

## SUBUMBILICAL MIDLINE INCISION VERSUS PFANNENSTIEL INCISION FOR CAESAREAN SECTION

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### **ABSTRACT**

**Objective:** To evaluate the effect of the type of skin incision for Caesarean Section on the incision-delivery interval, and fetomaternal outcome.

**Methods:** A quasi-experimental study with convenient sampling involving two groups of women who underwent primary lower segment transverse caesarean section. Standard surgical techniques were used in both groups except the technique of skin incision : subumbilical midline or Pfannenstiel. A comparison of the two groups were made with regard to incision delivery interval, duration of surgery, day of oral intake, day of ambulation, duration of hospital stay, wound infection and estimated blood loss. Data was managed using SPSS software. Chi-Square test and Student t-test were used for analysis. P value was placed at  $P < 0.05$ .

**Results:** 200 women were studied (96 allocated to subumbilical midline and 104 to Pfannenstiel group). There were no significant differences between both groups in terms of incision delivery interval and duration of surgery. Those with Pfannenstiel incision were significantly associated with early oral intake, early ambulation, shorter duration of hospital stay and reduced risk of wound infection ( $P = 0.001$ ). Neonatal Apgar scores were better in Pfannenstiel group.

**Conclusion:** Pfannenstiel skin incision is associated with less morbidity and earlier recovery.

**Keywords:** subumbilical midline, Pfannenstiel, skin incision, caesarean section

### **INTRODUCTION**

Caesarean section is the commonest major operation performed by the obstetrician worldwide. Operative techniques used for caesarean section vary and some of these techniques have been evaluated through randomized trials<sup>1-5</sup>.

Various abdominal incisions have been used for caesarean section. These include vertical (midline and paramedian) incisions and transverse incisions (Pfannenstiel, Mayland, Cherney, Joel-Cohen, etc.)<sup>1,6,7</sup>. The type of incision used may depend on many factors including the clinical situation and the preference of the operator. In a recent Cochrane review<sup>1</sup> the authors concluded that the Joel-Cohen incision has advantages compared to the Pfannenstiel incision. These are less fever, pain and analgesic requirements, less blood loss, shorter duration of surgery and hospital stay. In Nigeria, out of the above incision types only sub umbilical midline and Pfannenstiel incisions are often used. The rest are virtually not used.

Traditionally, vertical incisions were used for caesarean delivery. Here the skin incision is made in the midline between the umbilicus and the pubic symphysis. The area is less vascular. This incision has the presumed advantage of speed of abdominal entry and less bleeding<sup>1</sup>. A vertical midline incision can be extended upwards if more space is required for access. Moreover this incision can be used if a caesarean delivery is planned under local anaesthesia. The disadvantage of this incision is the greater risk for postoperative wound dehiscence and the development of postoperative hernia. The scar is cosmetically less pleasing. The Pfannenstiel on the

**Table I: Selected Demographic Characteristic among comparison group**

Variable	Subumbilical midline	Pfannenstiel	Statistical Analysis
	N=96 Mean $\pm$ SD	N=104 Mean $\pm$ SD	
Mean Age (years)	28.13 $\pm$ 4.39	29.52 $\pm$ 5.45	t=1.402 P=0.154
Range	19-37	19-43	
Mean Parity	1.90 $\pm$ 1.37	1.00 $\pm$ 0.99	t = 0.840
Range	0-7	0-4	P=0.403
Mean Gestational Age (Weeks)	38.21 $\pm$ 1.85	38.35 $\pm$ 1.89	t=1.14
range	36-41	36-41	P=0.650
Type of surgery:			
Elective	22(22.9%)	26(25.0%)	X <sup>2</sup> =0.059
Emergency	74 (77.1%)	78(75.0%)	P=0.907
Cadre of Surgeon:			
Consultant	16(16.7%)	12(11.5%)	X <sup>2</sup> = 0.545
Resident	80(83.3%)	92(89.5)	P=0.460

other hand has the advantage of cosmetic approval and minimal risk of postoperative wound disruption<sup>18</sup>. However despite these advantages of Pfannenstiel incision, there is still the general belief that subumbilical incision is favored in Nigeria especially among older obstetricians<sup>9</sup>. There is scarcity of studies in our environment comparing both techniques especially to confirm if there is significant difference among them with respect to

duration of operation, blood loss, incision- delivery interval, and the effect of these on the neonatal outcome. Such studies are necessary since an increasing population of our pregnant women demand the Pfannenstiel incision due to its cosmetic effect and also due to the fact that they want to conceal the scar of caesarean section since most women are averse to it<sup>9,12</sup> and it may lead to public ridicule especially in a polygamous family setting<sup>8</sup>

