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ORIGINAL ARTICLE

Clinical Audit for the Management of Placenta Previa at the International General Hospital

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Abstract

Background: **The internal cervical os is directly over or extremely close to the placenta in placenta previa (PP). The high rates of maternal and fetal morbidity and mortality caused by PP place a significant burden on medical resources. The frequency of cases of PP and associated complications, such as placenta accreta (PA), will grow as maternal age and the prevalence of caesarean sections rise.**

Aim and objectives: **To compare the management of placenta previa to standard management according to international guidelines.**

Patients and methods: **This study is a cross-sectional observational study, which was conducted at Luxor International Hospital, Gynecology, and Obstetrics Department on all patients with placenta previa from 1/3/2020 to 28/2/2021.**

Result: **Close liaison with the hospital laboratory, use of preoperative ultrasonography, and use of pharmacological and surgical measures to control hemorrhage were 100% positive. Availability of rapid infusion and warming devices and the use of intraoperative ultrasonography were 100% negative.**

Conclusion: **One of the biggest treatment challenges in modern obstetrics is placenta previa. It occurs more frequently as the number of cesarean sections increases. It is challenging to validate this condition's prenatal diagnosis, which frequently occurs.**

Keywords: General obstetrics, Maternal medicine, PAS, Placenta previa

1. Introduction

In placenta previa, the placenta either entirely or partially covers the internal os of the cervix.[1] The frequency of placenta previa, which impacts 0–2% of pregnancies in the third trimester, has increased due to the rising prevalence of caesarean procedures.[2] Most cases are detected by sonography in the first trimester of pregnancy, although some women may arrive at the emergency room in the second or third trimester of pregnancy with painless vaginal bleeding.[3]

A history of advanced maternal age (>35 years), multiparity, smoking, a history of curettage, usage of cocaine, and a history of caesarean section are risk factors for placenta previa (s).[4] It is a significant risk factor for postpartum hemorrhage and can cause both maternal and neonatal morbidity and mortality (Jing L et al., 2018).

Due to the circumstances, a cesarean section must be performed to deliver the newborn. A woman's risk for placenta accrete spectrum (PAS) can also rise in the presence of placenta previa.[3]

Accreta, increta, and percreta of the placenta are included in this spectrum of ailments. Placenta previa-related bleeding can cause postpartum hemorrhage, which necessitates blood transfusions, hysterectomy, hospitalization to a hospital's urgent care unit, and even death for the mother.[5]

Regardless of the method of delivery, postpartum hemorrhage is defined as blood loss of more than or equal to 1000 ml, which occurs within 24 h after

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delivery and is accompanied by signs or symptoms of hypovolemia. If a patient with PAS wants to get pregnant, there is a conservative management option. Until the placental bed is revascularized and the remaining placental tissue can be removed more safely or resorbs on its own, the placenta can be kept in place. Following cautious therapy, great fertility rates have been observed in several investigations. However, the rate of placenta accrete recurrence is considerable, ranging from 17 to 29%.[6]

2. Patients and methods

This study, which was carried out at the Gynecology and Obstetrics Department of Luxor International Hospital, was cross-sectional and observational. This study included all patients with placenta previa during the period from 1/3/2020 to 28/2/2021.

2.1. Inclusion criteria

All patients admitted to Luxor International Hospital from 1/3/2020 to 28/2/2021 with a diagnosis of placenta previa at 28 weeks or beyond and all types of placenta previa.

Exclusion criteria: Normally situated placenta.

2.2. Patient information

Explain details of the aim of the work to all patients.

2.3. Data collection

All participants were subjected to the following:

Consent to this participation.

Complete history taking: Personal history, menstrual (accurate last menstrual dates, gestational age by Naegele's rule), obstetric (regarding parity, gravidity, previous caesarean section), present, past, and family history.

Physical examination: General examination (body mass index, blood pressure, and other signs) Obstetric abdominal examination (fundal level, fetal presentation, lie, and scars of previous operations).

