions and by simple stitches, Blair Donati stitches or by intradermal overlock for transverse incisions.

The protocol without dressing

At the end of the intervention, there was no dressing on the wound. The medical staff cleaned the edges of the wound with a cloth soaked with polyvidone iodine every morning and evening during the hospital stay and the patient is initiated to the gestures. Five day after the interventions, patients were responsible themselves for the care. They were reviewed on the 7 day, the 11 day, 15th day and the 30th day after cesarean section. Wire Ablation was performed for single stitches on the 7 day (1 out of 2) then on the 11th day (total ablation). Patients were advised not to wet the wound until it healed.

The protocol with dressing

The surgical wound was covered with gauze attached by adhesive tape. The patients were reviewed on the 7th day, 11th day, 15th day and the 30th day after cesarean section. Wire ablation was done for single points on the 7th day (1 of 2) then on the 11th day (total ablation). Antibiotic prophylaxis and antibiotic therapy are given in both groups. The endpoint was the occurrence of infection on the surgical site as defined by the Atlanta CDC. The data was entered on Word, Excel and analyzed on Epi info and SPSS.

Statistical test

The Chi 2 test was used with a level of significance of $p = 0.05$ and the Fisher test for numbers below 5. Confidence interval was at 95 for RR.

Results

Epidemiological and clinical characteristics of patients

The average age of our patients was 26.23 years and the extremities were 15 years and 45 years old. They were 44.2% to be evacuated in the group “with dressing” and 34.4 % in the group “without dressing” with $P: 0.212$ (Table 1). Patients had at least 3 uterine scars in 3.2% of cases. Nulliparous constituted 38.3% of the «with dressing» group versus 35.1% in the «without dressing» one ($p = 0.932$). Caesarean sections were performed urgently in 83.1% in the “with dressing” group and 83.8% in the “without bandage” one with $P: 0.878$ (Table 2). The skin incision according to Joël Cohen was the most surgical technique performed on 96.4% in both groups (Table 3). The cutaneous suture was made by single stitches in 98.1% in the group “with dressing” and 93.5% in the group “Without dressing” (Table 4). The average duration of our interventions was 27.23 min and the extremes were 20 and 46 min. the average duration of hospital stay was 3.63 days in both groups. The average duration of antibiotic therapy was 8.40 days and the average healing time was 12.63 days in both groups. There was a difference of 3650 FCFA in care costs for patients in the group of “without dressing”.

Admission mode	Dressing		Total (%)
	Yes (%)	No (%)	
Self referred	83 (53.9)	98 (63.6)	181 (58.8)
Evacuated	68 (44.2)	53 (34.4)	121 (39.3)
Referred by others	3 (1.9)	3 (1.9)	6 (1.9)
Total	154 (100.0)	154 (100.0)	308 (100.0)

Table 1: Distribution according to admission mode.

Khi-2 = 3.103 p = 0.212

Context of the intervention	Dressing		Total (%)
	Yes (%)	No (%)	
Emergency	128 (83.1)	129 (83.8)	257 (83.4)
Prophylactic	26 (16.9)	25 (16.2)	51 (16.6)
Total	154,100	154,100	308,100

Table 2: Distribution according to the context of the intervention.

Khi-2 = 0.023 p = 0.878

Type of incision	Dressing		Total (%)
	Yes (%)	No (%)	
Joel Cohen	149 (96.8)	148 (96.1)	297 (96.4)
IMSO	5 (3.2)	3 (1.9)	8 (2.6)
Pfanenstiel	0 (0.0)	3 (1.9)	3 (1.0)
Total	154 (100)	154 (100)	308 (100)

Table 3: Breakdown by type of skin incision.

Khi-2 = 3.50 P = 0.173

Type	Dressing		Total (%)
	Yes (%)	No (%)	
Simple points	151 (98.1)	144 (93.5)	295 (95.8)
Intradermal overcast	2 (1.3)	10 (6.5)	12 (3.9)
Blair donati	1 (0.6)	0 (0.0)	1 (0.3)
Total	154 (100.0)	154 (100.0)	308 (100.0)

Table 4: Distribution according to the type of cutaneous suture.

