

# Anesthesia for cesarean section in pregnancies complicated by placenta previa

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## ABSTRACT

**الأهداف:** تقييم العوامل التي تؤثر على اختيار تقنية التخدير للعملية القيصرية لدى النساء اللواتي يعانين من مشيمة منزاحة.

**الطريقة:** في دراسة استيعادية تم فحص سجلات جناح العملية والولادة بمستشفى جامعة بينين التعليمي - مدينة بينين - نيجيريا، في الفترة من 1 يناير 2000م إلى 31 ديسمبر 2004م، وذلك لتحديد جميع النساء اللواتي خضعن لعملية قيصرية نتيجة لكون المشيمة منزاحة. تم تسجيل الصفات الاجتماعية والسكانية للمريضات، ونوع المشيمة المنزاحة، وتقنية التخدير، وتقدير كمية الدم المفقود، ونتائج الأمومة والجنين.

**النتائج:** أجريت العملية القيصرية لـ 126 مريضة نتيجة للمشيمة المنزاحة ولكن توفرت 81 (64.3%) مريضة فقط للتسجيل. خضعت 52/81 (64.2%) مريضة للتخدير العام وتلقت 29/81 (35.8%) مريضة لتخدير العامود الفقري على التوالي. سبق وان تعرضت 61.7% (عدد=50) مريضة لنزف قبل الولادة. واحدة وثلاثون مريضة من اللواتي لم يتعرضن لنزف قبل الولادة، تلقت 15/31 مريضة تخدير عام و16/31 مريضة تخدير العامود الفقري. تلقت المريضات اللواتي تعرضن لنزف ما قبل الولادة 37/50 مريضة تخدير عام و13/50 تلقتن تخدير العامود الفقري. كان هناك زيادة في فرصة استعمال التخدير العام إذا كان نزف قبل الولادة حاضراً، ( $p=0.03$ , odds ratio = 3.1, 95% confidence interval = 1.2-7.8).

**خاتمة:** قد يكون استعمال تخدير العامود الفقري مفيداً للمريضات اللواتي يعانين من مشيمة منزاحة. قد يشجع حدوث النزف قبل الولادة استعمال التخدير العام لعملية الولادة القيصرية.

**Objective:** To evaluate the factors affecting the choice of anesthetic technique for cesarean section in women with placenta previa.

**Methods:** In this retrospective study, the records of the Labor Ward Theatre of the University of Benin Teaching Hospital, Benin City, Nigeria were

examined from January 2000 to December 2004 to identify all the women who had cesarean section for placenta previa. The patients' socio-demographic characteristics, type of placenta previa, anesthetic technique, estimated blood loss, maternal and fetal outcomes were recorded.

**Results:** One hundred and twenty-six patients had cesarean section for placenta previa, however, only 81 patients (64.3%) were available for analysis. General anesthesia was administered to 52/81 patients (64.2%), and 29/81 patients (35.8%) received spinal anesthesia. A history of antepartum bleeding was recorded in 61.7% (n = 50). Of the 31 patients without antepartum hemorrhage (APH), 15/31 had general anesthesia, and 16/31 had spinal anesthesia. The patients who had APH, 37/50 had general anesthesia, and 13/50 had spinal anesthesia. There was an increased chance of using general anesthesia if APH were present ( $p=0.03$ , odds ratio = 3.1, 95% confidence interval = 1.2-7.8).

**Conclusion:** Spinal anesthesia may be useful in patients with placenta previa. The presence of APH may encourage the use of general anesthesia for cesarean delivery.

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Placenta previa is a major cause of obstetric hemorrhage, and consequent maternal and fetal morbidity and mortality. As a result, many anesthetists prefer general anesthesia instead of regional anesthesia due to the risk of excessive bleeding and shock that may ensue.<sup>1</sup> The presence of placenta previa in a woman scheduled for cesarean section may constitute a clinical

dilemma for the attending anesthetist. Thus, there has been extensive administration of general anesthesia for cesarean whenever placenta previa was the indication. The association of placenta previa with significant antepartum hemorrhage (APH),<sup>2</sup> and the possibility of cesarean hysterectomy in these patients often prompts the choice of general anesthesia for cesarean section. There has been an increase in the use of regional anesthesia for cesarean section worldwide.<sup>3,4</sup> It is not clear if the change in pattern of anesthetic practice globally has affected the local or the national choice of anesthetic technique for cesarean section in pregnancy complicated by placenta previa. The aim of this study was to evaluate the factors affecting the anesthetic choices for cesarean section for placenta previa.