Investigation: Ultrasound for the diagnosis of placental site, gestational age confirmation, fetal presentation, exclusion of placenta accreta and congenital anomalies, and Doppler ultrasound versus MRI. Complete blood count, Rh and blood group, coagulation profile, renal, and liver function tests.

Different ways of management plan for every patient will be recorded.

Post management follow-up of 48 h stay in hospital with neonatal evaluation, which will include neonatal gestational age, birth weight, 1- and 5-min Apgar scores, enrollment in the newborn critical care unit, and any additional difficulties. Care of the mother: follow-up of vital signs 'blood pressure, temperature, pulse, respiratory rate,' regular per vaginal 'P.V' examination, and urinary output.

2.4. Ethical consideration

All procedures involving human subjects carried out for this study complied with the ethical guidelines established by the ethics committee of Al-Azhar University and any later changes or equivalent ethical guidelines. All study participants were given the go-ahead after providing informed permission. There was privacy for participants and confidentiality of data.

3. Results

As regards hospitalization in case of recurrent bleeding, it was positive in 22% and negative in 78%. Counseling about preterm labor in the third trimester was positive in 54% and negative in 46%. Use of cervical cerclage was 100% negative. Antenatal corticosteroid therapy was positive in 83% and negative in 17%.The use of tocolysis in the presence of symptoms was positive in 18% and negative in 82%. Gestation at which delivery occurred (bet.36w and 37w) was positive in 80% and negative in 20%.

Discussion before delivery with partners and the availability of blood transfusion services (blood bank) were 100% positive. Prevention and treatment of anemia during the antenatal period was positive in 93%. Surgical procedures carried out by an experienced operator and the presence of a senior obstetrician and senior anesthetist (usually a consultant) were 100% positive. Regional anesthesia in placenta previa was positive in 34% and negative in 66%.

Close liaison with the hospital laboratory, use of preoperative ultrasonography, and use of pharmacological and surgical measures to control hemorrhage were 100% positive. The availability of rapid infusion and warming devices and the use of intraoperative ultrasonography were 100% negative.

CS hysterectomy in placenta previa was positive in 4% and negative in 96%. Delivery for women diagnosed with PAS in a specialist center with ICU, NICU, gestation of delivery for PAS (bet.35w and 36 + 6 w), women with PAS understand risks of CS and risks of PAS, delivery for women with PAS managed by multidisciplinary team and CS

Table 1. Demographic characteristics of the studied group.

	Range	Mean ± SD
Age	20–44	31.64 ± 6.18
20–29	36 (36.0%)	
30–39	52 (52.0%)	
40–49	12 (12.0%)	
Parity	0–8	2.32 ± 1.52
Prev. CS	0–8	2.08 ± 1.39
Abortion	0–3	0.34 ± 0.71
BMI	18–30	23.88 ± 3.51
GA at admission (week)	28–39	36.25 ± 2.44
GA at termination (week)	28–39	36.26 ± 2.44
	Number (%)	
Occupation		
Housewife	95 (95.0)	
Employer	5 (5.0)	
Residence		
Rural	26 (26.0)	
Urban	74 (74.0)	
Smoking		
No	100 (100.0)	

Table 2. Medical and surgical history of the studied group.

	Number (%)
Past history	
Not DM	94 (94.0)
DM	2 (2.0)
GDM	3 (3.0)
Hist. of GDM	1 (1.0)
Past history	
HTN	1 (1.0)
Hist. of preeclampsia	1 (1.0)
HTN	2 (2.0)
Not HTN	94 (94.0)
Not HTN, asthmatic	1 (1.0)
Preeclampsia	1 (1.0)
Family history	
No similar condition	99 (99.0)
Family history of twins	1 (1.0)
Other uterine operation	
No	99 (99.0)
Myomectomy	1 (1.0)
Hist.of P.Previa	
No	97 (97.0)
Yes	3 (3.0)
Blood transfusion during current pregnancy	
No	84 (84.0)
Once	13 (13.0)
Twice	3 (3.0)

Table 3. Preoperative laboratory investigation.

