

## MATERNAL BLOOD LOSS BY MODE OF UTERINE INCISION AT CAESAREAN SECTION: A COMPARISON BETWEEN SHARP AND BLUNT TECHNIQUES

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### ABSTRACT

**Objective:** To evaluate the effect of two techniques of uterine incision expansion at caesarean section on the maternal blood loss, inadvertent extension of incisions and the feto-maternal outcome.

**Methods:** A quasi-experimental study with convenient sampling involving two groups of women who underwent lower segment transverse caesarean section. Both groups were studied for their demographic characteristics and clinical data. Standard surgical techniques were used in both groups except the technique of uterine incision either by blunt or sharp method. Finally a comparison of the two groups was made regarding blood loss, changes in haematocrit, blood transfusion and uterine tears. The study was conducted at the obstetric unit of Obafemi Awolowo University teaching Hospital Ile-Ife, Nigeria from January to December 2006.

**Result:** Seventy-two women were studied (36 into either method). Blunt method of uterine expansion was significantly associated with increased risk for blood loss, fall in haematocrit ( $P=0.001$ ), need for blood transfusion ( $P<0.05$ ) and uterine, vaginal and cervical tears due to inadvertent extension compared to sharp expansion group.

**Conclusion:** The sharp expansion method is recommended because it is associated with reduced maternal morbidity in term of blood loss and uterine tears

**Keywords:** Uterine expansion at Caesarean Section, sharp, blunt techniques.

### INTRODUCTION

Although caesarean section is much safer today due to improved techniques, antibiotics, anaesthetic procedures and blood transfusion<sup>1-3</sup>, it is still a major cause of intra-operative and post-operative complications worldwide<sup>4</sup>. Its morbidity remains

high as compared to vaginal delivery<sup>5,6</sup>.

Attention has therefore been focused on reducing morbidity associated with the procedure through refinements of the surgical techniques<sup>7-9</sup>. A variety of surgical techniques have been employed to restrict blood loss during caesarean section. These include; spontaneous versus manual removal of placenta<sup>10</sup>, in situ repair of uterine incision versus uterine exteriorization<sup>10</sup>. T and J extension in low transverse births<sup>11</sup> and comparison of modified Joel-Cohen technique for Caesarean Section with Pfannenstiel technique<sup>12</sup> among others. One of the techniques that remains debatable is the blunt versus sharp expansion of uterine incisions in low transverse caesarean section<sup>13,14</sup>. Different surgeons based on their own experience have advocated each method. Very few prospective studies have demonstrated any merit or demerit associated with either of these methods

This prospective study tries to compare which technique of extending the uterine incision that is associated with less morbidity in terms of less intra-operative blood loss, need for blood transfusion and uterine tears. This is particularly important in our environment where there is scarcity of compatible blood during emergency obstetric conditions and great aversion towards caesarean section.

### METHODS

All the patients requiring caesarean section at the obstetric unit of Obafemi Awolowo University Teaching hospital Ile-Ife, Nigeria from January to

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December 2006 who fulfilled the inclusion criteria were recruited into the study after obtaining informed consent. A quasi experimental study with convenience sampling involving two groups of women who underwent caesarean section was

patients uterine extension was done bluntly (digital extension). The other half (36) were designated group 11 (in which uterine extension was made by sharp incision). Distribution of patients in either group was made on the basis of non-randomized

<b>Variable</b>	<b>Bunt group N=36</b>	<b>Sharp group N=36</b>	<b>Statistical analysis</b>
Age (years)	29.06?6.92	26.72?7.33	t=0.981
Range	19-40	17-41	P=0.333
Parity	1.44?1.62	1.33?1.78	t=0.196
Range	0-5	0-6	P=0.846
Gestational age range	39.11?1.57 37-43	39..50?1.68 37-43	t=0.993 P=0.479
Types of surgery			
Emergency	28(77.5%)	36(88.9%)	X2=0.800
Elective	8(22.2%)	2(11.1%)	P=0.371
Stage of labour			
Antepartum	8(22.2%)	10(27.8%)	X2=3.278
First stage	20(61.1%)	26(72.2%)	P=0.194
Second Stage	6(16.7%)	-	

studied.

