

## Comparative Study between Lack of Dressing and Dressing of Surgical Wounds in Caesareans in the Health District of Bamako Commune V (Mali)

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### Abstract

**Introduction:** Caesarean section is the most common obstetric intervention in the world. The operating wound it causes can experience an unfavourable development. **The objective:** of this work was to compare the evolution of operative wounds in caesareans with or without dressing. **Patients and methods:** This was a randomized, open and controlled trial over a period of 5 months from 1<sup>st</sup> May to 30 September 2019 at the reference health centre in the commune V of Bamako district. **Results:** The study involved 294 patients, including 147 for each arm. We recorded 30 cases (10.2%) of infection of the operating site, including 13 (8.84%) among patients with no dressing, versus 17 (11.56%) among those with dressing without significant statistical difference ( $p = 0.25$ ). The average cost of the dressing was estimated at 24,075 CFA francs (48.15 Dollars) for caesarean sections with a dressing and 3,075 CFA francs (6.15 Dollars) for those without a dressing with a difference of 21,000 FCFA (42 Dollars). **In sum:** We did not find a statistically significant difference in regard to the evolution of the surgical wound in the two attitudes. However, this results in a certain economic interest if the operating wound is not covered with a dressing.

**Keywords:** caesarean section, wound, without dressing.

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## I. INTRODUCTION

Caesarean section is the most common obstetric intervention in the world. The operative wound which it causes can experience an unfavourable evolution [1]. The infection of the operating site has an estimated incidence between 2 and 5% [2]. Its prevalence is 15 to 20% of nosocomial infections [2]. It is responsible not only for lethality (2-4%), but also for an extension of the hospital stay by approximately three to twenty days [3-6]. In order to prevent infection of the operating site, the caesarean wound is covered with a bandage after suturing. But with the continuous improvement of surgical techniques, some practitioners prefer to leave the suture without dressing in order to promote its healing by preventing the proliferation of anaerobic germs. The lack of bandage on the caesarean wound has a financial advantage especially in developing countries.

Previous studies in other countries (Switzerland, Togo etc.) as well as in Mali (Sikasso and Bamako) have shown that there was no difference between the two attitudes [3, 7, 8, 9]. Since the free delivery of the caesarean section in Mali on June 23, 2005, practices likely to reduce its cost have been considered. But, considering climate and socio-demographic changes from one place to another, including hygiene and working conditions, is it applicable in our context? We wanted to answer this question by introducing this study in the service.

## II. MATERIALS AND METHODS

This was a randomized, open and controlled over a period of five months, from 1<sup>st</sup> May to 30 September 2019 at the reference health center in the commune V of Bamako District. The minimum sample size was 294, including 147 for each arm. The target population for the study included all patients who

delivered by caesarean section. Altemeier class I and II patients (clean-contaminated surgery) were included in the study. Those of classes III and IV have been excluded. After obtaining the informed consent of the patient or legal guardian, they were assigned to one of the therapeutic groups in the study and this randomly according to random randomization numbers generated by a computer. Each random number was printed on a sheet folded in several layers and placed in an envelope sealed (depending on the order of inclusion and the randomization list). The progress of the wounds was monitored until the healing phase. The variables studied were: age, profession, educational level, personal history, type of incision, duration of the intervention, type of suture, dressing, antibiotic therapy, infectious score, the condition of the operating site, the type of infection, the cost related to the two attitudes. The study progressed as follows:

#### Protocol common to the two groups of patients

For scheduled caesarean sections, a preoperative health check was requested, including fasting blood sugar, blood group, the creatinine, counting blood formulae / platelets, transaminases, azotaemia, the prothrombin time, partial thromboplastin time activated, bleeding time and clotting time, HBS antigen and HIV serology. For emergency caesarean sections, a minimum assessment was required, namely blood group and haemoglobin level as well as HIV serology. We have adopted a protocol for preoperative preparation of the patient. It was an aseptic protocol practiced in four stages between motherhood and the operating room:

- 1st step: Washing the operating field with liquid soap.
- 2nd step: Rinsing the area with sterilized water in the autoclave.
- 3rd step: Drying the area with a sterile compress.
- Step 4: The banding the operative field with the 10% povidone iodine dermal.

Different surgical techniques have been performed. The skin suture was made with single stitches, Blair Donati stitches or intradermal overlock. The sutures used were absorbable or not. The protocol with or without dressing was carried out at the end of the intervention according to the randomization number.