Before	Range	Mean ± SD
Hb%	7–12.8	11.09 ± 1.17
Hct	22.8–40.9	32.07 ± 4.17
PT	11.4–14.7	12.87 ± 0.72
INR	0.88–1.3	1.04 ± 0.07
S.urea	15–40	27.78 ± 6.56
S.creat.	0.4–1.4	0.79 ± 0.22
RBS	60–240	97.72 ± 23.23

Table 4. Postoperative laboratory investigation.

After	Range	Mean ± SD
Hb%	6.3–11.7	9.75 ± 1.01
Hct.	16.9–34.6	28.41 ± 3.29
PT	11.2–14.8	13.02 ± 0.69
INR	0.81–12.1	1.17 ± 1.11
S.urea	18–128	33.24 ± 14.92
S.creat.	0.5–7	1.03 ± 0.66
RBS	75–261	119.39 ± 22.2

Table 5. EFW, APGAR score, and admission to the NICU.

	Range	Mean ± SD
EFW(kg)	800–4000	2720.9 ± 772.05
APGAR score 1st	0–10	7.19 ± 2.36
APGAR score 2nd	8–10	9 ± 1.41

hysterectomy in PAS was positive in 3% and negative in 0% Tables 1–7.

4. Discussion

Pregnant women are frequently in danger of losing their lives due to placenta previa, the most prevalent cause of postpartum hemorrhage. Growing numbers of scientists now concur that the outcome of a pregnancy is significantly influenced by the position of the placenta previa.[7]

This study aims to compare the management of placenta previa to standard management according to international guidelines. This cross-sectional observational study was conducted on patients, who underwent cesarean section procedures in the Gynecology and Obstetrics Department of Luxor International Hospital. It included all patients with placenta previa from 1/3/2020 to 28/2/2021. In our results, as regards methotrexate adjuvant therapy in expectant management of PAS, it was 1 %. Our results were supported by an audit study conducted by **Pande & Shetty**.[8] They reported that four patients (6.6 %) had hysterectomy, and four more (6.6 %) had uterine artery ligation, uterine compression suture insertion, intrauterine balloon tamponade, or a combination of the aforementioned procedures. One of them was a patient who had a

Table 6. Cervical length measurement and surgical hemostatic techniques.

	Number (%)
Cervical length measurement	**0 (0.0)**
Surgical hemostatic techniques	
B.lunch	3 (1.0)
Modified B.lunch	1 (1.0)
Methotrexate adjuvant therapy in expectant management of PAS	**1 (1.0)**

Table 7. RCOG standard of the studied group.

	Positive number (%)	Negative number (%)
Hospitalization in case of recurrent bleeding	22 (22.0)	78 (78.0)
Counseling about preterm labor in the third trimester	54 (54.0)	46 (46.0)
Use of cervical cerclage	0 (0.0)	100 (100.0)
Antenatal corticosteroid therapy	83 (83.0)	17 (17.0)
Use of tocolysis in the presence of symptoms	18 (18.0)	82 (82.0)
Gestation at which delivery occurred (bet.36w and 37w)	80 (80.0)	20 (20.0)
Discussion before delivery with partners	100 (100.0)	0 (0.0)
Availability of blood transfusion services (blood bank)	100 (100.0)	0 (0.0)
Prevention and treatment of anemia During the antenatal period	93 (93.0)	7 (7.0)
Surgical procedures carried out by an experienced operator	100 (100.0)	0 (0.0)
Presence of a senior obstetrician and senior anesthetist (usually a consultant)	100 (100.0)	0 (0.0)
Regional anesthesia in placenta previa	34 (34.0)	66 (66.0)
Close liaison with the hospital laboratory	100 (100.0)	0 (0.0)
Availability of rapid infusion and warming devices	0 (0.0)	100 (100.0)
Use of preoperative ultrasonography	100 (100.0)	0 (0.0)
Use of intraoperative ultrasonography	0 (0.0)	100 (100.0)
Use of pharmacological and surgical measures to control hemorrhage	100 (100.0)	0 (0.0)
CS hysterectomy in placenta previa	4 (4.0)	96 (96.0)
Delivery for women diagnosed by PAS in a specialist center with ICU, NICU	3 (3.0)	0 (0.0)
Gestation of delivery for PAS (bet.35w and 36 + 6 w)	3 (3.0)	0 (0.0)
Women with PAS understand the risks of CS and the risks of PAS	3 (3.0)	0 (0.0)
Delivery for women with PAS managed by a multidisciplinary team	3 (3.0)	0 (0.0)
Delivery by spinal anesthesia in PAS	0 (0)	0 (0.0)
CS hysterectomy in PAS	3 (3.0)	0 (0.0)