**Table II: Surgical Outcome among Comparison Group**

Variable	Subumbilical midline	Pfannenstiel	Statistical Analysis
	N=96	N=104	
Incision Delivery interval (mins)	8.25 $\pm$ 5.17	8.94 $\pm$ 5.21	t=0.667 P=0.507
Range	3-30	4-30	
Duration of Surgery (minutes)	63.13 $\pm$ 12.87	65.63 $\pm$ 16.81	t = 0.838 P=0.407
Range	40-105	35-107	
Day of Oral intake range	1.96 $\pm$ 0.944	1.54 $\pm$ 0.64	t=2.62 P=0.010*
	1-4	1-3	
Ambulation day range	2.06 $\pm$ 0.84	1.23 $\pm$ 0.47	t=6.196 P=0.001***
	1-4	1-3	
Duration of hospital stay range	7.92 $\pm$ 2.47	6.00 $\pm$ 2.07	t=4.224 P=0.001***
	4-13	4-8	
Estimated Blood loss (mls)	537.71 $\pm$ 187.12	472.31 $\pm$ 189.99	t=1.732 P=0.086
Range	200-950	200-1000	
Wound Infection	7(7.3%)	1(0.9%)	X <sup>2</sup> = 17.926 P=0.001***

\*Significant at P<0.05 ; \*\*\* Very Significant at P<0.05

**Table III: Neonatal Outcome among comparison Group**

Variable	Subumbilical midline	Pfannenstiel	Statistical Analysis
	N=96 Mean $\pm$ SD	N=104 Mean $\pm$ SD	
Apgar Scores at 1 minute range	7.60 $\pm$ 1.819 3-10	8.46 $\pm$ 1.38 5-10	t=2.729 P=0.008***
Apgar Scores at 5 minutes Range	6.67 $\pm$ 1.55 6-10	9.62 $\pm$ 0.87 7-10	t=-3.819 P=0.001***
Birth weight (kg) range	3.15 $\pm$ 0.46	3.05 $\pm$ 0.37	t=1.22 P=0.224

\*\*\* Very Significant at P<0.05

Most published studies on abdominal surgical incision for caesarean sections focused on comparing Pfannenstiel with Joel-Cohen technique or its modified form or other forms of skin incision mentioned above<sup>1-6</sup>. The operation of caesarean Section is performed so frequently that differences in morbidity are likely to have a significant costs effect, especially in poor settings like Nigeria with a great aversion for the surgery<sup>7-9</sup>.

This study compares the effects of Pfannenstiel skin incision versus sub umbilical midline

obtaining an informed consent for surgery. A quasi-experimental study with convenience sampling involving two groups of women who underwent caesarean section was used. Two hundred women were assigned into either group (96 into sub umbilical midline and 104 into Pfannenstiel incision). Similar anaesthetic and surgical techniques were employed for the two groups of women. Packed cell volumes and blood grouping and cross matching were performed in all patients. Pre-operative preparations and techniques were same in both groups except the procedure of skin incision.

**Table IV: Indications for Surgery among comparison group**

Variable	Subumbilical midline	Pfannenstiel
	N=96	N=104
Obstructed labour	28(29.2%)	8(7.72)
Cephalopelvic Disproportion	42(41.82)	28(26.9%)
Antepartum haemorrhage	2(2.1%)	14(13.5%)
Bad obstetric history	6(6.3%2)	20(19.2%)
Breech	2(2.1%)	4(3.8%)
Preclampsia/Eclampsia	2(2.1%)	2(1.9%)
Fetal distress	10(10.4%)	16(15.3%)
Failed Induction	4(4.2%)	10(6.6%)

incision on incision-delivery interval, duration of surgery, duration of hospital and risks for wound infection.

## METHODOLOGY

All the patients requiring primary caesarean section at the obstetrics unit of Wesley Guild Hospital, Ilesa, from June 2006 to July 2007 who fulfilled the inclusion criteria were recruited into the study after

The inclusion criteria were patients requiring primary caesarean section, no previous abdominal or pelvic surgery, while exclusion criteria were patients with previous Caesarean Sections and those with previous abdominal or pelvic surgery. The outcome measures compared include the skin incision delivery interval, duration of surgery, day of oral intake, ambulation day, and duration of hospital stay,

estimated blood loss and risk for wound infection.