- **Specifics of each of the 2 patient groups**

For arm 1, there was no dressing on the wound. We cleaned the edges of the wound with a compress soaked in polyvidone iodine morning and evening throughout the hospital stay. The Patient and her companion have been subsequently initiated continuing care once they return home. Operates were reviewed on the 7<sup>th</sup> day, 11<sup>th</sup> day, 15<sup>th</sup> day and 30<sup>th</sup> day after caesarean section. The removal of the yarn was carried out for simple points 7<sup>th</sup> day (1 of 2) and then the 11<sup>th</sup> day (total ablation) and the 11<sup>th</sup> day for

overlocking. The patients were sensitized to not wet the wound before healing, do not touch the wound with dirty hands and wear clean and dry clothes to be changed at least twice a day until recovery.

For arm 2, the surgical wound was covered with sterile compresses stuck with adhesive plaster or hypafix adhesive. The patients were reviewed on 7<sup>th</sup> day, 11<sup>th</sup> day, 15<sup>th</sup> day and 30<sup>th</sup> day after caesarean section. Removal of the yarn was carried out for simple points 7<sup>th</sup> day (1 of 2) and then the 11<sup>th</sup> day (total ablation) and the 11<sup>th</sup> day for overlocking.

Antibiotic prophylaxis and antibiotic therapy were administered in both groups. The endpoint was the occurrence of an infection at the surgical site, as defined by the Atlanta Centres for Disease Control and Prevention (CDC). The data were entered in Word, Excel and analysed on Epi info and SPSS version 21. The statistical tests used were Chi 2 with a significance level of  $p = 0.05$  and the Fisher test for numbers less than 5. The confidence interval was 95 for the relative risk.

## RESULTS

We performed 325 caesarean sections during the study period, of which 294 were included and 31 were not included due to situations of extreme urgency, high risk of infection or non-consent of the patient or her guardian.

The average parity was 3 with extremes of 1 and 11. Nulliparous women constituted 42.6 % of the bandage group against 30.3 % of the group without bandage ( $p = 0.82$ ).

The evolution of surgical wounds is reported in Tables I and II: indeed, we have registered 30 cases (10.2%) of surgical site infection, including 13 cases (8.84 %) among patients with no dressing and 17 cases (11.56 %) among those with dressing. The difference was not statistically significant between the two groups of patients ( $p = 0.25$ ).

The average age of our patients was 27.32 years. The age extremes were 13 and 47 years. The patients were not educated ( $p = 0.66$ ). They were housewives ( $p = 0.53$ ), married ( $p = 0.98$ ) and residing in commune V ( $p = 0.31$ ). These different aspects are reported in Table III. The relationship between the emergency context and the evolution of the operating site is illustrated in Table IV. Thus, among the emergency caesarean 20.6% had an infection of operating site against 21.1% in the art programmed.

The evolution of surgical site according to obstetric data is summarized in table V. Patients were evacuated in 44% of cases in the dressing group against 56% in the group without dressing without statistically significant difference ( $p = 0.42$ ). The patient's physical

appearance showed good personal hygiene in 37% of the cases in the two groups. The membranes were intact in 39% of cases in the dressing group against 77 % of patients in the group without dressing with a statistical difference not significant ( $p = 0.16$ ). The patients had at least a uterine scar in 41% of cases. In our sample, 41 % of patients in arm 1 had at least a history of pelvic surgery against 53% of those in arm 2 with no significant statistical difference ( $p = 0.4$ ). It is the same as the use of the same protocol of antibiotics per and postoperative ( $p = 0.16$ ).

The incision Joel Cohen was the most frequently performed, followed by incision Pfannenstiel. Under umbilical midline incision was performed in patient's having such scar earlier. We found no major statistical difference between the 2 groups of patients about the type of incision. The most common skin suture was the single separate stitches followed by the mostly intradermal suture and the separate blair Donati stitches.

The average duration of the intervention was 46 minutes with extremes of 31 and 60 minutes. The average cost of the dressing reported in Table VI has been estimated at 24,075 CFA francs or 48.15 dollars for caesareans with dressing. For those without dressing, it boiled down to a bottle of Betadine and a box of compress, or 3,075 CFA francs, which corresponds to 6.15 Dollars. Patients without a dressing therefore each saved a sum of 21,000 FCFA or 42 Dollars.