history of four previous CS, a bladder invasion, and an initial pregnancy with an anterior placenta previa/percreta. Her CS procedure was performed using a standard upper segment incision while the placenta was allowed to involute. She was given methotrexate in an effort to speed involution because she continued to experience intermittent bleeding symptoms. While two other women in **Lee *et al.***[9] underwent a scheduled delayed simple hysterectomy after vascular embolization, cautious placenta care, and methotrexate therapy in asymptomatic women; elective caesarean delivery is not advised before 38 weeks of pregnancy for placenta previa or before 36–37 weeks of pregnancy for suspected placenta accrete, according to RCOG.[10] In some circumstances, tocolysis for the treatment of bleeding brought on by placenta previa may be helpful. The agent and ideal regimen are still being defined, although betamimetics were used in the research conducted thus far and are known to be associated with severe side effects: In this area, more research is required. Cervical cerclage is a procedure used to stop bleeding and lengthen pregnancy, although there is insufficient data to justify its use outside of a clinical trial. Our results showed hospitalization in case of recurrent bleeding, positive in 22% and negative in 78%. Counseling about preterm labor in the third trimester was positive in 54% and negative in 46 %. Use of cervical cerclage was 100% negative. Antenatal corticosteroid therapy was positive in 83% and negative in 17%. Use of tocolysis in the presence of symptom was positive in 18% and negative in 82%. Gestation at which delivery occurred (bet.36w and 37w) was positive in 80% and negative in 20%. Despite the fact that placenta previa and placenta accreta cause 40% of women to deliver before 38 + 0 weeks of pregnancy, these situations are unanticipated and could only be avoided by a policy of delivery at 32 weeks of gestation. This is desired because to infant morbidity, but delaying too long also raises the possibility of neonatal death. Although individual characteristics should be taken into consideration, planned delivery at around 36–37 weeks of gestation is indicated due to the preparation needed for the very high-risk patients suspected of having placenta accreta.[10]

In the **Addley *et al.***[11] retrospective case note, audits of all deliveries involving placenta previa were conducted. Using criteria and standards from RCOG Green Top Guideline 27, it was discovered that 16 women (or 50%) had elective caesarean sections, of which 8 (or 50%) were delivered prior to 38 weeks. Ten women (or 36% of patients) underwent emergency caesarean sections, whereas two patients underwent routine deliveries.

The present study showed that discussion before delivery with partners and availability of blood transfusion services (blood bank) were 100% positive. Prevention and treatment of anemia during the

antenatal period was positive in 93%. Surgical procedures carried out by an experienced operator and presence of a senior obstetrician and a senior anesthetist (usually a consultant) were 100% positive. Regional anesthesia in placenta previa was positive in 34% and negative in 66%.

In accordance with our study, the audit study of **Pande & Shetty**[8] stated that the case notes-based preoperative counseling for CS was reviewed.