**Methods.** The surgical registry of the Labor Ward Theatre was reviewed from January 2000 to December 2004 to identify women who had cesarean section for placenta previa in the University of Benin Teaching Hospital, Benin City, Nigeria, a referral center covering 2 Midwestern states of Edo, Delta and parts of Ondo and Kogi states of Nigeria. The hospital provides tertiary care for well over 10 million persons (mainly Nigerians) living in these states with a good case load of low and high-risk obstetric patients. Approval for the study was sought and received from the institutional Ethics and Research Committee. The diagnosis of placenta previa was taken as recorded in the records of delivery. The records of women with pregnancies complicated by placenta previa were reviewed to document the socio-demographic characteristics of the patients, type of placenta previa, nature of cesarean section, anesthetic technique, estimated blood loss (EBL), length of hospital stay, and maternal and fetal outcome. Placenta previa was defined as per hospital protocol as placenta that by ultrasound is partially or completely covering the internal os of the cervix. The placenta previa was classified as types 1-4. Types 1 and 2 are minor, and 3 and 4 are considered as major placenta previa. The nature of cesarean section was either elective or emergency as defined by the absence or presence of labor. The blood loss was based on visual estimation of abdominal swabs and the volume in the suction bottle. Women with diagnosis of abruptio placenta were not studied.

Data are presented as frequency and percentages. Parametric data are summarized as mean (SD) and categorical data analyzed using Fishers exact test. For statistical tests, a *p*-value less than 0.05 was considered significant. All data analyses were performed with GraphPad Instat 3.0.

**Results.** A total of 126 patients had cesarean section for placenta previa. Medical records for 81 patients (64.3%) were available for analysis. The characteristics of the patients indicate the mean maternal age (+SD) of the patients as 30.5 ± 5.2 years, and the mean gestational age (+SD) was 36.8 ± 2.8 weeks. Fifty-eight (71.6%) of the parturients were multiparous. Barely half of the patients (n=48) received antenatal care in the hospital. Fifty-five (67.9%) women had APH. A history of previous uterine surgery was present in 12 patients (14.8%). Major placenta previa (types 3 and 4) was seen in 41 patients (50.6%) and 40 patients (49.4%) had minor placenta previa. Table 1 presents the perioperative clinical variables. Most of the patients with placenta previa had emergent cesarean section. Fifty-two patients had general anesthesia, and 35.8% received spinal anesthesia. A total of 18 patients had blood transfusion (Table 1). Table 2 compares the technique of anesthesia and outcome in women with placental previa. There was a three-fold chance of general anesthesia if APH was present (*p*=0.03, odds ratio=3.1, 95% Confidence

**Table 1** - Perioperative clinical variables (N=81).

Variable	Frequency (%)
<i>Type of Cesarean-section</i>	
Elective	20 (24.7)
Emergency	61 (75.3)
<i>Anesthesia</i>	
General anesthesia	52 (64.2)
Spinal anesthesia	29 (35.8)
Estimated blood loss (mL)	653.7±266.9
<i>Transfusion</i>	
Preoperative	1 (1.2)
Intraoperative	13 (16.1)
Postoperative	4 (4.9)

**Table 2** - Technique of anesthesia and outcome.

Variable	General anesthesia	Spinal anesthesia
Antepartum hemorrhage	37*	13
No bleeding	15	16
Estimated blood loss (mL)	672.4±226.2	643.3 ± 288.7
Transfusion	14	4
Apgar at one min <7	26†	1
Stillbirths	3	1

\**p*=0.03, OR = 3.1, 95%, CI = 1.2-7.8,  
 †*p* < 0.0001, OR = 2.0, 95%, CI = 1.5-2.7

Interval=1.2-7.8). General anesthesia was associated with lower one-minute Apgar scores. Transfusion occurred more in the general anesthesia group as against women receiving spinal anesthesia, although this did not achieve statistical significance.

**Discussion.** Placenta previa, a positional disorder of the human placenta wherein its insertion overlaps the internal cervical os or in close proximity, could lead to major maternal hemorrhage. What constitutes the best technique of anesthesia for cesarean section in women with placenta previa is controversial.<sup>5</sup> Little evidence exists regarding the best anesthetic care of women with placenta previa. Surveys have shown that there is a place for regional anesthesia in the management of patients with placenta previa.<sup>5,6</sup> These surveys at best reflect intentions, and not the actual decisions in real time clinical practice. Thus, this study attempts to identify factors that may determine the choice of anesthetic technique for cesarean section in pregnancies complicated by placenta previa. Our data shows that spinal anesthesia or general anesthesia could be used in the anesthetic management of women with placenta previa for cesarean section. Indeed, over a third (35.8%) of the patients received spinal anesthesia for the cesarean section particularly those without APH.