The sample size for the comparison of independent means was used<sup>15</sup>:  $N = \frac{S^2 (Q^{-1} A + Q^{-1} B (Z_{\alpha} + Z_{\beta}))^2}{U^2}$

$U^2$

Where  $S^2$  = pooled estimate of the common variance of the two samples;  $QA$  = the proportion of the total sample in sample A;  $QB$  = the proportion of the total sample in sample B;  $U$  = the difference detected between the means of the two samples. Using the

(convenience) sampling. General anaesthesia was administered to all patients. Packed cell volume, blood group and cross matching were performed in all patients. Pre-operative preparations and techniques were same in both groups except the procedure for expanding the uterine incision. A sub-umbilical midline incision was made for all the patients, followed by a low transverse uterine incision. After making an incision of 2cm in the

**Table II Haematological Profiles of blunt and sharp group**

<b>Variable</b>	<b>Blunt group N=36</b>	<b>Sharp group N=36</b>	<b>Statistical analysis</b>
Pre-operative	37.22?2.36	36.44?2.33	t=0.993
PCV	33-41	33-41	P=0.280
Post operative	29.89?2.29	33.06?2.26	t=4.16
PCV	25-34	30-37	P=0.0001***
Fall in haematocrit	7.28?3.78	3.39?2.06	t=3.82
Range	3-16	1-8	P=0.0001***
Estimated blood loss(mls)	605.56?190.88	419.44?101.66	t=3.65
Range	350-1000	300-600	P=0.0001***
No of pints of	0.28?0.06	-	t=2.55
Blood transfused	0-1	-	P=0.02*

\* significant at  $P < 0.05$  \*\*\* very significant at  $P < 0.05$

computer system CPEA (computer programme for epidemiologic analysis) to calculate the sample, it gave a minimum sample size of 22 patients for each group. However seventy two women were recruited in the study to increase the statistical significance. 36 of them were assigned to group 1 (in these

uterine walls with a scalpel, the incision was extended either by blunt or sharp method. The blunt method involves the introduction of fore fingers into the initial uterine incision, followed by forcefully splitting the uterine musculature laterally and

superiorly<sup>16</sup>. In sharp method, using curved dissecting scissors, the initial uterine incision was extended lateral and superiorly to avoid the lateral

partum haemorrhage, previous history of post partum haemorrhage and uterine fibroids all of which are risk factors for increased blood loss during and after surgery. All data pertaining to the age of

Table III Maternal and Neonatal Outcome

Variable	Blunt group Mean ?SD	Sharp group Mean ?SD	Statistical analysis
Any tear			
Yes	18(50.0%)	6(16.7%)	X <sup>2</sup> =4.500
Extension to vagina	4	2	P=0.034*
Lateral tears	10	2	
Cervical tears	4	2	
Injury to baby	4(11.1%)	4(11.1%)	X <sup>2</sup> =0.00 P=0.1065
Apgar scores at 1 minute	7.00?2.97 6-10	8.44?1.04 7-10	t=1.947 P=0.065
Apgar scores at 5 minutes	8.06?3.09 6-10	9.44?0.78 8-10	t= 1.007 P=0.075
Birth weight (kg)	3.24?0.47 2.740-4.000	3.23?0.354 2.750-4.000	t=0.095 P=0.925

\* significant at P<0.05

Table IV: Indication for Surgery among Comparison Group

Variable	Blunt group	Sharp group	Statistical analysis
Indication			
Obstructed labour	12(33.3%)	2(5.6%)	X <sup>2</sup> =14.714
Breech presentation	6(16.7%)	4(11.1%)	P=0.65
Cephalopelvic disproportion	8(22.2%)	2(5.6%)	
Failure to progress	2(5.6%)	8(22.2%)	
Eclampsia/Pre-eclampsia	-	6(16.7%)	
Transverse lie	-	4(11.1%)	
Bad obstetric history	4(11.1%)	-	
2 previous caesarean section	2(5.6%)	-	

angles of the cervix.

After delivery of the fetus, the placenta was delivered by controlled cord traction. Intravenous oxytocics were given alongside uterine incision and abdominal incision was closed in layers. The intraoperative blood loss was estimated by measuring the amount of blood in the suction apparatus and weighing the pre-weighed sponges. Haemotocrit was repeated after 48 hours of surgery. A record of blood transfusion was kept along with the number and extent of tears. An extension of tear was defined in this study as an inadvertent extension of uterine incision beyond normal limits.