Khi-2 = 6.499P = 0.039

Risk factors	With dressing	Without dressing	RR [95% CI]	P
Evacuation				
Yes	68 (44.2)	53 (34.4)		0.212
No	86 (55.8)	101 (65.6)		
State of the membranes				
intact	11 (7.1)	14 (9.1)	0,769 [0.338 - 1.935]	0.531
broken	143 (92.9)	140 (90.9)		
Duration of intervention				
less than 45 min	153 (99.4)	154 (100)		0.553
More than 45 min	1 (0.6)	0 (0)		
Caesarean				
Emergency room	128 (83.1)	129 (83.8)		0.878
Programmed	26 (16.9)	25 (16.2)		

Table 5: Comparison in uniform analysis of infectious Risk Factors (FDR) in Both Groups (N = 308).

The average duration of the intervention for both groups was approximately 27.23 min with the extremes of 20 and 46 min. The different types of cutaneous suture were the single stitches, the “Blair Donati” stitches and the intradermal overlock. The two groups of the study were homogeneous as to the types of stitches on the skin: single stitches 98.1% vs 93.5% respectively in the group with dressing and the group without dressing. The average cost of the dressing was estimated at thirteen thousand nine hundred (13,900) CFA francs for caesareans with dressing and ten thousand two hundred and fifty (10,250) CFA francs for the C-section without dressing. There was a difference of 3650 FCFA in costs for the patients of the group of “without dressing”, 26.25% reduction in the cost of post-operative care. This shows the economic interest in the absence of dressing on the caesarean section (Table 6).

Designation	Price in FCFA	
	With dressing	Without dressing
Polyvidone iodine	750 F	750 F
Gloves in bulk	5000 F	5000 F
Sterile gloves	2000 F	-
Sterile compress	3000 F	3000 F
plaster	1500 F	-
Transport costs	1650 F	1500 F
Total	13900 F	10250 F

Table 6: Comparison of two groups by dressing cost.

Incidence of surgical site infections

The overall infection rate of the operative site was 2.6% (8 out of 308 cases). There was no statistical difference in the risk of parietal infection between the “with dressing” group (1.9%) and the “without dressing” (3.2%) (p = 0.723). Conventional risk factors of infection have not been statistically associated with the ISO cases (Table 5). Peleg D et al., [8] reported in their study that the incidence of wound complications was not significantly different between the groups, 13.8% in the 6-hour group and 12.5% in the 24-hour group (odds ratio, 1.16; 95% confidence interval, 0.58 - 2.14).

Comments and Discussion

Incidence of surgical site infection

In our study the evolution of the operative wound was simple on 151 patients (98.1%) in the group “with dressing” and 149 patients (96.8%) in the group of “without dressing”. The wound was infected in 3 patients (1.9%) in the group of dressing and 5 patients (3.2%) in the group of “without dressing”. The overall infection rate was 2.6% of patients. Statistically there is no significant difference between the two groups (P = 0.723). The end point was the occurrence of infection on the operative site as defined by the Atlanta CDC [9]. The incidence

of surgical site infections is highly variable and can be modified by several factors [10].

This rate is comparable to those reported by Meylan [2] (2%) in Switzerland, Corditz et al., [11] 11.1% of ISO and Dosseh [3] (2%) in Togo; but on the other hand it is lower than those reported by Sima and Coll (14.1%) [12] in Bamako, Traore Y [13] (1.6%) and Koné et al., (13.5%) [14] in Ivory Coast. We did not record deep suppuration in both groups. There is no significant difference between surgical wounds sutured either by intradermal suture, single stitches separated or by Blair Donati stitches ($P = 0.493$).

Epidemiological and clinical characteristics

In our study the average age of our patients was 26-23 years with extremes of 15 years and 45 years. This result is close to those of Sima et al., [12] in Bamako (26-75 years) and Baby in Sikasso [15] (27-19 years) with extremes of (16 and 42 years) and (15 and 44 years), but it is different from those of Meylan G and Coll [3] in Switzerland and Benie A [14] in Ivory Coast, who had respectively extreme ages of (30 and 87 years), (12 and 64 years). This difference could be explained by the fact that their sampling encompassed all gynecological and obstetric interventions while ours included only caesareans. In our study, more than half of the selected patients were self-evident, with 63.6% of the patients in the “no dressing” group and 53.9% of the “dressing” ones. This result is close to that of Baby [15] in each dressing group with respective rates 61.22% and 53.74.