To ensure adoption of standardized and adequate counseling for the management of such a high-risk surgical procedure, it seems that counseling for blood transfusion, hysterectomy, interventional radiology, and other surgical procedures, such as inserting an intrauterine balloon for tamponade, uterine compression suture, or ligating uterine/iliac arteries, were not well documented and could be improved. This is also supported by the results of **Kocaoglu *et al.***,[12] who concur that regional anesthesia is safe in the absence of an abnormal or intrusive placentation. **Dinsmoor *et al.***[13] retrospectively evaluated 88 women who had placenta previa, and only 12 (14%) of them would have qualified for autologous blood donation or transfusion. Only 2 of 12, who needed a combined 12 and 18 units of blood, needed blood transfusions during delivery. The RCOG opposes this procedure, which is only permitted under current law in the European Union's blood institutions.[14]

The current study showed that close liaison with the hospital laboratory, use of preoperative ultrasonography, and use of pharmacological and surgical measures to control hemorrhage were 100 % positive. Availability of rapid infusion and warming devices and use of intraoperative ultrasonography were 100% negative.

Our results were supported by the study of **Pande & Shetty**[8] as they stated that:

At the 20-week detailed scan, the placenta placement was discussed with each patient in this series. Transabdominal scans were used to diagnose the majority of PPs; 17% of patients had further TVS to confirm the aberrant placental location (in the third trimester). To rule out placenta accreta, a tiny percentage (4/60; 6.6%) received magnetic resonance imaging (MRI). In two individuals (3.3%), a previa/accreta combination was confirmed. At the 20-week scan, just 45% of the total PP was diagnosed. The remaining cases were split into three groups: 15% were discovered after a scan for an unrelated condition; 30% were discovered only after admission for APH; and 10% were discovered during a growth scan (high head, follow-up of fibroid, preterm prelabor rupture of membranes, and an incidental diagnosis during a private 3D scan).

In the **Addley *et al.***[11] study, follow-up imaging procedures were carried out at 32 weeks in 96% of cases (transabdominal 89%, transvaginal 7%). Two out of seven women who had prior caesarean deliveries underwent MRIs. To diagnose placenta previa, they came to the conclusion that transvaginal ultrasound and MRI should be used more frequently. In the study in our hands, CS hysterectomy in placenta previa was positive in 4% and negative in 96%. Delivery for women diagnosed by PAS in a specialist center with ICU, NICU, gestation of delivery for PAS (bet.35w and 36 + 6 w), women with PAS understand risks of CS and risks of PAS, delivery for women with PAS managed by multidisciplinary team, and CS hysterectomy in PAS was positive in 3% and negative in 0% RCOG Consent Advice No.7: Caesarean section outlines the fundamental methods for approaching and obtaining consent for a caesarean section; nevertheless, placenta previa significantly raises the risk of serious hemorrhage by a factor of roughly 12. This should be discussed together with any potential blood transfusion needs. The risk of the procedure is increased when hysterectomy is paired with a prior caesarean section.[15]

In addition, **Pande and Shetty**[8] showed that most patients had minimal blood loss and that only a very small percentage needed more volume support than crystalloid or colloid. The majority of surgical outcomes were positive, with 87% being handled with a smooth CS. Similar to ours, examples of delayed hysterectomy have been documented 8 weeks following the first procedure, where bladder involvement was present.[16]

However, in the study of **Addley *et al.***,[11] hemorrhage, transfusion, and hysterectomy consent rates were 96%, 85%, and 73%, respectively, among women having caesarean sections.

4.1. Conclusion

Placenta previa is one of the greatest treatment challenges in current obstetrics. Its occurrence is rising in association with the rising rate of cesarean sections. Prenatal diagnosis of this condition is difficult and so often cannot be confirmed. A multidisciplinary team method and preparation is necessary to manage this challenging condition, which can lead to neonatal and maternal morbidity and mortality.

Consent for publication

All authors have agreed to submit the work.

Availability of data and material

Available.

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Conflicts of interest

The authors declared that there were no conflicts of interest.

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