The observance of care at the operating site was correct in the "without dressing" group with 97% against 77% in the "dressing" group.

**Table-I: Evolution of the operating site**

Evolution of the operating site	Arm 1	Arm 2
Normal	134	130
Infection	13	17
Total	147	147

( $p = 0.25$ )

**Table-II: Dressing and evolution of the operating site**

Dressing	Favourable development	Infection	Total
Without dressing	134	13	147
Pad	130	17	147
Total	264	30	294
RR = 0.74 CI = 0.32 - 1.39 $p = 0.44$			

**Table-III: Dressing and socio-demographic characteristics**

Dressing				
Sociodemographic characteristics		Yes	No	Statistical tests
Age	19 years old	33	36	Chi 2 = 3.40 $p = 0.18$
	20-34years	87	88	
	35 years	27	23	
Educational level	Not educated	100	109	Chi 2 = 1.57 $p = 0.66$
	Fundamental	34	28	
	university	11	9	
	Post university	2	1	
Profession	Household	109	119	Chi 2 = 2.19 $p = 0.53$
	Shopkeeper	13	8	
	Student	11	9	
	Official	14	11	
Marital status	Married	131	132	Chi 2 = 0.04 $p = 0.98$
	Single	16	15	
Residence	Commune V	125	115	Chi 2 = 2.26 $p = 0.31$
	Outside commune V	24	30	

**Table-IV: Context of emergency and evolution of the operating site**

Intervention			Operating site infection		
			Yes	No	Total
Emergency	Dressing	Yes	3%	97%	100%
		No	17.6%	82.4%	100%
Scheduled	Without dressing	Yes	10.3%	89.7%	100%
		No	10.8%	89.2%	100%

Chi 2 = 2.74  $p = 0.25$

**Table-V: Dressing and obstetric data**

Obstetric data		Dressing characteristics		
		Dressing	Without Dressing	Statistical tests
Mode of admission	Evacuated	44%	56%	Chi 2 = 4.6 p = 0.4
	Herself	56%	44%	
Woman's appearance	Good hygiene	37%	63%	Chi 2 = 4.6 p = 0.4
	Poor hygiene	63%	37%	
Condition of membranes on admission	Intact	39%	77%	Chi 2 = 1.74 p = 0.16
	broken up	61%	23%	
History of surgery	Yes	41%	59%	Chi 2 = 4.6 p = 0.4
	No	53%	47%	
Type of incision	IMSO	39%	61%	Chi 2 = 2.84 p = 0.24
	Joël Cohen	52%	48%	
	Pfannenstiel	67%	33%	
Type of suture	Blair Donati	51%	49%	Chi 2 = 0.44 p = 0.80
	Single points	90%	10%	
	overlock	99%	1%	
Duration of the intervention	30 mins	51%	49%	Chi 2 = 4.6 p = 0.4
	31-60mn	48%	52%	
	60mn	57%	43%	
Duration of antibiotic therapy	7-14 days	65%	45%	Chi 2 = 1.74 p = 0.16
	15-28days	0%	100%	
Operating site infection	Yes	11%	9%	Chi 2 = 3.40 p = 0.18
	no	89%	81%	

**Table-VI: Cost of dressing sessions**

Designation	Average unit price in FCFA / Dollars \$	Total
1 bottle of Polyvidone iodine	875 F (\$ 1.75)	875 (\$ 1.75)
4 pairs of sterile gloves	400 F (\$ 1)	1600 (\$ 3.2)
2 boxes of sterile compresses	2200 F (\$ 4.4)	4400 (\$ 8.8)
2 meters of adhesive plaster	600 F (\$ 1.2)	1200 (\$ 2.4)
4 Round trip transportation costs	4000 F (\$ 8)	16000 (\$ 32)
Total 24,075 FCFA (\$ 48.15)		

## COMMENTS AND DISCUSSION

The criterion of evaluation in this study was the occurrence or absence of an infection of the surgical site, as defined by the Atlanta CDC [9]. The overall infection rate of the operating site was 10.2% (30 cases out of 294). The incidence of surgical site infections is very variable and can be modified by several factors [7]. This rate is comparable to those reported by Sima *et al.* in Bamako [9] (14.1%) in Bamako and Bénéié in Côte d'Ivoire [11] (13.5%). Our rate is however higher compared to those of Meylan in Switzerland [2] (2%), and Dosseh in Togo [3] (2%); Traoré Y in Mali [10] (1.6%). Peleg D *et al.* [6] reported in their study that the incidence of wound complications was not different between the groups with 13.8% in the group of patients who had their first dressing after the first 6 hours and 12.5% in the group of patients who had their first dressing after the first 24 hours after the intervention (OR = 1.16; CI [0.58 - 2.14]). We did not record any deep suppuration in both groups. There was no significant difference between the different techniques suture (separate single points running sutures, point Blair Donati). The average age of our patients was 27.32 years with extremes of 13 and 47.