Inclusion criteria comprised of all singleton pregnancies with gestational age 37-42 weeks. Exclusion criteria were all pregnant women with multiple pregnancies, polyhydramnios, ante

patients, Parity, gestational age, indication for surgery, and birth weight of the baby were recorded in a proforma and a comparison made. All the data were fed into statistical package for social sciences (SPSS) version 11. Data were analyzed using the chi-square test and student t-test. Level of significance was placed at P<0.05

## RESULTS

Seventy-two patients who fulfilled the inclusion criteria were assigned into each group (36 women per group). Table I shows the selected demographic characteristics of the blunt and sharp group. There were no statistical significant difference between the two groups in the mean age, mean parity, mean gestational age at delivery, type of surgery, and the

stage of labor when the surgery was performed ( $P>0.05$ ).

Table II shows the haematological profiles of the comparison group. While there was no difference between both groups in their mean pre-operative packed cell volume ( $P>0.05$ ), there was significant reduction in postoperative packed cell volume (PCV) among patients who had blunt dissection compared to those with sharp dissection (29.89 versus 33.66)  $P=0.001$ . Similar findings were seen in the mean fall of haematocrit ( $P=0.001$ ) and in the estimated blood loss ( $P=0.001$ ). One patient among the blunt group had a pint of blood transfused post-operative. Table III shows further maternal and neonatal outcome among both groups. Patients who had blunt dissection had more inadvertent tears (50%) compared to 16.7% among the sharp group ( $P<0.05$ ). There was no significant difference in the risk for fetal injury, mean Apgar scores at 1 and at 5 minutes and in the mean birth weight ( $P>0.05$ ).

Table IV shows that indications for surgery were similar among both groups. These indications include; obstructed labour, cephalopelvic disproportion, breech presentation, fetal distress, failure to progress, pre-eclampsia/eclampsia, transverse lie, bad obstetric history and two previous caesarean sections.

## DISCUSSION

Surgical techniques to perform caesarean sections have evolved over the passage of time<sup>7</sup>. In this study we compared the technique of extension of uterine incision by blunt versus sharp methods. There were no significant difference between the study groups in terms of maternal age, gestational age at delivery, and neonatal Apgar scores. Our results showed that the blunt dissection group had significantly increased risk for blood loss, and fall in post-

operative haematocrit compared to the sharp group. While this is similar to the findings of other authors<sup>13</sup>, it contrasts with others who in their study observed more blood loss in the sharp group<sup>14</sup>. However, both our study and theirs reported more tears in the blunt group compared with the sharp group. The increased risk for tears observed in the blunt group had been attributed to the fact that the force required to expand the incision in the blunt group cannot always be calculated or controlled and therefore may result in inadvertent extension of the incision laterally into the broad ligament which may damage major vessels thus leading to more blood loss<sup>16</sup> as was observed in our study. There were also extension of the tears into the vagina, and the cervix which further increased blood loss and the repair may actually increase the duration of surgery. In comparison, the sharp grouped had less tears and blood loss probably because the expansion of the incision with curved scissors was well controlled and precise hence reducing the risk of inadvertent extension.

However, in contrast to our findings, Magann et al conducted a comparative study between the two techniques and found that blood loss and uterine tears were more in sharp group<sup>14</sup> than in the blunt group. These differing findings call for more research into the various techniques so that the morbidity arising from blood loss and tears would be reduced with concomitant reduction in hospital costs and duration of hospital stay.

The reduced mean blood loss and the less need for blood transfusion observed in our study among the sharp group is worthy of note. This technique should be encouraged in our locality where there is great aversion to caesarean section and blood transfusion<sup>18,19</sup>.

It is further advantageous in our environment where there is scarcity of blood for transfusion during obstetric emergencies. Further more, many of our

patients requiring caesarean section present late in labour when complications had set in and many may be in obstructed labor with the head deeply impacted in the pelvis<sup>20,21</sup>. Careful expansion by sharp dissection in such conditions would be beneficial because any inadvertent extension to the vagina or broad ligament may be catastrophic if there is inadequate blood supplies.

In conclusion, our study showed that blunt expansion in uterine incision at caesarean section is associated with increased morbidity in terms of blood loss and inadvertent tears compared to the sharp method.

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