All the data were analysed using statistical package for social sciences and Epi-Info. Statistical analysis was done using student T-test for continuous variables and chi-square for categorical variables. Level of significance placed at  $P < 0.05$ .

## RESULTS

Two hundred women were compared (96 allocated to subumbilical midline incision and 104 to Pfannenstiel incision). Table I shows the demographic characteristics of comparison groups. There is no statistical significance difference in the mean age, mean parity, type of surgery and the cadre of surgeons.

Table II shows the surgical outcome among the groups. There was no significant difference in between them in terms of incision delivery interval (in minutes), duration of surgery (minutes), and the estimated blood loss. However Pfannenstiel incision group was statistically significantly associated with early day of oral intake ( $P < 0.05$ ), earlier ambulation ( $P < 0.001$ ), shorter duration of hospital stay ( $P = 0.001$ ) and reduced risk of wound infection ( $P = 0.001$ ) compared to the subumbilical midline incision group. Table III shows that the mean Apgar scores at 1 and 5 minutes were better with Pfannenstiel group compared to subumbilical midline group ( $P = 0.001$ ) while the mean birth weight was similar in both groups. Table IV shows similar indications for surgery in both groups which included obstructed labor, cephalopelvic disproportion, bad obstetric history, Breech presentation, Preeclampsia/Eclampsia, fetal distress and failed induction.

## DISCUSSION

In developed countries, Pfannenstiel incision at present is the most acceptable skin incision for caesarean section compared with sub umbilical midline incision<sup>7,8</sup>. However, the sub umbilical midline incision is said to be the favoured incision in Nigeria<sup>9</sup>, because of the claim that it is quick to make, and is less bloody. However in our study there was no significant difference in the duration of surgery and in the mean skin incision-delivery interval between the subumbilical midline incision compared to Pfannenstiel ( $8.25 \pm 5.17$  versus  $8.94 \pm 5.21$ ). The skin incision delivery actually ranges from 3-30 minutes in subumbilical midline compared to 4-30 minutes in the Pfannenstiel group. The claim that subumbilical midline incision is quicker<sup>1</sup> is therefore not confirmed in this study.

The mean estimated blood loss was also similar in both groups. It was 537mls in sub umbilical midline versus 472mls in Pfannenstiel group but did not show statistical significance. The fear that Pfannenstiel incision may be bloody is therefore not confirmed by the findings from this study.

The patients who had Pfannenstiel incision in our study had earlier day of oral intake, earlier ambulation and shorter duration of hospital stay ( $P = 0.001$ ) compared to those who had sub-umbilical midline incision. The reason for the earlier day of oral intake is not quite clear from this study. Further studies may be needed to unravel this. However the earlier day of oral intake may account for the earlier ambulation and consequently shorter duration in hospital stay. Studies had suggested that early post-operative enteral feeding may be associated with reduced protein-store depletion, improved wound healing and faster recovery, with earlier hospital discharge and reduced costs<sup>13-19</sup>. When the cosmetic advantage of Pfannenstiel<sup>11</sup> is considered in addition

to these findings, one can make a strong case for the Pfannenstiel incision to be used as primary skin incision during caesarean section in Nigeria.

Our study also shows higher wound infection in the sub umbilical midline group (P=0.001) which may partly explain the longer duration of hospital stay (P=0.001). This may in the final analysis increase the hospital bills. In an environment such as ours where much aversion for caesarean section exists<sup>9-12</sup>, it is imperative to adopt measures which will not only make caesarean section acceptable but also affordable while reducing the associated morbidity<sup>10-12</sup>. The absence of clinical studies in our environment to justify the assumed advantages of subumbilical midline incision as is widely believed questions the rationale of such beliefs.

The findings of better mean Apgar scores in the Pfannenstiel group despite the fact that they had more cases of fetuses in distress is surprising and cannot easily be explained from the findings in the study. Further studies are needed to elucidate this fact.

In conclusion Pfannenstiel skin incision for primary caesarean section is not associated with increased morbidity for mother and baby and should be recommended due to its cosmetic effect and reduced incidence of wound infection. We suggest that more studies should be done to compare the preference of these skin incisions by patients.

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