The patients were very often pauciparous with an age between 20 and 34 years ( $p = 0.18$ ). They were in most of the housework ( $p = 0.53$ ), uneducated ( $p = 0.66$ ), married ( $p = 0.98$ ) and living in commune V. This result is close to that of Sima and al [9] in Bamako (26-75 years), but it is different from that of Meylan G and al [3] in Switzerland and Bénéié A [11] in Côte d'Ivoire, who respectively reported extreme ages of (30 and 87 years), (12 and 64). This difference could be explained by the fact that their study took into account all the other gynaecological and obstetrical interventions whereas ours only included the caesareans. In this work, 59% of patients already had previous surgery of the pelvis. Our results are higher than Sima [9] and Baby [15] who reported 31.6% and 33.4% respectively of the patients having had a previous caesarean section. This difference could be explained by the fact that we preferred to consider all the pelvis surgeries given the fact that any scar could probably have an impact on the evolution of the operating site. Only patients of classes I and II of Altemeier were included in the study, but all our patients belonged to class I. This result is similar to that of Sima in Bamako [9] 100% of class I. It is close to that of Baby in Sikasso

[15] who found 98 % of class I. We found 39 % of premature rupture of the membranes in the bandage group and 77 % in the group without bandage ( $p = 0.16$ ). All our patients had a lower score infectious or equal to 4. In our study, caesarean emergency was performed in 79.6% of cases. This rate is close to that of Sima [9] which was 82.5% and of Baby [15] 86.3%. Skin suturing was done in single separate points in almost all cases (92.5%) during our study. This result is similar to that of Baby [15] who found (90.1%) patients in the two groups. On the other hand, our rate is higher than that of Sima [9] who found 65% of cases of sutures in separate stitches. The duration of the intervention was on average 46 minutes with extremes of 31 and 60 minutes in our study with no statistically significant difference ( $p = 0.43$ ). This rate is slightly higher than that of Baby at Sikasso [15] and Sima in Bamako [9] who reported an average duration of 41.71 min and 41.91 min. In our study, the average duration of antibiotic treatment was 8.7 days. It was extended in the event of infection. Our result is close to that of Sima Bamako (7, 40 days) [9] and Baby Sikasso (8, 20 days) [15]. Regarding the advantages of the dressing-free technique compared to the dressing technique, the average length of hospital stay was 2.18 days ( $p = 0.23$ ). This is comparable to that of Baby and the [15] in Sikasso who reported an average of 3.58 days of hospitalization. The healing period averaged 10.25 days in the group of "dressing" and 10.06 days in the group of "without dressing" without difference statistically significant ( $p = 0.21$ ). The average healing time varied between 10 and 18 days in 97.3% of the cases in the "dressing" group and 93.6% of the cases in the "nodressing" group. This result is higher than that of Baby *et al.*, [15] who reported 87.3% of cases of scarring before 15 days postoperative. In their study on the absence of a dressing on surgical wounds, Walter CJ *et al.* [16] reported that there was no evidence that a dressing significantly reduces infection rates at the operating site.

The cost supported by Mali to ensure free caesarean being high, we found that in addition to the time and quality of healing, other arguments argue in favour of a removal of the dressing to ensure and support the sustainability of this free service. The average cost of the dressing has been estimated at twenty-four thousand seventy-five francs (24,075 FCFA or 48.15 dollars) for caesarean sections with dressing and three thousand seventy-five francs (3,075 FCFA or 6.15 dollars) for the "no dressing". There was therefore a difference of 21,000 FCFA or 42 Dollars less in the costs for the patients of the "no dressing" group, hence the definite economic interest in the absence of dressing on the caesarean suture.

## CONCLUSION

Whether or not the surgical wound is closed with a bandage has no influence on the incidence of

infection at the surgical site or on the healing time. However, we found that the new "no dressing" reduced the cost of post-operative care.

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