There are 2 main concerns with the use of regional techniques in the setting of placenta previa by anesthetists. Firstly, impaired cardiovascular reflexes during extensive regional block exist in all patients.<sup>7</sup> This may be made worse, and poorly tolerated in the event of significant intraoperative hemorrhage in patients with placenta previa. Secondly, the management of significant hemorrhage in the awake and conscious patient remains a challenge to the anesthetist, and may worry the patient. Nevertheless, these concerns can be sufficiently addressed in patients who are not actively bleeding, hemodynamically stable, and undergoing elective cesarean section. A well-conducted spinal anesthesia and prophylactic use of fluids and vasopressors should maintain adequate circulatory volume and improve outcome.

In a previous study, Parekh et al<sup>8</sup> demonstrated that up to 60% regional anesthetic cesarean section in patients with placenta previa, and spinal anesthesia accounting for 45%. McShane et al<sup>9</sup> reported an incidence of 25% of regional anesthesia without maternal morbidity or mortality. The use of spinal anesthesia in the present study (35.8%) is comparable with the above reports. In addition, our study indicates that significant antepartum bleeding may provoke the choice of general anesthesia for cesarean section in women with placenta previa. However, there was no significant difference in the EBL between patients who received general anesthesia

or spinal anesthesia. The absence of difference may be related to the limited number of case notes available for analysis. Nevertheless, general anesthesia for women with placenta previa has been showed to increase EBL, risk of blood transfusion, and lower postoperative hemoglobin concentration.<sup>10</sup> These differences in the EBL may be related to the limitations in the use of EBL, which underestimates the real blood loss,<sup>11</sup> and often does not reflect the total perioperative blood loss.<sup>12</sup>

Advancement in imaging medicine has enhanced prenatal diagnosis of placenta previa. The benefits of prenatal diagnosis of placenta previa are lost to the poor utilization of antenatal facilities in Nigeria. An issue such as this has remained a major challenge to improved management of the obstetric patients in Nigeria.<sup>13</sup> It is not surprising therefore that approximately three-quarters of the patients had emergency cesarean section. It is not clear from our data the proportion of women without antenatal care in the population of patients who had emergency cesarean section. It could be speculated, however, that the women who did not receive antenatal care in hospital would form a sizable proportion of the emergency cesarean section group. The hospital protocol allows for routine ultrasound scanning for placental localization. Second, the hospital is a referral center for 3 of the 36 states in Nigeria. Undiagnosed placenta previa and intrapartum diagnosis of placenta previa may account for some of the reasons for urgent surgery. Varying data exists on the effect of anesthetic technique on neonatal Apgar scores and other parameters of assessing neonatal well-being. Gordon et al<sup>14</sup> reported that for both emergency and elective cesarean sections, significantly more infants in the general anesthesia group required active resuscitation. The implication of their study is that low Apgar scores occur commonly with general anesthesia, as also demonstrated in our study. However, the relationship between general anesthesia and neonatal outcome in women with placenta previa is not simple. It is well established that the optimal anesthetic choice depends on the clinical condition. The comparison of Apgar scores after general anesthesia and spinal anesthesia, in the setting of placenta previa could be complex. Placenta previa, on its part, is associated with lower Apgar scores,<sup>15</sup> and poor neonatal outcome<sup>16</sup> when compared with neonates among non-placenta previa births. Fetal growth restriction<sup>16</sup> and preterm deliveries<sup>16,17</sup> have been associated with such poor neonatal outcomes. Furthermore, general anesthesia was more likely if there was APH, which may provoke preterm delivery by cesarean section in women with placenta previa. Therefore, the clinical significance of lower Apgar scores in the general anesthesia group is limited by our inability to compare patients with similar

clinical situations of placenta previa with those receiving spinal anesthesia for cesarean section.

There are some limitations to the interpretations of these findings. It is a retrospective evaluation with its inherent problems. In particular, the number of patients' records retrieved was rather low. Medical record keeping is a major problem in developing countries.<sup>18</sup> Nevertheless, the relationship between antepartum bleeding and the choice of anesthetic technique remains a major strength of this study. Indeed, Bhat et al<sup>19</sup> observed that nearly two-thirds of pregnancies complicated by placenta previa resulted in antepartum bleeding.

In conclusion, this retrospective study evaluated the factors that may affect the anesthetic choices for cesarean section for placenta previa. General anesthesia and spinal anesthesia were used in this series. There was a threefold risk of general anesthesia if there was antepartum bleeding. Spinal anesthesia may be useful in patients with placenta previa, particularly those without APH.

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