Surgical history

In our study, 29.5% of patients had experienced caesarean section in the past while 70.5% of patients had no history of caesarean section. Our results are close to those of Sima [12] and Baby [15] who found respectively 31.6% and 33.4% of patients with a previous caesarean section.

Obstetrical history

The majority of our patients were primigest and nulliparous with respective rates of 35.1% and 36.7%. This could be explained by the young age of our patients. Only Altemeier class I and II patients were involved, but all our patients were class I (100%). This result is similar to that of Sima in Bamako [12] 100% of class I. It is close to that of Baby in Sikasso [15] which found 98.0% of class I. There were 25 cases of RPM including 11 cases in the group of with dressing and 14 cases in the group of without dressing ($P = 0.53$). Of the cases of RPM, only 3 wounds were infected, including 1 in the group of with dressing and 2 wounds in the group of without dressing. All our patients had an infectious score of less than or equal to 4. In our study caesareans were performed urgently in 83.4% of cases. This rate is close to those of Baby [15] 86.3%, and Sima [12] 82.5%. Dermal suture in separate points was performed in 95.8% during our study. This result is similar to that of BABY [15] who found (90.1%) of patients in both groups, higher than that of Sima [12] who found (65.1%) of the patients. The average duration of the intervention was 25.67 minutes in our study. This rate is lower than those of Baby in Sikasso [15] 41.71 min and Sima in Bamako [12] 41.91 min. The influence of the duration of the intervention on the infectious risk is not statistically significant ($p = 0.445$). In our study the average duration of antibiotic therapy was 8.40 days. It has been prolonged in cases of infection. Our result is close to those of Baby (8.20 days) in Sikasso [15] and Sima [12] (7.40 days) in Bamako.

Advantages of the technique without dressing compared to the technique with dressing

The average duration of hospitalization was 3.63 days. 97.4% of our patients had a hospital stay of 3-4 days. ($p = 0.257$) This result is comparable to that of Baby [15] and Col in Sikasso (3.58 days). The average time to healing was 12.63 days. The average time to healing was 12.77 days in the group of with dressing and 12.49 days in the group of “without dressing”. There is no significant statistical difference between the two groups ($P = 0.151$). Walter CJ et al., [16] reported in their dressing study that there was no evidence that a dressing significantly reduced surgical site infection rates compared to any other dressing or left the exposed wound. In addition, no significant differences in pain, scarring or acceptability were observed between the dressings.

External scarring was observed between 11 and 15 days postoperatively in 96.1% of cases in the group of with dressing and 92.2% of cases in the group of without dressing. This result exceeds that of her Baby et al., [15] (87.3% of cases before 15 days postoperative). Apart from the clinical interest of the absence of adhesive bandage on the operative wound [17], other arguments plead in favor of its suppression. The average cost of the dressing was estimated at thirteen thousand nine hundred (13,900) CFA francs for caesareans with dressing and ten thousand two hundred and fifty (10,250) CFA francs for the “without dressing”. There was a difference in cost of 3650 FCFA for the patients of the group of “without dressing” making a reduction 26.25% in the cost of post-operative care. Which could affirm the economic interest of the absence of dressing on the caesarean section wound.

Conclusion

The closure or not of the operative wound by a dressing has influence neither on the incidence of infection of the operative site nor the healing time. However, we found that the new method (without dressing) reduced the cost of post-operative care by 26.25%. This could be of benefit to the patient. Currently there is no evidence in the literature regarding the beneficial effect of dressing covering the operative wound on the infection rate of the operative site. For this purpose the choice of dressing should be based essentially on the cost of post-operative care. The Compliance with procedures to prevent infection of the surgical site will allow us to significantly reduce our rate of this infection.

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